AN ANALYSIS FOR PORTUGUESE *VEL*-ADJECTIVES IN THE LIGHT OF DISTRIBUTED MORPHOLOGY

Maurício RESENDE[*]
Núbia RECH[**]

▪ ABSTRACT: This paper presents an analysis of Portuguese *vel*-adjectives based on Distributed Morphology (HALLE and MARANTZ 1993). This proposal, developed on Oltra-Massuet's (2014) paper, argues that the modal (possibility, probability and obligation) and the non-modal (trigger) readings associated to *vel*-adjectives result from the presence of different functional heads composing their structure (vP, Asp and Mod). Considering of that point of view, this paper claims that /vel/ corresponds to a single Vocabulary item spelling out the adjectival head (aº) in the environment of both ModP morpheme and [CAUSE] feature. This explains the different readings, which Brazilian Portuguese speakers relate to these adjectives. Adjectives licensing a modal interpretation have a ModP morpheme in their structure, whereas the ones with a non-modal reading do not project it. This study proposes an important structural distinction among *vel*-adjectives licensing a modal reading, namely, only the ones presenting a possibility-reading project VoiceP, the other ones project only vP, which inserts the event-reading, but does not license the extern-argument projection (see KRATZER 1996; ALEXIADOU 2001). Finally, the present analysis suggests the occurrence of a [CAUSE] feature at adjectival head, which assigns the trigger reading to *vel*-adjectives with a non-modal reading.

▪ KEYWORDS: Distributed morphology. *vel*-Adjectives. Modality.

Introduction

The literature on Portuguese (as on other languages) already recognizes certain properties as common to both lexical and grammatical inventories of a language as regards the expression of modality, namely, (i) modality can be expressed by different linguistic devices belonging to different categories, such as verbs – *poder* ('can/may'), *dever* ('must') –, adverbs – *provavelmente* ('probably'), *necessariamente* ('necessarily') –, affixes – such as -*vel* ('-ble'); (ii) the very items can be used to express

* Universidade Estadual de Campinas (UNICAMP), Instituto de Estudos da Linguagem, Campinas - SP - Brasil. mauri_cio_resende@hotmail.com. ORCID: 0000-0001-7487-5043

** Universidade Federal de Santa Catarina (UFSC), Departamento de Língua e Literatura Vernáculas, Florianópolis - SC - Brasil. nubia.rech@ufsc.br. ORCID: 0000-0002-9278-2702

different types of modality, such as deontic, epistemic, circumstantial, and so on;[1] (iii) items conveying modal readings render sometimes other uses, such as the verb *dever* ('must/owe') in (1) and the affix *-vel* ('-ble') in (2).

(1)
    a. O Pedro deve dinheiro para o João.
       'Peter owes money to John'
    b. O Pedro deve viajar na terça-feira.
       'Peter must travel on Tuesday'

(2)
    a. Este tecido é lavável (= pode ser lavado).
       'This fabric is washable (= can be washed)'
    b. Este tecido é confortável (≠ pode ser confortado).
       'This fabric é comfortable (≠ can be comforted)'

In (1a), *dever* ('owe') is a lexical verb and denotes a debt-situation. In (1b), *dever* triggers a modal reading (deontic or epistemic). Much research has been carried out on the morphosyntactic and semantic properties of *dever*. They will not be discussed here. The example in (2a) triggers a modal reading, which can be attested by the paraphrase with the verb *poder* ('can/may') and the possibility-reading. In (2b), the example seems to convey a non-modal reading, since the paraphrase with *poder* is out – suggesting that *-vel* would be compatible with different interpretations as well.

A possible way of understanding the different occurrences of *-vel* in Portuguese would be to consider it a polysemous item, or to accept the existence of different *vel*-suffixes, with the same phonological form, but with distinct meanings, which leads us to homonymy. Naturally, both accounts have to deal with the fact that this multiplicity of meanings is found cross-linguistically (what is a strong piece of evidence against homonymy). Moreover the psychological extent of language is supposed to be taken into account, which would preclude a great deal of suffixes.

Authors as Pires de Oliveira and Ngoy (2007), Pereira, Silvestre and Villalva (2013), Moreira (2014), Jovem and Silva (2016), argue that many of the interpretations conveyed by *vel*-adjectives can be captured by the category of stem, that is, the different readings can be the result from nominal and verbal properties serving as basis to *vel*-adjectives derivation. It is worth mentioning, however, that if the different readings for these adjectives depended on (even minimally) a word serving as basis to their formation, it would be not possible to explain the occurrence of examples in (3), where there is no verb or noun morphologically related to.

---

[1]   Kratzer (1981, 1991), Hacquard (2006, 2010), Pires de Oliveira and Ngoy (2007), Moreira (2014), among others.

(3)

afável ('affable')	formidável ('formidable')	potável ('potable')
comestível² ('edible')	inefável ('ineffable')	responsável ('responsible')
compatível ('compatible')	inexorável ('inexorable')	suscetível ('susceptible')
deplorável ('deplorable')	maleável ('malleable')	vulnerável ('vulnerable')
flexível ('flexible')	plausível ('plausible')	

The data in (3) raise the question that, whichever the approach to vel-adjectives may be, it must take into account some properties other than the presence of a (verbal or nominal) stem, since this element is not found in a great number of cases – contra Jovem and Silva (2016)'s analysis, for instance. Of course, some may argue that the examples in (3) are cases of lexicalization and only a diachronic analysis can handle these occurrences – this is the case made by Pereira, Silvestre and Villalva. (2013). In any case, as we discuss in section *The syntax of vel-adjectives*, the root being synchronically inactive does not prevent for the *vel*-adjectives from having a transparent reading.

However, from the language acquisition point-of-view, this is not a valid argument, since for an infant acquiring language everything is Portuguese, regardless the historical linguistic path of the word. Furthermore, it is possible to recognize that some of semantic readings (including the modal one) are available even for cases such as those, as one can see in *potável* ('potable' – "that can be drunk"), *comestível* ('edible' = "that can be eaten"), *plausível* ('plausible' = "that can be sustained"), *maleável* ('malleable' = "that can be manipulated"), and so on.

