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Perception verbs in Brazilian Portuguese: A functional approach

Abstract: This paper examines the semantic and morphosyntactic complementation patterns of perception verbs in Brazilian Portuguese. Using the framework of Functional Discourse Grammar, five semantic complement types are identified. It is subsequently shown that these five types are in an implicational relationship, such that the set of semantic complement types that a certain perception verb in Brazilian Portuguese may take occupies a contiguous segment on a hierarchy of semantic complement types. The morphosyntactic complements of perception verbs in Brazilian Portuguese include noun phrases, finite, and non-finite clauses, the latter comprising gerundial and infinitival forms. The second part of the study shows that the choice for one of these types can to a high extent be predicted from the semantics of the complements, using the same hierarchy of semantic complement types.

Keywords: perception verbs, complement clauses, Functional Discourse Grammar, Brazilian Portuguese

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1. Introduction

The aim of this paper is to give a systematic description of the complementation patterns exhibited, both semantically and morphosyntactically, by perception verbs in Brazilian Portuguese within the framework of Functional Discourse Grammar (FDG, Hengeveld & Mackenzie 2008). To this end, we will first, in Section 2, give a brief outline of FDG. We then move to its treatment of perception verbs in Section 3. From this treatment a number of predictions follow, which are given in Section 4. The predictions concern the distribution of semantic complement types with perception verbs on the one hand, and the way in which the morphosyntactic complement types of perception verbs may be predicted from their semantics on the other. These predictions are tested in Sections 5 through 8. We round off the paper with our conclusions in Section 8.

2. Functional Discourse Grammar¹

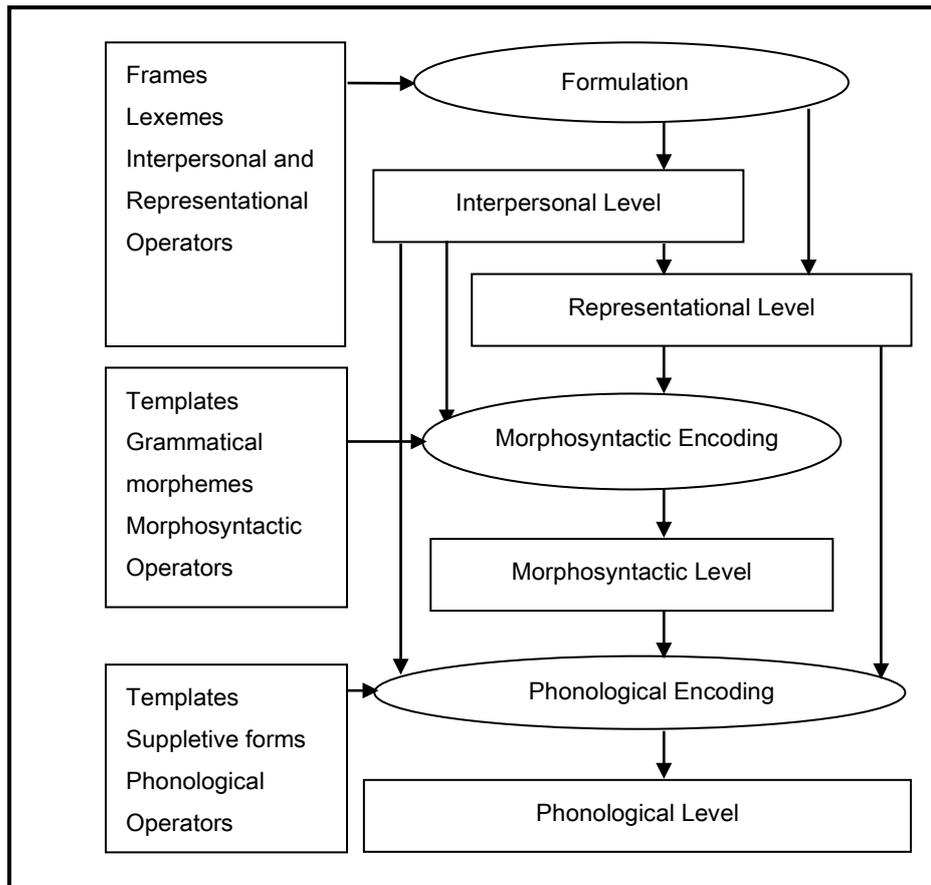
2.1. Introduction

Functional Discourse Grammar is a typologically based theory of language structure. A summary of the various properties of this model may be found in Hengeveld & Mackenzie (2010); a full presentation of the model is given in Hengeveld & Mackenzie (2008) and in Keizer (2015). A general overview of the FDG model is given in Figure 1, which shows that various levels of analysis are recognized within the grammar: the Interpersonal², the Representational, the Morphosyntactic, and the Phonological Levels. Each level consists of various hierarchically ordered layers.

¹ This section is largely based on Bastos et al. (2007).

² Technical terms specific for FDG are capitalized throughout the text.

Figure 1. Outline of FDG



2.2. Levels

For this paper the levels that are most relevant are the Interpersonal Level and the Representational Level, which we will present in somewhat more detail in this section.

At the Interpersonal Level the hierarchical structure given in (1) applies:

$$(1) \quad (M_1: (A_1: [(F_i) (P_1)_S (P_2)_A (C_1: [...(T_1) (R_1)...] (C_1))] (A_1)) (M_1))$$

The hierarchically highest unit of analysis given here is the Move (M), which may contain one or more Discourse Acts (A). A Discourse Act is organized around a basic Illocution (F), which combines with the speech act Participants (P, the speaker S and the addressee A) and the Communicated Content (C) evoked by the speaker. The Communicated Content, in turn,

contains a varying number of Ascriptive (T) and Referential (R) Subacts. Note that the latter two units are operative at the same layer, i.e. there is no hierarchical relation between them. In general, then, at the Interpersonal Level units are analysed in terms of their communicative function.

At the Representational Level the layers presented in (2) are relevant:

(2) (p₁: (ep₁: (e₁: [(f^c₁: [(f^l₁) (x₁)] (f^c₁)) (e₁])) (ep₁)) (p₁))

At this level of analysis linguistic units are described in terms of the semantic categories they designate. Propositional Contents (p) are mental constructs; Episodes (ep) are thematically coherent combinations of States-of-Affairs; States-of-Affairs (e) are events or states that develop in time; Individuals (x) are concrete entities; and Properties (f) only exist when they are applied to something else. Note that an (f) unit occurs both as a unit characterizing a states-of-affairs, the Configurational (c) Property (f^c₁) in (2), and as an independent constituent, the Lexical (l) Property (f^l₁) within the State of Affairs. The units (f₁) and (x₁) in (2) belong to the same layer, i.e. there is no hierarchical relation between them.

Note that the internal organization of these levels can in fact be much more complex than represented here, since recursivity is not shown in the above representations.

An important property of the model is that the Interpersonal, Representational, and Morphosyntactic Levels of linguistic organization are built up using different sets of primitives. The Interpersonal and Representational Levels of organization are structured on the basis of pragmatic and semantic frames, into which lexemes and primary operators (i.e. operators that are defined in terms of their meaning) are inserted. The Morphosyntactic Level is organized in terms of structural templates, into which, apart from lexical material from the preceding levels, grammatical words and morphosyntactic secondary operators (i.e. operators anticipating bound grammatical expressions) are inserted. The Phonological Level is organized in terms of prosodic patterns, into which the lexical material from the preceding levels is inserted, together with bound morphemes and possibly tertiary operators (i.e. operators anticipating the acoustic expression of the utterance).

Finally, it is important to note that levels are related to each other through operations, represented in circles in Figure 1. There is a fundamental distinction between Formulation on the one hand, and Encoding on the other. The process of Formulation is concerned with specifying those pragmatic and semantic configurations that are encoded within the language. In terms of Formulation, languages may differ in e.g. the kind of pragmatic and semantic functions that are relevant for a description of their grammatical system. The process of Encoding is concerned with the morphosyntactic and phonological form pragmatic/semantic configurations take in the language. In terms of Encoding, languages may differ in e.g. their word order, morphological types, phoneme inventory, etc.

