ON THE SEMANTICS OF 'DE VOLTA': AN EXERCISE ON COUNTERDIRECTIONALITY[1]

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■ ABSTRACT: Within the framework of formal semantics and pragmatics of natural languages, the aim of this paper is to analyse the expression 'de volta' in Brazilian Portuguese, considering it as an event modifier of a particular type, a counterdirectional modifier. In order to do this, we develop our analysis using Neo-Davidsonian Event Semantics and the Semantics of Trajectories proposed by Zwarts (2005, 2008), allied to an analysis of event modifiers. First, we present the domain of counterdirectionality, its main distinctions and the proposal of Zwarts and Basso (2016), which also deals with Brazilian Portuguese. Next, we present several data related to the interpretations of 'de volta'; in the following section, we develop our specific proposal for the semantic analysis of 'de volta'. As a result, we propose a unified analysis of 'de volta' which accounts for its returnative, responsive, restitutive, and repetitive interpretations. We also present a review of the conclusions of Zwarts and Basso (2016) about 'de volta'. We conclude this paper with some open issues.

■ KEYWORDS: Counterdirectionality. Modifiers. Event Semantics. Formal Semantics. Presupposition.

Introduction

Amongst verbal modifiers, there is a domain that that can be identified as "counterdirectional", as suggested by Fabricius-Hansen (2001). This domain has only recently received systematic attention by researchers in semantics, pragmatics and syntax of natural languages, such as Beck and Gergel (2015), Abrusan (2016), Zwarts and Basso (2016) and Zwarts (2019). The modifiers in the counterdirectional domain express that a given movement or event happens as a response to a previous movement or event, and it unfolds in the opposite of the usual direction. As argued by Zwarts and Basso (2016), this domain is composed of several interrelated meanings. Considering data from Brazilian Portuguese (BrP), examples of counterdirectional meanings can

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be found when verbal predicates are combined with expressions such as 'ao contrário' ('fazer ao contrário', "to make something backwards"), 'de trás para frente' ('contar de trás para frente', "to count backwards"), 'para trás' ('andar para trás', "to walk backwards" i.e. with one's back leading), 'de volta' ('caminhar de volta', "to walk back"), and various uses of the prefix 're-', as in 'retornar' ("return"), 'recolocar' ("to put something back", "to relocate"), etc. (cf., CHUMAN, 2015).

In this paper, our aim is to provide a semantic characterization for one of the elements of the counterdirectional domain of BrP, namely the expression 'de volta'. This paper is organized as follows: in the first section, we will characterize the counterdirectional domain, present some of the meanings that belong to it, and show how BrP, English and Dutch organize this domain as an illustration of different lexicalization paths. In the next section, we will analyze the uses and interpretations of 'de volta' which will motivate the semantic proposal that will be developed in the third section, "A semantic analysis for 'de volta'". On the Conclusion we will summarize our main conclusions and present some of the issues that need to be further investigated.

On the counterdirectional domain

The investigation of the counterdirectional domain is based on the observation that certain lexical items in different languages of the world aggregated a series of seemingly disparate meanings that on a more detailed scrutiny share common characteristics. This kind of observation was made by several researchers working under different theoretical frameworks and at different times. "Back", in English, is an example of such an item – it is a polysemic item, which appears in different grammatical classes in its various interpretations and uses, and can be classified as a preposition, an adverb, a verbal particle, and a name. Note, for instance, the following sentences:

(1) Dunworthy stepped *backward* and crashed into a six-year-old holding a plush Santa. (Connie Willis – The Doomsday Book)
(2) I counted *backwards* from 10.
(3) I ran *back* a few blocks.
(4) Someone kicked a ball to John, and he kicked it *back*.
(5) The explosion made him *back* awake.
(6) The door closed *again*.

Except for the example (6), "back" (or a form derived from it) appears with different interpretations in all cases. However, there is something in common between these interpretations, which is precisely what motivates the existence of a "counterdirecional" domain, namely the fact that all these interpretations involve a trajectory or an event that goes in the opposite direction (or in response, in the opposite orientation) of a conventional or initial trajectory or event.

In (1) there is a movement made in the opposite direction to what is considered natural, since the subject walks in the direction towards which his back is facing – normally we move forward in the direction towards which our eyes are pointing and not in the direction towards which our back is pointing. But in (1) this is precisely what happens: a walk against the conventional orientation, in the orientation to which one's back is pointing. This meaning can be called **rearward** and can be illustrated by BrP predicates such as 'andar para trás' or 'caminhar de costas' ("to walking backwards / with the back leading").

Sentence (2) illustrates an event that occurred in the opposite direction to what is usual; in this case, count 'de trás para frente' ("backwards", "from back to front") is the exact opposite of what we normally do when we count. This is the **retrograde** meaning, and it is found in BrP examples such as 'contar de trás para frente' ("to count backwards") and 'pedalar ao contrário' ("to pedal backwards"); such meaning may involve the reversion of a trajectory or simply the reversion of the way in which an event unfolds.

The **returnative** meaning refers to a returning movement to an earlier place, considering a previous trajectory. Sentence (3) exemplifies the **returnative** meaning: the subject has returned, running, a few blocks (in the previously traveled trajectory). Examples of this meaning in BrP are 'voltar' ("to go back"), 'retornar' ("to return"), and the presence of 'de volta' combined with verbal predicates, the topic of this paper. Sentence (4) exemplifies the **responsive** meaning, which occurs when an event is made in response to a previous one, and in that sense it occurs in the opposite direction – if A does something for B (A➔B), the answer will be something that goes from B to A (B➔A), that is, in the opposite direction of the first event. For BrP, once again 'de volta' plays an important role in expressing that meaning.

The **restitutive** meaning is exemplified in sentence (5): it indicates that a previous situation is reestablished, and again we have an opposite movement, back to an earlier situation, albeit in a more abstract domain because these cases involve states-of-affairs[2]. Finally, example (6) shows the **repetitive** meaning; this meaning presupposes the existence of a previous event of the same nature to which one returns, repeating it. The repetitive meaning is also part of counterdirectional domain because in several languages the item that expresses this meaning also expresses the restitutive meaning. For BrP, these meanings are expressed by the expressions 'de novo', 'outra vez' ("again") and in some cases 'de volta' for the restitutive meaning ("back").

In summary, considering the case of the English item "back", it is possible to find a series of different meanings, expressed by the same lexical item, which has as its

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[2]   We will not discuss the complex philosophical question of defining what are "states-of-affairs" in this paper. But it is interesting to note, as we shall see later, that we can take "states-of-affairs" as a specific organization of particulars and universals that make the sentences of a language true, according to the Correspondence Theory of Truth. As we hope will be clear, the philosophical details, however important, will have no impact on our semantic analysis.

basis an (abstract) notion of return, which can be understood as a movement[3] contrary to what is normally the case – there can only be a return if there has been a previous movement, and the return has to occur necessarily in the opposite direction.