Additionally, there are cases, where it is possible to hold a relation between *vel*-adjectives and items from another category, such as verb or noun, as the examples in (4) point out. In any case, an account assuming that words deriving from other words or specifically *vel*-adjectives are deverbal (as they derive from verbs) or denominal (as they derive from nouns) should explain how stems relate to their deriving form in allomorphy contexts, that is, whether adjectives with root-allomorphy consist of a different lexical entry or if the rule forming the *vel*-adjective is sensitive to variation in the form.

---

² Indeed, *comestível* ('edible') can be related to the verb *comer* ('eat'), but the fact that there is more morphological material in the adjective form other than the verbal root (in the case, *-est-*) suggests that *comestível* cannot be directly derived from the verb, since there is no such a verb as **comestar*.

(4)

admissível ('admissible')	perceptível ('perceptible')
audível ('audible')	possível ('possible')
compreensível ('comprehensible')	reversível ('reversible')
disponível ('available')	sensível ('sensible')
legível ('readable')	risível ('laughable')
móvel ('mobile')	solúvel ('soluble')
mutável ('changeable')	visível ('visible')

On this issue, Pereira, Silvestre and Villalva (2013) argue that it is possible to hold a semantic nexus between *visível* ('visible') and *ver* ('see') or *sensível* ('sensible') and *sentir* ('feel'), but these formations cannot be explained by Portuguese morphology. A lexeme-based approach to morphology struggles to relate forms derived from the same root. However, it does not seem to be the case that there is no explanation for these derivations, since allomorphy is a very recurring phenomenon and not exclusive to *vel*-adjectives, since it can be found – to give an example – in participle forms, such as *abrir* ('open')/*aberto* ('open'), *ver* ('see')/*visto* ('seen') and *pôr* ('put')/*posto* ('put'). Moreover it is worth mentioning that allomorphy takes place even in cases, where the root-form is easily related to a noun other than a verb, as one can see in (5).

(5)

razoável (← razão) ('reasonable ← reason')
rentável (← renda) ('income ← profitable')
factível (← fato) ('feasible ← fact')

That been said, the present paper aims at proposing an account to morphology and syntax of *vel*-adjectives in Portuguese, which considers their morphophonological, syntactic and semantic properties, without disregarding cases presenting root-allomorphy – as in (4) and (5) – or those whose root is no longer productive under a synchronic point-of-view – as in (3).

In order to do so, this paper assumes Distributed Morphology (HALLE; MARANTZ, 1993), in a syntactic approach to word formation. Built on this theory, specifically on Oltra-Massuet (2014)'s proposal for *ble*-adjectives, this work argues that the different readings triggered by *vel*-adjectives do not result from properties of their stems, but come from different functional heads composing their structure, such as v°, Asp and Mod.

Furthermore, by waiving a model, where "lexical items" are the atoms of syntactic derivation, it is possible to generate words not depending (structurally or semantically) on other words, but only on the roots and the functional heads they contain. Thus, based on the Distributed Morphology (DM) approach, this paper proposes that root-allomorphy found in cases, such as (4) and (5), can be predicted by a rule determining the phonological form for a given root, depending on the morphosyntactic environment, where it appears. Finally, instead to polysemy and homonymy, this paper argues that /

vel/ is a single Vocabulary item spelling out the adjectvizer head (aᵒ) in the context of a ModP projection and a [CAUSE] feature, regardless its interpretation – what explains its multiplicity of occurrences.

So, this case-study work is presented as follows. In section *The semantics of vel-adjectives*, we discuss the possible readings for *vel*-adjectives in Portuguese to convey. Next, we present a proposal for the typology of these adjectives, following Kratzer (1981, 1991). In section *The syntax of vel-adjectives*, we briefly introduce Distributed Morphology framework and present an analysis for *vel*-adjectives built on this model, along the lines of Oltra-Massuet (2014), by focusing on their syntactic properties. In section *The morphology of vel-adjectives*, we make some specific remarks on the morphophonological properties of this group of adjectives, assuming DM model.

The semantic of *vel*-adjectives

It is already a common ground in the literature on *vel*-adjectives (regardless the theory) that, at least one of their uses conveys a modal reading – specifically a possibility-reading. The point where these analyses break down (aside from the theoretical background) concerns (i) the set of interpretations, which this affix conveys, that is, how many readings there are aside the possibility-reading; (ii) where this multiplicity of meanings comes from. Chart 1 summarizes the major treatments found in the literature on Portuguese, according to the semantic readings of *vel*-adjectives assigned for the different authors.

Chart 1 – Summary of *vel*-adjectives typologies, according to their interpretation

Type of reading	P and N (2007)	Pereira, Silvestre and Villalva (2013)	|Moreira (2014)	Example
property	✔	✔		durável ('durable')
subject property			✔	admirável ('admirable')
possibility	✔	✔		calculável ('calculable')
impossibility		✔		invencível ('unstoppable')
moral obligation	✔			louvável ('laudable')
active interpretation		✔		variável ('variable')
modal interpretation			✔	quebrável ('breakable')

Source: Author's elaboration.

Unlike the authors appearing in Table 1, Jovem and Silva (2016) do not propose a typology for *vel*-adjectives, classifying them according to their syntactic and/or semantic properties. Still, they recognize that one of *vel*-adjectives' uses (when derived from transitive verbs) conveys a *possible to be*-reading and such an interpretation is

not available for adjectives deriving from nominal stems. Whatever may be the case, a quick look at the classification proposed by the authors appearing in Table 1 reveals that although the types of reading are not a common ground, all authors – including Jovem and Silva (2016) – share some intuition about the data.

Nevertheless, as regards the typology for *vel*-adjectives proposed in this paper, one of them, as stated in the literature, triggers a possibility-reading. It is easily captured in a paraphrase, such as *pode ser X*-constructions ('can be X-ed'), as seen in *lavável* ('washable' = "can be washed"), *quebrável* ('breakable' = "can be broken"), *clonável* ('cloneable' = "can be cloned"), and also in a negation-context, such as in *invencvíel* ('unstoppable' = "cannot be sopped") or *inquebrável* ('unbreakable' = "cannot be broken"), and so on.

There are *vel*-adjectives denoting probability and thus, this group is better paraphrased by constructions employing *dever* ('must/be supposed to') – and not *poder* ('can/may') – as we can see in *durável* ('durable' = "that lasts/that is supposed to last"), *agradável* ('agreeable' = "that delight/that is supposed to delight") and *inflável* ('inflatable' = "that inflates/that is supposed to inflate"), as in the difference between *pode chover* ('it might rain') and *deve chover* ('it should rain') – see Resende (2015) for a discussion on these cases.