2.3. Layering

Each level has a hierarchical organization consisting of several layers. Lower layers are contained within higher layers. Each layer at the Interpersonal and Representational Levels has the following internal structure, where α ranges over all variables:

$$(3) \quad (\pi \alpha_1: [(\text{complex}) \text{head } (\alpha_1)_\phi]: [\sigma (\alpha_1)_\phi])_\phi$$

A unit may be built up using lexical and grammatical means. The lexical means can be subdivided into obligatory heads and optional modifiers (σ). The head is represented as the first restrictor, the modifier as a non-first restrictor. The grammatical means are subdivided into operators (π) and functions (ϕ). Operators capture non-relational properties expressed through grammatical means, functions capture relational properties expressed through grammatical means.

The main semantic domains of operators and modifiers at the various layers of the Interpersonal and Representational Levels are listed in Table 1 and are illustrated in this table with examples of modifiers.

<i>Interpersonal level</i>	
M	Communicative status of the move (e.g. <i>however</i>)
A	Communicative status of the act (e.g. <i>in addition</i>); Stylistic properties of the act (e.g. <i>briefly</i>)
F	Illocutionary manner (e.g. <i>frankly</i>)
C	Subjective attitude (e.g. <i>fortunately</i>); Reportativity (e.g. <i>reportedly</i>)
<i>Representational level</i>	
p	Propositional attitude (e.g. <i>possibly</i>); Evidence (e.g. <i>apparently</i>)
ep	Order of episodes (e.g. <i>first</i>); Absolute time (e.g. <i>yesterday</i>)
e	Relative time (e.g. <i>after that</i>); Reality status (e.g. <i>hardly</i>); Event quantification (e.g. <i>twice</i>)
f	Manner (e.g. <i>beautifully</i>); Aspect (e.g. <i>continuously</i>)

Table 1. Semantic domains of operators and modifiers

By way of example, consider the interpersonal (5) and representational (6) formalization of example (4), adapted from Hengeveld & Wanders (2008):

- (4) Reportedly a man was deliberately cutting himself with a knife yesterday.
(5) $(A_i: [(F_i: DECL (F_i)) (P_i)_S (P_i)_A (C_i: [(T_i) (R_i) (R_j) (R_k)] (C_i): reportedly_{Adv} (C_i))]) (A_i)$
(6) $(p_i: (past\ ep_i: (sim\ e_i: (progr\ f_i^c: [(f_i: cut_V (f_i): deliberately_{Adv} (f_i)) (1\ x_i: man_N (x_i))_{Ag} (x_i)_{Pat}] (f_i^c): (1x_j: knife_N (x_j))_{Instr} (f_i^c)) (e_i) : yesterday_{Adv} (e_i)) (ep_i)) (p_i))$

The various lexical modifiers are represented at their respective layers: *reportedly* at the C-layer of the Interpersonal Level in (5), *deliberately*, *with a knife*, and *yesterday* at the f_i^- , f_i^c -, and e_i -layer of the Representational Level in (6). The past progressive form of the verb is triggered by the combination of an aspectual and a temporal operator at the f_i^c - and ep_i -layer in (6).

2.4. Complementation

Just as layers may be further specified by modifiers and operators, they may be turned into the arguments of complement-taking predicates, which then serve functions parallel to those of the operators and modifiers as listed in Table 1. For a full discussion of complementation in FDG see Hengeveld & Mackenzie (2008, chapter 4).

Complement-taking verbs expressing the semantic domains listed in Table 1 for the Interpersonal and Representational Levels, take arguments with decreasing internal complexity the lower the layer they embed. The layers distinguished at the Interpersonal and Representational Levels that may potentially underlie a subordinate clause are listed in (7) and (8):

(7) Interpersonal layers underlying subordinate clauses

- a $(\Pi M_1: (\Pi A_1: [\dots (\Pi C_1: [(T_1) (R_1)] (C_1): \Sigma (C_1)]) (A_1): \Sigma (A_1)) (M_1): \Sigma (M_1))$
- b $(\Pi A_1: [\dots (\Pi C_1: [(T_1) (R_1)] (C_1): \Sigma (C_1)]) (A_1): \Sigma (A_1))$
- c $(\Pi C_1: [(T_1) (R_1)] (C_1): \Sigma (C_1))$

(8) Representational layers underlying subordinate clauses

- a $(\pi p_1: (\pi ep_1: (\pi e_1: (\pi f^c_1: [(f_1) (x_1)] (f^c_1): \sigma (f^c_1)) (e_1): \sigma (e_1)) (ep_1): \sigma (ep_1)) (p_1))$
- b $(\pi ep_1: (\pi e_1: (\pi f^c_1: [(f_1) (x_1)] (f^c_1): \sigma (f^c_1)) (e_1): \sigma (e_1)) (ep_1): \sigma (ep_1))$
- c $(\pi e_1: (\pi f^c_1: [(f_1) (x_1)] (f^c_1): \sigma (f^c_1)) (e_1): \sigma (e_1))$
- d $(\pi f^c_1: [(f_1) (x_1)] (f^c_1): \sigma (f^c_1))$

A higher layer generally contains all lower layers. As a result, subordinate constructions can be classified in terms of the highest layer they contain. Furthermore, since every layer brings along its own set of operators and modifiers, we can predict that operators and modifiers pertaining to the highest layer a subordinate clause contains, as well as all lower ones, can be expressed in that subordinate clause. Modifiers and operators pertaining to layers higher than the highest layer the subordinate clause contains, are barred from expression in that subordinate clause.

Consider the following examples and their underlying formalizations:

- (9) While it is difficult to make generalizations about such a diverse public, it is easy to conclude [that, *in sum* these actions have led to a net loss of vegetative cover relative to pre-settlement conditions, as well as a substantial change in the type of vegetation present. At the same time, public consciousness regarding the importance of urban vegetation has certainly risen in the last ten years, although how much of that awareness has translated into changed behavior vis a vis urban plants in Quito is an open question.] (Internet)

(f₁: conclude_v (f₁))

(x₁)_Φ

(M₁: [(A₁), (A₂) ...] (M₁) Σ (M₁))_Φ

- (10) I might add that, *frankly speaking* (**in sum*), you're going to have bigger problems than just raising capital.

(f₁: add_v (f₁))

(x₁)_Φ

(A₁: [ILL (P₁)_S (P₂)_A (C₁: [...(T₁) (R₁)...] (C₁))] (A₁))_Φ

- (11) He said that *reportedly* (**frankly speaking/*in sum*) there was some history of threats of domestic abuse in the family. (communicated content)

(f₁: say_v (f₁))

(x₁)_Φ

(C₁: [...(T₁) (R₁)...] (C₁))_Φ

The verb *summarize* in (9) introduces the summarizing Move in an argumentative series. This Move is represented as its argument M_1 and consists of a series of Discourse Acts. The fact that it is a Move explains that it may contain the M-modifier *in sum*. The verb *add* in (10) takes a single act A_1 as its argument, which explains why it may have the A-modifier *frankly speaking* but not an M-modifier. And the verb *say* in (11) introduces the Content C_1 communicated in the original discourse act, which is why it may contain the C-modifier *reportedly*, but not an A-modifier or an M-modifier.

Complement-taking verbs expressing the semantic domains listed in Table 1 for the Representational Level, take arguments with decreasing internal complexity the lower the layer they embed. Consider the following examples and their underlying formalizations:

(12) He believed that I had *possibly* gone too far. (propositional content)

$(f_1: \text{believe}_v (f_1))$

$(x_1)_\Phi$

$(p_1: (ep_1: (e_1: [(f_2: [(f_3) \dots] (f_2)) (e_1)_\Phi]) (ep_1)) (p_1))_\Phi$

(13) It ends with that, *when he returns from the war*, he (**possibly*) breaks up with her, and she runs crying out in the hall. (episode)

$(f_1: \text{end}_v (f_1))$

$(ep_1: (e_1: [(f_2: [(f_3) \dots] (f_2)) (e_1)_\Phi]) (p_1)), (p_2: (e_2: (f_4: [(f_5) \dots] (f_4)) (e_2)) (ep_2))_\Phi$

(14) He wanted me to come home *before dinner* (**when he returns from the war/*possibly*). (state-of-affairs)

$(f_1: \text{want}_v (f_1))$

$(x_1)_\Phi$

$(e_1: [(f_2: [(f_3) \dots] (f_2)) (e_1)_\Phi])_\Phi$

(15) He continued to cry *uninterruptedly* (**before dinner/*when he returns from the war/*possibly*). (configurational property)

(f₁: continue (f₁))

(x₁)_Φ

(f^c₁: [(f₃) ...] (f₂))_Φ

The verb *believe* in (12) expresses a propositional attitude, and thus takes a propositional complement (p₁). This explains why it may contain a modifier expressing a propositional attitude, such as *possibly*. The verb *end_with* in (13) introduces the final episode of a story, represented as its argument (ep₁), and may contain an absolute temporal specification, such as *when he returns from the war*, but not a p-modifier. The verb *want* in (14) takes as its argument the State-of-Affairs wanted, and thus takes as its complement the description of a State-of-Affairs (e₁), which contains the relative tense *before dinner*, but is not allowed to occur with p-modifiers and ep-modifiers. The verb *continue* in (15) describes the continued application of a property, and thus takes the minimal unit (f₁) as its complement. This unit allows the insertion of an aspectual adverbs such as *uninterruptedly*, but not of p-modifiers, ep-modifiers, and e-modifiers. Note that in all these cases grammaticality judgements concern the uses of modifiers with scope over the embedded domain only.