Zwarts and Basso (2016, p.28) propose the following scheme to represent the relations between the meanings in the counterdirectional domain, based on semantic relations between these various meanings and on attested lexicalization patterns:

Scheme 1 – Organization of the counterdirectional meanings

| rearward | ------- | returnative | ------- | restitutive |
| retrograde | | responsive | | repetitive |
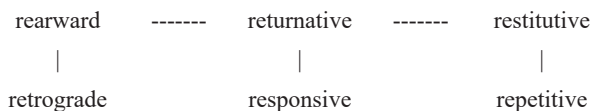
Source: Author's elaboration.

In that same paper, the authors offer the following proposal of organization for the expression of these meanings in English, Dutch and Brazilian Portuguese, which serves as an exemplification of the possible lexical organizations within the counterdirectional domain for different languages:

Scheme 2 – Lexicalization of counterdirectional meanings in English
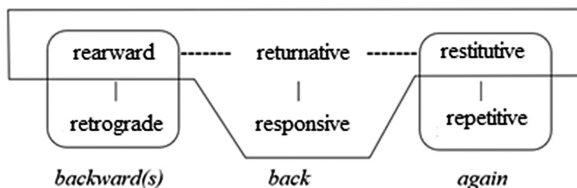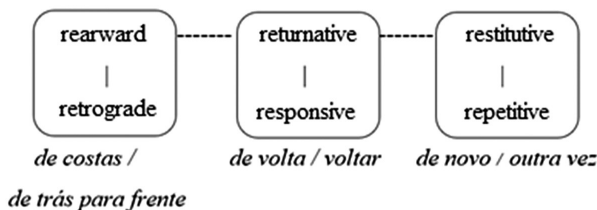

Source: Zwarts and Basso (2016, p.28).

Scheme 3 – Lexicalization of counterdirectional meanings in Dutch
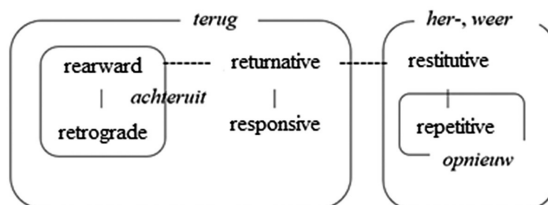
Source: Zwarts and Basso (2016, p.41).

Scheme 4 – Lexicalization of counterdirectional meanings in BrP

Each one of these languages followed different paths in the lexicalization of these meanings, but it is interesting to note that for the first four meanings (rearward, retrograde, returnative, and responsive), the items used by the three languages have a clear origin on body parts and/or orientation – "costas" (back), back, terug ("back"), trás (back), frente (front), voltar, '-wards', 'achter'[4]. The restitutive and repetitive meanings are more commonly composed of items that involve the idea of occurrence, such as 'vez', 'time', and 'weer'.

In this paper, as we have said, our focus is on the expression 'de volta' and its semantic characterization. Now that we have showed the counterdirectional domain and its main meanings, in the following section we will explore some uses of 'de volta' in order to verify if the classification of Zwarts and Basso (2016) is sufficient or if there are other counterdirectional meanings that 'de volta' expresses. In the section "A semantic analysis for 'de volta'", based on the systematization of the data, we will propose a unified semantic analysis for 'de volta'.

'De volta' and its meanings

There are several items with which 'de volta' combines, verbal and nominal in nature. Let's start by investigating 'de volta' combined with names, as in the examples below, which are not intended to be exhaustive:

(7) jogo de volta (return game / home game)
(8) caminho / trajetória / percurso / rota de volta (path / way / route back)
(9) passagem / ticket / bilhete de volta (return ticket)

For all these cases, an earlier event is presupposed, and it is this event which, in an intuitive sense, motivates and licenses the use of the expression 'de volta'. That is, a 'jogo de volta' ("home game") is only possible if there was already a 'jogo de ida'

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[4] "back" comes from the word that refers to the back, as well as "rug" (in "terug") and "achter" in Dutch, which refer to the back, or to the back of something.

("away game"), which are opposed to each other; the same is true, *mutatis mutandis*, considering the examples in (8): they all presuppose the existence of a previous trajectory, in the opposite direction of the one mentioned in (8), combined with 'de volta'. The examples in (9) are only felicitous if there is an outward/go ticket, which involves a trajectory contrary to that of the return ticket[5].

It is also important to note the symmetry present in these cases: the return game can only occur if it involves the same teams (although there may be variation amongst the players); the way back has to end at the point where the *going* started; and a return ticket must have as its end point the departure point of the outward/go ticket – although there can be variation in the trajectory; for example: one can go from São Paulo to Brasília through Belo Horizonte but can make a way back (to São Paulo) without necessarily passing through Belo Horizonte.

Considering the cases in (8) and (9), we can represent the beginning of a trajectory p as p(0) and its end as p(1). Any trajectory pA, with final pA(1), will have a counterpart 'de volta', pB, whose end will be pB(1) = pA(0), even if there are different points in the middle of the trajectory – we will return to these questions later, as well as to a further explicit formalization. Moreover, in the cases in which there is a name on the surface structure, it is important to note its eventive nature – for (7) we are considering a "playing" event, and for (8) and (9) we are considering an event of movement, which shows that 'de volta' is a modifier that has events as arguments[6].

Let's now focus on verbal predicates. 'de volta' can combine with virtually all the verbs that indicate movement in the BrP, as exemplified in the list below, which is not exhaustive (cf. MEIRELLES; CANÇADO, 2017; RAMMÉ, 2012):

(a) verbs of manner of movement: ir (to go), caminhar (to walk), nadar (to swim), voar (to fly), dirigir (to drive), rastejar (to creep), engatinhar (to crawl), pedalar (to pedal), pilotar (to pilot), navegar (to sail), correr (to run), andar (to walk), pular (to jump), acompanhar (to accompany), seguir (to follow), conduzir (to lead)

(b) verbs that involve movement (inherently directed) / displacement: jogar (to play), chutar (to kick), trazer (to bring), levar (to take), carregar (to carry), embarcar (to embark), cair (to fall), arremessar (to throw)

The verbs in (a) can be associated with trajectories and their lexical content conveys different ways of fulfilling, traversing and reaching the end of such trajectories (PINKER, 1989; TALMY, 2000). When one combines any of these verbs with 'de volta', the result is the inverse of the trajectory traversed: if we consider that the trajectory

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[5] The opposition contrast with "ida" ("going") becomes clear also when we consider that we can change 'de volta' for 'da volta' in examples from (7) to (9).

