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BE THE ONE*

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Abstract

This paper presents an analysis of the semantics of *be* in which the verb only contains an argument position. In a sense, the function of this verb is to introduce a subject in a proposition. Different readings of the verbs are accounted for by assuming that the rules that combine the verb with other terms introduce semantic distinctions, the restrictions on what is possible being determined by the capacity of the representation constructed to relate to a situation in the world. The analysis emerges from the assumption that an adequate description of a term should not refer to contingent properties—that is, properties the term only has in specific context—a position that, when pushed to its logical conclusion, leads to articulate the sound-meaning relation in grammar in a different light than what is generally assumed in traditional frameworks.

1 Introduction

This paper challenges the traditional idea that the verb *be* is a copula, an element whose function is relate two things (for example, a subject and a complement). Instead, I argue that *be* is not a relational element at the lexical level, and only provides an argument position. The function of the verb is to provide a subject in the sentence, and nothing else. This hypothesis follow from adopting the assumption that the description of terms should not be based on contingent properties—i.e. properties which are specific to a construction where the term appears. Accordingly, I start the paper by detailing the motivation behind this assumption (section 2). The consequences of this approach go beyond the description of *be*. Thus, section 3 shows that following the approach leads to the hypothesis that the rules of syntax are instrumental in accounting for certain fundamental meaning distinctions in natural language. Under this view, the classic distinction between the predicative and identity readings of copular constructions is seen as a function of how syntax combines terms, as opposed to a function of the content of these terms. In section 4, other uses of *be* are discussed, and show that under the assumption that *be* only introduces one entity in the discourse, it becomes possible to account for why the verb selects a PP complement—as opposed to simply an NP—in its locative use.

2 The Contingency Problem

To account for the fact that natural languages have the potential to create an infinite number of expressions, a theory of grammar minimally needs to distinguish between two levels of analysis: a terminal level (a finite set of simple expressions); and a combinational system (a morphosyntax) that creates expressions (constructions) from simpler expressions. The combinational system makes it possible to create, out of a finite set of expressions at the

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terminal level, a potentially infinite number of expressions at the syntactic level. The starting point of my research is that a system that makes a distinction between a terminal and a constructional level imposes specific constraints on how to describe the sound-meaning relations, constraints that are not respected in traditional descriptions of terms.

Specifically, the problem with traditional descriptions of terms is that they generally make reference to *contingent* properties, that is, properties the terms only have in specific contexts. Formally, the context in which a term appears is a *construction*. Descriptions based on contingent properties take properties that are only true of a *syntactic* object (a context where a term appears) to describe a *terminal* object (one of the expression that is part of the context). This causes a mismatch between what is observed and what is described: a property that, observationally, is only true of a construction, is used as a descriptive feature of a term.

This practice has a theoretical cost: it increases the level of arbitrariness in grammar, and necessarily leads to the introduction of other statements in the grammar to account for the meaning the term has in other contexts. These theoretical consequences follow from the fact that the sound-meaning relations at the terminal and syntactic levels have different theoretical status. For an expression that belongs to the terminal level, the association between sound and meaning is arbitrary; it is irreducible, and must thus be learned by the speakers. This means that the linguist does not need to provide—and in fact, cannot provide—an explanation for the sound-meaning relation observed. At this level, the relation has an inherent "cost" for the grammar that cannot be escaped because it can only be stated. For expressions that are created by morphosyntax, however, the sound-meaning relation should not have to be learned by speakers. In fact, because syntax has the potential to create an infinite number of expressions, it should in principle be impossible to learn all the sound-meaning relations of the complex expressions of a language. Theoretically, then, the association between sound and meaning at the syntactic level should be motivated (not arbitrary) or at least capable of being motivated.

Using a contingent property to describe a term means that something that should be motivated—a property that is only true at the syntactic level—is taken as arbitrary. Also, additional statements must be provided to account for the meaning the term has in other contexts. Given that a term can appear in a potentially infinite number of contexts, using a property that is specific to a context to describe the term necessarily implies additional statements to account for the properties the term has in other contexts.

Let me illustrate the essence of the argument by looking at the standard hypothesis that *be* is a copula. Generally, this analysis is taken as meaning that *be* has little or no semantic content of its own, its function being to provide a support to relate two elements. Consider for example how this is expressed in Partee (1986):

(1) be: $\lambda P \lambda x[P(x)]$

Under this analysis, *be* takes the argument *x* it selects, and makes *x* the argument of the predicative complement P it selects. Numerous logic-based analysis of *be* have this type of description, or a variation of it, following the views of Montague (1974), a position that dates (at least) to the view of copula presented in Russell (1919). That the verb's function is to relate two things is not only assumed in logic-based analysis, as the approaches in Jackendoff (1983), (1996), and Langacker (1984) and many others show.

The description of *be* in (1) is contingent in the sense described above: it only applies to certain constructions where the verb appears. For example, it describes the predicative sentences in (2), where the complement is an adjective or an indefinite NP.

(2) Predicate reading of *be*
   a. Peter Parker is shy.
   b. Peter Parker is a photographer.

