CHAPTER 4

An event-extension analysis of MECs

In the preceding chapter, I tried to prove that the MEC is a self-standing constructional entity which is irreducible to any of the three constructions under discussion—the free relative, the embedded wh-question, and the headed relative. If the specific attributes that uniquely define these three construction types are removed, one arrives at a structural description that is traditionally referred to as the A-bar construction, i.e. a syntactic tree containing an operator-variable dependency. Obviously, it is not explanatory to analyze the MEC simply as an A-bar construction (of the wh-type), which is by the way precisely the kind of analysis that has recently been devised by a number of scholars (even if under different labels; see the remarks in §3.3.4). Proponents of such a “minimal” analysis have two basic options: either they remain agnostic with respect to any MEC-specific properties and hence massively overgenerate (as in Caponigro 2003, at least to a certain extent) or they heavily rely on stipulations (as in Grosu 2004 who postulates an MEC-specific C-head). It seems self-evident that a proper analysis of MECs will involve something in addition to the structural description of the A-bar construction. But what is this “something”? And where is it located?

In this chapter I put forth a novel hypothesis that addresses precisely these questions. In direct analogy with MECs’ “sister constructions” (the “candidate constructions” of the preceding chapter), I will assume that the MEC-specific expression is placed on the top of the MEC. As opposed to MECs’ sister constructions, however, I will propose that this element is not purely functional, i.e. a functional head with no non-logical content, but rather a lexical one. In particular, it is a verbal predicate with its own descriptive content (though quite an impoverished one) as well as its own argument structure. The structural
description of MECs is therefore of the following format

\[(1)\]

\[
\begin{array}{c}
\text{BeP} \\
\text{BE} \\
\text{WH} \\
\text{CP} \\
\ldots \text{t}_1 \ldots \\
\ldots \text{t}_2 \ldots \\
\text{TP} \\
\end{array}
\]

The verb BE maps to a predicate predicating existence of individuals. This is somewhat in the spirit of Barwise and Cooper (1981) and McNally (1998), who also make use of a lexical existence predicate rather than just a functional existential quantifier (see e.g. Milsark 1974 for the general case and Kondrashova and Šimík to appear for MECs). The predicate will be argued to take the MEC as its “event extension argument”, for which reason I call the analysis the event-extension analysis. The “participant argument” slot (SpecBeP), normally filled by the object whose existence is predicated will be removed from the structure and the variable that corresponds to it will be existentially closed by the predicate. The way this MEC-selecting BE functions, both syntactically and semantically, is well detectable on the English predicate available around which the informal discussion will revolve. I will argue that the predicate BE can be held responsible for the core MEC properties, including their distribution, modality and mood, and narrow scope existential quantification.

This chapter is organized as follows. In §4.1 I devote some space to the characterization of two crucial but very special properties of MECs—their limited distribution and their modality. I will investigate the state of the art in approaching these issues and will conclude that none of the existing analyses provides a satisfactory account. In §4.2 I take the first steps towards an analysis by investigating the properties of the predicate available. We will see that in its fully spelled-out argument structure, it relates two individuals by a possessive-like relation and states that it is possible that some event takes place in which one or both of these individuals are involved. This possible event is expressed by what I will call the possibility clause, which is an infinitival clause with an operator-variable dependency. In this section, I also spell out my background assumptions concerning the theory of argument structure and event composition. In §4.3 I look more into the properties of the class of predicates that are capable of selecting MECs, so called MEC-embedding predicates. It turns out that there is a significant overlap of this class and the class of predicates that can embed purpose clauses (Faraci 1974; Jones 1991). I will argue that both classes of predicates are uniquely characterized by involving the same stative predicate that is also found in the predicate available. This predicate predicates the existence of some object/individual and at the same time introduces modal quantification over the possibility clause. It will be schematically referred to as

\footnote{The universality of MECs’ CP-hood is compromised in Chapter 5}
BE\textsubscript{E} (the predicate BE with an event-extension component). Finally, in §4.4 I investigate how MEC-embedding predicates compose with MECs. It will be shown that a modification in the argument structure of BE\textsubscript{E} is needed. In particular, the MEC-selecting predicate undergoes a process akin to antipassivization. The consequence of this is the apparent “headlessness” of MECs, as opposed to purpose clauses. In §4.5 I conclude the chapter.

