DENOMINAL VERBS IN BRAZILIAN PORTUGUESE: DISTINGUISHING BETWEEN DIACHRONIC AND SYNCHRONIC STRUCTURES WITHIN DISTRIBUTED MORPHOLOGY APPROACH

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■ ABSTRACT: Recent work on argument structure has shown that there must be a synchronic relation between nouns and derived verbs that can be treated in structural terms. However, a simple phonological/morphological identity or diachronic derivation between a verb and a noun cannot guarantee that there is a denominal structure in a synchronic approach. In this paper we observe the phenomenon of Denominal Verbs in Brazilian Portuguese and argue for a distinction between etymological and synchronic morphological derivation. The objectives of this paper are 1) to identify synchronic and formal criteria to define which diachronic Denominal Verbs can also be considered denominal under a synchronic analysis; and 2) to detect in which cases the label "denominal" can be justifiably abandoned. Based on results of argument structure tests submitted to the judgments of native speakers, it was possible to classify the supposed homogenous Denominal Verbs class into three major groups: Real Denominal Verbs, Root-derived Verbs, and Ambiguous Verbs. In a Distributed Morphology approach, it was possible to explain the distinction between these groups based on the ideia of phases in words and the locality of restriction in the interpretation of roots.

■ KEYWORDS: Denominal verbs. Morphosyntax. Argument structure. Distributed morphology. Phases.

Introduction: what is a Denominal Verb?[1]

From an etymological point of view, a Denominal Verb (DV) is historically derived from a nominal base. Traditionally, dictionaries consider a verb as denominal when its cognate nominal form is older than the verbal one in language records. For example, the verb *arcar* (to handle) in Portuguese is considered etymologically derived from the noun *arca* (ark); however, it seems that native speakers of Brazilian Portuguese (BP) do not recognize this historical relation anymore. Therefore, the following question arises: are there real DVs in synchronic terms?

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[1] This paper discusses the main points of my master's thesis *Formação e interpretação dos verbos denominais do Português Brasileiro* (BASSANI, 2009).

Previous treatments of BP data regarding verb derivation focused on diachronic approaches or in lexicalist approaches by word formation rules located in the mental lexicon (BASILIO, 1993), like these exemplified in (1) for a suffixal formation and (2) for the so called parasynthetic formation (simultaneous addition prefix and suffix):

Lexical Rules of verb formation from nouns:

(1) $[X]_N \rightarrow [\,[X]_N a^2]_V$ ex: *arca* ('ark') → *arcar* ('to handle')

(2) $[X]_N \rightarrow [\,\text{pref}\,[X]_N a]_V$ ex: *conselho* ('advise') →*aconselhar* ('to advise')

This kind of description blends often with the diachronic perspective and does not reveal much about the nature of the relationship between verb and noun and about how the actual speaker "sees" the internal structure of these verbs. However, recent work within Generative Grammar framework about argument structure has shown that there must be a synchronic relation between nouns and derived verbs that can be treated in structural terms (KYPARSKY, 1997; HALE; KEYSER, 2002; HARLEY, 2005; ARAD, 2003).

So far, we saw that there are at least two basic ways of treating what is called a DV: from a synchronic or from a diachronic perspective and it is a fact that this distinction is not so clear in many approaches. In order to clarify this question, it is necessary to make a distinction between etymological and synchronic criteria in the definition of DVs.

As the historical treatment has already been well discussed by common and etymological dictionaries (FERREIRA, 1988; CUNHA, 1999), the aims of this paper are: i) to identify synchronic and formal criteria to establish which DVs, from a diachronic perspective, can be considered denominal under a synchronic analysis of word formation; ii) to detect in which cases the internal structure of the verb asks for the abandonment of the label "denominal".

After denying a lexicalist analysis based on word formation rules (BASÍLIO, 1993),[3] we offer a treatment based on lexical-syntactic approaches such as Hale and Keyser (2002) (henceforth H&K), but mostly based on Distributed Morphology model (pure syntactical approach) (HALLE; MARANTZ, 1993; HARLEY; NOYER, 1999), more specifically, based on ideas from Arad (2003) and Marantz (2001, 2008).

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[2] Verbal Theme Vowel for the first conjugation class in Portuguese. New verbs are always formed following the pattern of the first conjugation pattern.

[3] Due to space limitations, we do not include the whole argumentation for not assuming such an approach. For a complete discussion see Bassani (2009).

Summary of Methodology: the data

There is an open discussion about the definition of the direction of the derivation between nouns and verbs in Portuguese. For example, it is not sure whether the verb *dançar* ('to dance') is a DV (from the noun *dança* 'dance') or whether the noun *dança* is a deverbal one (from the verb *dançar*). Therefore, simple phonological/morphological identity between a verb and a noun are not sufficient to determine that the verb is denominal. Alternatively, tests involving the argument structure determined by a certain verb constitute a more reliable indicator for this relation.

Based on this idea, we collected a sample of 4.548 etymologically DVs of Portuguese language from the dictionary *Dicionário Houaiss da Língua Portuguesa* (2002)[4] and reduced it to a sample of 95 verbs according to a frequency criterion.[5] These verbs constitute in fact the object of this study.[6] In sequence there are a few examples of the general morphological form of the collected verbs':

(3) Formed through suffixal derivation (noun + verbal suffix):

a. *Martelo*$_N$ + *-ar* > *martelar*$_V$
Hammer +TV.INF[1] > 'to hammer'

b. *Cristal*$_N$ + *-iz-ar* > *cristalizar*$_V$
Crystal + V- TV.INF > 'to crystallize'

(4) Formed through parasynthetic derivation (prefix + noun + verbal suffix):

a. *en-* + *gaveta*$_N$ + *-ar* > *engavetar*$_V$
PREF + drawer + TV.INF > To drawer

b. *a-* + *crédito*$_N$ + *-ar* > *acreditar*$_V$
PREF + credit + TV.INF > 'to believe'

We submitted all the verbs to the argument structure tests suggested by Kyparsky (1997), Hale and Keyser (2002) and Arad (2003) as likely indicators of a

[4] We acknowledge Mario Viaro (DLCV-USP) for relevant comments about historical morphology and Zwinglio Guimarães (IF-USP) for data extraction from the dictionary.

[5] In order to systematically measure the frequency of each verb, we collected results from the Google search engine (www.google.com.br), restricted by the following filters: pages written in Portuguese and located in Brazil. We thank Fidel Beraldi for that.

[6] The list with the 95 most frequent etymological Denominal Verbs is included in Appendix 1.

nominal layer within a verbal structure. The tests are: presence of Periphrastic Expression (Test 3); Presence of Cognate Object (Test 4); Presence of Cognate Adjunct (Test 5); Presence of Hyponym and Hypernym Adjunction (Test 6). We also tested the verbs for the possible alternations of syntactic structure: Inchoative-Causative Alternation (Test 1) and Middle Alternation (Test 2). The hypothesis is that if a verb is judged as grammatical when framed in a sentence resulting from tests 3 through 6 this will mean that we have a synchronic DV.