A third case is that for *vel*-adjectives triggering a *moral obligation*-reading (PIRES DE OLIVEIRA; NGOY, 2007), that is, forms such as *admirável* ('admirable' = "that ought to be admired"), *louvável* ('laudable' = "that ought to be lauded") and *lamentável* ('regrettable' = "that ought to be regretted"). According to Oltra-Massuet (2014), these adjectives denote a speaker's value judgement on a given element. The modal reading in this kind of adjective seems to come from an obligation-idea; hence the compatibility with paraphrases employing the modal auxiliary *dever* ('ought to') in a deontic reading. Moreover, the moral obligation-reading also allows for paraphrases with the verb *merecer* ('deserve'), as in *essa attitude é louvável* ('this attitude is laudable' = "this attitude deserves lauding"). This kind of obligation relates to what Feldmann (1986) labels *ought to be*-obligation, which describes a state of affairs as it ought to be, not committing a specific participant to carrying out a law or a rule.

Finally, there is a use of *vel*-adjectives that, unlike the ones presented earlier, do not trigger a modal reading. This is the case of *amável* ('lovely' = "that triggers love"), *confortável* ('comfortable' = "that triggers comfort"), *horrível* ('horrible' = "that triggers horror"). These appear to trigger a causativity-reading – what is agreed upon Oltra-Massuet (2014). The paraphrase is such cases is with the verbs *causar* ('cause'), *despertar* ('trigger'), *trazer* ('bring about'), that embrace a trigger-reading.

That been said, agreed upon other work in the literature, this paper claims that *vel*-adjectives can trigger four types of reading, namely, (i) possibility, (ii) probability, (iii) obligation, (iv) trigger. The summary can be seen in Chart 2.

Chart 2 – Classification for *vel*-adjectives according to their interpretation

Type of reading	Paraphrase	Examples
possibility	'that can be X-ed'	lavável, aplicável, curável
probability	'that is supposed to X, that X'	variável, agradável, perecível
obligation	'that ought to be X-ed'	respeitável, lastimável, memorável
trigger	'that triggers X / that causes X'	confortável, amigável, desprezível

Source: Author's elaboration.

As summarized in Table 2, three from four employs of *vel*-adjectives embrace a modal reading. The multiplicity of different readings is an issue that has also been approached in the literature concerning modal verbs – see Pires de Oliveira and Scarduelli (2008), Rech (2010), Pessotto (2011), Resende (2015) for discussion. Examples of these cases can be seen in (6).

(6)
    a. A Maria pode chegar atrasada hoje. Na verdade, acho isso bem possível.
      'Mary may be late today. Actually, I think it is most likely'
    b. A Maria pode chegar atrasada hoje. Ela tem minha autorização para isso.
      'Mary may be late today. She got my permission to do so'
    c. A Maria pode chegar atrasada hoje. E isso por causa do mau tempo.
      'Mary may be late today. This is because of the weather'

As the data in (6) show, an item with the same morphophonological form can trigger different modal readings. In (6a), *pode* ('may') has an epistemic reading, that can be rephrased by *according to the speaker's knowledge on the world and on Mary, she arrives late today*. On the other hand, in (6b), the verb *pode* ('may') has a deontic reading and conveys a permission-reading similar to *given the current rules, Mary is allowed to be late today*. Finally, in (6c), *pode* ('may') triggers a circumstantial reading, which also appears in *due to the weather, it is likely that Mary be late today*.

This paper does not aim at presenting a detailed (or formalized) semantic analysis of such cases or of *vel*-adjectives' – but see Pires de Oliveira and Ngoy (2007). However, it is important to show that conveying different modal readings in a single element is also likely in other domains. The data in (7) illustrate different modal readings associated to *vel*-adjectives.

(7)
    a. Esta camisa é lavável, por causa do material de que ela é feita.
      'This shirt is washable because of its fabric'
    b. Aquela pilha é durável. E é bem provável que dure até o final do dia.
      'That battery is durable. It is most likely it lasts until the end of the day'

c. Essa situação é lamentável. Não há como discordar disso.

'This situation is regrettable. There is no disagreeing that'

Based on the examples in (7), assuming Kratzer's (1981, 1991) proposal, this paper argues that the ingredients responsible for the different modal readings are those appearing in Chart 3. By following this proposal, paraphrases for data in (7) can be found in (8).

Chart 3 – Ingredients for modal interpretations

Type of reading	Type of modality	Modal force	Modal base	Ordination source
possibility	circumstantial	possibility	circumstantial	stereotypic
probability	epistemic	necessity	epistemic	stereotypic
obligation	deontic	necessity	circumstantial	deontic

Source: Author's elaboration.

(8)

a. [é possível] [por causa do seu material] [se tudo ocorrer normalmente] lavar essa camisa.

'it is possible, because of its fabric, if everything goes normally, to wash this shirt'

b. [é necessário] [dado o mundo como ele é] [se tudo ocorrer normalmente] essa pilha durar.

'it is necessary, being the world as it is, if everything goes normally, this battery lasts'

c. [é necessário] [dadas as circunstâncias] [seguindo as leis morais] lamentar essa situação.

'it is necessary, given the circumstances, following moral laws, to regret this situation'

As for verbs, by using concepts such as *modal force*, *modal base*, and *ordination source*, it is possible to derive the different modal readings associated to *vel*-adjectives. How to code these ingredients into the structure for these adjectives appears in section *The syntax of vel-adjectives.*

The syntax of *vel*-adjectives

The section *The semantics of vel-adjectives* presented a proposal to classify *vel*-adjectives according to the type of reading they trigger. This section presents an analysis of the syntactic structures for these adjectives, mirroring the different types of semantic reading. In section *The morphology of vel-adjectives* we show their morphophonological particularities.