4.1 Open issues: distribution and modality

There are two major issues that are central to the syntax and semantics of MECs but for which no explanatory account is available: distribution and modality. Thanks to the work of Alexander Grosu (2004), the problem of distribution has at least received a proper description. Concerning the problem of modality, there has been no doubt about MECs always exhibiting existential (as opposed to universal) modality. With the exception of Pancheva-Izvorski (2000), there has never been a serious attempt at explaining why the modal force can only be existential. Concerning the modal flavor, it still awaits a proper description.

4.1.1 Distribution

The first serious attempt to constrain the distribution of MECs is in Pesetsky (1982), who argues that MECs are limited to object positions which are under normal circumstances assigned a structural case, typically accusative. Indeed, it appears to be a necessary condition for an MEC to appear in such a position, however, it is by far not a sufficient condition. The issue of precise distribution was then ignored for more than twenty years, typically being glossed over with a few unrevealing comments about the existential nature of the selecting predicates. It was Alexander Grosu (2004) who provided the first more systematic description of the class of predicates that can select MECs.

By and large, MECs occur as arguments of verbs/predicates whose semantics includes an existential component, and which fall into two major classes; (i) assertion of existence (usually expressed by verbs of the ‘be’ or ‘have’ type), and (ii) coming into being, view, or availability, or causation of one of these (for example, ‘arrive’, ‘be born’, ‘choose’, ‘look for’, ‘find’, ‘send’, ‘obtain’, and ‘wangle’). Some languages disallow MECs entirely, while others permit them only with predicates of type (i). There are also more “permissive” languages, which allow MECs with predicates of type (i) and with some predicates of type (ii), but none, to my knowledge, that freely allow MECs with all of Szabolcsi’s (1986) predicates. In relation to the more permissive languages just referred to, Szabolcsi’s predicates are partly ordered by a scale of accessibility (that marks type
4.1. Open issues: distribution and modality

(i) predicates as most accessible), with individual languages selecting different cut-off points on this scale. (Grosu 2004:406)

Grosu’s claim is that the class of predicates that can select MECs is a (possibly proper) subset of predicates that Szabolcsi (1986) identifies (for Hungarian) as imposing an indefiniteness requirement on their internal argument and which she therefore calls *definiteness effect predicates*. According to Szabolcsi, these verbs fall into 4 categories: (i) verbs that simply assert existence, (ii) verbs that express *becoming available in a particular fashion*, (iii) *causing to become available in a particular fashion*, and (iv) *causing to become existent in a particular fashion*. The first Szabolcsi’s class corresponds to Grosu’s class (i) and Szabolcsi’s classes (ii)-(iv) correspond to Grosu’s class (ii). The terms that I will use to refer to these categories of predicates are *stative* and *dynamic* MEC-embedders (or simply predicates), respectively. Grosu’s classification strongly implies that the factor determining the upper bound on MEC-selecting predicates has to do with definiteness effects and hence with the indefinite nature of the MEC. This would in turn support the view that MEC-selecting predicates contain an existential component and MECs are non-quantification al expressions (properties) that are greedy for being existentially quantified over. As I will show in §6.1.2, this is indeed a view of the semantics of MECs that has occasionally been adopted (though not by Grosu 2004 himself). Although I will assume that the existential force comes from the embedding predicate, I will not consider it the primary factor in determining the right distribution. Rather, it will fall out as an epiphenomenon of an argument reduction process (see §4.3).