As the main issue in this paper is to recognize whether an analysis of denominal derivation can be maintained in synchrony, we give special attention to tests 3, 5 and 6 that deserve a more detailed explanation. The reason why we have not included test 4 as a recognizer of denominal structures will be explained in the next sections.

Test 3: Periphrastic Expression

Certain verbs can be paraphrased by analytical forms (light verb + noun) and it may be an indicator of the presence of nouns within their structures. For example, unergative verbs like **to laugh** and **to dance** can be correlated to structures like **make/do a laugh** and **make/do a dance**, while unaccusative verbs like **to redden** and **to clear** can be related to periphrases such as **make/turn red** and **make/turn clear**. Moreover, DVs of the type called location/locatum can be correlated to periphrastic structures with a light verb, such as **put the books on the shelf (to shelf the books)** or **get the horse with the saddle (to saddle the horse***)*. The same holds for Portuguese corresponding verbs *dançar*, *avermelhar*, *clarear* or *esclarecer*, *empratelleirar* and *selar*.

The hypothesis behind this test is that the periphrastic structure reveals that the verbs had in their internal structure a noun, so the prediction is that DVs can be paraphrased by a light verb and the noun that formed this DV; internal to it. See the example with the verb *fazer* (to do) + noun in BP:

(5) *O João criticou a seleção brasileira.*
The John criticize.PST.3.S the team Brazilian.[7]
'John criticized the Brazilian soccer team.'

(6) *O João fez uma crítica à seleção brasileira.*
The John make. PST.3.S a criticism to team Brazilian.
'João made a critic on the Brazilian soccer team.'

[7] All the examples with verbs are in indicative mood form. Brazilian Portuguese presents three moods: indicative, subjunctive and imperative. Glosses – PST=Past; PRS=Present; 3=Third Person; S=Singular; PL=Plural.

Test 4: Cognate Object

It is assumed in the literature that English unergative DVs allow, in general, the occurrence of a cognate object (HARLEY, 2005). The same seems to happen with Portuguese verbs *dançar* ('to dance'), exemplified in (7), *rir* ('to laugh'), *correr* ('to run') among others (LEUNG, 2007). Transitive verbs with the occurrence of cognate objects are much less common and, as all the verbs selected for our study were transitive in nature with some intransitive alternation, the test 4 was not so relevant for the discussion of our data. Some of the collected DVs allowed for the presence of a cognate object (8) and others did not (9). However, it is not clear for us if it is due to the nature of the syntactic structure (unergative or transitive) or to the semantic nature of the verb. We will return to this point below:

(7) *Ela dançou uma dança esquisita.*
She dance. PST.3.S a dance weird.
'She danced a weird dance.'

(8) *O sorteio agrupou três grupos de times bons.*
The raffle group.PST.3.S three groups of teams good.PL.
'The raffle grouped three groups of good teams.'

(9) **Ela praticou uma prática de yoga tranquila.*
She practice. PST.3.S a practice of yoga calm.
'She practiced a calm yoga practice.'

Test 5: Cognate Adjunct

In sentences with DVs, the noun within the verb can be incorporated in the adjunct phrase since it is modified by some element adding new information, in general an adjective, as exemplified in (10). This seems to be indirect evidence for the morphological and semantic relation between noun and verb. Notice that a completely semantic unrelated noun in the adjunct position raises some kind of oddity for the sentence in (11).

(10) *João criticou a seleção brasileira com uma crítica construtiva.*
John criticize. PST.3.S the team Brazilian with a criticism constructive.
'John criticized the Brazilian soccer team through a constructive criticism'.

(11) #*João criticou a seleção brasileira com uma oração construtiva.*
John criticize. PST.3.S the team Brazilian with a prayer constructive.
'John criticized the Brazilian soccer team with a constructive prayer.'

T6: Hyponyms and Hypernyms adjuncts

The inner noun within the verb can have a semantically related, but not morphologically identical, noun in the adjunct position, as shown in the sentence (12) where *parecer* ('feedback') is a hypernym of *crítica* ('criticism').

(12) *João criticou a seleção brasileira com um parecer negativo.*
John criticize. PST.3.S the team Brazilian with a feedback negative.
'John criticized the Brazilian soccer team with a negative feedback.

In sum, tests 1 and 2 identify the syntactic structure of the verb, whether they can undergo alternation, while tests 3-6 indicate the type of relationship established between the noun and the DV. The prediction is that synchronic DVs are able to form grammatical sentences when submitted to these tests of argument structure.

Arad (2003) proposed three criteria for distinguishing words derived from roots and words derived from other actual words in the language: phonological identity criterion; morphological identity criterion; semantic identity criterion. According to this view, there are phonological, morphological and semantic clues for the identification of a noun within a verb. The methodology of data selection for this research assured that all nouns had morphological and phonological identity with historical related verbs. Thus, it was only necessary to investigate more deeply the semantic identity criteria, what could be done through tests 3-6.

For each of the 95 verbs selected we formed six sentences, one for each test of argument structure plus a basic sentence. In sequence, all the sentences were submitted to the grammaticality judgment of 40 native speakers of Brazilian Portuguese leading to the generalizations briefly described in the next section.

Summary of generalizations[8]

The results of the grammaticality tests showed that there is heterogeneity in the behavior of the general class of etymological DVs. There is a group of verbs to which the tests (grammaticality for tests 3, 5 and 6) indicated a nominal stage in the derivation of the verb (Real DVs) and another group of verbs to which the tests did not indicate the presence of such noun (ungrammaticality for tests 3, 5 and 6): (Root Derived Verbs). Also, in the selected sample, there are verbs that do and that do not allow alternations (grammaticality and ungrammaticality for tests 1 and 2) and, finally, there is an interesting group of verbs for which one

[8] Here we have presented the core aspects of generalizations relevant for analysis purposes. For a detailed view of tests, results and generalizations see Bassani (2009).

meaning indicates the presence of an inner noun and there is a second meaning for which tests point to the absence of this noun. This last group represents a challenge for syntactic theories of word formation that do not have the possibility of resorting to two lexical entries for the same verb. As already pointed out, unlike the expectations, test 4 presented no effect in the recognition of DVs at a first glance. The treatment of this topic needs more attention and will not be discussed in detail here. Finally, for some verbs the judgments by the speakers were so split between grammatical and ungrammatical that it was not possible to classify then among the main groups, they remained undefined. So far, we are faced with the following distribution for the supposed equivalent initial data regarding their relation to an inner noun:

i) Group I: Real DVs

Verbs that include a noun within its derivation (grammatical for tests 3, 5 and 6). In terms of the theoretical view we are assuming, these verbs are characterized by the categorization of a root (√[9]) by a noun (n) and, then, by a verb (v). We observed the presence of sentences containing these verbs with different syntactic behaviors: a) non-alternating DVs: *testar* ('to test'); *aproveitar* ('to take advantage of'), *alimentar* ('to feed'), among others; b) Alternating DVs: *misturar* ('to mix'); *amanhecer* ('to dawn'); *cristalizar* ('to crystallize'), among others; c) Location DVs: *engarrafar* ('to bottle') and *engavetar* ('to put in the drawer'), etc; and locatum DVs: *selar* ('to saddle'), *sinalizar* ('to signal'), etc.