Thus, since higher layers contain all lower layers, complement clauses may be classified in terms of the highest layer that their underlying representation contains. At the same time, the presence of a higher layer predicts the presence of all lower ones.

3. Perception verbs in Functional Discourse Grammar

3.1. Introduction

Perception verbs, like *see* and *hear*, specify a relation between an individual (the perceiving entity) and different kinds of the representational/interpersonal categories introduced

above, according to the nature of what is perceived. In Dik and Hengeveld (1991), a description of the different kinds of perception verb complements is given within the FG framework, accounting for the many subtle semantic differences between them. Drawing on earlier work by e.g. Kirsner & Thompson (1976), Holierhoek (1980), Barwise & Perry (1983), Noonan (1985), and van der Auwera (1985), the authors argue that perception verb complements can be understood in terms of the hierarchical clause structure used in FG to represent utterances. In the same way, in this section we carry out the characterization of perception verbs and their complements, but now according to the FDG model, taking the previous description as our starting point.

Perception verbs can take five different types of complement: Properties (f), Individuals (x), States-of-Affairs (e), Propositional Contents (p), and Communicated Contents (C). Episodes do not constitute a type of their own, which is understandable as they can be understood as thematically coherent strings of States-of-Affairs: the perception of an Episode is therefore identical to the perception of a series of coordinated states-of-affairs.

From this section onwards we will use Brazilian Portuguese examples. All these examples were obtained through internet searches using the Google search engine.

3.1. Perception of Property

A perception verb in this case describes the perception of a property by an individual. Since properties do not exist by themselves, the object of perception is a characteristic of another entity, as illustrated in (16):³

- (16) Nunca **sentiram** o cheiro de comida estragada.
'They never **sensed** the smell of spoiled food.'

³ In Brazilian Portuguese examples and their translations we present the perception verb in bold and its complement through underlining.

The verb *sentir* ‘sense’ in (16) specifies a relation between the perceiving x-type category, the understood subject ‘they’, and the perceived f-type category *o cheiro de comida estragada* ‘the smell of spoiled food’.

3.2. Perception of Individual

In this use of perception verbs what is described is the perception of one individual by another, as illustrated in (17):

- (17) Eu **ouvi** o passarinho.
‘I **heard** the little bird.’

In this case, the verb *ouvir* ‘hear’ specifies a relation between two semantic categories of the same type: a perceiving x-type category *eu* ‘I’ and a perceived x-type category *o passarinho* ‘the little bird’, both individuals, and consequently, concrete and tangible entities.

3.3. Perception of State-of-Affairs

This reading concerns the direct perception of a state-of-affairs by an individual, as the following example shows:

- (18) Eu **vi** o carro bater numa bike.
I **saw** the car crash into a bicycle.

In (18), the verb *ver* ‘see’ specifies a relation between the perceiving x-type category *eu* ‘I’ and a directly perceived e-type category *um carro batendo numa bike* ‘a car crashing into a bicycle’.

3.4. Perception of Propositional Content

The fourth possible reading concerns the acquisition of a piece of knowledge by means of perception through one of the senses, as illustrated in the following sentence:

- (19) Eu **vi** que o carro tinha batido numa bike.
'I **saw** that the car had crashed into a bicycle.'

As is clear from the tenses used, in this example the first person subject did not witness a car crashing into a bicycle directly, as in (18). Rather, he/she comes to the conclusion that the crash has taken place on the basis of visual evidence. The difference with (18) is thus that in (18) the complement clause represents the state-of-affairs witnessed directly and is thus of the e-type, while in (19) it represents the conclusion the speaker arrived at and is thus of the p-type.

There are a number of differences between the two constructions that allow us to distinguish them, as shown in Dik and Hengeveld (1991). These are: (i) the simultaneity of the e-complement with the main clause; (ii) the impossibility to negate the e-complement independently; and (iii) non-factivity, i.e., the absence of a presupposition on the part of the speaker that the e-category took place.

The first property is shown in (20):

- (20) *Eu **vi** o carro ter batido numa bike.
I **saw** the car having crashed into a bicycle.

While the use of the past tense is fine in (19), it leads to ungrammaticality in (20). This is because direct perception requires simultaneity of the perceiving and the perceived State-of-Affairs.

The examples (21) show that an e-complement can not be negated, while a p-complement can:

- (21) a *Eu **vi** o carro não bater numa bike.
 I **saw** the car not crash into a bicycle.
 b Eu **vi** que o carro não tinha batido numa bike.
 ‘I **saw** that the car had not crashed into a bicycle.’

While negation of the complement is fine in (21b), it is not in (21a). The reason is that something that does not happen cannot be perceived directly.

Finally, the examples in (22) demonstrate that the truth of p-complements is presupposed, while that of e-complements is not:

- (22) a Eu não **vi** o carro bater numa bike. (e eu sei que ele não bateu)
 I did not **see** the car crash into a bicycle. (and I know that it didn’t)
 b Eu não **vi** que o carro bateu numa bike. (*e eu sei que ele não bateu)
 ‘I did not **see** that the car crashed into a bicycle.’ (and I know that it didn’t)

When the verb *ver* ‘see’ takes a propositional complement, it describes acquisition of knowledge. Predicates of acquisition of knowledge are semi-factive, that is, the speaker presupposes the truth of the complement. For this reason, the continuation in (22b) is ungrammatical.

3.5. Perception of Communicated Content

This reading is only possible with predicates of hearing and seeing (in the sense of ‘reading’) when used by the speaker to relay words or thoughts of someone else, as illustrated in (23):

- (23) Ontem **vi** no jornal que um jovem de 21 anos matou o irmão de 22.
 ‘Yesterday I **saw** in the newspaper that a 21 years old boy killed his brother of 22.’

In this example, the verb *ver* 'see' specifies a relation between the perceiving unexpressed x-type subject 'I' and the perceived Communicated Content *que um jovem de 21 anos matou o irmão de 22* 'that a 21 years old boy killed his brother of 22', which represents a piece of information claimed by a third party.

The grammatical expression of the perception of a Communicated Content is different from that of a Propositional Content. As shown in (23), in the former case the source of the information, here *o jornal* 'the newspaper', may be specified. In the latter case, this is not possible, as shown in (24):

- (24) **Percebi** (pelas suas ações/*pelo João) que ela é uma pessoa muito legal.
 I **noted** (through her actions/through João) that she is a very nice person.

3.6. The representation of perception verbs in FDG

Constructions with perception verbs, like the ones presented in 3.1 to 3.5, are used to describe what the subject is doing or experiencing at a particular moment in time, i.e., they are used to describe the subject's perception of an aspect of the extralinguistic world. In this way, this kind of construction is dealt with at the Representational Level in the FDG model.

In this subsection we will present the underlying representations for the constructions with perception verbs presented so far. As shown before, perception verbs can have different representational or interpersonal categories as their complement, and these are represented by different variables. We may therefore formalize the differences between them exploiting the variables introduced earlier. 'PV' is shorthand for 'perception verb'.

- (i) perception of Property:

- (25) [(f_i: PV (f_i)) (x_i) (f_j)]
 e.g. 'I (x_i) saw (f_i) the redness of her eyes (f_j).'