As mentioned earlier, the analysis we propose in this paper argues that a lexeme-based approach to morphology – that is, a framework assuming that words coming from words, in the lexicon – struggles to handle the set of empirical phenomena surrounding *vel*-adjectives. This is why this paper proposes a non-lexicalist approach, relying on the Distributed Morphology assumptions, aiming at showing that a syntactic account for word formation has more advantages over a lexicalist approach, in the light of *vel*-adjectives' properties.
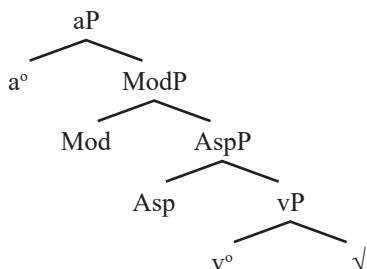
Specifically, unlike lexeme-based approaches, DM argues that the only generative component of the grammar is syntax and both words and phrases/sentences are formed by the same set of operations (merge, move, agree). In DM framework, "word" does not have a privileged theoretical status and the phonological, morphological, syntactic and semantic information of the so-called "lexical items" is distributed into three lists, accessed in different stages of the derivation. According to Marantz (1997), List 1 (*Narrow lexicon*) feeds syntax with roots and bundles of abstract syntactic and semantic features (that is, lacking phonological and non-compositional semantic content). This first list provides the computational system (syntax) with the pieces to the formation of structures, and it generates words, phrases, and sentences.

From this point-of-view, adjectives cannot be deverbal or denominal: the syntactic operations will determine the word-category by merging the root with functional heads (among them, categorizers). Later, the structures generated in the syntax are spelled out: at PF branch, *morphological structure* (MS) makes further operations in the structure (fusion, fission, impoverishment, insertion of dissociated morphemes, and so on), to respect language-specific requirements on morphological formation. Next, an operation called *Vocabulary insertion* provides the structure generated by the system with phonological information, which appears in List 2 (*Vocabulary*) jointly the contextual information to its insertion.

Simultaneously at LF branch, List 3 (*Encyclopedia*) provides the structures with their non-compositional semantic content through contextual instructions to their interpretation. Therefore, unlike lexicalist approaches, where words are the atoms of the syntactic derivation, in DM the syntactic primes are roots (lexical morphemes) and bundles of abstract grammatical features (functional morphemes). Thus, syntax manipulates from morphemes to sentences – what is referred to as *hierarchical syntactic derivation all the way down* (HALLE; MARANTZ, 1994).

Specifically, as regards *vel*-adjectives, a syntactic analysis of their formation requires a lexical morpheme (a root) and functional heads (the syntactic terminal nodes) licensing the morphological, syntactic and semantic properties found in the generated items. So, the derivation must contain at least an adjectivizer (aº) and a root ($\sqrt{}$). Other functional heads between these two morphemes will be responsible for the syntactic and semantic nuances of the adjectives. Thus, assuming Chart 2 and 3, the basic structure of *vel*-adjectives with modal readings proposed in this paper is shown in (9).

(9)

```
                    aP
                 ╱      ╲
               a°       ModP
                      ╱      ╲
                   Mod       AspP
                           ╱      ╲
                        Asp        vP
                                 ╱    ╲
                               v°      √
```

As argued in section *The semantics of vel-adjectives*, three from four employs of *vel*-adjectives trigger a modal reading. For Oltra-Massuet (2014), this kind of reading can be captured by projecting a modal functional head (Mod), as we can see in (9). However, as shown in Chart 3, the modal interpretation results from more than one element. Thus, following Oltra-Massuet (2014), the present work proposes that the modal functional head (Mod) must come specified for modal force (existential or universal). This ingredient must be coded in the structure. As for the type of modality, it is specified by modal base and ordination source, both given by the conversational background (KRATZER, 1981, 1991).

In addition to the modal element, a lot of work agree that some *vel*-adjectives have verbal properties. This observation rendered other studies – for instance, Pereira, Silvestre and Villalva (2013) and Jovem and Silva (2016) – the idea that these come from verbs – or verbal stems. However, this paper argues that words are formed in syntax and do not come from other words (or stems). Still it is also likely to find great empirical generalizations as regards properties usually assigned to verbs (or "deverbal" items) in DM framework.

Marantz (1997), Alexiadou (2001), Harley (2009) and Oltra-Massuet (2014), to mention a few, argue that the verbal properties of a given structure can be licensed by the presence of a verbal layer in the structure, that is, vP – as (9) points out. Maybe the most apparent verbal property is the event-interpretation (the same appearing in verbs). This event-reading allows for introducing temporal adjuncts in the structure, as we can see in (10) for the three modal adjectives – (a) possibility, (b) probability, (c) obligation.

(10)
    a. Um raio infravermelho é detectável <u>quando</u> o Sol está em uma posição α.
       'An infra-red ray is detectable when the sun in an α-position'
    b. O plano é infalível <u>enquanto</u> o Pedro estiver no comando.
       'The plan is infallible while Peter is in charge'
    c. Esta é uma situação lamentável independentemente de <u>quando</u> ocorra.
       'This is a regrettable situation no matter when it takes place'

Additionally, following Fu, Roeper and Borer (2001) and Alexiadou (2001), the very presence of a verbal layer in the structure should be license VP-adverbs (in the case, manner-adverbs), as the examples in (11) show.

(11)
    a. Um cronograma <u>facilmente</u> ajustável tem suas vantagens.
       'An easily adjustable schedule has its advantages'
    b. Uma bateria durável apenas <u>temporariamente</u> não resolve o meu problema.
       'A battery lasting just temporally does not solve my problem'
    c. Um professor <u>plenamente</u> respeitável não deveria ter uma atitude dessas.
       'A fully respectful teacher should not accept a behavior like this'

Furthermore, the presence of a verbal layer and consequently the possibility for event-reading should allow for licensing the occurrence of agents. The data in (12) refer to this licensing.

(12)
    a. Esse quebra-cabeça é montável <u>por qualquer criança</u> com mais de dois anos.
       'This puzzle is solvable by any kid older than two years'
    b. *Esse plano é infalível <u>por alguém</u> que tem conhecimento sobre o assunto.
       'This plan is infallible by someone who has knowledge on the subject'
    c. *Esse é um cenário lamentável <u>por quem</u> deseja um país melhor.
       'This is a regrettable scenario by whom hopes for a better country'

What the data in (12) show is that the three types of modal adjectives differ from each other as regards licensing agents, that is, only *vel*-adjectives with the possibility-reading allow for agents as adjuncts. Whatever the reason, it does not consist of a piece of evidence against postulating a verbal layer, but only suggests – contra Oltra-Massuet (2014) – that the external argument it not licensed by vP. Thus, following Kratzer (1996), Alexiadou (2001), among many others, this paper proposes that the external argument is licensed by a functional head different from v^o (projecting the internal argument), namely, Voice. Hence, this analysis suggests that three types of modal *vel*-adjectives have a vP, but only the adjectives denoting possibility have a VoiceP.