However, it cannot be applied directly to the identity sentences such as the ones in (3) or to the "existence" use of *be* in (4):

(3) Identity/equative reading of *be*
   a. Peter Parker is Spiderman.
   b. Mary is John's sister.

(4) Existence use of *be*
   a. To be or not to be.
   b. I think, therefore I am.
   c. Time does not seem to pass here: it just is. (from *Lord of the Ring*, J.R.R. Tolkien)
   d. Time is, time was, time passed. (From *The Manticore*, R. Davis)

In (3), the complement is not a predicate—it is a proper noun or a definite NP— and in (4), *be* does not even have a complement.

At the observational level, then, the presence of a predicative complement with *be* is a characteristic of some constructions where the verb appears, such as those in (2), but not all of them, as in (3) and (4). Under description (1), the presence of this complement is seen as a property of *be* itself. This description does not match what is observed, because a property of one construction of the language is used to describe one of the terminal element of the language. Information that belongs to the level of constructions is included at the terminal level. As a consequence, this analysis of *be* requires additional statements to describe the uses of *be* in (3) and (4), because the description in (1) only applies to the examples in (2), mechanisms such as lexical homonymy/polysemy, type-shifting rules, existential closure, etc. The point here is that these mechanisms are required because a characteristic which is specific to a construction where *be* appears is used to describe the expression *be* itself.

It seems to me that once the distinction between the terminal and the constructional level is accepted, a description for terms must exclude contingent notions if it is to be observationally adequate. Otherwise, the terminal level is described by properties which are only true of constructions. In order to arrive at such descriptions, I assume the guideline in (5), a contingent property being defined as in (6) for sake of clarity:

(5) Do not make reference to contingent properties in the description of a term.

(6) A property P is a contingent property of expression E if P characterizes E in context A, but not in context B.

Ideally, an adequate description of a term will be true for all the contexts where it appears, the application of the approach tending towards monosemic descriptions for terms (in the sense of Ruhl, 1989, Bouchard, 1995, and many others). In practice, it is of course impossible to verify whether a description is appropriate for all the contexts where it can appear. (5) has to be taken in a relative manner so that when studying a given item in a number of constructions, the proposed description should at least apply to all these constructions

Returning to the three uses of *be* discussed so fare–the predicative use (2), the identity use (3) and the existence use (4)–we see that no generalization can be made about the nature of the complement selected by the verb: the complement has a predicative value in (2) and has an entity value in (3). Furthermore, *be* does not even have a complement in (4). Thus, the only thing these examples have in common is that they all have a subject. Given this, a description that can be attributed to *be* under (5) can only make reference to the subject–and nothing else. Any reference to the selection of a complement in the description of *be* would not respect the spirit of (5). Thus, I assume that *be* is not a copula, but simply provides an argument position. The verb has the minimal content that is needed to talk about something.

What can be said about this something is dependant on the relations the verb establishes with the other elements in the sentence. As I show in section 3, the descriptive ideal in (5) also affects how these other element are described.

3 Compositionality revisited

Perhaps the most significant consequence of aiming at the descriptive ideal (5) is its implication for compositionality. As I show in section 3.1, starting with descriptions faithful to the ideal (5) leads to the conclusion that the meaning of the whole is *more* than the meaning of its parts. This conclusion is behind the hypothesis presented in section 3.2 that the meaning of a syntactic expression is not only the meaning of the parts, but also *how* these parts are combined. In section 3.3, I develop an account of ambiguous pseudocleft construction which requires no meaning change for the terms (no homonymy or type shifting rules). The section ends on a discussion of the consequences of the description ideal for in understanding the relation between grammatical knowledge and world knowledge.

3.1 Compositional meaning

Intuitively, the distinction between the predicative reading (2) and the identity/equative reading (3) seems to depend on the nature of the complement of the copula: when the complement has a predicate value, as in a (2), then the sentence is predicative; when the complement has an entity/individual value, as in (3), the sentence has an identity/equative reading. Although it appears from the examples in (2) and (3) that the difference in meaning is a function of the content of the complement of the verb—that is, its category or type value—this turns out to not be always possible because for many expressions, type value is a contingent notion. The number of type-shifting rules required for NP interpretation that are listed in Partee (1987) shows the extent to which type value is contingent.

The minimal pair in (7), where the expression *red* has different type values, illustrates the consequence of contingency of type if (5) is adopted:

(7) a. Mary's favorite car is red.
b. Mary's favorite color is red.

Speakers of English recognize that these sentences are logically distinct: in the case of (7a), the sentence has a predicative reading (*red* is a property of the car), whereas (7b) has an identity reading (the sentence identifies a specific color). Inverting the subject and complement, as in (8), confirms the difference in value:

(8) a. ?* Red is Mary's favorite car.
b. Red is Mary's favorite color.

Just like identity sentences in general, (7b) can be inverted to yield the logically equivalent (8b), which indicates that the subject and complement have the same type. In contrast, the inversion of (7a) leads to a much less natural result in (8a). Fronting of a predicate can be felicitous, but it require very specific discursive circumstances.