[6] A more detailed analysis will certainly be interesting for these cases, especially if one considers that different nominalizations can lead to different counterdirectional meanings. For example, "jogo de volta" ("away game") is responsive, but "nado de volta" ("back-swimming") can be returnative. Be that as it may, our point here is only to note that there is always an event involved in these interpretations.

denoted by a particular use of the verb 'navegar' ("to navigate") as pN, its beginning as pN(0) and its end as pN(1), the result of the combination with 'de volta', 'navegar de volta' ("to navigate back"), will involve the trajectory pNV, which will have the following characteristic: $pNV(1) = pN(0)$. It is important to note once again that the pNV trajectory does not need to be composed of all the points that make up the pN trajectory – one can navigate one route (pN) and return through another (pNV), but we only consider it as a return (and we can use 'de volta') if the end of pNV is the beginning of pN, as we have seen with examples (8) and (9) above.[7]

It is also interesting to note that 'de volta', considering the verbs in (a), imposes restrictions on the trajectories involved and on their directionality, but not on how they are traversed, as the following example demonstrates:

(10) João foi para a escola de ônibus, mas caminhou de volta.
João went to the school by bus, but he walked back.

In (10), considering that João left from and returned to his house, the trajectory of going to school, pE, was traversed by bus, and the opposite trajectory, the way back, pEV, was walked on foot; moreover, it is quite likely that the routes traveled were different, since the bus route does not have to be the same as the walking route. In fact, what matters to license the use of 'de volta' is that $pEV(1) = pE(0)$.

Perhaps one of the main characteristics of the verbs in (a) is that they are agentive (non-causative) and involve the subject's displacement or movement. The verbs in (b), on the other hand, involve movement of their object, with a subject that causes or triggers such movement[8]. Despite this difference, what seems to be involved here, as in the cases in (a), is the existence of an anterior displacement or movement of the denotation of the sentence object in a certain direction/with a certain orientation; in all these uses we have concrete displacement, in the sense of involving a change on spatial location – the result of using 'de volta' is a spatial trajectory contrary to the one which occurred first.

Take, for instance, the sentence below:

(11) João chutou a bola de volta para o Pedro.
João kicked the ball back to Pedro.

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[7]   Consider a case in which João went from point A (initial) to point B (end), passing through point C, between the two other points. Suppose now that he has to go to point C; even if we can say that João returned to point C from B, it would not be appropriate to say that he made a trajectory 'de volta' (i.e., that he went back). Notice the difference between (a) 'João fez o caminho de volta' ("João made the way back") and (b) 'João fez o caminho de volta até C' ("João made the way back to C"). In the situation described, only (b) would be acceptable, and this is because a trajectory 'de volta' considers the given (or contextually retrieved) starting point. For this not to be the case, it is necessary to say explicitly which one is the new point to be considered.

[8]   There are several other ways of characterizing verbs in (a) and (b), such as saying that in (a) one will find the PATH-ROUTE verb type, and in (b), the GOAL verb type. We note that these classifications are orthogonal and compatible with our analysis of their counterdirectional component.

Sentence (11) is only felicitous if there was an earlier event in which the ball goes from Pedro to João – ideally, Pedro kicks the ball to John. Only under such conditions can one say that João kicked the ball back ('de volta') to Pedro. However, it is important to note that, again, the events do not need to be identical. Consider the case in which Pedro throws the ball with his hands at João, and when João returns it to Pedro, João uses his feet, kicking the ball. Even in this kind of situation, (11) is an adequate sentence; what matters is that the ball goes from Pedro, and returns to him – that is, considering the trajectory that the ball traveled from Pedro to João as pBPJ, and its beginning as pBPJ(0), the sentence in (11) represents an event whose trajectory, pBJP, has the following characteristic: $pBJP(1) = pBPJ(0)$.

In more technical terms, the use of 'de volta' with motion verbs, and with the nominals in (7)-(9), (i) presupposes a previous motion event, which unfolds in space[9], with a specific directionality, and (ii) results in an event of movement with an opposite direction with respect to the presupposed event, although neither the route nor the manner of the movement need to be the same. Considering these characteristics, we can conclude that the interpretations of 'de volta' that we have seen so far fit correctly into the **returnative** counterdirectional meaning, and its semantic description involves the presupposition of a previous event and the subsequent occurrence of an event in the opposite direction[10].

Before exploring the relevant presuppositions and defining more explicitly what is to be taken as the "reverse direction" (or "opposite direction"), it is important to note, as the examples below show, that 'de volta' does not only combine with motion verbs. Consider the following list, which also does not aim to be exhaustive:

(c) escrever (to write), ligar (to call), mandar (to send), comprar (to buy), transferir (to transfer), receber (to receive), remeter (to forward), chamar (to call), enviar (to send), falar (to talk), bater (to hit), olhar (to look),

In fact, 'escrever de volta' ("write back"), 'ligar de volta' ("call back"), or even 'comprar de volta' ("buy back"), among others, do not involve a spatial dimension. But they involve, in a more abstract sense, a difference in directionality that presupposes the existence of an earlier event. Let's take the sentence below to illustrate this point:

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[9] Obviously, verbs such as 'jogar' ("play") have non-spatial interpretations, as in "João jogou o argumento de volta para o Pedro" ("John threw the argument back to Peter"), but such cases can be interpreted as metaphorical extensions from the spatial domain to the argumentative or eventive domain, and would thus be classified, as we shall see below, as cases of responsive meaning. We consider here spatial cases only to point out that spatial interpretations can be used, via analogy, in other domains (see PONTES, 1992; TALMY, 2000; JACKENDOFF, 1983, 1996, among several others). Be that as it may, in all cases, as we will argue, the role of 'de volta' will always be the same.

[10] Some verbs such as 'rastejar' ("crawl"), 'embarcar' ("embark"), 'cair' ("fall") may also have restitutive and repetitive interpretations, which is what we expect since all these meanings are instantiations of the counterdirectional domain, and, as we shall argue, can be expressed by 'de volta'.

(12) João escreveu de volta para a Maria.
João wrote back to Maria.

(12) presupposes that there was a previous event of writing that "departed" from Maria and "arrived" at João, that is, the event of writing, simplifying things, has a trajectory that begins in Maria and ends in João, in a very similar way to what we have seen with example (11), above. We propose then a meaning extension for 'de volta' – it would also act in the eventive and not only in the spatial domain, offering the same counterdirectional semantic contribution. If we consider such a characterization, we can also say that 'escrever de volta' ("write back") in (12) describes an event that begins in João and ends in Maria – as in the cases of the verbs in (a) and (b), we have thus the counterdirectionality guaranteed in such cases.

What is the similarity, for the cases of the verbs in (c), between the previous event (presupposed) and the counterdirectional event (expressed by 'de volta')? Can they be different as in the previous examples? In other words, is it strictly necessary, for the proper and felicitous use of (12), that Maria *wrote* to João, or she may have *spoken* to him, for example, instead of writing?

At least for the case of 'escrever' ("writing"), it seems to be the case that the events involved have to be "written events", and the following example illustrates this:

(13) A Maria deixou uma mensagem para o João, e ele escreveu de volta.
Maria left a message for João, and he wrote (her) back.