Moreover, as for the properties of the verbalizer, something else must be stated. Some authors – as Marantz (1997), Alexiadou (2001), Harley (2009), Oltra-Massuet (2014), to mention a few – argue that not all verbalizers have the same properties. For instance, some must be specified for passive or active readings/structures. By relying on this idea, Oltra-Massuet (2014) claims that v^o from modal readings is specified with [PASS] feature, for passive syntax – an underlying intuition in Pereira, Silvestre and Villalva's (2013) and Moreira's (2014) work.

The postulation of this feature can explain why the paraphrase corresponding to the possibility-reading (*contável* = 'countable'/"can be count") and the obligation-

reading (*lamentável* = 'regrettable'/"ought to be regretted") involve a passive construction, unlike what happens to adjectives with probability-reading (*agradável* = 'agreeable'/"that is supposed to delight", but not # "that ought to be delighted"). Therefore, this analysis argues that the verbalizer of *vel*-adjectives with possibility- and obligation-readings (that is, circumstantial and deontic modality) are specified with [PASS] feature, but those with probability-reading (epistemic) do not – and hence, they have an "active syntax".

As for AspP appearing in (9), along the lines of Oltra-Massuet (2014), it must be specified with a resultative feature ($_R$). Following Embick (2004), for Oltra-Massuet, it is a morpheme creating a result-state from an earlier event (expressed by vP), that is, a *publishable book* is a book that, given the circumstances, has the property of being published or achieving the result-state of a publishing-event. Under the same perspective, a *durable product* is a product that, if everything goes normally achieves a "lasting" state, resulting from a lasting-event. Finally, along the same lines, a *regrettable incident* is an incident that, according to the current laws, achieves a result-state of a regretting-event (to be regretted).

Additionally, this proposal has the advantage to handle adjectives presenting a circumstantial modal reading, even if they do not have a relating verb, such as some members of the set in (3), namely, *comestível* ('edible' = "that can be eaten"), *compatível* ('compatible' = "that can coexit"), *flexível* ('flexible' = "that can adapt"), *inefável* ('ineffable' = "that cannot be described"), *inexorável* ('inexorable' = "that cannot be corrupted"), *maleável* ('malleable' = "that can be manipulated"), *plausível* ('plausible' = "that can be sustained"), *potável* ('potable' = "that can be drunk"), *suscetível* ('susceptible' = "that can be affected"), *vulnerável* ('vulnerable' = "that can be damaged"). The same applies to adjectives as *responsável* ('responsible' = "that ought to respond"), *memorável* ('memorable' = "that ought to be remembered") and *razoável* ('reasonable' = "that ought to be reasoned"), which have a deontic reading.

Although not all suggested paraphrases are fully equivalent, the modal reading is easily identifiable, as it seems to be the case for *potable water* ("it is possible, given the circumstances, if everything goes normally, to drink this water") or a *project susceptible to change* ("it is possible, given the circumstances, if everything goes normally, to change this project"). Under the same perspective, a *memorable event* (it is necessary, due to the circumstances, given the current laws, to remember this event").

Finally, aside from *vel*-adjectives with modal reading, something must be said about the set of examples with trigger-reading. Given the lack of modal interpretation, these adjectives do not present in their structure a ModP projection. As it can be inferred from data in (13), this group does not contain a vP projection – what is captured by postulating a nominal stem in lexicalist approaches, as in Pereira, Silvestre and Villalva. (2013) and Jovem and Silva (2016).

(13)

    a. Esse sofá é confortável *em três horas/*imediatamente/*pela empregada.
       'this sofa is comfortable *in three hours/*immediately/*by the clean-lady'

    b. Esse cãozinho é amigável *por uma semana/*repentinamente/*pela Maria.
       'This puppy is friendly *for a week/*suddenly/*by Mary'

    c. Sua atitude é desprezível *por um dia/*inteiramente/*pelo professor.
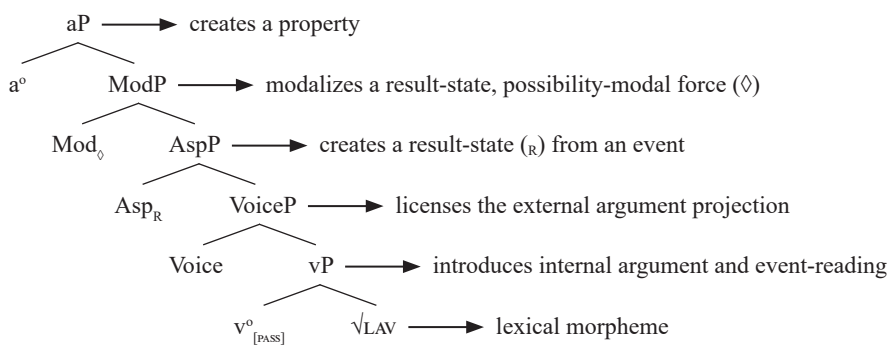   'Your behavior is disposable *for one day/*fully/*by the teacher'

Thus, along the lines of Embick (2004) and Oltra-Massuet (2014), this paper proposes that the trigger-reading in these adjectives can be captured in a structure, where the root directly merges an Asp head, specified as ($_E$), and not as result-state as in modals. Next, the formation of the adjective takes place by subsequently merging an adjectivizer (aº), as in the other cases. The trigger-reading can be captured in these cases by a [CAUSE] feature hosted in the adjectivizer.