The difference in reading depends on the categorial or type value of the complement *red*: when *red* is interpreted has a predicate (or, in more traditional terms, is an adjective) in (7a), the sentence is predicative; when *red* is interpreted as an individual constant (is a noun) in (7b), the sentence has an identity reading. The problem is that under (5), categorial or type value cannot be a descriptive property of *red*. The categorial of *red* changes depending on the syntactic context, and it is therefore a contingent property. We appear to be at an impasse: the different readings of the sentences in (7) depend on the value of one expression, but because this value is contingent, it cannot be a descriptive property of the expression.

To resolve this dilemma, we must look outside of the description of the term. It must the case that the two readings in (7) are dependant on something other than the meaning of their parts. I will argue that this "something" is syntax itself—the distinction arises because syntax combines the same complement with the verb in two different ways.

3.2 Constructing meaning distinctions

In this section, I flesh out the idea that syntax introduces meaning distinctions as it combines elements. I assume that syntax introduces two distinctions, each dependant on a different rule of combination. This means each time a relation is established between two syntactic nodes, a choice must be made about which rule combines them.

The two readings in (7) arise from applying these two rules to the same expression. As we saw above, a term like *red* cannot be described as having a categorial or type value, since this value changes depending on the context. The value arises depending on the rule that combines the expression with the verb. I assume the existence of a *rule of description* (whose function is to create a predicative element) and a *rule of identification* (whose function is to name). Sentence (7a) is a case where *red* is combined by the rule of description, making it a predicate with respect to the subject: *red* is then taken as a descriptive feature of the entity *Mary's favorite car*. In sentence (7b), *red* is combined by the rule of identification, whose function is to name; *red* is then interpreted as the name of the entity *Mary's favorite color*. Under this view, *red* has no specific value which says that it should be interpreted as a predicate or an entity. How it is combined determines what its value is, and thus what the reading of the sentence as a whole is.

This hypothesis is, as far as I can see, a departure from contemporary approaches to linguist meaning, and I feel it is important to formalize it in terms that will not be confused with other standard notions Let me first look at the content of verbs. I assume that verbs provide functional content upon which the rule of syntax can build states of affairs. The nature of the states of affairs constructed will depend on the content of the particular verb involved, and on the rules that are used to combine the verb with other elements in the context. For example, the predicative and identity readings of copular constructions are states of affairs constructed upon the content of *be* depending on how the complement is combined with the verb.

As the discussion of section 2 made clear, the content of *be* is minimal: it provides essentially an argument position. Let me represent an argument position as in (9):

(9) Content of *be*: ( )

I assume that an argument position that is filled—or identified—by an syntactic argument is interpreted as a discourse entity: this argument is then a thing that can be talked about. This means that a verb like *be* can thus be used in the grammar to construct states of affairs pertaining to one entity. It is important to note that since *be* is a verb, and thus bears Tense morphology, the argument associated with the content of *be* is also situated with respect to the Tense specification of the sentence. The presence of Tense information is secondary at this point of the discussion and will be discussed in section 4.1.

The two rules of syntax can use the position in (9) to construct states of affairs. What the rules of syntax do, formally, is place the content of the node it combined with the position at different places in the representation: given where the content is placed, it will have a different value. For example, I assume that placing the content of an expression *x* next to the right of the position, as in (10), expresses the application of the rule of identification.

(10) ( ) + x ⇨ ( )x

The rule in (10) reads as *combining the content* x *with the content of* be *gives the result:* ( )x. This result is interpreted as *the entity identified as* x. In other words, *x* is the name of an entity. When it is the rule of description that is applied, the content of *x* appear inside the position, as in (11):

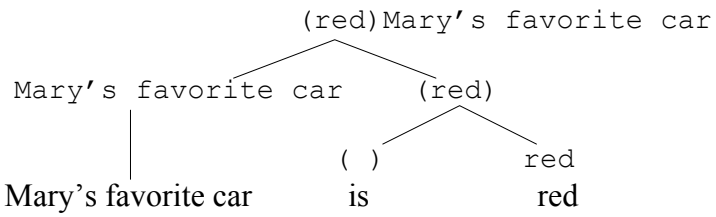
(11) ( ) + x □ (x)

The rule in (11) reads as *combining the content* x *with the content of* be *gives the result* : (x). This result means: an entity is described as having *x,* and *x* is thus one of its property.

Rules (10) and (11) combine complements to the verb. To have a complete sentence, a subject needs to be added. I assume that subjects have a fixed relation with verbs, a relation of identification. In other words, the subject always names something (essentially the entity that is talked about). Thus, the relation between a verb and a subject looks like the result of the representation in (10).