ii) Group II: Root derived verbs

Judgments of ungrammaticality for tests 3, 5 and 6 reveal verbs for which the speakers do not recognize a synchronic derivational relation with the phonological/ morphological related noun. Assuming our theoretical framework, we have to say that in these structures there is a direct categorization of a root (√) by a verb (v), with no nominal stage. Some examples are *brincar* ('to play'); *arrumar* ('to organize'); *desfrutar* ('to enjoy'). Again, among these there are verbs that do (*acabar* – to finish) and that do not alternate (*arrumar* – to organize), showing different syntactic behaviors, although non-alternating verbs are the majority in this subclass.

iii) Group III: Ambiguous Verbs

We classified in this group three interesting verbs that present ambiguous behavior in relation to the tests depending on the meaning they have. Depending

[9] We use the simbol √ to represent roots and distinguish them from bases and whole words.

on the meaning assigned to the verb the tests can result in grammatical or ungrammatical. These verbs are *apontar* (meaning to sharpen or to indicate); *processar* (to prosecute or to process data) and *traçar* (to draw or to plan). We will treat these verbs as DVs or as root-derived ones depending on their behavior with regard to the tests.

In order to provide a plausible explanation to the different behavior of the verbs studied here, as revealed by the tests, instead of assuming that they are a uniform class showing only differences in simple morphological formation as descriptions in and above represent, we assume that their differences (three groups) can be treated in terms of distinct internal syntactic structures. To provide an adequate explanation to the different verb structures distributed in groups i, ii and iii, we resort to a syntactic theory of word formation called Distributed Morphology.

Theoretical Background: a distributed morphology approach

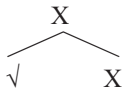
The Distributed Morphology Model (DM), formally introduced by Halle and Marantz (1993), presents an alternative analysis for the treatment of word formation, in which rules are not required as generative mechanisms of the Lexicon.

The main difference of this theory is the assumption that the same operations that form sentences are used to form words. These operations are Merge and Move, syntactic nature operations largely assumed by the Minimalist Program (CHOMSKY, 1995). In a DM approach, the words are not completed units introduced in the syntactic component to form sentences. We could roughly say that words are built together and can influence in the final sentence structure. This assumption is empirically supported by phenomena involving morphological changes caused by syntactic environment[10].

Based on these main assumptions, we treat the differences between the kinds of DVs as reflex of differences in their internal morphological/syntactic structure. We will base our explanation on the distinction between words that are directly derived from a bare root and words that are derived from other words where the root has been previously subcategorized by a functional categorizer head (*n, a* or *v*). Assuming this distinction we can represent deadjectival, denominal and deverbal structures (14) and distinguish them from words derived directly from a root (13).

[10] For examples of some empirical phenomena cf. Halle and Marantz (1993), Harley and Noyer (1999), Embick and Noyer (2007) between others.

(13)



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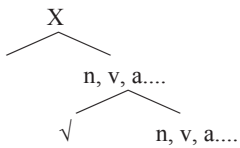

More specifically, two close ideas are of special value for our analysis: the idea of phases in words Marantz (2001, 2008) and the locality restriction in the interpretation of roots Arad (2003).

Based on cyclic in nature of the syntactic computation (CHOMSKY, 2001), Marantz (2001) and Arad (2003) suggest that there are locality effects for semantic and phonological processes within words. Marantz (2001) proposes that core lexical categories (adjective, noun, verb) are phase domains for word formation. The idea of phases is that items within a certain locality domain would have its interpretation and phonological form linked to the results of operations occurring within this domain. After the formation of each phase, spell-out would apply and the phase would receive semantic interpretation at Logical Form (LF) and phonological material and relevant application of phonological processes at Phonological Form (PF).

It was observed by the authors that many different interpretations may be assigned to root derived words while words derived from other words have their interpretation and phonology linked and determined by the word already present in the first phase of the derivation. For example, in our word structure in (14) the meaning of the final word labelled by the category X would have its phonological form and interpretation linked to the subwords *n*, *v* or *a*. A simple and concrete example about locality is extracted from Scher (2006): in general, the noun *martelo* ('hammer') is pronounced with the front open mid vowel mart[ɛ]lo and both the adjectival participle *martelada* ('hammered.part') and the verb *martelar* ('to hammer') are produced with the front close-mid vowel [e]. The phonological identity in the production of the second vowel of the root and the interpretation of the participle *martelada* as eventive would be evidences of a derivation involving the verb *martelar* (16) instead of a derivation directly from the root *martel-* (15), in other words there is a verbal phase within the adjective.

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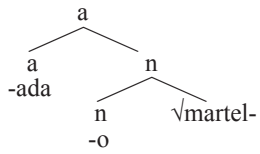

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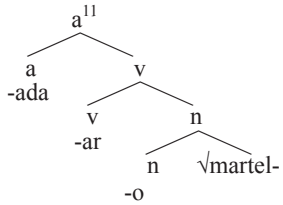


In the next sections, we will explain the phenomenon involving DVs in BP with this theoretical framework and the hypothesis of locality in word formation.

Real DVs

Most verbs analyzed in our sample still maintain a relationship with the morphological related noun (See appendix 1). Although we can label a big group of verbs as Real DVs, there are degrees of variation in the intensity and type of semantic relationship that these verbs maintain with their related nouns. Moreover, this group is not completely homogeneous in the structural aspects. In general, verbs that showed grammaticality for tests 3, 5 and 6 together can be categorized in this class. We also find heterogeneity regarding morphological structure since there are suffixal and parasynthetic formations in this class. Some examples are e*nfrentar* ('to face'), *complementar* ('to complement'), *acreditar* ('to believe'), *alimentar* ('to feed'), *aproveitar* ('to take advantage'), *desejar* ('to wish'), among others (the whole list is in appendix 1). In the next subsections, we present the subgroups in the Real DVs class regarding their syntactic behavior.

Non-alternating DVs

We will focus on the examples with the verbs *testar* ('to test') and *aproveitar* ('to take advantage of'). The verb *testar* presents a typical behavior of a synchronic DV: it does not allow both alternations, presents a periphrastic expression through

[11] We leave aside the details of this derivation, specially the relevant phonological operations as this example is not central for this paper.

the combination of the light verb *fazer* ('to do') with the noun *teste* (test); allow cognate and hyponym adjunct *com um teste novo/ com um experimento novo* ('with a new test/with a new experiment'). In sequence, we present the results for *testar* (to test) regarding argument structure tests.