The intuition behind (13) is that Maria left a written message for João, and so he *wrote* her back. Suppose now that Maria has left a voice message for João, and he has written back to Maria – in such a case, (13) does not seem completely adequate.

Let's now use the verb 'telefonar' ("to phone"), suppose Maria has called João – can we now use (13), or its variation (13a)?

(13a) ? A Maria telefonou para o João, e ele escreveu de volta.
Maria phoned João, and he wrote (her) back.

Again, this does not seem to be the case: for the verbs in (c), the events involved require a greater degree of similarity[11] than those involved in the cases (a) and (b)[12].

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[11] It is important to consider "similarity" and not "identity", because Maria, for instance, may have left a written note to João, and he may have written an email back to her; but the two cases are still characterized as "writing" events. As noted by an anonymous reviewer, whom I thank for the remark, it may be possible to accept cases like (13a); the reason for this is probably because we consider, however different, that the events described are part of a whole event composed of events with different "directions". So if we are considering one and the same conversation between João and Maria, we can accept that one of the events is via telephone and the other via written letter, for example.

[12] One possible explanation for this may lie in the fact that the cases in (a), (b), and the nominal ones we saw earlier are clearly linked to the spatial dimension, and it is a spatial trajectory (and its reverse) that guarantees the use of

Using the description of the counterdirectional meanings that we have showed in section 1, we can see that the verbs in (c) should be classified as instances of the **responsive** meaning, which refers to an action (or event) made in response to a previous action. We are not faced with events that develop or unfolds in space, but we are now in a rather more abstract domain involving events and a certain directionality in the relationship between the participants of these events. So, for instance, if João transfers money 'de volta' ("back") to Pedro, it is because Pedro first transferred money to João, that is, from Pedro to João and only then from João to Pedro - it is on that directionality that 'de volta' operates when combined with the verbs in (c); we are dealing, roughly speaking, with actions or events that take place in opposite directions. Considering that "Pedro transfere dinheiro para João" ("Pedro transfers money to João") has the trajectory pTPJ, and that "João transfere dinheiro de volta para Pedro" ("João transfers money back to Pedro") has the trajectory pTJP, the result is pTJP(1) = pTPJ(0) – using the idea of (opposite) directionality for events, we can keep the same basic meaning for 'de volta' and explain these cases.

Differently from Zwarts and Basso's (2016) claim, the examples below, in (d), show that 'de volta' also expresses the **restitutive** counterdirectional meaning:

(d) pegar (to take), pedir (to ask), pagar (to pay), dar (to give), mudar (to move), enfiar (to stick), atrair (to attract), colocar (to put)

Consider sentence (14), below:

(14) João$_1$ pegou seu$_1$ livro de volta.
João$_1$ took his$_1$ book back.

In (14) it is not the case that its interpretation involves a spatial trajectory (as in the returnative meaning) nor a "response" event (as in the responsive meaning) – for João to get his book back, it is enough that the book is not with João. As soon as João takes his book back, the state of "João having his book" is restored, and that is what we described as the role of the restitutive counterdirectional meaning. In other words, there is a return to an earlier state – consider the moment t0 where João has his book (JL) and also consider a later moment t1 in which João does not have his book (J~L); what 'de volta' does is to express that the state t0 is again the case, that is, it indicates that we "traverse" back a state path going from t1 (J~L) to t0 (JL). Taking t0 as the beginning of a trajectory pJL and t1 as its end, the trajectory with 'de volta', pJLV, will

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'de volta', rather than the specificity of the event performed. When we move to the domain of events that do not involve movements in space, we no longer have a "concrete" spatial trajectory to guarantee the similarity between the trajectories involved, and so this similarity must also be guaranteed by the types of events involved, which must have a high degree of similarity. Another possibility is that the events involved for the cases in (a) and (b) are all of motion, and thus fall under the same broad notion of motion events, which is not the case for items in (c). Obviously, these are just sketches of explanations, which need to be further developed but nonetheless illustrate possible alternatives to these issues.

have the characteristic: pJLV(1) = pJL(0), that is, at the end of pJLV João will have his book back ('de volta'), as it was in t0.

A similar description holds for 'atrair de volta' ("to attract back"), 'colocar de volta' ("to put back"), 'mudar de volta' ("to move back") etc. – in all these cases, the result is the restitution of an earlier/previous state, but without involving spatial trajectories or a "response" to a previous event. Verbs such as 'pagar' ("to pay") and 'dar' ("to give") can have both a **responsive** and a **restitutive** interpretation, depending on contextual information. However, this fluidity of meanings should not be seen as a problem: our analysis of 'de volta' will ensure that it always has the same basic meaning and all these possibilities of interpretation are contained within the counterdirectional domain.

The ambiguity that exists between the items that express the **restitutive** and the **repetitive** meanings is noted by several researchers (DOWTY, 1979; KLEIN, 2001, among many others). In fact, an item like 'de novo' ("again") in BrP presents such ambiguity, as we can see in the example below:

(15) A porta abriu de novo.
The door opened again.

(15) can mean that the door has opened again (event repetition), or that the door is open again (state restitution). Since 'de volta' has restitutive meaning, and given the close relationship between these two meanings, we may wonder if 'de volta' also has repetitive meaning. The answer is positive, although that meaning may not be the most common for 'de volta'. Consider the example below:

(16) O exercício tá todo errado! Faz de volta!
The exercise is all wrong! Do it again!

The most usual interpretation for (16) is that of repetition, according to which the exercise must be done again – note that there is no spatial trajectory, response, or even the restitution of a previous state, but simply the repetition of an event. Whenever there is **restitution** there is **repetition**, and in that sense a repetition involves the idea that something will begin again, and to begin again, it is necessary to return to the beginning of a trajectory, be it on the spatial domain or on the eventive domain, which places repetition within the domain of counterdirectionality.

Finally, before we move on to the next section, there are three interesting cases that need to be considered: 'estar de volta' ("to be back"), 'ter de volta' ("to have back") and 'querer de volta' ("to want back"). Consider the sentences below, taken from popular Brazilian songs:

(17) Estou de volta pro meu aconchego... (Dominguinhos, "De volta pro aconchego")
I'm back to my coziness ...

(18) ... quem me dera ao menos uma vez ter de volta todo o ouro... (Legião Urbana, "Índios")
... I wish at least once to have all the gold back ...

Sentence (17) as well as variations using the structure 'estar de volta' ("to be back") involve spatial trajectories and can be considered as a case of the examples in (a). The peculiarity of (17) is that it involves the reaching of a TARGET of a motion verb that is not pronounced – we do not know the original trajectory p or how the reverse trajectory, pV, has been traversed, but we know that (17) expresses that $pV(1) = p(0)$[13].

The structure 'ter de volta' ("to have back") in (18) and similar ones have an interpretation close to what we have seen for the cases in (d), that is, we have here a counterdirectional restitutive meaning – 'ter de volta' is equal to restore an earlier state, which may or may not involve some kind of possession (cf., 'ter de volta minha poupança' ("to have back my savings") vs. 'ter de volta toda a minha paz' ("to have back all my peace").