Grosu’s classification in terms of Szabolcsi’s definiteness effect predicates is a clear step forward. It gains even more credibility from my personal cross-linguistic survey presented in Chapter 2 which gives us confidence to claim that with Grosu’s insight, we have achieved descriptive adequacy. However, descriptive adequacy should never be mistaken for explanatory adequacy. First of all, it is still unclear *why* MECs are distributed as they are. The existing accounts, however they capture the observed existential quantification (see §6.1), boil down to mere technical redescriptions of the fact. Moreover, it seems to me that existential quantification cannot be the only determinant of the distribution. If it were, one would expect MECs to have the distribution of weak indefinite DPs (just like FRs have the distribution of definite DPs). Not only can weak indefinites be distributed in external argument positions, they can even be licensed as argument of non-existential predicates, just as long as they are in the right position to be quantified over by the existential closure (Heim 1982; Diesing 1992). Why is the existential closure not enough for licensing MECs?
4.1.2 Modality

Modality is probably the most understudied and puzzling aspect of MECs. Many scholars have had the intuition that MECs express more than just a plain assertion of possibility. In particular, the possibility is closely related to the assertion of the existence of an individual (or a place/time/etc. for that matter). Consider some of the intuitions provided in the literature:

... with the sentence [Jest co jist? lit. ‘Is there what to eat?’] I am asking whether, by [the existence/presence/availability of] some food, the first condition for eating is satisfied at all [...]. (Zubaty 1922:66)

The function of affirmative infinitive existential sentences [i.e. MECs] [...] is to assert that the necessary conditions exist for the realization of the action denoted by the infinitive [...]. (Babby 2000:2)

This is the type of modality in I can (always) talk to John—not in view of a permission or of a physical ability to talk on my part (as deontic and dynamic possibility would have it), but because John is physically present (at relevant times/locations) and there is no prohibition on, or impossibility of, my talking to him. There is a further element in this modal meaning, brought out quite successfully by a paraphrase such as I can (always) talk to John if I feel like it. Thus, to characterize the meaning, in terms of quantification over possible worlds: in some of the worlds in which I wish to talk to John, I do so. More formally, we are dealing with a possibility modal with a circumstantial accessibility relation. (Pancheva-Izvorski 2000:27/28)

The NE∼ items in Russian [i.e. the conflation of negation and wh-words in Russian MECs; see the discussion in §2.2.2 and §5.2.1] infinitival existential constructions [i.e. MECs] point at the impossibility of performing the action expressed by an agentive infinitive, due to the absence or non-existence or unavailability of (the referent of) a grammatical relation that is originally associated with (i.e. selected or required by) this infinitive. For instance, in [Detjim negde igrat’ ‘There is no place where the children can play’] the children cannot play due to the lack of space, while in [Nam ne za čto ego blagodarit’ ‘There is no reason why we could thank him’] we cannot thank him because there is no reason for doing that. (Avgustinova 2003:461)

Arguably, the availability reading associated with IFRs [irrealis

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2The Czech original is “[...] větou [jest co jist?] se ptám, je-li nějakými zásobami vůbec dáná první podmínka jídla [...].”
free relatives, i.e. MECs] could be attributed to the interpretation of IFRs. In particular, it could be claimed that IFRs do not have a modal reading either [as Greek “future wh-clauses”, the topic of Agouraki’s paper], and that what *prima facie* appears to be a modal reading is in fact the intensional indefinite reading of IFRs. [Agouraki 2005:306]

It is noticeable how often the word “availability” pops up in the intuitive descriptions of the modality. Arguably, this reflects the tight connection between the possibility to “perform an action” and the existence of an object/individual, both of which seem to be integrated in the meaning of the predicate available. Another aspect that often comes up is the conditional or causal relation between these two, so that the existence of an object/individual is a condition or a cause for the possibility to be realized.

Despite the rough intuitive consensus about the MEC modality, none of the existing analyses actually reflects the intuition about the tight relation between the individual existence and the possibility. Most analyses (e.g., Caponegro 2003; Grosu 2004) treat the MEC modality essentially on a par with the modality in ordinary (headed) infinitival relative clauses, so that (2a) is expected to be semantically equivalent to (2b):

(2) a. Czech
Mám mu co říct.
‘There is something that I can tell him.’

b. I have something to tell him.