(ii) perception of Individual:

(26) [(f_i: PV (f_i)) (x_i) (x_j)]

e.g. 'I (x_i) saw (f_i) your brother (x_j).

(iii) perception of State-of-Affairs:

(27) [(f_i: PV (f_i)) (x_i) (e_i)]

e.g. 'I (x_i) saw (f_i) him arrive (e_i).'

(iv) perception of Propositional Content

(28) [(f_i: PV (f_i)) (x_i) (p_i)]

e.g. 'I (x_i) saw (f_i) that he had arrived (p_i).'

(v) perception of Communicated Content

(29) [(f_i: PV (f_i)) (x_i) (C_i)]

e.g. 'I (x_i) hear (f_i) you were fired (C_i).'

In the representations from (25) to (28), the variables representing the perception verb complement pertain to the Representational Level. In (29), it belongs to the Interpersonal Level. This is due to the fact that, in this reading of perception verbs, the complement of the verb is the Communicated Content produced by a different speaker in an interpersonal act.

4. Predictions

After introducing the theoretical background and the classification of the complement types of perception verbs that follows from it, we now may formulate two predictions concerning the distribution of semantic complement types and their morphosyntactic expression.

Not all perception verbs may occur with all five semantic complement types introduced above. For instance, the verb *ver* 'see' was used above to illustrate all five complement types, as it is compatible with all of them. Other verbs, however, such as *provar* 'taste' have a much more limited range of possibilities. This particular verb only occurs with f-complements and x-complements, shown in (30)-(31):

(30) **Provámos** o sabor autêntico da dourada.

'We **tasted** the authentic dorada taste.'

(31) **Provamos** a famosa torta do Café Sacher.

'We **tasted** the famous cake of Café Sacher.'

The question is now whether there is any systematicity in the distribution of semantic complement types across perception verbs. We expect that there is. Our prediction is that perception verbs take complements based on lower layers relatively easily, while it becomes more unlikely for them to take complements based on higher layers. The reason is that basic perception is a physical process, and that the higher one gets in terms of layering, the less concrete and the more abstract the layers become. We thus predict that individual perception verbs will take semantic complement types according to the following implicational hierarchy:

(32) f c x c e c p c C

That is, if a certain perception verb allows a complement of, say, the p-type, it will also allow all the complement types to the left of p in the hierarchy. And if it does not allow, for instance, a complement of the x-type, it won't allow all the complement types to the right of

5. The semantics of perception verbs and their complements in Brazilian Portuguese⁴

The Brazilian Portuguese perception verbs investigated in this paper are the following:

- (i) visual perception: *olhar* 'look', *avistar* 'catch sight of', *visualizar* 'visualize', *ver* 'see', *perceber* 'perceive', *observar* 'observe', and *notar* 'notice';
- (ii) auditory perception: *escutar* 'listen', *ouvir* 'hear', *ver* 'see', *perceber* 'perceive', *observar* 'observe', *notar* 'notice';
- (iii) olfactory perception: *cheirar* 'smell', *perceber* 'perceive', *sentir* 'sense', *experimentar* 'try'.
- (iv) gustatory perception: *experimentar* 'try', *degustar* 'taste', *provar* 'try/taste', *saborear* 'savor', *sentir* 'sense', *perceber* 'perceive';
- (v) tactile perception: *tocar* 'touch', *apalpar* 'touch', *palpar* 'touch', *sentir* 'feel', *tatear* 'touch', *perceber* 'perceive';

As can be noted in this listing, there are quite a number of perception verbs that can be used to express perception through various senses. For instance, the verb *experimentar* 'try' can be used for olfactory and gustatory perception, the verb *perceber* 'perceive' for all five senses. The distribution of the perceptual modalities covered by these verbs does not seem to be random, as Table 2 shows.

Especially remarkable is that in three cases the same verb may be used to express visual and auditory perception. A typological study of Viberg (1984) shows that it is uncommon for languages to not express visual perception by a separate lexical item, a situation which occurs in only three of his 53 languages. In none of Viberg's three cases the polysemy⁵ exhibited concerns just visual and auditory perception. In Brazilian Portuguese, however, this type of polysemy is readily found, though it is restricted to the perception of

⁴ Earlier work on perception verbs in Brazilian Portuguese includes Barros (1977), Carvalho (2004), and Vendrame (2010).

⁵ For the question of polysemy in perception verbs, see also the discussion in Gisborne (2010).

properties. Examples (34)-(36) show the use of *ver* 'see', *observar* 'observe', and *notar* 'note' to express visual perception:

<i>Visual perception</i>	<i>Auditory perception</i>	<i>Olfactory perception</i>	<i>Gustatory perception</i>	<i>Tactile perception</i>
Avistar, Olhar, Visualizar	Escutar, Ouvir	Cheirar	Degustar, Provar, Saborear	Apalpar, Palpar,
Observar, Notar, Ver		Experimentar		Tocar
		Sentir		
Perceber				

Table 2. *The semantic distribution of perception verbs in Brazilian Portuguese*

- (34) **Vi o verde dos teus olhos**
I **saw** the green of your eyes.
- (35) Logo no momento em que foi servida, **observei a cor cristalina**.
Then in the moment that the food was served, I **observed** the crystalline colours.
- (36) Já **notaram a cor do biquíni?**
Did you already **note** the colour of the bikini?

Examples (37)-(39) show the use of those same verbs to express auditory perception:

- (37) **Vi um barulho de carro**.
I **heard** the noise of a car.
- (38) **Observei um barulho na transmissão**.
I **observed** a noise in the transmission.
- (39) Assim que **notei o barulho**, com 500km, levei o carro na concessionária.
'As soon as I **noted** the noise, after 500 km, I took the car to the dealer.'

Given the extensive amount of polysemy observed, where necessary we will indicate with a superscript which reading of a perception verb is intended. Thus *ver^A* will mean that the verb *ver* 'see' is used in its auditory reading.

6. The distribution of semantic complement types

In Section 4 we predicted that perception verbs take different sets of semantic complement types according to the following hierarchy:

(40) f ⊂ x ⊂ e ⊂ p ⊂ C

This hierarchy predicts that semantic complement types more to the left of the hierarchy are implied by the presence of semantic complement types more to the right of the hierarchy. Table 3 shows that this prediction is fully born out by the data. The data on which this table is based are all given in Appendix 1.

At the top of Table 3 the perception verbs with the widest range of semantic complement types are given, at the bottom those with the narrowest range are given. The verbs at the top combine with all possible complement types, the ones at the bottom only with the property denoting complement type, the lowest one on the hierarchy. All intermediate cases show systematic decreasing combinatorial possibilities following the various steps in hierarchy (40).

The verbs highest on the hierarchy are verbs of visual and auditive perception taking a C-complement. This is not surprising, as linguistic units can only be perceived through reading and listening, i.e. through visual and auditory perception. At the other end of the hierarchy we find verbs with a primary visual reading being used in an auditory sense. We do not see an evident explanation for this fact. In between we find other sets of combinations of perception verbs with semantic complement types, but importantly these always obey the hierarchy in (40). Our first prediction is thus fully born out.

	Property	Individual	State-of-Affairs	Propositional content	Communicated content
<i>Escutar</i> ^A	+	+	+	+	+
<i>Ouvir</i> ^A	+	+	+	+	+
<i>Ver</i> ^V	+	+	+	+	+
<i>Avistar</i> ^V	+	+	+	+	-
<i>Notar</i> ^V	+	+	+	+	-
<i>Observar</i> ^V	+	+	+	+	-
<i>Perceber</i> ^V	+	+	+	+	-
<i>Perceber</i> ^G	+	+	+	+	-
<i>Perceber</i> ^T	+	+	+	+	-
<i>Perceber</i> ^O	+	+	+	+	-
<i>Sentir</i> ^G	+	+	+	+	-
<i>Sentir</i> ^T	+	+	+	+	-
<i>Sentir</i> ^O	+	+	+	+	-
<i>Visualizar</i> ^V	+	+	+	+	-
<i>Olhar</i> ^V	+	+	+	-	-
<i>Ver</i> ^A	+	+	+	-	-
<i>Experimentar</i> ^G	+	+	-	-	-
<i>Provar</i> ^G	+	+	-	-	-
<i>Degustar</i> ^G	+	+	-	-	-
<i>Saborear</i> ^G	+	+	-	-	-
<i>Tocar</i> ^T	+	+	-	-	-
<i>Apalpar</i> ^T	+	+	-	-	-
<i>Palpar</i> ^T	+	+	-	-	-
<i>Tatear</i> ^T	+	+	-	-	-
<i>Cheirar</i> ^O	+	+	-	-	-
<i>Experimentar</i> ^O	+	+	-	-	-
<i>Observar</i> ^A	+	-	-	-	-
<i>Notar</i> ^A	+	-	-	-	-
<i>Perceber</i> ^A	+	-	-	-	-

Table 3. The distribution of semantic complement types

7. The morphosyntax of perception verbs in Brazilian Portuguese

The perception verbs analyzed in this paper allow various types of morphosyntactic complement. The first division is between noun phrase complements and clausal

complements. Within the group of clausal complements we find finite and non-finite clauses. And the latter group consists of gerundial and infinitival clauses.