For 'querer de volta' the analysis we propose is that this structure carries an elided verb, which may belong to any of the classes we distinguished above, and so we cannot analyze 'querer de volta' by its own:

(19) querer ir de volta (to want to go back) – returnative / repetitive
(20) querer chutar de volta (to want to kick back) – responsive
(21) querer ter de volta (to want to have it back) – restitutive
(22) querer fazer de volta (to want to do it back/again) – repetitive

As a summary of our descriptive analysis, we can say that 'de volta' has returnative, responsive, restitutive, and, perhaps less commonly, repetitive uses, covering thus many of the possible counterdirectional meanings. In addition, 'de volta' presupposes previous events similar to those with which it combines[14]. Another important component that we have mentioned is the fact that 'de volta' expresses events that occur in the opposite direction of the presupposed event, and in order to capture all its uses, we must clearly define "counter" or "reverse direction". We will deal with this topic in the next section, in order to provide a semantic description for 'de volta'.

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[13] There is a great number of metaphorical uses and extensions in cases with 'estar de volta' ("to be back") which involves the person returning to his or her home, origins, roots, etc., which are not always spatial, but still involve an idea of path or journey, which can be subsumed in what we call trajectory. A clearer and more precise definition of these cases is certainly interesting, but it would take us too far from the task of providing a comprehensive description of 'de volta' and its counterdirectional uses.

[14] The same goes for 'de volta' combined with names, as we noticed earlier.

A semantic analysis for 'de volta'

The formal apparatus that will be used to describe the meaning of 'de volta' involves the notion of path or trajectory, the idea of an opposite direction (applied to trajectories), and certain presuppositions. Therefore, the first point we will elaborate on is the theory about trajectories that will be adopted in this paper.

In his influential work, Zwarts (2005), based on notions derived from "vector space semantics"[15] (VSS, see ZWARTS, 1997; ZWARTS; WINTER, 2000), assumes that a trajectory is an ordered sequence of spatial points, which can be formally captured as a continuous function, in the interval of real numbers, between [0,1]; the starting point of a trajectory or path p is formalized as p(0) and the end point as p(1), and any points between 0 and 1 are intermediate parts of the trajectory. In the same manner as the sets of points used to model the meaning of locative prepositions in VSS, the trajectories p are part of the spatial domain P, alongside with the domains E (for individuals and events[16]) and T (for truth values). The denotation of directional prepositions, such as 'para o parque' ("to the park"), 'pelo hospital' ("through the hospital") and 'do trabalho' ("from work"), are sets of trajectories.

In order to relate trajectories to movement events, Zwarts (2005), following Verkuyl (1993) and Krifka (1998), among many others, proposes a thematic function TRACE – if e is an event and p a trajectory, TRACE(e) relates the development of the event e to the trajectory p (which is the denotation of the directional PP). Schematically, we have the following (ZWARTS, 2005, p.17):

(23) $[[V\ PP]] = \{e \in [[V]]: TRACE(e) \in [[PP]]\}$

It is important to notice, as claimed by Zwarts (2008), that there are different types of trajectories that can be taken as the denotation of directional prepositional phrases, and their properties affects the aspectual characteristics of the verbal predicates with which they combine. We will not, however, discuss this topic in this paper because we need only a definition of trajectory and a way to relate trajectories to verbal predicates, as stated in (23). In the last section, we have already used some of this formalization, which was only made explicit here.

Considering that 'de volta' indicates opposite direction in the spatial and in the eventive domains, the next step in describing 'de volta' is to explore what we must understand by "contrary" or "reverse". Zwarts (2019, p.224) proposes a REVERSE relation, defined as in (24) below:

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[15] The Vector Space Semantics theory is an approach to deal with the semantics of simple locative spatial expressions and their modification by measure phrases such as '3 meters behind the house'. Many of the notions of the theoretical proposal that we present here come from the VSS and, therefore, they share a series of semantic properties.

[16] It is an ontological simplification to consider events and individuals in the same domain. A richer ontology, however, is perfectly compatible with the analysis we offer here.

(24) for any two paths p and p', REVERSE(p, p') if and only if

(i) p(0)=p'(1); and

(ii) there is a point j ∈ (0,1] and a point i ∈ [0,1) such that p(j)=p'(i)

We have already seen, albeit informally, the first of the conditions in the last section, and it ensures that a reverse trajectory (i.e., given as the oppose of a previous one) must end where the original trajectory begins. Point (ii) demands that there be another non-initial point in p that coincides with some other non-final point in p' – this condition guarantees, for example, the "looping" reading as in the case in which the trajectory is (p(0) = p'(1) and p(1) = p'(0)), and also guarantees that the trajectories are not necessarily identical[17].

Using a theory of trajectories, we can define trajectories as well as operations on them, and that is what we have done so far. We must now deal with the presuppositions associated with 'de volta'. In order to do that, it is also necessary to make explicit the treatment given to the counterdirectional meanings considered in this paper. Following Zwarts (2019, p.218) suggestions, we can treat each of the meanings seen in section 1 as event modifiers:

REARWARD, RETROGRADE, ... = λEλe [E(e) ∧ ...(e)...]

"E" represents the set of events denoted by a given verbal predicate and "e" represents a subset of those events that have the relevant counterdirectional property – the semantic representation is Neo-Davidsonian. That is, each of the counterdirectional meanings is a modifier that takes events as arguments and returns events with some counterdirectional specification – thus, [[REARWARD]], for instance, denotes a set of sets of events, whereas 'walk' denotes a set of events. If we consider 'de costas' ("back") as an expression that instantiates the rearward meaning, the expression 'andar de costas' ("walk backwards") denotes the set of walking events that goes in the opposite direction to what is considered the usual, with the back "leading".

(25) defines the idea of a "back leading" orientation, using the VSS tools, such as the spatial axes and the FRONT function, which operates on the vector related to the motion verb (concrete or abstract), allied to a direction function DIR (e, t). Taking into account other common assumptions within event semantics, the meaning of REARWARD can be defined as in (26) (see ZWARTS, 2019, p.221):

(25) ∀t [t ∈ τ(e) → −FRONT(THEME(e), t) = DIR(e, t)]

(26) REARWARD = λEλe [E(e) ∧ ∀t [t ∈ τ(e) → −FRONT(THEME(e), t) = DIR(e, t)]]

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[17] According to Zwarts (2019, p.223-224), in a sentence such as "João saiu de São Paulo, mas veio de volta para Porto Alegre" ("John left from São Paulo but came back to Porto Alegre") the starting point of the trajectory to São Paulo does not have to be Porto Alegre, which is the end point of the return trajectory. But in cases like these, we can assume that some contextual element will provide the information that the relevant trajectory has, in fact, begun in Porto Alegre.