Testar (To test)

(17) *O laboratório testou os medicamentos*. (Basic sentence, henceforth BS)
The lab test. PST.3.S the.PL drugs.
'The lab tested the drugs.'

(18) **Os medicamentos testaram*. (T1)
The.PL drugs test. PST.3.PL.
'The drugs tested.'

(19) **Medicamentos testam bem*. (T2)
Drugs test. PRS.3.PL well.
'Drugs test well.'

(20) *Os laboratórios fizeram testes em medicamentos*. (T3)
The.PL labs make. PST.3.PL tests in drugs.
'The labs made tests in the drugs.'

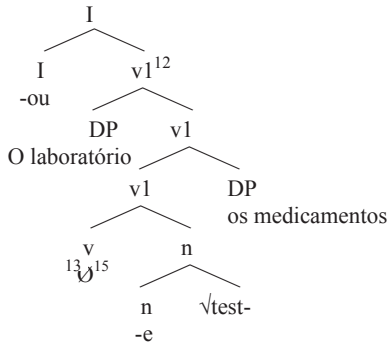
(21) *Os laboratórios testaram um teste novo para os medicamentos*.(T4)
The.PL labs test. PST.3.PL a test new to the.PL drugs.
'The labs tested a new test for the drugs.'

(22) *Os laboratórios testaram os medicamentos com um teste novo*. (T5)
The.PL labs test. PST.3.PL the.PL drugs with a test new.
'The labs tested the drugs with a new test.'

(23) *Os laboratórios testaram os medicamentos com um experimento novo*.
The.PL labs test.PST.3.PL the.PL drugs with a experiment new.
'The labs tested the drugs with a new experiment.' (T6)

We suggest for the basic sentence (17) the simplified structure before movements in (24); and to the periphrastic expression sentence in (20) the structure in (25):

(24)



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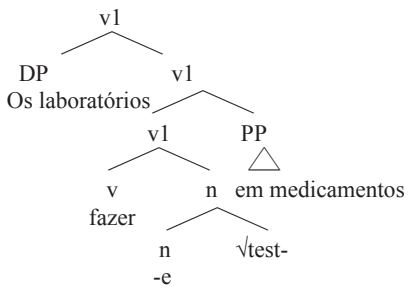


In the derivation of the verb *testar* the first step is the merge of the root √*test-* with the *n* head and then with the *v* head. In this case, the *v* head is empty, just adapting the noun to receive inflectional morphology on I. However, the *v* head could be phonologically realized in cases of verbs with overt verbalizing morphology, such as the suffix *-iz-* in *cristalizar* ('to crystallize') or *-ec-* in *amanhecer* ('to dawn'). Another alternative would be to assume that the verbal head is always filled by a theme vowel (*a*, *e*, *i*) adapting the verb to a class conjugation of Portuguese (1st, 2nd, 3rd); with the addition of inflectional morphology, the theme vowel would have to be deleted someway. For now, we represent the head *v* by Ø when there is no overt morphology. The presence of the zero or affixal morpheme (defective form) at the *v* head may motivates movement of the noun into this position. Finally, the complex head v+noun moves to I in order

[12] We assume, with Marantz (1997), two kinds of v. v1 projects an agent and is compatible with roots that imply external cause or agent and v2 does not have these features.

[13] The verbal head is represented by the symbol Ø in all structures because the verbs in question are represented in sentences, with inflectional morphemes. However, we assume that this position could be filled, for example, by phonological material that indicate to which verbal classe it belongs to by means of theme vowels *a (cantAr)*, *e (vendEr)* or *i (sorrIr)*.

to receive inflectional morphology. At the *n* head, the first spell-out occurs and results in maintaining the denotation of the noun *teste* in the sentences formed with *testar*. We do not assume that a trace is left after merge of the root to the first category. We assume, with H&K, that in such cases there is no movement, but rather a kind of incorporation called conflation.

In the periphrastic form (25), a light verb is introduced at v, and the noun formed from the root does not undergo movement to conflate with the *v* head, remaining in situ.

The verb *aproveitar* ('to take advantage of') includes a prefix, does not allow both alternations, presents periphrastic expression combining the light verb *tirar* (to take) and the noun *proveito* (advantage).

Aproveitar ('To take advantage of')

(26) *O rapaz aproveitou a oportunidade*. (BS)
The boy enjoy.PST.3.S the opportunity.
'The boy took advantage of the opportunity.'

(27) **A oportunidade aproveitou*. (T1)
The opportunity enjoy.PST.3.S.
'The opportunity took advantage.'

(28) **Oportunidades como essa aproveitam logo*. (T2)
Opportunities like these enjoy.PRS.3.PL quickly.
'Opportunities like these take advantage quickly.'

(29) *O rapaz tirou proveito da oportunidade*. (T3)
The boy take.PST.3.S advantage of-the opportunity.
'The boy took advantage of the opportunity.'

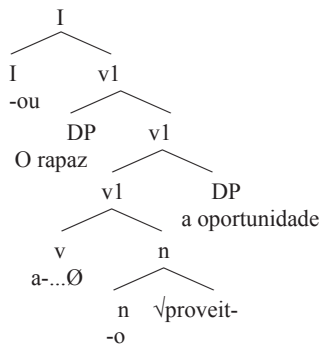
(30) *O rapaz tirou proveito da situação*. (T4)
The boy take.PST.3.S advantage of-the situation.
'The boy took advantage of the situation.'

(31) *O rapaz aproveitou a oportunidade com proveito*. (T5)
The boy enjoy.PST.3.S the opportunity with advantage.
'The boy took advantage of the opportunity with advantage.'

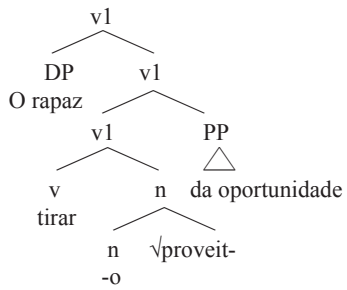
(32) ?*O rapaz aproveitou a oportunidade com serventia*. (T6)
The boy enjoy. PST.3.S the opportunity with usefulness.
'The boy took advantage of the opportunity wih usefullness.'

In (33) we suggest a representation to the BS (26) and to the periphrastic expression sentence in (29) we suggest the structure in (34).

(33)



(34)



The DV *aproveitar*, unlike *testar*, needs both a sufix and a prefix, and this raises a question: why is this prefix needed? We suggest the hypothesis of a fissioned verbal morpheme and abandoned the idea of a prefixal preposition for that verb, but not for others as we will see. In other words, the verbal head that categorizes the noun into a verb (v) is covered by two phonological materials: the prefix *-a* and the suffix Ø/theme vowel in this case. [14]

Alternating DVs

Verbs like *misturar* ('to mix') and *amanhecer* ('to dawn') are more permissive regarding alternations. The suggested structure has to account for this characteristic. In spite of being denominal in structure, these verbs behave like

[14] This hypothesis raises many other questions that are under investigation in our current research. For the moment, we assume what seems to be the less problematic alternative.

verbs whose internal heads are adjectives. As H&K have already pointed out, the category cannot define syntactic structure. Following this idea, nothing prevents nouns to project structures similar to deadjectival structures, i.e. causative-inchoative alternating structures.