However, this approach clearly overgenerates, not only with respect to the force of the modality, which is exclusively existential in MECs but ambiguous in relatives (see Bhatt 2006), but also with respect to its flavor. Besides the plain circumstantial possibility modality typical of MECs, infinitival relatives can express bouletic (referring to e.g. desires), deontic (referring to laws or rules) (3a) or ability (3c) modality:

(3) a. I came because I have something to tell you.
‘I came because there is something I want/wish/have to tell you.’

b. There’s nothing to do against this virus.
‘There’s nothing we {can/are able to} do against this virus.’

MECs are completely ungrammatical under these readings.

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3Alexander Grosu (p.c.) informs me that translations of these MECs are grammatical and interpretable in Romanian. However, they only have the readings predicted by the present account, i.e. ‘I came because there is something that I can tell you’ and ‘There is nothing that we can (in view of the (non-)existence of something, not in view of our ability) do against the virus.’ I should note that this is also true of the Czech example in (4a) but not really of (4b) which seems unacceptable on any reading. I do not know the source of the contrast between Czech and Romanian in this respect.
The approach taken by Pancheva-Izvorski (2000) seems more promising, as she tries to tie the existential quantification over the individual variable introduced by wh-words to the existential flavor of the modality. Unfortunately, the semantic account she offers is entirely informal. Moreover, it is unclear why tying together the two existential forces (also present in Šimůk 2009a) should be instrumental in constraining the modal flavor.

Despite the numerous intuitive descriptions, it is necessary to conclude that no scholar has managed to provide any analytical insight into how modality in MECs should be handled.

4.1.3 Summary
The aim of this subsection was to point out two issues that are crucial for a theory of MECs but that have so far resisted explanation and to some extent even proper description: distribution and modality. In the rest of this chapter I will argue that the key to understanding these two problems is a formalized notion of availability.

4.2 Introducing availability
The last section left us with two big puzzles. In this section, I take the first steps towards a unified solution. The basic idea is that both MEC-selecting predicates and the MEC modality are associated with a common semantic component, namely availability. Availability will be characterized as the possibility for an event to take place as a result of the existence, presence, or possession of some individual/object.

This section lays the foundations of the account by spelling out the notion of availability and the way availability is associated with MEC-selecting predicates. In §4.2.1 I discuss some relevant properties of the English predicate available, especially its argument structure, the role of its arguments, and their mutual relations. In §4.2.2 I set up the stage for a formal account of availability. I discuss my background assumptions concerning the theory of argument structure and event composition and then I provide a background analysis of existence and possession. In §4.2.3 I spell out an explicit formal semantics of the predicate available. I argue that with all its arguments saturated, it conveys a conjunction of two propositions, one expressing a have-like relation and
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Another expressing a modal statement. Finally, §4.2.4 concludes the present section.

4.2.1 The predicate available

The adjectival predicate available has quite a flexible realization of argument structure, as illustrated below.

(5) a. The book is available.
   b. The book is available to Dave.
   c. The book is available to read.
   d. The book is available for Dave to read.
   e. The book is available to Dave for his children to read.

In (5a) available behaves as a simple property, semantically close to existence, which is attributed to a nominal argument, the book in this case. In (5b) available is a two-place predicate, which is semantically very close to the possessive predicate have in that the two individuals which it relates are in some contextually specified relation based on spatial proximity. For instance, Dave has access to the book by virtue of the book being in a library of which Dave is a member. In (5c), the internal argument is an infinitival clause. It expresses an event of reading which can take place thanks to the availability of the external argument. I will call this infinitival clause the possibility clause. The sentence in (5d) is just like (5c), except that it overtly expresses the individual that can benefit from the availability of the book by reading it. Finally, the example in (5e) contains all the participants of the complex semantic structure which is made available by the predicate available.

I will be particularly interested in the argument realizations of available that make use of the possibility clause, i.e. (5c) through (5e). Notice first that the examples are superficially similar to so-called tough-constructions, illustrated below.