(25) expresses that the unfolding of an event e ($\tau(e)$) occurs with the THEME of the event having its back forward/leading ($-$FRONT(THEME(e), t)) the directionality of event (DIR(e, t))[18].

Putting all the pieces together, and ignoring tense, sentence (27) is analyzed as in (27'):

(27) João andou de costas.
João walked backwards / with his back leading
(27') [[João andou]] = $\exists(e)$[WALK(e) $\wedge$ THEME (e, joão)][19]
[[de costas]] = $\lambda E\lambda e$ [E(e) $\wedge$ $\forall t$ [t $\in \tau(e) \rightarrow -$FRONT(THEME(e), t) = DIR(e, t)]]
[[de costas]]([[João andou]]) =
    $\lambda E\lambda e$ [E(e) $\wedge$ $\forall t$ [t $\in \tau(e) \rightarrow -$FRONT(THEME(e), t) = DIR(e, t)]]($\exists(e)$[WALK(e) $\wedge$ THEME (e, joão)]) =
    $\exists(e)$[WALK(e) $\wedge$ THEME (e, joão) $\wedge$ $\forall t$ [t $\in \tau(e) \rightarrow -$FRONT(THEME(e), t) = DIR(e, t)]]
(i.e.: there is a walking event; the theme of this event is João; while the event unfolds, its direction is oriented to the back of its theme).

When considering the **returnative** meaning, Zwarts (2019, p.223-224) proposes the following characterization (below we show an adapted version):

RETURNATIVE = $\lambda E\lambda e$: $\exists e'$[e' < e $\wedge$ E'(e') $\wedge$ REVERSE(LPATH(e), LPATH(e'))]. [E(e)]

In this formula, the material between the colon and the end point represents a presupposition. There are three pieces of information presupposed, which we detail below:

$\exists e'$[e' < e = this first part is about the existence of an event e' prior to the event e; the event e is asserted[20] in the expression;
E'(e') = this line states that event e' is of the type E'; it says that the events e and e' are closely related or similar. This is important to account for cases such as in (10) in which we need events that involve movement without necessarily being identical, and as in (13) where we need more similar events, such as events that are identified as "writing"

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[18] In order to apply "FRONT" to the THEME, we must first consider the spatial coordinates of the THEME in a vector semantics, since "FRONT", being a spatial function, can only be applied to vectors or points of the domain P. The necessary semantic operations are available in VSS and are compatible with the analysis developed here. Similarly, we can say that the direction of the event e is determined by a vector that relates its unfolding to a time; in this case, the vector is characterized as having its beginning "backwards" (i.e., "$-$FRONT").

[19] The existential closure is given by the tense morpheme of the verb; again, a common assumption in event semantics that has no direct relation to our theme.

[20] We use "assert" as opposed to "presuppose" in this paper.

REVERSE(LPATH(e), LPATH(e')) = this line guarantees that the asserted event unfolds contrary to the presupposed event e', as we saw in (24). In addition, "LPATH" explicitly states that we are dealing with a spatial trajectory – we will come back to this point later.

Finally, the asserted part of the formalization simply states the existence of an event e that has the property of being **returnative**.

Using the suggested formula, let's look at the following example:

(28) João dirigiu de volta.
João drove back.

(28') [[João dirigiu]] = $\exists(e)[DRIVE(e) \land AGENT(e, joão)]$
[[de volta]] = $\lambda E \lambda e: \exists e'[e' < e \land E'(e') \land REVERSE(LPATH(e), LPATH(e'))].[E(e)]$
[[de volta]]([[João dirigiu]]) =
$\quad \lambda E \lambda e: \exists e'[e' < e \land E'(e') \land REVERSE(LPATH(e), LPATH(e'))]. (\exists(e)[DRIVE(e) \land AGENT(e, joão)])$
$\quad \exists(e). \exists e'[e' < e \land movement^{21'}(e') \land REVERSE(LPATH(e), LPATH(e'))].$
$[DRIVE(e) \land AGENT(e, joão)])$
(in prose: there is an event e; there is a presupposed event e' previous and similar to e, which unfolded in a direction opposed to e; e is a driving event; the agent of e is João)

Finally, we can check the existence of the presuppositional content using the test known as "p-family" (cf. CHIERHIA, 2003, p.186): if A presupposes B, then (i) a questioning using A also presupposes B, (ii) the negation of A also presupposed B, and (iii) a conditional sentence using A as its antecedent also presupposes B. Taking sentence (29) as A, and (29a) as its presupposition B, we can see that (29b), (29c) and (29d) presuppose B just like (29) does:[22]

(29) João caminhou de volta.
(29a) Houve um evento anterior de deslocamento de João, que pode ter ou não ter sido uma caminhada, e que se deu numa certa direção.
(29b) João caminhou de volta?
(29c) João não caminhou de volta.
(29d) Se João caminhou de volta, então não veio ninguém com ele.

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[21] Here and in the other examples of derivation, we will leave the event in lowercase to represent that it is a presupposed event whose specificities will only be contextually resolved.

[22] For the English version:
(29) João walked back.
(29a) There was an earlier event of João's displacement, which may or may not have been a walk, and which took place in a certain direction.
(29b) Did John walk back?
(29c) John did not walk back.
(29d) If John walked back, then no one came with him.

We propose that this analysis correctly describes the nominal cases that we saw in the previous section, as well as the verbs in (a) and (b) – obviously, with proper adjustments, but in all cases, we have a spatial trajectory involved.

When we move to the cases in (c) presented in the section "'de volta' and its meaning", we are no longer dealing with spatial trajectories, but rather with two related events so that one occurs in response and in the opposite direction of a previous event; this is the **responsive** meaning. To capture this difference and maintain the same denotation of 'de volta' that we used in example (28'), Zwarts (2019, p.225) suggests that what are changed are the types of the paths related by REVERSE, which are no longer spatial (i.e., LPATH) but rather occur in the domain of events, so in this case we have APATHs ("A" for 'action'). The formula offered by the author is as follows:

RESPONSIVE = λEλe: ∃e'[e' < e ∧ E'(e') ∧ REVERSE(APATH(e), APATH(e'))]. [E(e)]

Such a strategy, although certainly quite simplified, accounts for the intuition that there is a changing from the spatial to the eventive domain, and so we have a different kind of trajectory for these cases, but 'de volta' has the same role in both cases. Let's look at the following analysis:

(30) Pedro telefonou de volta para a Maria.
Pedro phoned back to Maria
(30') [[Pedro telefonou para a Maria]] = ∃(e)[PHONE(e) ∧ AGENT(e, pedro) ∧ THEME(e, maria)]
[[de volta]] = λEλe: ∃e'[e' < e ∧ E'(e') ∧ REVERSE(APATH(e), APATH(e'))]. [E(e)]
[[de volta]]([[Pedro telefonou para a Maria]]) =
    λEλe: ∃e'[e' < e ∧ E'(e') ∧ REVERSE(APATH(e), APATH(e'))]. (∃(e)[PHONE(e) ∧ AGENT(e, pedro) ∧ THEME(e, maria)])
    ∃e: ∃e'[e' < e ∧ phone'(e') ∧ REVERSE(APATH(e), APATH(e'))]. [PHONE(e) ∧ AGENT(e, pedro) ∧ THEME(e, maria)])
(in prose: there is event e; there is a presupposed event e' previous and similar to e, which unfolds in the opposite direction of e, that is, it is a phoning-event which "goes from" Maria and "arrives at" Pedro; e is a phoning-event which "goes from" Pedro and "arrives at" Maria)[23]

As we noted in the previous section, the main difference between cases such as (28) and (30) is that the events related in (30) must have a greater degree of similarity, and therefore the presupposed event in (30) must also be classified as a "phoning-event".