(41) Morposyntactic types of complement of perception verbs

Noun phrase

Clause

Finite

Non-finite

Infinitival

Gerundial

Examples (42)-(45) illustrated the various types of complement: a noun phrase in (42), a finite clause in (43), infinitival complements in (44), and a gerundial complement in (45).

(42) **Vi** o verde dos teus olhos

‘I **saw** the green of your eyes.’

(43) Quando pego o telefone **ouço** que o modem não entr-a na linha.

enter-PRES.IND.3.SG

‘When I take the phone I **hear** that the modem doesn’t connect.’

(44) a Nem **notaram** o homem de paletó preto entr-ar apressado na sala.

enter-INF

‘They didn’t see the man in the dark suit hurry into the room.’

b Agora **via** as pessoas discut-ir-em entre si.

argue-INF-3.PL

‘Now I **saw** people argue among themselves.’

(45) Eu **percebi** eles faz-endo força pra arrancar algo.

do-GER

‘I saw them using force to drag something along.’

Under certain circumstances, which are irrelevant to our purposes here, the infinitive may receive person inflection, as shown in (44b).

We argued there that the higher the layer on which the semantic complement type is based, the more likely that this complement type will be expressed by a finite complement clause. The first two categories in the hierarchy are irrelevant for this prediction, as they can only be expressed by noun phrases.

As shown in the previous section, not all perception verbs allow all semantic complement types. In order to test the prediction in (52) we therefore have to limit ourselves to the perception verbs that allow a wide range of semantic complement types. The ones we have selected are those that allow at least a propositional content as their semantic complement. Table 4 shows which perception verbs comply with this criterion. The data on which this table and later tables in this section are based are all given in Appendix 2.

	Property	Individual	State-of-Affairs	Propositional content	Communicated content
<i>Escutar</i>	+	+	+	+	+
<i>Ouvir</i>	+	+	+	+	+
<i>Ver</i>	+	+	+	+	+
<i>Avistar</i>	+	+	+	+	-
<i>Notar</i>	+	+	+	+	-
<i>Observar</i>	+	+	+	+	-
<i>Perceber</i>	+	+	+	+	-
<i>Sentir</i>	+	+	+	+	-
<i>Visualizar</i>	+	+	+	+	-

Table 4. Perception verbs exhibiting a wide range of semantic complement types

Table 5 now shows the ways in which the complement types expressing States-of-Affairs, Propositional Contents, and Communicated Contents are realized morphosyntactically in terms of finiteness. In this table a + indicates that a complement is finite, a – that it is non-finite, while ‘irr’ indicates that a slot is irrelevant.

	State-of-Affairs	Propositional Content	Communicated content
<i>Escutar</i>	–	–/+	–/+
<i>Ouvir</i>	–	–/+	–/+
<i>Ver</i>	–	–/+	–/+
<i>Avistar</i>	–	–/+	irr
<i>Notar</i>	–	–/+	irr
<i>Observar</i>	–	–/+	irr
<i>Perceber</i>	–	–/+	irr
<i>Sentir</i>	–	–/+	irr
<i>Visualizar</i>	–	–/+	irr

Table 5. Non-finite and finite complements

What is clear from Table 5 is that there is a clear split between complements designating States-of-Affairs on the one hand, and those designating Propositional Contents and Communicated Contents on the other. The former are always expressed through non-finite forms, the latter through finite and non-finite forms.

A further generalization arises when we further distinguish between the two non-finite forms, gerunds and infinitives, and consider their distribution across semantic complement types. This is shown in Table 6.

	State-of-Affairs	Propositional content	Communicated content
<i>Escutar</i>	GER/INF	INF/FIN	INF/FIN
<i>Ouvir</i>	GER/INF	INF/FIN	INF/FIN
<i>Ver</i>	GER/INF	INF/FIN	INF/FIN
<i>Avistar</i>	GER/INF	INF/FIN	irr
<i>Notar</i>	GER/INF	INF/FIN	irr
<i>Observar</i>	GER/INF	INF/FIN	irr
<i>Perceber</i>	GER/INF	INF/FIN	irr
<i>Sentir</i>	GER/INF	INF/FIN	irr
<i>Visualizar</i>	GER/INF	INF/FIN	irr

Table 6. Gerundial, infinitival, and finite complements

Table 6 shows that gerunds are only found in the expression of complements designating States-of-Affairs. A construction with p or C-complement in the gerund form is ungrammatical, as shown in (53), or results in a State-of-Affairs reading, as in (54):

- (53) Porém, **notamos** ser/*sendo comum no cerne dessas teorias a idéia de igualdade.
 ‘However, we **note** that the idea of equality is common to the core of those theories.’
- (54) Durante a transmissão do jogo São Paulo x Boca Juniors **ouvi** que o Fla tá negociando com o Alex Dias para o ano quem vem/o Fla negociando com o Alex Dias para o ano quem vem.
 ‘During the broadcast of the game between São Paulo and Boca Juniors I **heard** that Fla is negotiating with Alex Dias for next year/Fla negotiating with Alex Dias for next year.’

Together with the data in Table 5, this leads to the overall picture presented in Table 7.

	State-of-Affairs	Propositional Content	Communicated Content
gerund	+	-	-
infinitive	+	+	+
finite	-	+	+

Table 7. Semantic and morphosyntactic types of complement clause

In all, and as predicted, we thus see a clear relationship between the semantic complement types on the one hand, and their morphosyntactic expression on the other.⁶

⁶ This is all the more interesting, as similar results were obtained for noun complements in Brazilian Portuguese in Souza (forthc.).

9. Conclusions

In this paper we have shown that the complements of perception verbs in Brazilian Portuguese can be classified semantically using the semantic and pragmatic categories proposed in Functional Discourse Grammar. Complements of perception verbs can be argued to express Properties (f), Individuals (x), States-of-Affairs (e), Propositional Contents (p), and Communicated Contents (C). This subdivision into complement types is relevant in two different respects. First of all, the set of semantic complement types that a perception verb can take is not random but follows a hierarchy, in which the categories mentioned above are ranked from lower to higher scope. If a perception verb can take a semantic complement type of a certain scope, it can also take all other semantic complement types with lower scope. And secondly, the morphosyntactic expression of complements of perception verbs in Brazilian Portuguese is closely linked to their semantic types: the higher a complement in the semantic hierarchy, the more likely it is to be expressed by finite forms. We furthermore found that gerundial forms are limited to complements denoting States-of-Affairs. In all, this study thus has shown that the semantic categories of complements distinguished in FDG provide a useful categorization that helps to systematically describe the semantic and morphosyntactic behaviour of perception verbs in their many readings as well as their complements in their many formal manifestations.

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Appendix 1: Semantic complement types with Brazilian Portuguese perception verbs

Visual perception – Property

Avistar

Chegando em Itu, num belo Sítio das árvores pintadas de branco na base, meias socket, **avistei o azul da piscina.**

‘Arriving at Itu, in a beautiful farm with trees painted in white at the base, ankle socks, I **saw the blue of the swimming pool.**’

Notar

Eles já **notaram a cor do biquíni?** É de encher os olhos: azul e branco.

‘Have they already **noted the color of the bikini?** It is a sight to see: blue and white.’

Observar

Logo no momento em que foi servida, **observei a cor cristalina,** o brilho que a vodca representa e já gostei.