(6) The book is easy (for Dave) to read.

There is an important difference between tough-predicates and the availability predicate, though. While in tough-constructions the structurally prominent nominal (the book) reaches its position by raising and is therefore interpreted only as an argument of the embedded clause (Rosenbaum 1967; Hicks 2003), the comparable nominal in (5) is a real argument of the predicate available. This is reflected by the fact that the availability predicate cannot take expletive subjects.\footnote{Charlotte Koster (p.c.) informs me that (5e) is slightly pragmatically odd; however, it is by no means ungrammatical.}

\footnote{The question whether tough-constructions really are raising constructions or not is a controversial one. However, the issue is not central to the present discussion, so I am not going to defend any particular analysis here. For a recent discussion and overview of issues, see Hicks (2003).}
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(7) a. It is easy (for Dave) to read the book.
b. *It is available (for Dave) to read the book.

The inability of available to take expletive subjects is further related to the fact that it only takes infinitival complements with gaps. This in turn suggests the presence of an operator that binds this gap. The members of this operator-variable chain are necessarily coindexed with the external argument of available.

(8) The book, is available [Op1/i to read t1/i / *it].

Another question that pertains to the argument structure of available is the structural position of the prepositional arguments to Dave and for Dave in (5b) and (5d) respectively. At first sight, their semantic role in these sentences appears indistinguishable: the former appears in absence of the possibility clause, while the latter appears in its presence. However, the sentence in (5e) suggests that they are in principle independent. The to-phrase is an argument of available and the for-phrase is an argument in the possibility clause.

In summary, in the presence of the possibility clause, available is a three-place predicate. It takes the possibility clause as its internal argument, a nominal phrase as its external argument (possessum, broadly construed), and an optional additional argument in the form of the to-phrase (possessor, broadly construed). The possibility clause obligatorily contains a gap coindexed with the external argument and optionally realizes its external argument in the form of the for-phrase. In the next subsection, I provide an explicit semantics for the predicate available.

4.2.2 Argument structure, existence, and possession

The semantic formalization used here relies on a version of Neo-Davidsonian (cf. Parsons 1990) event-based system proposed by Ramchand (2008). I first characterize the system and then move on to the analysis of existence and possession. The reader should keep in mind that I do not follow Ramchand (2008) in every respect of her analysis. Any modifications of mine will be clearly stated. The material presented in this subsection is the set of background assumptions that I will use for the upcoming analysis of MEC-embedding predicates. As

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An interesting support for this view comes from Hartman’s (to appear) discussion of tough-constructions. Hartman shows that experiencers introduced by the preposition to, unlike those introduced by for, defectively intervene for the tough-raising of the embedded argument:

(i) Adapted from Hartman (to appear)
   a. It is annoying {for / to} those boys to talk to John.
   b. John is annoying {for / *to} those boys to talk to.

On the basis of this evidence, Hartman argues that to those boys is an object of the tough-predicate (rather than subject of the embedded predicate) and as such defectively intervenes (in the sense of Chomsky 2000) for the raising of John. The fact that this intervention is not triggered with for those boys suggests an embedded position in turn.
the reader can verify shortly, these assumptions are not among the most standard ones. However, I hope to show that their use is justified by the upcoming analysis of availability and MECs.

A theory of argument structure and event extension

The basic idea of Ramchand’s (2008) theory of argument structure is that predicates that express complex (possibly dynamic) events are decomposed into atomic two-place predicates, each of which expresses a relation between an individual $x$ and an event predicate $E$, stating that the individual $x$ is involved in some particular event $e$ that extends to the existence of another event $e'$ in the domain of $E$. The event extension, marked as $e' \rightarrow e''$ (for $e'$ extends into $e''$), is equal to the complex event that characterizes the semantics of the complex predicate. The extension relation underlies the (typically) causative semantics that holds between atomic events which constitute a complex event. Every atomic event has at most one participant. The argument that corresponds to this participant, i.e. the external argument of the two-place predicate, will be called the participant argument. This argument is equated with the participant role (corresponding to the traditional theta role, hence marked by $\theta$) introduced by the predicate. The internal argument, i.e. the predicate of events characterizing the event to which the event introduced by the predicate extends, will be called the (event) extension argument. The schema of the argument structure of some atomic predicate $PRED$ is given in (9).