A similar strategy can be used to deal with the **restitutive** meaning, that is, we must again consider in which domain we will find the relevant trajectories. In this case, we

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[23] We might, for example, suggest that the thematic roles of AGENT and THEME are systematically associated with what we call the beginning ("departing") and end ("arriving") of the relevant abstract trajectories. However, such a statement, although reasonable, requires further investigations that we will not develop in this paper.

will suggest that the relevant operation occurs in a domain of state-of-affairs, and that the trajectories of this domain are named EPATH, following the description we have made for the previous cases. Thus, we will define the **restitutive** meaning simply as[24]:

RESTITUTIVE = $\lambda E \lambda e$: $\exists e'[e' < e \land E'(e') \land$ REVERSE(EPATH(e), EPATH(e'))]. [E(e)]

What is at stake here is a return to a previous state-of-affairs, but the analysis is a little more complex because it is necessary to relate the event with the state-of-affairs that it restores, and that is precisely the role which we attribute to EPATH. Consider the following example:

(31) Maria pegou seu livro de volta.
Mary took her book back.

The relevant interpretation for (31) is something like: Maria picking up her book back restores Maria's state-of-affairs to be with her book. Intuitively, (31) presupposes: (i) the book was with Mary some time before, and (ii) the book is no longer with Mary. (31) states that the book is with Mary again, reestablishing an earlier state. The presupposed event e' is a possession event[25], whose EPATH is as below:

EPATH(e') = p(0)have_the_book / p(1)not_have_the_book

That is, the beginning of e' is to have possession of the book, and its end is to have no longer the possession of the book. As in the other cases, REVERSE results in an EPATH for e that is the opposite of the EPATH for e':

EPATH (e) = p(0)not_have_the_book / p(1)have_the_book

As the intuitive paraphrase given above suggests, a felicitous context for (31) is the one in which the EPATH of the presupposed event e' was "traveled", that is, Maria no longer has the book; the assertion of (31) involves an event e similar to the presupposed event, whose trajectory unfolds in the opposite direction to the presupposed event e', that is, at the end of the EPATH of e Maria has the book.

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[24] This is not, for example, the solution proposed by Zwarts (2019) nor by Beck and Gergel (2015) to deal with the restitutive meaning; these researchers use scales and scalar events to explain the restitutive cases. Here we choose to deal with states-of-affairs because not every restitutive meaning is combined with scalar (verbal) predicates; our example (31) shows this.

[25] An alternative would be to consider that states and events are separated on the ontology, and so instead of speaking of "possession events", we could speak of "possession" or "possession states". Again, this ontological distinction does not go against our analysis, since 'de volta' would have the same role, but according to this alternative, we would have a trajectory traversed in the eventive domain. Our choice here, however, is to continue to speak only in terms of events to highlight the semantics of 'de volta' without further exploration of ontological issues.

(31') [[Maria pegou seu livro]] = ∃(e)[TAKE(e) ∧ AGENT(e, maria) ∧ THEME(e, Maria's_book)]

[[de volta]] = λEλe: ∃e'[e' < e ∧ E'(e') ∧ REVERSE(EPATH(e), EPATH(e'))]. [E(e)]

[[de volta]]([[Maria pegou seu livro]]) =

λEλe: ∃e'[e' < e ∧ have_the_book'(e') ∧ REVERSE(EPATH(e), EPATH(e'))]. (∃(e)[TAKE(e) ∧ AGENT(e, maria) ∧ THEME(e, Maria's_book)])

The role of 'de volta' once again is the same, what will change, as in the other cases, is the domain in which the trajectories unfold – now in a more conceptual, more abstract domain.

The last case is the one in which 'de volta' has the **repetitive** meaning, which is always very close to the **restitutive** meaning. As we have mentioned, this is probably not the most commonly associated counterdirectional meaning for 'de volta', but its existence can also be understood in the same way as we have seen above. Following a suggestion made by Zwarts (2019, p.226-227), we can represent the **repetitive** meaning as below:

REPETITIVE = λEλe: ∃e'[e' < e ∧ E'(e')]. [E(e)]

The emphasis in this case is no longer on the state-of-affairs that a given event brings about, but rather on the realization of a given event that presupposes the existence of a previous similar event. In this case, there are no more trajectories involved, but we still must consider that the **repetitive** meaning is part of the counterdirectional domain because in several different languages the items that express the **repetitive** meaning also express many of the other meanings of this domain. Still, it is possible to conceive that to redo an event means to go back to the beginning of a given process and then start it again, that is to say, there is, albeit in a more distant way, a path being traversed in reverse in the idea of doing something again, redo or restart something. In our analysis, repeating an event imposes fewer constraints than, for example, returning a movement event, responding to an event that does not necessarily involve spatial movement, or even reestablishing a state.

Given our characterization of the 'de volta' so far, we can return to the scheme that Zwarts and Basso (2016) propose for BrP. This scheme needs to be reformulated as below, in which 'de volta' expresses the returnative, responsive, restitutive and repetitive meanings:

Scheme 5 – Lexicalization of BrP counterdirectional meanings
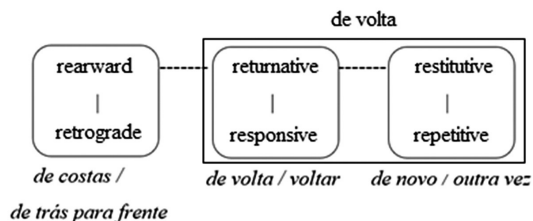
With respect to semantic analysis, we can offer a single analysis for the returnative, responsive and restorative meanings abstracting the different types of trajectory involved in the presupposed REVERSE relation, noted now only as PATH. The result is the following structure:

$$[[\text{de volta}]] = \lambda E \lambda e: \exists e'[e' < e \land E'(e') \land \text{REVERSE}(\text{PATH}(e), \text{PATH}(e'))]. [E(e)]$$

That is, in these three uses, 'de volta' is an event modifier that carries specific presuppositions which relate the presupposed and the asserted event, so that the trajectory of one of them, in some conceptual domain, occurs in the reverse direction of the trajectory of the other.