‘As soon as the drinks were served, I **noticed the crystalline color,** the brightness that vodka represents and I liked it immediately.’

Olhar

Olhei a cor daquela flor.

‘I **looked at the color of that flower.**’

Perceber

Muitas vezes engolem a comida sem sequer parar para sentir o sabor, **perceber a cor.**

‘Often they swallow the food without at least stopping to feel the flavor, to **perceive the color.**’

Ver

Senti o teu cheiro perto de mim, o calor do teu corpo, **vi o verde dos teus olhos,** mais brilhantes do que nunca. Ouvi a tua voz, claramente.

‘I felt your scent close to me, the heat of your body, I **saw the green of your eyes,** shinier than ever. I heard your voice, clearly.’

Visualizar

Informe à gráfica em qual escala você **visualizou** a cor e, de preferência, sempre visualize no suporte que irá imprimir.

'Inform the printing house in which scale you **visualized** the color and, preferably, always visualize it in the same software it will be printed.'

Visual perception – Individual

Avistar

Antes que eu respondesse **avistei** o cavalo um pouco mais para baixo.

'Before I answered I **saw** the horse a little more downward.'

Notar

E então, provavelmente, vocês **notaram** o cachorro.

'And then, probably, you have **noticed** the dog.'

Observar

Eles apenas **observaram** os animais, nada de tiros.

'They only **observed** the animals, no shots.'

Olhar

Olhei o homem à minha esquerda.

'I **looked at** the man on my left.'

Perceber

Nesse momento, o apito do trem soava longe, quando **percebi** uma mulher e duas meninas.

'At this moment, the train whistle sounded at a distance, when I **noticed** a woman and two little girls.'

Ver

Você **viu** aquela mulher da novela?

'Did you **see** that woman from the soap opera?'

Visualizar

Pensativo, o dono do (ex-)castelo **visualizou** seu pai.

'Thoughtful, the owner of the (ex-)castle **visualized** his father.'

Visual perception – Event

Avistar

Avistei ele vindo na minha direção todo lindo, vestindo uma camisa branca, jaqueta azul e calça jeans.

'I **saw** him moving toward me looking all handsome, in a white shirt, blue jacket and jeans.'

Notar

Nem **notaram** o homem de paletó preto entrar apressado na sala.

'They didn't even **notice** the man in a black jacquet entering quickly in the room.'

Observar

Eu **observei** eles dormindo por mais um tempo e fui pra casa.

'I **watched** them sleeping for a while and then I went home.'

Olhar

Olhei o homem louco tocando os sinos da igreja por quase uma hora.

'I **looked at** the crazy man ringing the church bells for almost an hour.'

Perceber

Eu **percebi** eles fazendo força pra arrancar algo.

'I **noticed** them striving to pull something out.'

Ver

Eu e um amigo **vimos** ele dando um empurrãozinho no antebraço.

'A friend and I **saw** him giving a small shove to his forearm.'

Visualizar

Uma vez **visualizei** Deus pairando sobre a Terra.

'Once I **visualized** God hovering over the Earth.'

Visual perception – Propositional Content

Avistar

Por um golpe de sorte, **avistei** que um dos carros estava deixando o "estacionamento oficial" da instituição - abrindo, assim, a minha tão desejada vaguinha.

'By a lucky fluke, I **noticed** that one of the cars was leaving the institution's official parking lot - thus opening up my much-desired parking space.'

Notar

Notamos ser a espiritualidade algo de suma importância para você.

'We **note** that spirituality is something of great importance to you.'

Observar

Ele, por ser médico, não precisou passar pela entrevista. Sua esposa também não, pois **observaram** ser uma união sem conflitos.

'Because he is a doctor, he did not have to be interviewed. His wife did not either, for they **observed** it is as a union without conflict.'

Perceber

Percebo que o mundo está cansado de sonhadores!

'I **realize** that the world is tired of dreamers!'

Ver

Analisando a situação econômica do país do réu, **vejo** ser esta precária.

'Analyzing the economic situation of the defendant's country, I **see** it is precarious.'

Visualizar

O presidente da Funai, Mércio Pereira Gomes, **visualizou** ser possível fazer valer os direitos das etnias indígenas para o acesso ao ensino diferenciado.

'The president of Funai, Mércio Pereira Gomes, **visualized** that it is possible to assert the rights of indigenous ethnic groups to access a differentiated instruction.'

Visual perception – Communicated Content

Ver

Hoje mesmo eu **vi** no jornal que Harry Potter já bateu a maior arrecadação de fim-de-semana com U\$90milhões nos EUA, batendo Jurassic Park.

'Today I **saw** in the newspaper that Harry Potter has already hit the highest weekend box office with \$ 90 million in the USA, overtaking Jurassic Park.'

Auditory perception – Property

Escutar

Eu **escuto** sons.

'I **hear** sounds.'

Notar

Assim que **notei** o barulho, com 500km, levei o carro na concessionária e chamei na mesma hora o engenheiro da fiat responsável por manutenção.

'As soon as I **noticed** the noise, after 500km, I took the car to the dealer and immediately called the engineer responsible for maintenance.'

Observar

O mal-cheiro de catalizador permaneceu, **observei** um barulho na transmissão de marchas 2ª para 3ª em baixa aceleração.

'The stench of the catalyst remained, I **noticed** a noise in the transmission from 2nd to 3rd gears in low acceleration.'

Ouvir

Ouvi o barulho da chuva.

'I **heard** the noise of the rain.'

Perceber

Comprei um cabo Stinger Hyperserie e após a instalação **percebi** os ruídos quando ligava o motor [do carro] ou até mesmo quando ligava a ventoinha do ar.

'I bought a Stinger Hyperserie cable and after the installation I **noticed** the noises when I turned on the engine or even when I turned on the air blower.'

Ver

Vi um barulho de carro. Seria a estrada? Sim, acho que sim, a mesma estrada que nos trouxe até o clube. Acho que estamos atrás do clube. Nos fundos.

'I heard a car noise. Would it be the road? Yes, I think so, the same road that brought us to the club. I think we're behind the club. In the back.'

Auditory perception – Individual

Escutar

E eu **escutei o passarinho**.

'And I **heard the little bird**.'

Ouvir

Eu **ouvi o passarinho**, às quatro da madrugada.

'I **heard the little bird** at four in the morning.'

Auditory perception – Event

Escutar

Escutávamos a galera gritando "Ronaldinho" direto.

'We **heard the crowd shouting "Ronaldinho" all the time**.'

Ouvir

Eu **ouvi o Diu dizendo que o serviço vai ser feito lá pelo pessoal do Rio**.

'I **heard Diu saying that the service will be done by the people from Rio**.'

Auditory perception – Propositional Content

Escutar

Tô dançando na balada e **escuto que a próxima música é uma que eu amo**.

'I'm dancing in a night spot and I **hear that the next song is one I love**.'

Ouvir

Quando pego o telefone **ouço que o modem não entra na linha**.

'When I take the phone, I **hear the modem doesn't connect**.'

Auditory perception – Communicated Content

Escutar

João estava indo para casa quando ligou o rádio e **escutou** que em uma cidade da Índia morreram 3 pessoas por causa de uma gripe desconhecida.

'John was going home when he turned on the radio and **heard** that in a city in India three people died because of an unknown flu.'

Ouvir

Durante a transmissão do jogo São Paulo x Boca Juniors **ouvi** que o Fla tá negociando com o Alex Dias para o ano quem vem.

'During the transmission of the match São Paulo vs. Boca Juniors I **heard** that Fla(mengo) is negotiating with Alex Dias for the next year.'

Olfactory perception – Property

Cheirar

Cheirei o perfume de seus cabelos.

'I **smelled** the perfume in her hair.'

Experimentar

Na verdade ainda estou em dúvida, eu **experimentei** umas três ou quatro fragrâncias nos braços (esse lance de cheirar papelzinho não é comigo - perfume tem que sentir na pele)

'In fact I'm still in doubt, I have **tried** three or four fragrances on my arms (this thing of smelling paper is not for me - perfume has to be felt on the skin).'

Perceber

Ontem **percebi** a suavidade do teu perfume.

'Yesterday I **perceived** the softness of your perfume.'

Sentir

Eu **senti** cheiro de marmelo.