With these assumptions, it becomes possible to construct two representations that distinguish the interpretations of the sentences in (7). The predicative reading of (7a) arises from having the complement *red* combined with *is* by the rule of description in (11), followed by the addition of the subject to identify the result. Leaving aside the internal composition of the subject, the semantic representation of the sentence is constructed as in (12):

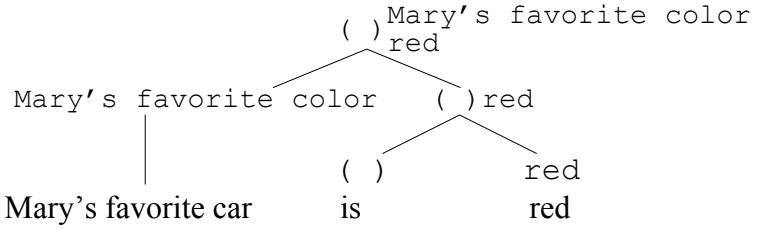
(12)



Each branching node of the syntactic tree is a semantic representation, composed of the meaning of the parts placed to express a semantic distinction. The final result—the most dominating node—is the semantic representation of the sentence. This representation is interpreted as *the entity identified as* Mary's favorite car *has the property* red.

The identity reading of (7b) results from combining *red* with the rule of identification in (10). Given that the subject also identifies the position associated with *be*, the result is (13).

(13)



The result expresses that *the entity that is identified as* Mary's favorite color *is identified as* red. The entity that is talked about turns out to relate have the name *red*, an identity reading.

In this analysis, *red* is essentially treated as a lexical constant—it can denote the same notion in the two readings—and it undergoes no formal changes between the two readings. What is different is where it appears in the representation given the rule that combines it with the verb, and thus what is its interpretation in the sentence. The formal source of the distinction between the predicative and identity readings in copular constructions is not in the terms, but in the syntax.

This implies that theoretically, a sentence of the form *x is y* could be ambiguous between the two readings even if none of its parts was ambiguous. This is precisely what happens with ambiguous pseudocleft.

3.3 Ambiguous pseudocleft

Pseudocleft sentences have many peculiar properties, perhaps most notably the phenomenon known as syntactic connectedness (see, Higgins, 1973). Another puzzling property of these sentences is the fact that they can be ambiguous. For example, the sentence in (14) can have either a predicative reading, meaning that something about John (for example, his profession) is unusual, or a specificational reading, which implies that it is John himself that is unusual:

(14) What John is is unusual.

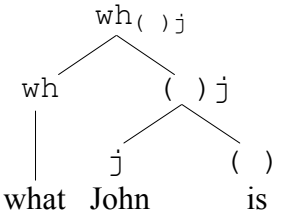
These readings have been related to the predication/identity distinction of copular constructions, the specificational reading being treated as a case of identity between the free relative *what John is* and *unusual* (see Higgins, 1973 for the original suggestion, and more recently Heycock and Kroch, 1999, who provide for strong arguments for this analysis).

Analyses based on the hypothesis that *be* is a copula that relates an argument and a predicate (e.g., as in (1)) require formal adjustments to account for the two readings. Assuming that *unusual* is a predicate, and that the free relative clause has the type required to be its argument, this description of *be* only applies to the predicational reading; it is not sufficient to account for the specificational reading without further adjustment. One hypothesis is that this reading is an instance of identity *be*, a distinct verb whose function is to equate two arguments (e.g., $\lambda y \lambda x[x=y]$) (see, for example, Higgins, 1973, Zaring, 1996—for Welsh—and Heycock and Kroch, 1999). However, this hypothesis alone is not sufficient. It also requires that the type of one of the two terms be changed in order to equate them. Another hypothesis is that *be*'s function is always to relate an argument and a predicate ((e.g., as in (1)), and that the specification reading is a case of reversed predication (the predicate being the *wh*-clause, and its argument the adjective *unusual*) (see, in particular, Partee, 1986 and Williams, 1990). But for this analysis to work, the type of the two terms that appear with *be* in the predicative reading need to be changed by type-shifting rule (Partee, 1986). These accounts of the ambiguity of (14) thus requires quite a bit of formal adjustment to arrive at the two readings.

Under analysis proposed here, this ambiguity is a function of syntax. The different readings of the pseudocleft depend on whether the complement *unusual* is combined with the main verb by the rule of description or the rule of identification. Once this result is combined with the free relative subject, then the two readings follow directly without resorting to any ambiguity of term or type-shifting rules.

To make this clear, I must first discuss certain assumptions about the free relative clause. Traditionally, *wh*-words are operators whose function is to relate information from the context (e.g. an answer to a question, an antecedent NP) to a grammatical function—a source—inside a clause. I will formally express the relation between the clause and the *wh*-word as a relation of identification, as expressed by the rule in (10). A clause combined with a *wh*-word by the rule of identification defines the domain in which the *wh*-word must look for a function. The free relative clause *what John is* is constructed as in (15), where *John is* is combined with *what* by the rule of identification:

(15)

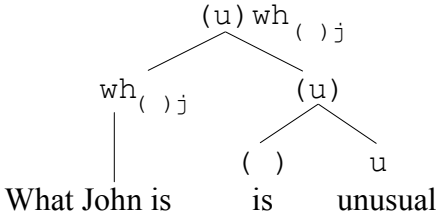


To account for the two readings of the pseudocleft, the source of the *wh*-word in the relative clause needs to be identified with the grammatical function associated with the rule of

description (i.e. inside the position in the relative). The relation the *wh*-construction establishes with the main verb in the pseudocleft can then be related to this source.