$$
\begin{array}{c}
\text{PredP} \\
\text{participant argument} \\
\text{Pred'} \\
\text{PRED} \\
\text{extension argument} \\
\ldots
\end{array}
$$

The semantics of predicates like $PRED$ in (9) will be of the general format in (10). The predicate expresses a relation between a world $w$, a property of events $E$, an individual $x$, and a complex event $e$, such that there is an event $e'$, which is characterized by $\text{Pred}$ (the descriptive content of $PRED$) in $w$ and $x$ is the participant in that event and there is an event $e''$, characterized by the

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7The term “event” is broadly construed and subsumes both states and processes (cf. Bach [1986]), as well as atomic and composite events.

8It corresponds almost perfectly (modulo complex-state semantics; see below) to Ramchand’s “leads-to” relation. The reason why I choose to use a different label is rather superficial, namely a bigger terminological flexibility. Also, I join Ramchand in avoiding the term “causation”, which is rather overloaded in the literature on events and often refers not to a general relation between any two composed atomic events but to a particular causative predicate, whether explicit or implicit (see Dowty [1979] for the introduction of the CAUSE predicate).
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event property $E$ such that the extension of $e'$ to $e''$ is equal to the complex event $e$.

(10) $\text{PRED} \Rightarrow \lambda w, \lambda E_{(s,vt)}(x, e), \lambda e, \exists e'[\text{PRED}(w) (e') \land \theta(e') = x \land \exists e''[E(w)(e'') \land e = e' \rightarrow e'']]$

I will further assume that predicates can express coda events, i.e. events that have no extension argument (i.e. no argument corresponding to $E$ above and, consequently, no existential quantification over events). These predicates are of the following general pattern:

(11) $\text{PRED}_C \Rightarrow \lambda w, \lambda x, \lambda e, [\text{PRED}_C (w)(e) \land \theta(e) = x]$

The syntax of a complex predicate composed of two atomic predicates, one of which expresses a coda event, is given in (12).

(12) \[
\begin{array}{ccc}
\text{PredP} & \text{participant argument} & \text{PredP} \\
\text{PredC} & \text{PredC} & \text{extension argument} \\
\text{PRED} & \text{PRED} & \\
\text{participant argument} & \text{PREDC} & \\
\end{array}
\]

The fact that predicates can introduce at most one participant has some notable consequences. Firstly, there are no predicates that genuinely relate two or more individuals. Relations between individuals are mediated by the relations between the events in which the individuals take part. Secondly, there are no theta roles in the traditional sense of the word, i.e. no agents, patients, experiencers, etc. (If I use these terms in what follows, it will be purely for the sake of convenience.) The descriptive content of $\theta(e)$ (i.e. agent vs. patient, etc.), which could be read as “participant in the event $e$”, is fully predictable from the descriptive content of the predicate, simply because it is the only one.

Existence and possession

I will depart from Ramchand’s system in that I will allow for extensions $e' \rightarrow e''$ even if both $e'$ and $e''$ are states. Such extensions are equal to complex states,

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9 I am reminded by Larson (2010) that this assumption receives some empirical support from the semantics of plurality and conjunction (Schein 1993, to appear; Pietroski 2005) as well as focus (Herburger 2000).