'I felt the smell of quince.'

Olfactory perception – Individual

Cheirar

Cheirei aquele homem de tão lindo, tão especial.

'I **smelled** that handsome man, so special.'

Experimentar

Experimentei o perfume, que é do meu namorado, e fiquei encantada com a fixação e com o cheiro.

'I **tried** the perfume, which is my boyfriend's, and I was delighted by the fixation and the smell.'

Perceber

No restaurante Sahid **percebeu** os cabelos de Orquídea molhados e o cheiro de banho.

Olhando para elas perguntou: - Vocês tomaram banho?

'In the restaurant Sahid **noticed** Orchid's wet hair and the smell of bath. He looked at them and asked: "Did you take a shower?"'

Sentir

Senti aquele corpo perfumado sobre o meu, aqueles cabelos longos sedosos roçando o meu rosto.

'I **felt** that perfumed body over mine, that silky long hair brushing my face.'

Olfactory perception – Event

Perceber

Não **percebi** o bolo queimando.

'I did not **notice** the cake was burning.'

Sentir

Continuamos o passeio como antigamente **sentindo** o pó levantar-se a cada passada, pois a chuva este ano tarda.

'We continue the walk as in the old days, **feeling** the dust rising at each step, because this year the rain will be late.'

Olfactory perception – Propositional Content

Perceber

Logo **percebi** que a rosca estava queimando, mas o padeiro nem reparou.
'I soon **realized** that the doughnut was burning, but the baker did not notice.'

Sentir

Senti que o feijão estava queimando.
'I **felt** that the beans were burning.'

Gustatory perception – Property

Degustar

Pedalei junto com vocês e **degustei** as delícias da comida espanhola e acima de tudo o bom vinho tinto de Rioja.

'I cycled with you and **tasted** the delicious Spanish food and most importantly the good red wine from Rioja.'

Experimentar

Já **experimentamos** o sabor romã com chocolate, que foi aprovadíssimo por todos.

'We have already **tasted** the pomegranate and chocolate flavor, which everyone very much liked.'

Perceber

Quando dei o primeiro gole **percebi** um gosto meio esquisito mas continuei bebendo até o final.

'When I took the first sip I **noticed** a strange taste but I kept on drinking until it had finished.'

Provar

Com nossos sentidos, **provamos** sabores.

'Using our senses, we **taste** flavors.'

Saborear

Já **saborearam** o sabor adocicado do caju?

'Have you already **tasted** cashew's sweet flavor'?

Sentir

H(o)j(e) nem **senti** o gosto da comida direito, fiquei sem apetite agora à noite, o que é ótimo!

'Today I haven't **tasted** the food's flavor very well, I wasn't hungry in the evening and that is great!'

Gustatory perception – Individual

Degustar

Presidente Lula **degusta** frango após lançamento do Plano de Prevenção da Influenza Aviária.

'President Lula **eats** chicken after launching the Plan Against Avian Influenza.'

Experimentar

Experimentei a comida e era muito estranha.

'I have **tried** the food and it was very strange.'

Perceber

Eu nunca **percebi** a comida com atenção... Achava perda de tempo. Mas o que impressionava era o ritual e a formalidade no momento das refeições, principalmente no oriente.

'I have never **perceived** food with much attention ... I thought it was losing time. But I was amazed by the ritual and formality during the meals, especially in the East.'

Provar

Provamos a feijoada vegetariana com arroz de coentros.

'We have **tried** vegetarian feijoada with coriander rice.'

Saborear

Equipe de socorristas da ONG Corpo Voluntário de Socorro e Resgate RS unidade de Gravataí também **saboreou** um cafezinho Melitta.

'The response team of the NGO Voluntary Search and Rescue Team from Rio Grande do Sul, Gravataí's unit, also **tried** Melitta's coffee.'

Sentir

Almoço em buffet todos dias quando dei a primeira garfada **sentí** a comida toda.

'I have lunch at restaurants every day, when I took the first bite I **tasted** the whole meal.'

Gustatory perception – Event

Perceber

Percebo a cerveja descer amarga na garganta

'I **taste** a bitter beer flavor going down into my throat.'

Sentir

A massa é bem macia, mas ao morder você **sente** as nozes invadirem sua boca.

'The dough is very soft, but when you bite it you **notice** the nuts in your mouth.'

Gustatory perception – Propositional Content

Perceber

Hoje, na hora do almoço, **percebi** que a comida estava sem gosto pra mim.

'Today, at lunch time, I **noticed** the food was tasteless for me.'

Sentir

Sinto que o bolo fica um pouco mais seco do que no forno convencional, mas não sei se é por causa do bolo de caixinha.

I **notice** that the cake is a bit drier than when it is baked in the traditional oven, but I don't know if it is due to its prefabricated dough.

Tactile perception – Property

Apalpar

Apalpei a maciez larga da parte carnuda da ave.

'I **touched** the softness of the bird's fleshy part.'

Palpar

Palpou a maciez do lençol buscando através do tato tornar o momento mais concreto.

'He **touched** the sheet's softness trying to turn the moment more real by means of touch.'

Perceber

Percebi a rigidez dos seus músculos quando Keaton apareceu para nos cumprimentar.

'I **noticed** the stiffness of his muscles when Keaton came to greet us.'

Sentir

Dei mais dois passos, coleí e **sentí** a maciez da pele sensual.

'I took another two steps, getting closer, and I **felt** the softness of his sensual skin.'

Tatear

Tateei a maciez da pedra e sorri nervosa, sabendo que não poderia tirar na frente dela.

'I **touched** the stone's softness and smiled nervous, because I knew I couldn't throw it on her.'

Tocar

Quando te vi **toquei** a aspereza de tuas mãos.

'When I saw you, I **touched** your hands' roughness.'

Tactile perception – Individual

Apalpar

Após o banho passei o creme pelo corpo e **apalpei** um caroço do lado esquerdo poucos centímetros atrás da orelha.

'After taking a shower, I applied the body cream and **touched** a nodule on the left side a few centimeters behind the ear.'

Palpar

Em setembro, depois da menstruação, **palpei um caroço**, fiz então um ultra som e lá estava o nódulo!

'In September, after having the period, I **touched a nodule**, an ultrasound was made and there it was, the nodule.'

Perceber

Assustado, **percebi** o corpo de Guto abraçado ao meu.

'Freaked out, I **noticed** Guto's body embraced on mine.'

Sentir

Sentiu o corpo dela em seus braços, quente como o sol apesar do frio de Nova York.

'He **felt** her body on his arms, hot like the sun, although it was cold in New York.'

Tatear

Quando estava quase morrendo de sede, **tateei** algo parecido com uma torneira e girei com tanta força que saiu um jato estrondoso, respingando litros em mim.

'When I was almost dying of thirst, I **touched** something similar to a tap and I turned it so strongly that it started to flow liters of water on me.'

Tocar

Também **toquei** seu corpo quente com o sabor do licor.

'I also **touched** his hot body which had liquor flavor.'

Tactile perception – Event

Perceber

Estava tão amedrontada que nem **percebi** ele me abraçando e mexendo no meu cabelo.

'I was so scared that I didn't **notice** he was embracing me and touching my hair.'

Sentir

Senti ela mexer de verdade.

'I **felt** her moving for real.'

Tactile perception – Propositional Content

Perceber

Percebi que Michele me abraçou apertado, não tinha jeito de escapar.

'I **felt** Michele hugged me tightly; there was no way to escape.'

Sentir

Tive um desmaio ou como se eu tivesse perdido a consciência naquele instante dai rolei escada a baixo **senti** ter quebrado o pescoço mas não doía nada.

'I fainted or it was like I was uncounscious at that moment, then I fell down the stairs and I

felt I had broken my neck but it didn't hurt.'

Appendix 2: Morphosyntactic complement types with Brazilian Portuguese perception verbs

Escutar – e – gerund

Escutávamos a galera gritando “Ronaldinho” direto.

'We listened to the crowd shouting "Ronaldinho" all the time.'

Escutar – e – infinitive

Eu escutei ela cantar

'I heard her sing.'

Escutar – p – infinitive

Sinto m(u)(i)ta dificuldade de Warpar PsyTrance... não fica perfeito... **escuto** o kick não ter aquele impacto em alguns compassos.