Misturar ('to mix')

(35) *A cozinheira misturou os ingredientes*. (BS)
The cook mix.PST.3.S the.PL ingredients.
'The cook mixed the ingredients.'

(36) ?*Os ingredientes misturaram*. (T1)
The ingredients mix.PST.3.PL.
'The ingredients mixed.'

(37) *Ingredientes naturais misturam fácil*. (T2)
Ingredients natural.PL mix.PRS.3.PL easy.
'Natural ingredients mix easily.'

(38) *A cozinheira fez a mistura dos ingredientes*. (T3)
The cook make.PST.3.S the mix of.the.PL ingredients.
'The cook made the mix of ingredients.'

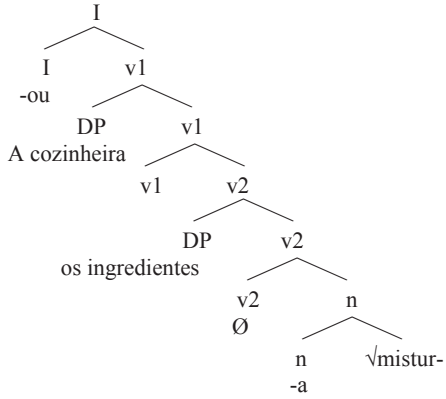
(39) ?*A cozinheira misturou uma mistura estranha de ingredientes*. (T4)
The cook mix.PST.3.S a mix weird of ingredients.
'The cook mixed a weird mix of ingredients.'

(40) *A cozinheira misturou os ingredientes com uma mistura estranha*. (T5)
The cook mix.PST.3.S the.PL ingredients with a mix weird.
'The cook mixed the ingredients with a weird mix.'

(41) *A cozinheira misturou os ingredientes com uma combinação estranha*.(T6)
The cook mix.PST.3.S the.PL ingredients with a combination weird.
'The cook mixed the ingredients with a weird combination.'

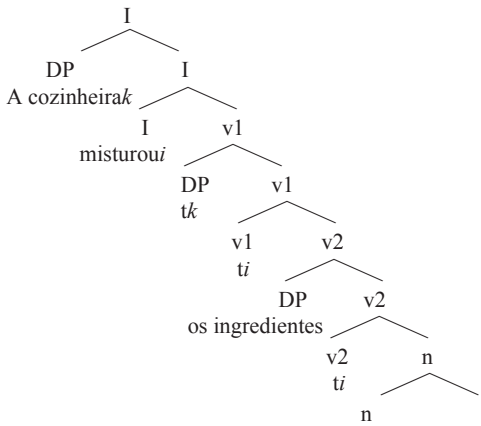
The verb *misturar* certainly allows the formation of middle sentences but with respect to causative-inchoative alternation, the results were not categorical besides of the fact that there were huge tendencies for the sentences to be judged as grammatical (25 grammatical x 15 ungrammatical judgments). This verb allows a periphrastic expression. We consider the following representations to its transitive (causative) form:

(42)



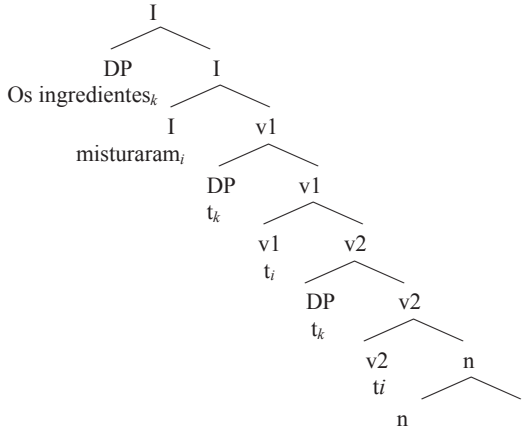
After movements:

(43)



If there is no external argument in the specifier position of I, the internal argument moves to the specifier of v1 and then to spec,I in order to satisfy Case and EPP (Extended Projection Principle) resulting in the intransitive (inchoative) version of the verb form (44).

(44)



Now, let´s consider the results for the verb *amanhecer* ('to dawn'), which presents two extra morphemes: the preffix *a-* and the verbal suffix *-ec-*. This last affix morphologically marks inchoactivity and change of state.

Amanhecer *('to dawn')*

(45) ?*O sol amanheceu o dia.* (BS)
The sun dawn.PST.3.S the day
'The sun dawned the day.'

(46) *O dia amanheceu.* (T1)
The day dawn.PST.3.S.
'The day dawned.'

(47) *O dia amanhece rapidamente em João Pessoa.* (T2)
The day dawn.PRS.3.S quickly in João Pessoa.
'The day dawns quickly in João Pessoa.'

(48) *A noite tornou-se manhã rapidamente.* (T3)
The night become.PST.3.S-cl.3 morning quickly.
'The night became morning quickly.'

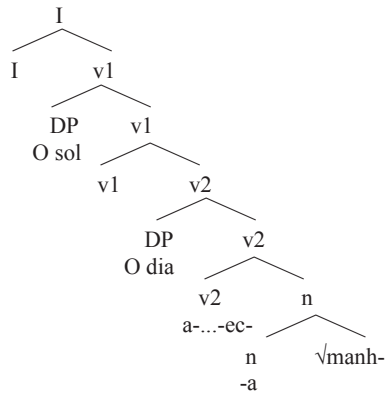
(49) *Amanheceu uma linda manhã.* (T4)
Dawn.PST.3.S a beautiful morning
'It dawned a beautiful morning.'

(50) *O dia amanheceu com uma linda manhã*. (T5)
The day dawn.PST.3.S with a beautiful morning.
The day dawned with a beautiful morning.

(51) *O dia amanheceu com uma linda alvorada*. (T6)
The day dawn.PST.3.S with a beautiful sunrise
'The day dawned with a beautiful sunrise.'

We suggest the following structure to the transitive version of *amanhecer*. The intransitive version (ommited here) is derived by the same principles just shown to the verb *misturar* (to mix).

(52)



DVs with location/*locatum* structures

The analysis we suggest for these verbs is not very different from that proposed by Hale e Keyser (2002). However, assuming DM, it is easy to accommodate the sentences in which the interpretation does not maintain the relationship between noun and verb treating them as root derived. Although considering verbs like *engarrafar* ('to bottle') and *empacotar* ('to pack') as denominals, we assume that there are certain formations with particular interpretations (most metaphorical) that do not necessarily require an inner noun.

First, let's consider the canonical meaning for *engarrafar* and check the results in the proposed tests.

(53) *O funcionário engarrafou o vinho branco*. (BS)
The employee bottle.PST.3.S the wine white.
'The employee bottled the white wine.'