10 Ramchand only allows for extensions from states to processes and from processes to states. A state whose extension characterizes a process is so called initiation state (init) and
i.e. states with more than one participant. An example of a complex state is possession, which involves two participants: a possessor and a possessum. Suppose that the state of possessing (something) is represented as a state of constituting some region of influence (\(\text{Reg}\)) and the possessor is represented as a participant of this state. The state of being possessed is represented simply as a state of being existent (\(\text{Exist}\)) and the possessum is a participant of this state. The extension from the former state to the latter state is convention-alized as the complex state of possession such that the region of influence of the possessor involves the state of being existent of the possessum. The terms “region of influence”, as well as “existence” should be understood very loosely. I assume that they are subject to contextual and lexical specification. For instance, having an idea refers to a “mental region”, having flu to a “bodily region”, having a friend to a “social region”, etc. Similarly, being in existence can also stand for being in “view” (as in there is a man on the backporch), in “awareness” (as in there is a problem), being “in reach”/“available”, etc. The hypothesis therefore is that these “flavors” of region and existence belong to our world knowledge and are not directly linguistically relevant—all of them share the same syntax and semantics.\(^{11}\)

The lexical entries of the two atomic predicates that constitute possession is given in (13) and (14). For the sake of simplicity, I label these predicates BE and AT, evoking the existential predicate there be and the locative preposition at, respectively. The set of events characterized by the predicate BE functions as the extension argument of the predicate AT. Since there is no extension of the event characterized by BE, this predicate expresses a coda event.

\[
\begin{align*}
\text{(13)} & \quad \text{AT} \rightarrow \lambda w \lambda x \lambda e_\cdot \lambda x_\cdot \exists e_\cdot \exists e_\cdot [\text{Reg}(w) \land \theta(e) = e \rightarrow e''] \\
\text{(14)} & \quad \text{BE} \rightarrow \lambda w \lambda x \lambda e_\cdot \exists e_\cdot [\text{Exist}(w) \land \theta(e) = x]
\end{align*}
\]

Suppose that we have a sentence like A has B. The syntactic structure of this sentence is in (15).

\[
\begin{align*}
\text{(15)} & \quad \text{AtP/} & \quad \text{BeP/}
\end{align*}
\]

The semantic computation is given in (16).

\[\text{a state characterized by an extension of a process is a result state (res).}\]

\(^{11}\)See for instance Heine (1997) and the references cited therein for all the flavors “possession” can have.
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The tree has leaves, different than the source is the idea that the existential verb there be is in fact a predicate with its own argument structure (see e.g. Barwise and Cooper 1981; McNally 1998). The other source is the idea that the existential (there) be is in fact a predicate with its own argument structure (see e.g. Barwise and Cooper 1981; McNally 1998).

12I take the existential closure to be a mechanism that steps in in the absence of any other element (such as another event predicate or an aspectual head) that would operate on the event predicate.

13I humbly admit that the presently adopted assumptions about possession are in desperate need of a thorough comparison with some standard analyses, such as the ones devised by Szabolcsi (1994) and Partee (1997). For time reasons, I cannot do more now than promise to look into this in the future.

(16) ① {$\lambda w \lambda x \lambda e.\exists \theta(w)(e) \land \theta(e) = x$} = (14) ② {$\lambda \eta$} ③ {$\lambda w \lambda e.\exists \theta(w)(e) \land \theta(e) = b$} ④ {$\lambda w \lambda x \lambda e.\exists \phi(w)(e') \land \theta(e) = x \land \exists \phi''[\exists \theta(w)(e') \land \theta(e') = \text{b} \land \text{e} = \text{e}' \to \text{e}'']$} ⑤ {$\lambda w \lambda x \lambda e.\exists \phi(w)(e') \land \theta(e) = x \land \exists \phi''[\exists \theta(w)(e') \land \theta(e') = \text{b} \land \text{e} = \text{e}' \to \text{e}'']$} ⑥ {$\lambda \eta$} ⑦ {$\lambda w \lambda e.\exists \phi(w)(e) \land \theta(e) = a \land \exists \phi''[\exists \theta(w)(e'') \land \theta(e'') = \text{b} \land \text{e} = \text{e}' \to \text{e}'']$} ⑧ {$\lambda w \lambda e.\exists \phi(w)(e) \land \theta(e) = a \land \exists \phi''[\exists \theta(w)(e'') \land \theta(e'') = \text{b} \land \text{e} = \text{e}' \to \text{e}'']$}