Under this perspective, a *comfortable sofa* is a sofa, whose property is triggering a comfort-state; a *friendly puppy* means a puppy triggering a friendship-state; a *despicable behavior* is a behavior that has the property to trigger a scorn-state. It is worth noting that a subset from examples in (3) fits in this trigger-reading group as well, what we can see in *afável* ('affable' = "that triggers welcoming"), *deplorável* ('deplorable' = "that triggers regret"), *formidável* ('formidable' = "that triggers admiring").
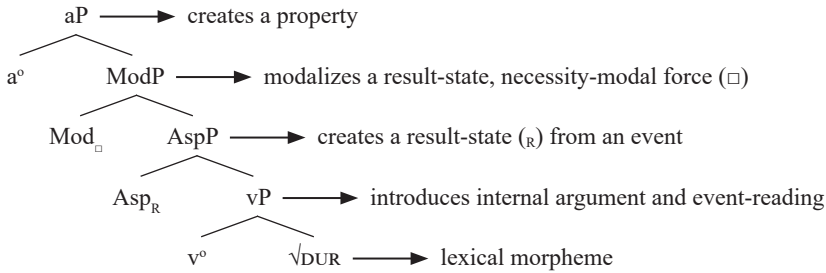
In short, as the analysis proposed in this paper, each usage of *vel*-adjectives involves a different syntactic structure, which manages to explain their syntactic and semantic properties, as shown in (14).
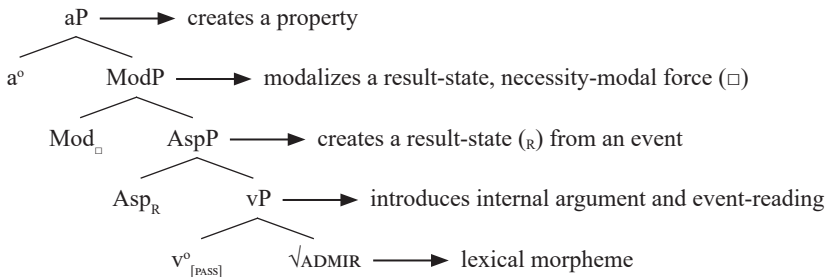
(14)

(a) lavável ('washable') – circumstantial modal, possibility-reading.

aP ⟶ creates a property

aº   ModP ⟶ modalizes a result-state, possibility-modal force (◊)

Mod$_◊$ AspP ⟶ creates a result-state ($_R$) from an event

Asp$_R$ VoiceP ⟶ licenses the external argument projection

Voice   vP ⟶ introduces internal argument and event-reading

vº$_{[PASS]}$ √LAV ⟶ lexical morpheme

(b) durável ('durable') – epistemic modal, probability-reading.

```
        aP ──────▶ creates a property
       ╱  ╲
     aᵒ    ModP ──────▶ modalizes a result-state, necessity-modal force (□)
          ╱    ╲
      Mod_□    AspP ──────▶ creates a result-state (_R) from an event
              ╱    ╲
          Asp_R    vP ──────▶ introduces internal argument and event-reading
                  ╱   ╲
                vᵒ    √DUR ──────▶ lexical morpheme
```

(c) admirável ('admirable') – deontic modal, obligation-reading.

```
        aP ──────▶ creates a property
       ╱  ╲
     aᵒ    ModP ──────▶ modalizes a result-state, necessity-modal force (□)
          ╱    ╲
      Mod_□    AspP ──────▶ creates a result-state (_R) from an event
              ╱    ╲
          Asp_R    vP ──────▶ introduces internal argument and event-reading
                  ╱   ╲
            vᵒ_[PASS]  √ADMIR ──────▶ lexical morpheme
```

(d) amigável ('friendly') – non-modal adjective, trigger-reading.

```
        aP ──────▶ creates a causative property
       ╱  ╲
 aᵒ_[CAUSA]  AspP ──────▶ creates a state-aspect (_E)
            ╱    ╲
        Aspᵒ_E    √AMIG ──────▶ lexical morpheme
```
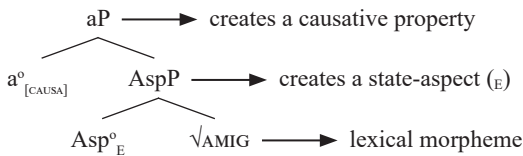
The morphology for *vel*-adjectives

The section *The semantics of vel-adjectives* aimed at classifying *vel*-adjectives according to their semantic properties (and consequently the readings they can trigger), while section *The syntax of vel-adjectives* presented a proposal for the (syntactic) structure of these adjectives, in that it is possible to capture their semantic and grammatical properties. Finally, this section intents to make some remarks specifically on *vel*-adjectives morphophonological properties, underlying not their syntactic or semantic behavior, but their narrowly formal one.

As mentioned, within DM framework, after the computational system generates the structures, these are spelled out. At PF branch, MS is the component operating on the generated structures to handle the specifically morphological requirements, such as insertion of dissociated morphemes. According to Embick (1997), these are morphemes inserted only in MS to carry out these requirements, without any syntactic or semantic significance. This is the case for theme vowels, for instance. Harris (1999) proposes that for every categorizer head (x°) in syntax, a theme position (*th*) will be projected in MS – as exemplified in (15).

(15)

      syntax   morphology (MS)

        x° ⟶ x°

                  x°   *th*
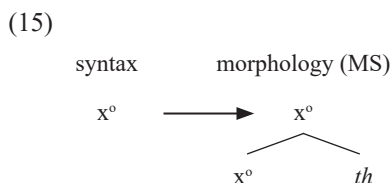
Assuming (15), from structures in (14), the presence of two theme vowels is expected, one for a° and another one for v° (both categorizers). As for the adjectivizer theme vowel, this proposal claims that it has a null realization in singular and just gets phonology material in plural contexts, which can be seen in the contrast between *quebrável* ('breakable$_{SING}$') and *quebráveis* ('breakable$_{PL}$'), for instance, where there is a systematic alternance between Ø (singular) and *-i-* (plural). It is worth mentioning that this alternance is likewise seen in some nominal environments, such as *amor* ('love$_{SING}$') and *amores* ('love$_{PL}$'), where Ø in the singular opposes to theme vowel *-e-* in the plural. As regards the theme vowel position projected by v°, as expected, it must be the same appearing in verbs, as we can see in (16).

(16)
      a. mont-a-r → mont-á-vel ('set → setable').
      b. beb-e-r → beb-í-vel ('drink → drinkable').
      c. pun-i-r → pun-í-vel ('punish → punishable').

As (16) shows, the theme vowel appearing in *vel*-adjectives is the same occurring in verbs. The occurrence of *-i-* and not *-e-* for second conjugation can be understood as a theme vowel allomorphy, the same appearing in participle forms, such as *beb-i-do* ('drunk'), but not *beb-e-do. Whatever this may be, the presence of theme vowel in these cases works as a further piece of evidence for postulating a vP in these adjectives – see Harley (2009) and Oltra-Massuet (2014) for more examples.