(54) **O vinho branco engarrafou*. (T1)
The wine white bottle.PST.3.S.
'The white wine bottled.'

(55) ?*Vinho branco engarrafa bem*. (T2)
Wine white bottle.PRS.3.S well.
'White wine bottles well.'

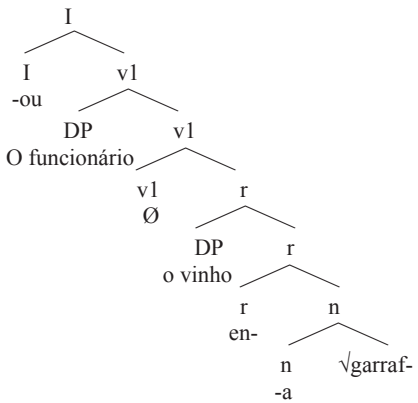
(56) *O funcionário pôs o vinho branco nas garrafas*. (T3)
The employee put.PST.3.S the wine white in.the.PL bottles.
'The employee put the white wine in the bottles.'

(57) *O funcionário engarrafou uma garrafa de vinho*. (T4)
The employee bottle.PST.3.S a bottle of wine
'The employee bottled a bottle of wine.'

(58) *O funcionário engarrafou o vinho branco na garrafa de vidro*. (T6)
The employee bottle.PST.3.S the wine white in.the bottle of glass.
'The employee bottled the white wine in the glass bottle.'

The structure below represents the basic sentence in (53):

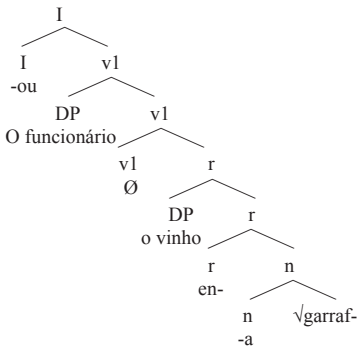
(59)



For a sentence with the structure x *engarrafar* y, the first interpretation is that "someone put something in the bottle", and so the noun is assumed for the structure: the noun *garrafa* (bottle) is part of the event. The incorporation of the

noun results in the formation of the complex verb *engarrafar*. The motivation to incorporate is the existence of a defective particle[15], which we call relational (r), following Lemle (2008). Furthermore, the periphrastic sentence represented in (60) shows a homophonous free preposition (*em* - in) that is also responsible for relation between the noun (*vinho* - wine) and the locative (*garrafa* - bottle):

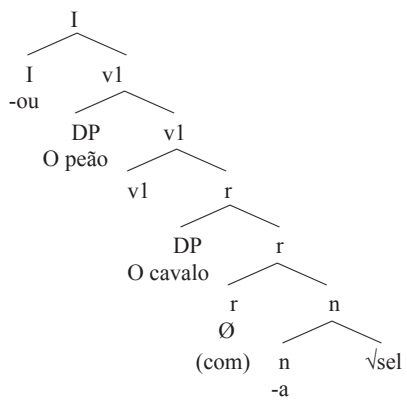
(60)



The same analysis suggested for the verb *engarrafar* can explain the formation of locatum structures, for the verb *selar* ('to saddle'), for example. The distinction between the two structures is the nature of the relational heads *em* (on) for location and *com* (with) for locatum structures.

(61) O peão selou o cavalo. (*'The cowboy saddled the horse'*)

(62)



[15] For Hale e Keyser (2002), a particle can trigger conflation when it is phonologically defective or null. However, in terms of DM, it is problematic to assume that phonological form can trigger a syntactic operation since Late Insertion is assumed. To account for this problem, we would have to assume, for example, that there is some feature indicating the defectiveness of the head prior to phonological form.

Root derived verbs

The major difference between denominal and non-denominal verbs is that in the first case there is merge between the root and a *n* head prior to verbalization, while in the latter, the root is merged directly with a *v* head.

The verbs that failed the tests 3, 5 e 6 altogether were classified in this subclass of root derived verbs. Some examples are *arrumar* ('to organize'), *cruzar* ('to cross'), *desfrutar* ('to enjoy'), among others (see appendix 1). In structural terms, these verbs in general do not allow alternations, excepting the verb *acabar* ('to finish') that allows transitive-intransitive alternation and the verbs *arrumar* ('to organize') and *filtrar* ('to filter') that allow middle alternation. Alternation structures will be the same suggested for the verb *misturar* ('to mix').

Observing results of tests of AE to the verb *arrumar* ('to organize'), which is historically related to the noun *rumo* ('course'), it is proved that this relation is no longer available.

Arrumar (to organize)

(63) *A Paula arrumou a casa*. (BS)
The Paula organize.PST.3.S the house.
'Paula organized the house.'

(64) **A casa arrumou*. (T1)
The house organize.PST.3.S.
'The house organized.'

(65) *Casa pequena arruma rápido*. (T2)
House small organize.PRS.3.S quickly.
'Small houses organize quickly.'

(66) **A Paula deu um rumo à casa*. (T3)
The Paula give.PST.3.S a course to.the house.
'Paula gave a course to the house.'

(67) **A Paula arrumou um rumo da casa*. (T4)
The Paula organize.PST.3.S a course of.the house.
'Paula organized a course of the house.'

(68) **A Paula arrumou a casa com um rumo certo*. (T5)
The Paula organize.PST.3.S the house with a course right.
'Paula organized the house with a right course.'

(69) *A Paula arrumou a casa com um caminho caprichado. (T6)
The Paula organize.PST.3.S the house with a way fancy.
'Paula organized the house with a fancy way.'

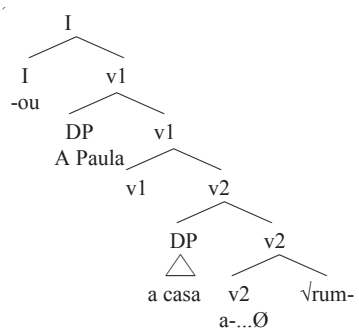
The verb *arrumar* in sentences like those tested, certainly does not have the interpretation of "*dar rumo a*" ('give direction to'). It actually means to organize, clean up, improve, and the speakers no longer recognize the noun within the verb.

One possible analysis would be to say that the root √*rum* is not present in the structure and, therefore, it seems possible to suggest that this root has been reanalyzed and generated another one, namely, √*arrum-*. Then, we would explain the inactivity of the prefix *a-*, which seems to be just a phonological element. Extra evidence for the existence of this new root would be other words in the language formed by the same root, as the nominalization *arrumação* (event of organize), the participle *arrumado(a)* ('tidy'), the agentive name *arrumadeira* ('chambermaid'), all with a sense of "organizing", and not with a sense of direction, and containing the supposed prefix *a-*.