The *wh*-construction being a subject, it is an argument combined by the rule of identification. This double status—predicate at the level of the relative, and subject at the level of the main clause—is the reason for the ambiguity of the pseudocleft. Thus, when *unusual* is combined by the rule of description, as in (16), the sentence has the predicative reading:

(16)

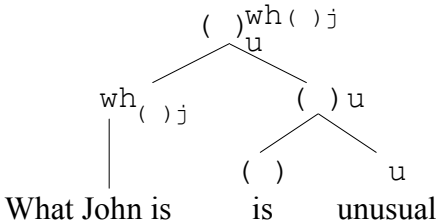


Unusual is combined with *be* by the rule of description, and the *wh*-clause then identifies the results. The entity located in the discourse is the *wh*-construction, and it is described as having the property unusual. This is a normal relation of predication, its particularity residing in the fact that the source of the *wh*-word in the relative clause is also a predicate with respect to *John*. A way to express this formally is to suppose that at the level of discourse interpretation, the relation established in the main clause is copied into the position in the relative, as in (17):

(17) (u) wh( )j becomes ((u) wh) j

The final representation reads: the entity identified by *John* is described by *wh*, which is itself described as *unusual*. In other word, something about John is *unusual*. Because the *wh*-word has a relation of description with respect to *John* in the free relative clause, it becomes possible to identify the *wh*-clause with *unusual* as in (18). This implies that it is a property of John himself that is identified by the sentence, the specificational reading:

(18)



(19) ( ) wh(?)j becomes (( ) wh) J
u u

After copying the relation of the main clause into the position of the relative clause in (19), the final representation reads: the entity identified by *John* is described has having a property *wh* that is identified as *unusual*. John is therefore unusual[1].

The ambiguity of sentence (14) is accounted for by applying the two rules that were proposed in section 3.2 to describe the predication and identity readings of copular constructions. No lexical homonymy or changes to the semantic value of the different terms are required because the ambiguity is a function of syntax, and is available independently of the content of the terms that are part of the expressions. The next section elaborates on the consequence of this result.

[1] This analysis fits very well with Heycock & Kroch's (1999) conclusion that connectedness effects of pseudocleft follow from their nature as equatives, and that the processes that are relevant to their account apply at the level discourse interpretation.

1.4 Grammatical meaning and world knowledge

Following the guideline in (5) has lead to an approach to semantics in which an essential part of the meaning of expressions is not driven by the content of terms, but by how the terms are combined in syntax. With this approach, it becomes possible to account for the predicative and identity readings of copular construction with unified descriptions of the terms they are made of: the content of *be* and of the other elements need not be altered to provide an account of the two readings.

In fact, the analysis implies that the content of all terms is not equally relevant to the construction of meaning. Consider first the functional content *be*. This content is clearly essential in the construction of meaning: it provides a formal supports upon which different states of affairs are constructed. The specifics of these states of affairs, however, does not affect the content of *be.* This content remains identical in the two readings discussed, namely to introduce an entity that can be talked about.

On the other hand, the content (or denotation) of *red* and *unusual* appears to be irrelevant in the analysis: the formal distinction between the predicative and identity readings of *be* does not lie in the content attributed to these elements. For example, what expresses the distinction between the predicative readings (in (12) and (16)) and the identity readings (in (13) and (18)) has nothing to do with the actual content of *red* and *unusual*: the terms can be understood has having exactly the same contribution in the two readings. The difference stems from how they are combined to *be*.

At the propositional level, then, the denotation of these terms has no bearing on the account of the formal properties of the two readings. The formal aspects of the distinction are strictly expressed by the relation between the content of *be* and the meaningless indexes in (20):

(20) a. Predication $(y)x$ b. Identity $(\ )^{x}_{y}$

At first, this conclusion might seem to contradict the observation that in the sentences in (6), repeated here in (21), the denotation of the terms *car*, *color* and *red* is clearly instrumental in the fact that (21a) has a predicative reading, and (21b) an identity reading, as opposed to the other way around.

(21) a. Mary's favorite car is red.
b. Mary's favorite color is red.

However, the fact that the relation between the denotation of *car*, *color* and *red* correlates with the readings does not necessarily mean that the distinction itself is a function of denotation. There is another way to interpret the role of the denotation of *car*, *color* and *red* in the analysis of (21).