Yet pairs as *desprezível* ('despicable') and *desprezável* ('negligible'), both derived from the root √PREZ, prefixed by *des-*, illustrate the fact that in the first case, when there is a modal reading (and as claimed, a v° morpheme), the occurring theme vowel is the same for the verb *desprezar* ('scorn'). On the other hand, in the second case, as for the

trigger-reading ('despicable' = "that triggers scorn"), the theme vowel is different – what in this paper is explained by the lack of vP.

Additionally, another phenomenon more easily accounted for within a syntactic approach to word formation is related to root-allomorphy. As illustrated by the data in (4) and (5), a lot of *vel*-adjectives present a root-spelling out different from those found in items belonging to other categories. Within DM, spelling out the root may be context-dependent. Thus, the allomorphy seen in *rentável* ('profitable' = "that triggers profits") can be captured by a contextual rule for Vocabulary insertion, as follows.[3]

(17)

$\sqrt{\text{REND}} \leftrightarrow$ /re^{n}t/ / ____ a°.
$\sqrt{\text{REND}} \leftrightarrow$ /re^{n}d/ / elsewhere.

The set of rules in (17) predicts that the root $\sqrt{\text{REND}}$ is spelled out as /re^{n}t/ in the context of an adjectivizer (deriving *rentável*, for instance), but spelled out as /re^{n}d/ elsewhere (as in the verb *render* and in the noun *renda*). Thus, it is possible to determine root-spelling out, based on the syntactic environment without calling upon homonymy or polysemy. This mechanism is also applicable in any cases in (4) and (5).

At last, as for *vel*-adjectives morphophonology, we also need to explain why so many (modal and non-modal) interpretations with different syntactic properties are spelled out as the same suffix. Oltra-Massuet (2014), for Spanish and Catalan, proposes a contextual rule for Vocabulary insertion, which is sensitive to the presence of a modal functional head. Thus, along the lines of this proposal, (18) could be the rule for Vocabulary insertion of modal *vel*-adjectives.

(18)

a° $\leftrightarrow$ /vel/ / ____ ModP.

The rule in (18) predicts that the adjectivizer is spelled out as /vel/ in the context of a modal functional projection (that is, ModP), as in (14a-c). This explains why (regardless the conveying modal reading) modal adjectives will always be spelled out as -*vel*. However, (18) does not account for why *vel*-adjectives with a non-modal reading (a trigger-reading) are spelled out with the same Vocabulary item, given the lack of the projection, working as context for its insertion – that is, ModP. In this case, it would be needed to postulate a rule of Vocabulary insertion sensitive not to a projection, but to a feature, hosted in a certain head – as we can see in (19), based on (14d).

(19)

[CAUSE] $\leftrightarrow$ /vel/ / ____ a°.

---

[3] This phenomenon can be likewise captured by means of phonological readjustment rules (HALLE; MARANTZ, 1993), with no damage to this proposal.

The rule in (19) determines that the [CAUSE] feature (responsible to the trigger-reading) is spelled out as /vel/ in the context of a° – but not in the context of a v°, for instance. Thus, (19) generates the expected phonological form. It is worth mentioning that Vocabulary insertion based on features is quite productive in verbal domain, as rules in (20) show – from Halle and Marantz (1993, p.126) to English verbal morphology (these are all T-features).

(20)
    [+PRET] ↔ /d/
    [+PARTICIPLE] ↔ /ing/
    [3.SG] ↔ /z/

Thus, based on (18) and (19), it is created two contexts for the insertion of the same Vocabulary item -*vel*, although these have quite distinct syntactic and semantic properties. Actually, the presence of the same Vocabulary item for structures with different interpretations is not exclusive to *vel*-adjectives and can also be found in the nominalizer -*ção* ('-ation'), where the iterative reading present in *matação de aula* ('skip$_{ITER}$ of classes'), *bateção de lata* ('beat$_{ITER}$ of kins') and *arrumação da casa* ('organize$_{ITER}$ of the house') is absent in *realização de um sonho* ('dream coming through'), *alteração no projeto* ('change in the project') and *observação dos resultados* ('outlook of results').

Final remarks

This paper proposed an analysis for *vel*-adjectives, accounting for their morphophonological, syntactic and semantic properties. This proposal, built on Oltra-Massuet (2014), argues that different readings associated to these adjectives result from the projection of functional projections composing their structure – vP, AspP and ModP. This work assumed that -*vel* is a single Vocabulary item, always spelling out the adjectivizer in the context of a ModP projection and in the context of a [CAUSE] feature, regardless their interpretation. This accounts for the fact that it can generate different modal readings and additionally a non-modal one. The analysis argues that the modal readings result from the projection of modal head Mod, which is specified for modal force. The type of modality is given by the conversational background.

Yet adjectives with modal reading differ as regards the presence of agents. It was shown that the occurrence of agent-adjuncts is only possible in constructions, where *vel*-adjectives have a possibility-reading. Thus, contra Oltra-Massuet (2014), this paper assumed that the external argument in licensed by VoiceP. As for vP, it is projected in all modal structures for these adjectives. Hence, this head differs regarding its specification as active or passive. For one thing, it accounts for the difference between possibility- and obligation-reading (both allowing a passive syntax) and for other, a probability-reading (which does not allow it).

Finally, *vel*-adjectives with trigger-reading project neither ModP nor vP. In this case, the root merges a state-aspect head and the trigger-reading is given by [CAUSE] feature, hosted in aº. As regards *vel*-adjectives morphophonological properties, one observed the occurrence of two theme vowels: one projected by aº and the other one by vº. The status of the vowel preceding *-vel* in non-modal contexts (as well as the head projecting it) calls for further research.

RESENDE, M.; RECH, N. An analysis for *vel*-adjectives in the light of distributed morphology. **Alfa**, São Paulo, v.64, 2020.