However, this independent evidence to the existence of √*arrum* is falsifiable. The fact that derived words such as the nominalization, the participle and the agentive name include the prefix *a-* can be explained by the fact that they are all deverbal nouns derived from the verb *arrumar* and the presence of this phonological piece *a-* is straightforward

So, in order to maintain a more uniform analysis and avoid the existence of two different roots (√*rum* and √*arrum*) in the absence of strong evidence for it, we account for the explanation of the facts using the operation of fission. If we assume that the prefix *a-* is also part of the fissioned verbal morpheme, as suggested for other verbs (*aproveitar*, for example), we can account for the unrelatedness between *rumo* and *arrumar* only with the absence of a nominal phase. We suggest a structure like (70) to the BS with *arrumar*.

(70)



In a DM approach, in addition, we can explain the formation of the verb *arrumar* with the meaning of "dar um rumo a" ('give a direction to'): it could be derived as a structure in which the root √*rum* is not directly categorized by a *v* but contains a nominal head.

For verbs like *brincar* ('to play') and *arcar* ('to handle') that are different from verbs like *arrumar* since they are only suffixed, we assume that they behave in the same manner as except for the fact that the verbal head does not suffer fission in the morphological component.

Otherwise, the verb *desfrutar* (to enjoy) is a more complex case. Its relationship with the former noun (*fruto*) was abandoned long ago. Diachronically, this verb was formed by a relationship between the prefix des-[16] (un/in), with the sense of taking, harvesting, and *fruto* ('fruit'), which meant in the metaphorical sense "rewards". However, to formulate the sentence with this verb does the speaker have to rebuild this historic journey? The answer is no according to the tests below[17]:

Desfrutar ('to enjoy')

(71) *O grupo desfrutou a viagem*. (BS)
The group enjoy.PST.3.S the trip.
'The group enjoyed the trip.'

(72) **A viagem desfrutou*. (T1)
The trip enjoy.PST.3.S.
'The trip enjoyed.'

(73) **Viagem de fim de ano desfruta muito*. (T2)
Trip of end of year enjoy.PRS.3.S very.
'End of year trips enjoy a lot.'

(74) **O grupo não fez fruto da viagem*. (T3)
The group not do.PST.3.S fruit of.the trip
'The group did not do fruit of the trip.'

(75) ?*O grupo não desfrutou bons frutos da viagem*. (T4)
The group not enjoy.PST.3.S good.PL fruits of.the trip
'The group did not enjoy good fruits of the trip.'

(76) ?*O grupo não desfrutou a viagem com bons frutos*. (T5)
The group not enjoy.PST.3.S the trip with good.PL fruits.
'The group did not enjoy the trip with good fruits.'

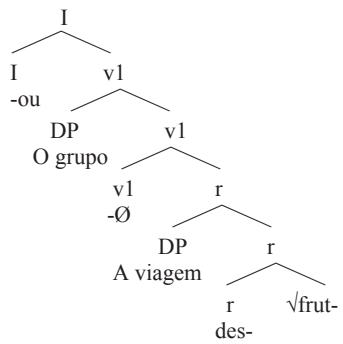
[16] For a full analysis of the prefix des- in BP verbal contexts see Bassani, Medeiros and Scher (2009).

[17] Test 6 was not formulated for this verb by being completely odd even for a test.

So, for verbs like *desfrutar*, as opposed to verbs like *descascar* ('to peel'), there is no compositional meaning in which the noun phase occurs. For these cases, we must assume that there is no denominal derivation. As it would be hard to motivate a fission operation for verbs containing prefixes like *des-* that have some independent phonological status (SCHWINDT, 2000), we assume for the moment that this prefix acts like a relational element between the root and the internal argument. For verbs in which the negative meaning of the prefix composes the final meaning of the verb it is easy to see how it makes this relation. See for example the DV *descascar a maçã* ('unpeel the apple') and its close meaning to the periphrastic expression *tirar a casca da maçã* ('take off the peel from the apple').

The special character acquired by verbs like *desfrutar* takes place because there is no *n* phase, so the root is "open" to negotiation of meaning until the first phase *v*. In the Encyclopedia,[18] the structure will receive new especial interpretation.

(77)



"Same verb" with opposite behavior: two verbs?

In our sample we found three polysemic vebs that required special attention. The verbs *apontar* (meaning 'to sharpen' or 'to point'), *traçar* ('to draw' or 'to plan') and *processar* ('to prosecute' or 'to process (data)') have been studied for their two current and most productive meanings. We will suggest a simple explanation for these cases: one interpretation contains a nominal phase and the other does not. Consider their opposite behavior regarding tests and the representations suggested for the verb *apontar*.

[18] DM theory assumes three lists in place of a generative lexicon: List A contains Morphosynthatic features, List B contains Vocabulary items (phonological material) and List C is the Encyclopedia, responsible for non-linguistic knowledge (world knowledge).

Apontar ('to sharpen')

(78) *O aluno apontou o lápis*. (BS)
The student sharpen.PST.3.S the pencil.
The student sharpened the pencil.

(79) ?*O lápis apontou*. (T1)
The pencil sharpen.PST.3.S.
The pencil sharpened.'

(80) *Lápis bom aponta fácil*. (T2)
Pencil good sharpen.PST.3.S easy.
'A good pencil sharpens easily.'

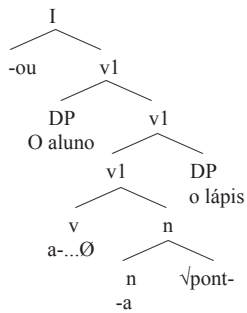
(81) *O menino (re)fez a ponta do lápis*. (T3)
The boy (re)make.PST.3.S the point of.the pencil.
'The boy (re)made the point of the pencil.'

(82) *O menino apontou a ponta (quebrada) do lápis*. (T4)
The boy sharpen.PST.3.S the point (broken) of.the pencil.
'The boy sharpened the (broken) point of the pencil.'

(83) *O menino apontou o lápis com a ponta fina*. (T5)
The boy sharpen.PST.3.S the pencil with the point thin.
The boy sharpened the pencil with a thin point.

(84) *O menino apontou o lápis com um bico exagerado*. (T6)
The boy sharpen.PST.3.S the pencil with a beak exaggerated.
'The boy sharpened the pencil with a thin tip.'

(85)



The structure in (85) represents an interpretation in which the speaker recognizes the relationship between the noun ***ponta*** ('point') and the verb ***apontar*** ('to sharpen'). On the other hand, in a different meaning for the verb ***apontar,*** most of the tests indicate a mismatch between noun and verb. For this reason, we suggest a different derivation in this case.

Apontar (to indicate)

(86) A *comissão apontou falhas no projeto*. (BS)
The commission point.PST.3.S failures in.the project.
'The commission indicated the failures in the project.'

(87) **As falhas apontaram*. (T1)
The failures point.PST.3.PL.
'The failures indicated.'

(88) **Falhas grotescas apontam fácil*. (T2)
Failures grotesques point.PST.3.S easy.
'Grotesque failures indicate easily.'