Suppose that substantive denotation belongs to a domain that lies outside of grammatical analysis, the domain of world (or conceptual) knowledge. Suppose that as far as semantic analysis is concerned, the role of denotation is one of "arbitration": denotation has no relevance in the construction of meaning, but only assesses whether the semantic representations constructed at the propositional level can find a possible correspondent in the world (i.e., whether they can have a truth value). The semantics of the proposition would be the domain defined by functional content (the meaning of verbs, determiners, etc.) in conjunction with the meaning distinctions provided by syntax. Within this domain, abstract states of affairs (e.g., predication and identity) can be constructed independently of the denotation associated with substantive elements. When a substantive term is combined with functional content in syntax, its denotation is in a sense "located in" a state of affairs. Whether a given state of affairs is "possible" or not will depend on the nature of the relation the denotation of the substantive elements in the clause have in the world. It is thus the

relation that the denotation of *red* has with the denotation of *color* and of *car* in this outside world that assesses that (21a) has a predicative reading and (21b) has an identity reading.

This analysis might seem to be redundant. If there is already a "world" in which the relevant relations are defined, and this world is required to assess whether the semantic representations constructed in the grammar are possible or not, why not directly use the distinctions from this world to describe the terms in the language? The answer relies on the methodological assumption in (5) that the ideal description of terms avoids contingent properties. If this methodological point of view is taken seriously, using distinctions drawn in this "world" to describe the terms is not possible. As was shown in section 3, the distinctions are contingent once inserted in certain grammatical contexts. The wide-spread use of type-shifting principles to adjust NP interpretation (see Partee 1987 for example) is testimony to the contingency of these notions.

Methodological considerations aside, there is a readily imaginable functional justification for this separation of world knowledge and grammatical knowledge, namely that it makes the grammatical system a perfect system with which to talk about or reflect on the world. Grammar creates representations that mimic the type of situations that exists in the world (or perhaps, representations that mimic how we conceptualize these relations). Having the possibility to "package" these representations into a speech stream can certainly be seen as a rather useful cognitive faculty.

To come back to the role of denotation, what this means is that the fact that *red* denotes a property in the world cannot be taken as evidence that it is a predicate at the linguistic level[2]. Describing substantive terms in this way amounts to using information that belongs to the outside world to describe objects that belong to the grammar. If the approach taken here is correct, it implies that formally, all substantive elements in the grammar can be treated as constants: each uniquely denotes a piece of knowledge which lies outside of grammatical knowledge. In theory, this constant can always be combined as a descriptor or an identifier. In practice, the denotation of a term constrains what states of affairs the construction can refer to, so that few terms can be effectively combined by the two rules in a given context.

Let me stress that the main point is not that the notions used to describe the denotational universe—for example, individual constants, predicate, sets, etc.—are totally irrelevant to semantic analysis. The point is that these notions do not belong to the level of linguistics semantics (as is argued in Bouchard, 1995 for example). Their relevance lies outside of linguistics proper, and they only become a factor for the analysis at a higher level of interpretation than the proposition (the level of discourse interpretation seems like a good candidate for this). In fact, the approach proposed here strongly suggests that the study of Grammar should provide a means to understand how human cognition organizes knowledge. If truth value is indeed an indicator of the validity of relations that belong to world knowledge, then semantic representations build in syntax could be taken as reflecting how human cognition organizes information about world knowledge.

In the next section, I return to the discussion on the meaning of *be*, and discuss how the analysis that the verb only introduces an entity in the discourse provides an explanation for the fact that its locative use requires a prepositional phrase. This analysis provides further support for the idea that the denotation of substantive terms should be treated as part of a domain that lies outside of linguistic semantics.

[2] A separation between "structural" semantics and a notion of meaning that belongs outside of it (call it lexical semantics) is generally taken for granted in formal semantics (see Partee, 1987 for a discussion). Under the view presented here, however, the practice of attributing type value to terms ends up not respecting this separation.

4 *Be* elsewhere

So far, the hypothesis that *be* introduces an entity in the discourse, in conjunction with the idea that syntax has a role in defining semantic notions, has provided a means to distingue the predicative and identity readings of copular constructions with unified descriptions. In this section, I want to discuss a few other uses of the verb, the existence use of *be* in 4.1 and its locative use in 4.2 This latter case illustrates how the distinction between grammar and world knowledge can be used to explain facts that might otherwise be considered arbitrary.

4.1 *Be* alone

The content assigned to *be* in the present analysis is in principle compatible for the examples in (4), repeated here in (24), where verb appears without a complement.

(22) a. To be or not to be.
b. I think, therefore I am.
c. Time does not seem to pass here: it just is. (from the *Fellowship of the Ring*)
d. Time is, time was, time passed. (From *The Manticore*)

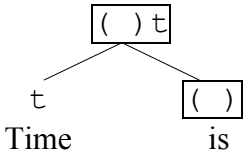
In this use, the sentence simply locates a subject in the discourse. However, given the description proposed for *be*, which makes no reference to an existential operator, why should this means existence?

It seems to me that this can just be an inference that follows from the fact that the argument of *be* is also a subject. A subject is the entity that is talked about, which presupposes its existence. Given that the verbs adds noting else about the entity it introduces, then the existence reading could simply arise as a result of the presupposition that the entity is already part of the discourse. If this approach is correct, a complete answer to the existential flavor of this reading would require a study that looks at the interaction of relevance theory, discourse analysis, and syntactic analysis, a topic that goes beyond the topic of the paper.