- *RESUMO: Este artigo apresenta uma análise para os adjetivos em -vel dentro do quadro teórico da Morfologia Distribuída (HALLE; MARANTZ, 1993). A proposta apresentada, desenvolvida com base em Oltra-Massuet (2014), postula que as leituras modais (possibilidade, probabilidade e obrigação) e a não modal (gatilho) associadas aos adjetivos em -vel resultam da presença de diferentes núcleos funcionais que compõem sua estrutura (vº, Asp e Mod). Nessa linha, argumenta-se que /vel/ corresponde a um único item de Vocabulário que realiza o núcleo adjetivizador (aº) na presença de um núcleo funcional ModP e também nos contextos de um traço [CAUSA]. Isso explica os diferentes sentidos que os falantes do PB associam a esses adjetivos. Os adjetivos que licenciam uma interpretação modal têm na sua estrutura a projeção de um núcleo ModP; ao passo que os adjetivos com leitura não modal não projetam esse núcleo. Este artigo propõe uma importante distinção estrutural entre os adjetivos em -vel com leitura modal, qual seja: apenas os que geram uma leitura de possibilidade projetam o núcleo VozP; os demais projetam apenas o núcleo vP, que introduz leitura de evento, mas não licencia a projeção do argumento externo (cf. KRATZER, 1996; ALEXIADOU, 2001). Essa proposta postula ainda um traço [CAUSA] presente no categorizador adjetival, o qual atribui a leitura de gatilho aos adjetivos em -vel com leitura não modal.*

- *PALAVRAS-CHAVE: Morfologia distribuída. Adjetivos em -vel. Modalidade.*

REFERENCES

ALEXIADOU, A. **Functional structure in nominals**: nominalization and ergativity. Amsterdam: John Benjamins, 2001.

EMBICK, D. On the resultative participles in English. **Linguistic Inquiry,** Cambridge, v.35, p.355-392, 2004.

EMBICK, D. Voice systems and the syntax/morphology interface. *In*: WORKSHOP ON ASPECT, ARGUMENT STRUCTURE, AND EVENTS, 1997, Pensilvânia. **Proceedings of the UPenn.** Pensilvânia: MIT, 1997. p.41-72. Disponível em: https://www.ling.upenn.edu/~embick/voicesys.pdf. Acesso em: 11 maio 2020.

FELDMAN, F. **Doing the best we can**. Dortrecht: Reidel, 1986.

FU, J.; ROEPER, T.; BORER, H. The VP within process nominals: evidence from adverbs and the VP anaphor do-so. **Natural Language and Linguistic Theory**, Dordrecht, v.19, p.549-582, 2001.

HACQUARD. On the event relativity of modal auxiliaries. **Natural Language Semantics**, Nova Iorque, v.18, n.1, p.79-114, 2010.

HACQUARD, V. **Aspects of modality**. 2006. 214f. Thesis (Doctor of Philosophy in Linguistics) – Massachusetts Institute of Technology, Cambridge, 2006.

HALLE, M.; MARANTZ, A. Some key features of Distributed Morphology. **MIT Working papers in Linguistics**: papers in phonology and morphology, Cambridge, v.21, p.275-288, 1994.

HALLE, M.; MARANTZ, A. Distributed morphology and the pieces of inflection. *In*: HALE, K.; KEYSER, J. (ed.). **View from the word building 20**. Cambridge: MIT, 1993. p.111-176.

HARLEY, H. The morphology of nominalizations and the syntax of vP. *In*: RATHERT, M.; GIANNAKIDOU, A. (ed.). **Quantification, definiteness and nominalization**. Oxford: Oxford, 2009. p.320-342.

HARRIS, J. Nasal depalatalization 'no', morphological well-formedness 'si': the structure of Spanish word classes. **MIT Working papers in Linguistics,** Cambridge, v.33, p.47-82, 1999.

JOVEM, M. S.; SILVA, J. R. Rede construcional dos adjetivos formados por '-vel' no português. **Odisseia**, Natal, v.2, n.1, p.3-18, 2016.

KRATZER, A. Severing the external argument from its verb. *In*: ROORYCK, J.; ZARING, L. (ed.). **Phrase strcuture and the lexicon**. Dordrecht: Springer, 1996. p.109-137.

KRATZER, A. Modality. *In*: VON STECHOW, A.; WUNDERLICH, D. (ed.). **Semantics**: an international handbook of contemporary research. Berlin: Walter de Gruyter, 1991. p.639-650.

KRATZER, A. The notional category of modality. *In*: EICKMEYER, H.; RIESER, H. (ed.). **Words, worlds and contexts**: new approaches in words semantics. Berlin: Walter de Gruyter, 1981. p.38-74.

MARANTZ, A. Sem escapatória da sintaxe: não tente fazer análise morfológica na privacidade do seu próprio léxico. **ReVEL**, Porto Alegre, v.13, n.24, p.8-33, 2015.

MOREIRA, B. E. C. Two types of dispositional adjectives. **ReVEL**, Porto Alegre, n. 8, nesp, p.86-196, 2014.

OLTRA-MASSUET. **Deverbal adjectives at the interface**: a cross-linguistic investigation into the morphology, syntax and semantics of '-ble'. Mouton: De Gruyter, 2014.

 PESSOTTO, A. L. 'Pode' e 'podia': uma proposta semântico-pragmática. **Revista da ABRALIN**, [*s.l.*], v.10, n.2, p.11-41, 2011.

PEREIRA, R. V.; SILVESTRE, J. P.; VILLALVA, A. Os adjetivos em '-vel' formados em português: estrutura argumental, estrutura temática e aspecto da base verbal. **ReVEL**, Porto Alegre, v.11, n.20, p.43-66, 2013.

PIRES DE OLIVEIRA, R.; NGOY, F. M. Notas sobre a expressão semântica do sufixo '-vel': a expressão da modalidade no PB. **Revista Letras**, Curitiba, n.73, p.185-201, 2007.

PIRES DE OLIVEIRA, R.; SCARDUELLI, J. A. Explicando as diferenças semânticas entre 'ter que' e 'dever': uma proposta em semântica de mundos possíveis. **Alfa**, São José do Rio Preto, v.52, p.215-234, 2008.

RECH, N.. O processo de auxiliaridade no português brasileiro: uma análise dos modais 'poder', 'dever' e 'ter que'. **Working papers em Linguística,** Florianópolis, n.2, p.37-51, 2010.

RESENDE, M. S. Algumas diferenças semânticas entre 'dever' e 'poder'. **Versalete**, Curitiba, v.3, n.5, p.36-49, 2015.