The repetitive interpretation, in a simplified way, is a metaphorical extension of the other cases that "erases" the need to relate different trajectories of two events but maintains the rest of the presuppositions. In a sense, a repetition event is a less restricted type of a returnative event, in which the constraint on trajectory reversal is not observed. Let's now move on to conclusions and to some open issues.

Conclusion

In this paper, we deal with the semantic interpretation of the expression 'de volta' in Brazilian Portuguese. We offer an analysis of this item within the framework of event semantics of natural language, which considers 'de volta' as a particular type of event modifier – a counterdirectional modifier. Among the six possibilities of counterdirectional modification that we have mentioned, 'de volta' can express four of them in BrP. We have proposed that three of the counterdirectional meanings of 'de volta' (returnative, responsive, and restitutive) are closely related, and that repetitive meaning is a less restrictive version of these meanings.

Our analysis unifies several apparently different meanings in a clear and organic manner, without using *ad hoc* notions, based on independently motivated concepts and ideas. We arrive at a simple and compositional formal description, within the framework

of formal semantics, of a very common structure of Brazilian Portuguese. In addition, our analysis can be seen as an argument in favor of the idea that the spatial, eventive, and state-of-affairs domains are linked by relations such as metaphors and analogies, and so the same item can act in different "layers" of the space < time / event < states-of-affairs hierarchy.

Among the open issues we left on this paper, we mention that it would be interesting to explore the exact conditions that permit the repetitive reading of 'de volta' and what are the relations between this expression and the counterdirectional uses of the verb 'voltar' ("to return"), as well as to explore possible differences of interpretations of 'de volta' related to its syntactic position. These are topics that certainly deserve further investigation.

Acknowledgment

- *RESUMO: Neste artigo, nosso objeto é apresentar uma análise, dentro dos moldes da semântica e da pragmática formal das línguas naturais, da expressão 'de volta' no português brasileiro, considerando-a como um modificador de eventos de um tipo particular, um modificador contradirecional. Para tanto, lançamos mão de uma semântica de eventos neo-davidsoniana e da semântica de trajetórias proposta por Zwarts (2005; 2008), aliada a uma análise de modificadores de eventos. Na primeira parte deste artigo, apresentamos o domínio da contradirecionalidade, suas distinções e a proposta de Zwarts e Basso (2016), que trata também do português brasileiro. Na sequência, apresentamos diversos dados relacionados às interpretações de 'de volta' para então, na seção seguinte, desenvolvermos nossa proposta específica de análise semântica para essa expressão. Como resultado, propomos uma análise unificada de 'de volta' que dá conta de suas interpretações retornativa, responsiva, restitutiva e repetitiva. Além disso, apresentamos uma revisão das conclusões de Zwarts e Basso (2016) sobre 'de volta'. Concluímos o presente texto com alguns problemas em aberto.*

- *PALAVRAS-CHAVE: Contradirecionalidade. Modificadores. Semântica de eventos. Semântica formal. Pressuposição.*

REFERENCES

ABRUSÁN, M. Presupposition cancellation: explaining the 'soft-hard' trigger distinction. **Natural Language Semantics**, Dordrecht, n.24, n.2, p.165-202, 2016. Available in: https://doi.org/10.1007/s11050-016-9122-7. Access on: 05 fev. 2019.

BECK, S.; GERGEL, R. The diachronic semantics of English again. **Natural Language Semantics**, Dordrecht, n.23, n.3, p.157-203, 2015.

CHIERHIA, G. **Semântica**. Campinas: Ed. da Unicamp; Londrina: Eduel, 2003.

CHUMAN, C. **A contradirecionalidade e o prefixo re-**. 2015. Completion of Course Work (Bachelor of linguistics) – Universidade Federal de São Carlos, São Carlos, 2015.

DOWTY, D. **Montague grammar and word meaning**. Dordrecht: Reidel, 1979.

FABRICIUS-HANSEN, C. Wi(e)der and again(st). *In*: FERY, C.; STERNEFELD, W. (ed.). **Audiatur vox sapientiae**: a festschrift for Arnim von Stechow. Berlin: Akademie Verlag, 2001. p.101-130.

JACKENDOFF, R. The architecture of the linguistic-spatial interface. *In*: BLOOM, P.; PETERSON, M. A.; NADEL, L.; GARRETT, M. F. (org.). **Language and space**. Cambridge: MIT Press, 1996. p.1–30.

JACKENDOFF, R. **Semantics and cognition**. Cambridge: MIT Press, 1983.

KLEIN, W. Time and again. *In*: FERY, C.; STERNEFELD, W. (ed.). **Audiatur vox sapientiae**: a festschrift for Arnim von Stechow. Berlin: Akademie-Verlag, 2001. p.267–286.

KRIFKA, M. The origins of telicity. *In*: ROTHSTEIN, S. (ed.). **Events and grammar**. Dordrecht: Kluwer, 1998. p.197-235.

MEIRELLES, L. L.; CANÇADO, M. A propriedade semântica movimento na representação lexical dos verbos do português brasileiro. **Alfa**, São Paulo, v.61, n.2, p.425-450, 2017.

PINKER, S. **Learnability and cognition:** the acquisition of argument structure. Cambridge: MIT Press, 1989.

PONTES, E. **Espaço-Tempo na língua portuguesa**. São Paulo: Pontes, 1992.

RAMMÉ, V. **A expressão do deslocamento nas línguas naturais:** análise da estrutura [$V_{maneira}$ + $Prep_{loc}$]. 2012. 144f. Dissertation (Master in Linguistics) – Universidade Federal do Paraná, Curitiba, 2012.

TALMY, L. **Toward a cognitive semantics**. Cambridge: MIT Press, 2000.

VERKUYL, H. **A Theory of Aspectuality:** the interaction between temporal and atemporal structure. Cambridge: Cambridge University Press, 1993.

ZWARTS, J. From 'back' to 'again' in Dutch: the structure of the 're' domain. **Journal of Semantics**, Oxford, v.36, n.2, p.211-240, 2019.

ZWARTS, J. Aspects of a typology of direction. *In:* ROTHSTEIN, S. (ed.). **Theoretical and crosslinguistic approaches to the semantics of aspect**. Amsterdam: John Benjamins, 2008. p.79-106.

ZWARTS, J. Prepositional aspect and the algebra of paths. **Linguistics and Philosophy,** Dordrecht, n.28, n.6, p.739-779, 2005.

ZWARTS, J. Vector as relative positions: a compositional semantics of modified PPs. **Journal of Semantics**, Oxford, n.14, p.57-86, 1997.

ZWARTS, J.; BASSO, R. M. Counterdirectionality crosslinguistically: comparing Brazilian Portuguese and Dutch. **Revista da ABRALIN**, [*s. l.*], v.1, p.19-44, 2016.

ZWARTS, J.; WINTER, Y. Vector space semantics: a model-theoretic analysis of locative prepositions. **Journal of Logic, Language and Information**, Dordrecht, n.9, p.169-211, 2000.