Let me provide a formal derivation of this use in order to make the relation between the verb and Tense marker explicit. Simplifying somewhat, let me assume that locating a state of affairs with respect to Tense is achieved by having a position relate to a temporal deictic marker. In doing so, any other element that relates to this position in the clause is also relating to this temporal information (see Bouchard, 1995 for a more articulate view of this idea, which is originally sketched in Lamarche, 1989). Depending on the Tense, the relation between the position and the marker is altered, being put in a difference sequence. In the present Tense, for example, the position would be directly aligned with the temporal marker. Assuming that this marker is represented as a box, the result can be expressed as in (23).

(23) 

The important point for now is the assumption that the position that relates to the Tense marker is reserved for a specific element in the sentence, namely the subject. This means that the semantic representation of the expression *time is* in (22d) is constructed as in (22):

(24) 

This identify the entity *time*, which is located with respect to the moment of speech. Evidently, this way of using *be* is highly limited. Given the reason why we talk–typically, to transmit information–sentences that only locates an entity in the discourse have very limited uses. Speakers generally do not spend much time talking about an entity for what it is, unless they are philosophers or writers. Because of this lack of informational content, *be* will tend to

appear with a complement. In fact, in conjunction with a complement the content of *be* become highly useful: it provides a means to highlight a multitude of states of affairs pertaining to a single entity.

It should be clear by now that the restrictions on the complement that *be* selects cannot be defined at the lexical level. Many of these restrictions—essentially those related to the truth value of an expression given the nature of the denotation of substantive elements—reflect the process of arbitration discussed in section 3.4. As such, they are not a problem for linguistic analysis per see. There are aspects of the selection of complement, however, that do depend on the grammatical system, namely those that lead to the construction of states of affairs by the functional content of verbs and the rules of syntax. The next section presents one specific example of how to address this issue.

4.2 The locative use

To construct a locative sentence with *be* generally requires the presence of a prepositional phrase. Consider the examples in (25):

(25) a. Jean Drapeau was Montreal.
b. Smith *is* (the planet) Mars. (from *Stranger in a Strange Land*, Robert Heinlein)

In the two cases the NP complement denotes a spatial entity, a object that can typically be construed as a location for another object. Despite of this, neither sentences in (25) can have a locative reading. The only possible readings for these all fall into cases of identity (with a personification of the entity denoted by the NP complement). For example, anyone who knows that Jean Drapeau was the Mayor of Montreal from many years, and that he had megalomaniac tendencies, can certainly interpret (25a) in a sarcastic way, meaning that he was (or he thought he was) the essence of what Montreal became. In the context of the science fiction novel where (25b) is taken from, the sentence conveys the idea that the subject is the legal representative of the planet Mars, its sole possessor and governing body. One could also imagine another type of identity reading for these sentences: for example, one could image that the subject in (25) is an actor in a play that portrays the solar system.

But no matter how the identity reading is construed, the fact is that neither sentences can have a locative reading unless the NP is introduced by a preposition, as in (26):

(26) a. Jean Drapeau was <u>in</u> Montreal.
b. Smith <u>on</u> Mars.

Why should this be the case? Why is it impossible to interpret the sentences in (25) with a locative reading? If the denotation of substantive elements had a relevance in grammar, one might expect that these sentences could have a locative reading.

Under the assumption that *be* only identifies one grammatical entity, however, this fact has a natural explanation. In the real world, locative relations imply the presence of two distinct entities (a place, and an element located in that place). Assuming that to have a sentence referring to a locative situation, the state of affairs constructed in the grammar should also identify two entities, the problem in the sentences in (25) lies in that *be* does not provide sufficient content to construct a locative relation. The verb *be* only introduces one entity, and there is therefore not enough argument positions in *be* in the sentence to construct a state of affairs that could correspond to a locative situation. An element that introduces a second entity needs to appear in the sentence if the situation is to have a locative reading.

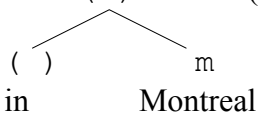
This is why there is a preposition in the locative use: it appears is to introduce a second entity. Formally, prepositions are minimally composed of an argument position. For the present, I will not attempt to distinguish different prepositions, nor venture into the question of where

those distinctions should be drawn formally (in the substantive domain, in the functional domain, or by a combination of notions from both domain). I will simply represent them as a position, as in (27):

(27) *in*: ( )

This position can be identified as the entity *x* when *x* is combined to it by the rule of identification. For example, the PP *in Montreal* would have the representation in (28)

(28) ( )m (= the entity identified as *Montreal*)



Adding the specific meaning of *in* to the representation would imply that it is the inside of the entity Montreal that is identified by (28).

To construct a locative relation, this result needs to be combined with the verb. At this point, a question arises: which rule is used to combined the two objects? Let me speculate that Locative construction is a case of identification: a located entity is an entity that is identified by the relation it establishes with another entity. The implication of this assumption is that the output of a rule of syntax can have different conceptual value depending on the content of the elements combined. In other words, a given rule—say the one I called identification—will give different results depending on what it combines. When this rule combines a substantive element and a functional element, it simply provides a name for the functional element. But if the same rule combines two elements headed by functional content, then the result is different, for example, a relation of localization. This means that what was called identification previously is the name of a specific application of a more general rule.