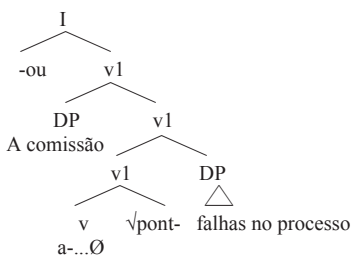
(89) **A comissão apontou a ponta das falhas*. (T3)
The commission point.PST.3.S the point of.the.PL failures.
'The commission indicated the point of the failures.'

(90) **A comissão fez uma ponta das falhas*. (T4)
The commission make.PST.3.S a point of.the.PL failures.
The commission made a point of the failures.

(91) **A comissão apontou as falhas com a ponta fina*. (T5)
The commission point.PST.3.S the.PL failures with the point thin.
The commission indicated the failures with a thin point.

(92) **A comissão apontou as falhas com um bico exagerado*. (T6)
The commission point.PST.3.S the.PL failures with a beak exaggerated.
The commission indicated the failures with a thin tip.

(93)



By treating different meanings in structural terms we do not have to resort to the postulation of two unrelated lexical entries for what seems to be the same verb and we also can capture differences regarding their syntactic behavior.

Conclusions

In this paper we showed that diachronic DVs may or may not remain as denominal in a synchronic analysis through structural tests of argument structure evaluated by native speakers of BP, ensuring reliability and contributing to a good description of the data. One of the major contributions of this paper is to advance in clarifying the differences between a synchronic and a diachronic approach to word formation, showing that historical explanation is not always the only possible.

Under a DM approach it was possible to distinguish and explain the so-called DVs in two big classes: i) those represented by structures that include a nominal phase in the derivation, containing verbs that are derived from the categorization of a root (√) by a noun (*n*) and, then, by a verb (*v*) (synchronic denominal structures). In this first group, we observed verbs presenting different syntactic behaviors and we suggested different kinds of syntactic structures: alternating, non-alternating and location/locatum; ii) those represented by structures in which the final verb is formed by the direct categorization of a root (√) by a verbal categorizer (*v*) (non-denominal structures). In sequence, we discussed some ambiguous verbs (iii) and we suggested that they can be formed either as DVs or as root-derived ones. We could then represent the structure of different types of so-called DVs regarding their syntactic behavior and the relation they establish with the noun derived by the same root. So, the difference between a denominal and a non-denominal verb relies in the presence or absence of a *n*P level in the derivation.

Finally, while recognizing that the internal structure of DVs can influence and determine the argument structure of the sentence we are faced with the well known question about the limits and interfaces between morphology and syntax (EMBICK; NOYER, 2007). Our results led us to follow the assumptions in which the principles and operations that govern word formation are the same which govern sentence formation.

Acknowledgments

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BASSANI, I. S. Verbos Denominais no Português Brasileiro: diferenciando estruturas diacrônicas e sincrônicas com uma abordagem em Morfologia Distribuída. *Alfa*, Araraquara, v.56, n.1, p.137-167, 2012.

- *RESUMO: Trabalhos recentes sobre Estrutura Argumental têm mostrado que deve existir uma relação sincrônica entre substantivos e verbos derivados que pode ser tratada em termos estruturais. No entanto a simples identidade fonológica/morfológica ou derivação diacrônica entre um verbo e um substantivo não necessariamente garantem que há uma estrutura denominal em uma abordagem sincrônica. Neste trabalho, observamos o fenômeno dos verbos denominais em Português Brasileiro defendendo uma distinção entre derivação morfológica etimológica e sincrônica. Assim, os objetivos deste trabalho são: 1) descobrir os critérios sincrônicos e formais para saber quais verbos denominais diacrônicos também podem ser considerados como tal no âmbito de uma análise sincrônica e 2) detectar os casos em que verdadeiras razões podem ser encontradas para o abandono do rótulo "denominal". Através de testes de estrutura argumental submetidos ao julgamento de falantes nativos foi possível dividir a classe inicialmente homogênea dos verbos denominais em três grandes grupos: verbos denominais reais, verbos derivados de raiz e verbos ambíguos. Em uma abordagem em Morfologia Distribuída, foi possível explicar a diferença entre esses grupos com base nas ideias de fases na palavra e restrição de localidade na interpretação das raízes.*

- *PALAVRAS-CHAVE: Verbos denominais. Morfossintaxe. Estrutura argumental. Morfologia distribuída. Fases.*

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Appendix 1: selected verbs for the study

GROUP I – REAL DENOMINAL VERBS
Abraçar (to hold); Acostumar (to get used); Acreditar (to believe); Adiar (to postpone); Agendar (to schedule); Agulhar (to neddle); Alimentar (to feed); Almoçar (to have lunch); Amanhecer (to dawn); Analisar (to analyze); Apostar (to bet); Aprimorar (to improve); Aproveitar (to enjoy); Armazenar (to store); Arriscar (to risk); Assustar (to scare); Auxiliar (to help); Basear (to base); Beneficiar (benefit); Cadastrar (to subscribe); Capturar (to capture); Colar (to paste); Complementar; (to complement); Copiar (to copy); Cristalizar (to crystallize); Criticar (to criticize); Depositar (to deposit); Desejar (to wish); Economizar (to save); Embarcar (to ship); Empacotar (to pack); Encurralar (to corral); Enfeitiçar (to bewitch); Enfrentar (to face); Engarrafar (to bottle); Engavetar (to quod); Escovar (to brush); Estrear (to debut); Evidenciar (to evidence); Favorecer (to favor); Focar (to focus); Forçar (to force); Gerenciar (to manage); Implementar(to implement); Incrementar (to increase); Influenciar (to influence); Ingressar (to enter); Interessar (to interest); Liderar (to lead); Listar (to list); Marcar (to mark); Martelar (to hammer); Memorizar (to memorize); Misturar (to mix); Movimentar (to move); Pesquisar (to research); Praticar (to practice); Privilegiar (to privilege); Programar (to program); Providenciar (to provide); Rastrear (to trace); Registrar (to register); Regulamentar (to regulate); Relatar (to report); Resgatar (to rescue); Sediar (to host); Selar (to saddle); Sinalizar (to signal); Somar (to sum); Subsidiar (to subsidize); Suplementar (to supplement); Testar (to test); Veicular (to vehicle).
GROUP II - ROOT-DERIVED VERBS
Acabar (to finish); Arcar (to handle); Arrumar (to organize); Avaliar (to evaluate); Brincar (to play); Casar (to marry); Causar (to cause); Concentrar (to focus); Cruzar (to cross); Desfrutar (to enjoy); Faltar (to miss).
GROUP III - AMBIGUOUS VERBS
Apontar (to sharpen and toindicate); Processar (to prosecute and to process); Traçar (to draw and to plan).
GROUP V - UNDETERMINED VERBS
Agrupar (to group); Caminhar (to walk); Encarar (to face); Estudar (to study); Fechar (to close); Filtrar (to filter); Modelar (to model); Valorizar (to value).

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