'I have a lot of difficulty to work with Warpar PsyTrance (Record Company) ... it does not look perfect ... I **hear** the kick does not have that impact in some bars.'

Escutar – p – finite

Tô dançando na balada e **escuto** que a próxima música é uma que eu amo.

'I'm dancing in a night spot and I **hear** that the next song is one I love.'

Escutar – C– infinitive

Tem certas coisas horrorosas visualmente nos pés das mulheres, que após meu questionamento, **escuto** ser “extremamente confortável”. Um coturno para um soldado é confortável também...

'There are certain horrible things on women's feet, which after my questioning about it, I **hear** being "extremely comfortable." A cowhide for a soldier is comfortable as well...'

Escutar – C– finite

João estava indo para casa quando ligou o rádio e **escutou** que em uma cidade da Índia morreram 3 pessoas por causa de uma gripe desconhecida.

'John was going home when he turned on the radio and **heard** that in a city in India three people died because of an unknown flu.'

Ouvir – e – gerund

Eu **ouvi** o Diu dizendo que o serviço vai ser feito la pelo pessoal do Rio.

'I **heard** Diu saying that the service will be made by the people from Rio.'

Ouvir – e – infinitive

Ouvi cantar o Ginguinhas numa taberna em Samora
'I **heard** the Ginguinhas to sing in a tavern in Samora.'

Ouvir – p – infinitive

Quando pego o telefone **ouço** o modem não entrar na linha. (constructed)
'When I take the phone I **hear** the modem does not connect.'

Ouvir – p – finite

Quando pego o telefone **ouço** que o modem não entra na linha.
'When I take the phone, I **hear** the modem doesn't connect.'

Ouvir – C – infinitive

Outro ponto que **ouvi** ser um ótimo ponto de vista.
'Another point I **heard** to be a great point of view.'

Ouvir – C – finite

Durante a transmissão do jogo São Paulo x Boca Juniors **ouvi** que o Fla tá negociando com o Alex Dias para o ano quem vem. Será que procede ou tô com cera demais no ouvido?
'During the transmission of the match São Paulo vs. Boca Juniors I **heard** that Fla(mengo) is negotiating with Alex Dias for the next year.'

Ver – e – gerund

Eu e um amigo **vimos** ele dando um empurrãozinho no antebraço.
'A friend and I **saw** him giving a small shove to his forearm.'

Ver – e – infinitive

aí um::/ uma vez teve um:: eu pa/ a:: passeando com meu marido e **vi**... um:: um carro batê(r) e o cara... levantô(u) saiu do carro tacô(u) a mão assim toda aí ele passô(u) a mão na:: na testa... ele viu o sangue (AC-128, L.17-19)
'Once I was walking with my husband and I **saw** a car crash and the guy got up, got out of the car and stuck his hand all over, then he put his hand on his forehead and saw the blood.'

Ver – p – infinitive

E, em analisando a situação econômica do país do réu, **vejo** ser esta precária.
'And in analyzing the economic situation of the defendant's country, I **see** it is precarious.'

Ver – p – finite

Eu **vi** que um carro tinha batido numa bike.
'I **saw** that a car had crashed into a bike.'

Ver – C – infinitive

Hoje mesmo eu **vi** no jornal Harry Potter já bater a maior arrecadação de fim-de-semana com U\$90 milhões nos EUA, batendo Jurassic Park. (constructed)
'Today I **saw** in the newspaper that Harry Potter has already hit the highest weekend box officewith \$ 90 million in the USA, overtaking Jurassic Park.'

Ver – C – finite

Hoje mesmo eu **vi** no jornal que Harry Potter já bateu a maior arrecadação de fim-de-semana com U\$90milhões nos EUA, batendo Jurassic Park.
'Today I **saw** in the newspaper that Harry Potter has already hit the highest weekend box office with \$ 90 million in the USA, overtaking Jurassic Park.'

Avistar – e – gerund

Avistei ele vindo na minha direção todo lindo, vestindo uma camisa branca, jaqueta azul e calça jeans.
'I **saw** him moving toward me all pretty, dressing a white shirt, blue jacket and jeans.'

Avistar – e – infinitive

Avistamos Rich sair do carro.
'We **saw** Rich leave the car.'

Avistar – p – infinitive

Por fora já **avistei** ser um ambiente agradável.
'On the outside I already **saw** it is a pleasant environment.'

Avistar – p – finite

Por um golpe de sorte, **avistei** que um dos carros estava deixando o "estacionamento oficial" da instituição - abrindo, assim, a minha tão desejada vaguinha.
'By a stroke of luck, I **noticed** that one of the cars was leaving the institution's official parking lot - thus opening up my much-desired wiggle.'

Notar – e – gerund

Notou uma fã cantando músicas do seu álbum.

'He **noticed** a fan singing songs from his album.'

Notar – e – infinitive

Nem **notaram** o homem de paletó preto entrar apressado na sala.

'They even noticed the black coat man to enter quickly in the room.'

Notar – p – infinitive

Notamos ser a espiritualidade algo de suma importância para você.

'We **note** that spirituality is something of great importance to you.'

Notar – p – finite

Nas praias **notamos** que, em geral, durante o dia o vento vem do mar para a Praia e à noite o vento vai da praia para o mar.

'On the beaches we **note** that, in general, during the day the wind comes from the sea to the beach and at night the wind goes from the beach to the sea.'

Observar – e – gerund

Eu **observei** eles dormindo por mais um tempo e fui pra casa.

'I **observed** them sleeping for a while and went home.'

Observar – e – infinitive

Observamos a luz entrar no quarto.

'We **observed** the light enter the room.'

Observar – p – infinitive

Ele, por ser médico, não precisou passar pela entrevista. Sua esposa também não, pois **observaram** ser uma união sem conflitos.

'Because he is a doctor, he did not have to be interviewed. His wife did not either, for they **observed** it is as a union without conflict.'

Observar – p – finite

Observamos que existe uma busca interminável do homem pela religião.

'We **observe** that there is an endless search of man for religion.'

Perceber – e – gerund

Eu **percebi** eles fazendo força pra arrancar algo.
'I **noticed** them striving to pull something out.'

Perceber – e – infinitive

Percebo a cerveja descer amarga na garganta
'I taste a bitter beer flavor going down into my throat.'

Perceber – p – infinitive

Percebemos ser essencial o conhecimento de como tais teorias se constroem.
'We **feel** the knowledge of how these theories are constructed to be essential.'

Perceber – p – finite

Percebo que o mundo está cansado de sonhadores!
'I **perceive** that the world is tired of dreamers!'

Sentir – e – gerund

Senti algo entrando dentro do meu corpo.
'I **felt** something entering my body.'

Sentir – e – infinitive

A massa é bem macia, mas ao morder você **sente** as nozes invadirem sua boca.
'The dough is very soft, but when you bite it you **notice** the nuts in your mouth.'

Sentir – p – infinitive

Tive um desmaio ou como se eu tivesse perdido a consciência naquele instante dai rolei escada a baixo **senti** ter quebrado o pescoço mas não doía nada.
'I fainted or it was like I was uncounscious at that moment, then I fell down the stairs and I **felt** I had broken my neck but it didn't hurt.'

Sentir – p – finite

Sinto que o bolo fica um pouco mais seco do que no forno convencional, mas não sei se é por causa do bolo de caixinha.
'I **notice** that the cake is a bit drier than when it is baked in the traditional oven, but I don't know if it is due to its prefabricated dough.'

Visualizar – e – gerund

Uma vez **visualizei** Deus pairando sobre a Terra.
'Once I **visualized** God hovering over the Earth.'

Visualizar – e – infinitive

Ao se aproximar do veículo em questão, **visualizou** ser jogada pela janela uma sacola.
'As he approached the vehicle in question, he **saw** a bag being thrown out the window.'

Visualizar – p – infinitive

O presidente da Funai, Mércio Pereira Gomes, **visualizou** ser possível fazer valer os direitos das etnias indígenas para o acesso ao ensino diferenciado.
'The president of Funai, Mércio Pereira Gomes, **visualized** that it is possible to assert the rights of indigenous ethnic groups to access a differentiated instruction.'

Visualizar – p – finite

A autora **visualizou** que as mulheres de classes populares sempre estiveram no feminismo.
'The author **visualized** that women of the popular classes have always been in feminism.'