To achieve this, the rules of identification and description need to be defined under parameters of a more abstract nature. Let me assume that identification and description are a function of distinct temporal alignments between two nodes. More specifically, let me assume that when two nodes are combined together, their content can either overlap completely—what I will call *coextension*—or the content of one occupies a subpart of the content of the other—what I will call *inclusion*.

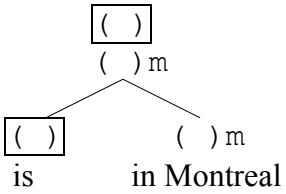
The rule of identification can be interpreted as a case of coextension. The content of the element combined by coextension to an argument position is understood as being in coincidence with the whole position. In other words, the representation ( )x can now be understood as meaning that the content of *x* occupies the whole portion defined by the position. For example, if *x* is a proper noun, the individual that *x* denotes is understood as occupying the position in the state of affairs. The name of the individual in the world is in a sense the name of the entity located in the discourse.

The rule of description is a case of inclusion. Thus, when *x* is included into a position, as in (x), it occupies a subpart of the position. Once this result is combined by coextension to an element *y*, then the denotation of *x* is understood as a subpart of the denotation of *y*. This result is the relation of a property to an entity.

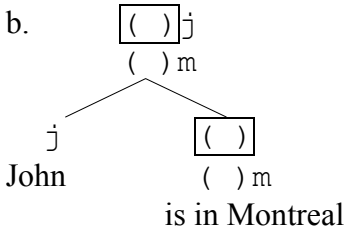
Returning to the construction of the locative state of affairs, the hypothesis assumed above is that locative relation result from the application of the same rule that is used for identification, that is coextension. This means that the complement is combined coextensively to the content of the verb. When the verb and the PP are combined, it is not the substantive content that is relevant to the combination (each functional element will be identified independently by a substantive element), but their functional content. In other word, it is the argument positions of the verb and the preposition who end up being temporally aligned.

To express this, I assume that coextensive combination of argument positions results in a stacking of the two objects at the same point in time, as in (29a), where *in Montreal* is combined with *is* by coextension.

(29) a.



b.



Once the subject—that relates to the position associated with Tense—is added to the result, we get the representation in (29b). This representation expresses that the entity talked about, *John*, coincides with the entity *Montreal* at a point in time. Stacking the two entities expresses that they are only temporally coextensive, but remain distinct from one another in the representation.

This analysis does not pretend to be more than a sketch of how the construction of meaning can be achieved under the type of approach proposed her. The significant aspect of the discussion is how it motivates the presence of a PP in the syntax. It is not clear how, under a system based on semantic type, the selection of a PP can be accounted for without resorting to some sort of subcategorization feature that associates the locative reading to a prepositional feature. Subcategorization is a contingent property, and also an arbitrary mechanism: it offers no hope of explanation. Under the view proposed here, the presence of the preposition follows from the architecture of the analysis: the preposition must appear to allow the construction of a state of affair composed of two entities, *be* providing insufficient content to support such a state of affairs by itself.

5 Conclusion

In this paper, I have shown that the hypothesis that *be* is not a copula, but is the linguistic support to introduce an entity in the discourse, allows a unified analysis of a series of uses of the verb. The motivation behind these analysis is the guideline (5), which require to attribute to the verb a description that is not contingent. A non contingent notion is one that applies to all the uses of the verbs, or at least, to all the used that are analyzed.

Respecting this guidelines turns out to have important consequences for many aspects of the semantics of natural language. First, it changes how the relation between the semantic of the whole and the semantics of the parts is seen. Many meaning distinctions which are traditionally associated with terms turn out to be contingent, leading to an approach where those distinctions are a function of the rules of syntax. This hypothesis allows an account for the difference between the predicative and identity reading of copular constructions under which no reference to the content of the substantive elements in the analysis is necessary. This further implies that the distinctions that characterize the denotation of substantive elements belong to a domain that lies outside of the level of grammatical analysis. The distinctions associated with substantive elements have a very different role the analysis: whereas under traditional approach these distinctions are descriptors of terms, they emerged as arbitrator of the semantic representations constructed in grammar under the approach proposed here.

It should be pointed out that the significance of this paper is in the conception that underlies the analyses, rather that in the specific details of the analyses themselves. This conception emerges as a response to the constrains that are imposed by the methodological assumption that description should respect the guideline in (5). Attempting to follow (5) necessarily

forces the revision of how the sound-meaning relation is understood in grammar, a result that I believe is an interesting one in itself. But perhaps more significant is that this methodological assumption has its roots in the fundamental axioms of linguistic theory. The rational behind (5) is that languages must distinguish between a terminal level and a constructional level. The guideline in (5) is an attempt at providing linguistic description that meet observational adequacy given the existence of these two levels of representation in grammar.

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