The truth conditions of $A$ has $B$ are characterized by $\Theta^*$; which is an existentially closed version of the compositionally derived $\Theta$. The sentence characterizes the set of worlds $w$ where there is a complex event $e$ and two atomic events $e'$ and $e''$ such that $e'$ is the state of constituting a region of influence, whose participant is $B$, and $e''$ is the state of being existent, whose participant is $A$, and $e$ equals the extension of $e'$ into $e''$, which is construed as $e''$ being in $e'$. Less technically, the sentence is true if $A$’s state of being existent “happens” in the region of influence constituted by $B$. As already suggested, the actual semantics of the states depends heavily on context and on the descriptive content of $A$ and $B$. Clearly, the sentence Dave has the flu means something quite different than The tree has leaves, for instance.

The issue of how the set of adjacent predicates, AT and BE in our case, gets lexicalized as have is not trivial, but is also not in the center of our attention. The options include head movement, lexicalization under adjacency (Ramchand 2008) or remnant movement of offending constituents and subsequent lexicalization of a maximal projection (Caha 2009). As far as I can tell, there is nothing in my account that favors one option over another, so I remain agnostic with respect to this issue.

The present analysis of possession has two sources of inspiration. Firstly, it is based on the idea that the possessive verb have can be decomposed into two basic components, one that corresponds to the existential verb be and the other to some locative predicate (see e.g. Freeze 1992; Kayne 1993; Harley 2002, 2004, or Beck and Johnson 2004) for various implementations of this idea; within the context of MECs, this analysis was assumed by Izvorski 1998. The other source is the idea that the existential (there) be is in fact a predicate with its own argument structure (see e.g. Barwise and Cooper 1981; McNally 1998).
rather than just the logical existential quantifier (see e.g. Mil- sark 1974, Kondrashova 1996, a logical existential-quantifier analysis was assumed for MECs by Kondrashova and Šimík [to appear]. It is not accidental that I opt for this type of analysis. The decomposition will be made use of in accounting for the various MEC-embedding predicates. The predicate-hood of the existential be will in turn play a role in accounting for the pivot-reduction phenomenon observed in MECs, which, under the present semantics, boils down to a relatively standard process of argument reduction (see §4.4, §6.5, and esp. §6.5.7 for discussion).

4.2.3 Formalizing availability

The intuitive truth conditions of a sentence like (17) have two basic components, given in (17a) and (17b).

(17) The book is available to Dave for his children to read \( \Rightarrow \) true iff
   a. The book exists in the region of influence of Dave, and
   b. it is possible that Dave’s children read the book (as a result of (a)).

That (17b) is an integral part of the truth conditions of (17) is supported by the observation that (18) sounds awkward as a continuation of (17). The only way for (18) to be felicitous after (17) is to interpret it with a deontic reading (‘Dave’s children are not allowed to read the book’), in which case it does not contradict the entailment, as it quantifies over a different set of worlds than the modal in (17).

(18) But Dave’s children can’t read the book.

The first truth condition, (17a), is based on the broadly construed possessive semantics introduced in the preceding section. This means that the *book is available to Dave* is construed just like *Dave has the book*, which roughly corresponds to intuition (but see footnote 15). The differences between them can be attributed to different flavors of the semantics of “region” and “influence”. Trying to characterize these differences in some systematic way would lead us astray, so I will abstract away from them and simply assume that both have and

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14 Thanks to the comments of Manfred Bierwisch (p.c.) and Kerstin Schwabe (p.c.) I have realized that the presently assumed concept of linguistic existence deserves an explicit delimitation with respect to the existence presupposition induced by some determiners. Let me just note here that the two concepts of existence are independent of each other. While existence presuppositions are entailments that are evaluated with respect to models or evaluation worlds, the presently assumed existence characterizes a set of states, which could possibly be construed in terms of minimal situations, i.e. proper subparts of worlds (cf. Kratzer 2008). This is why a DP carrying an existence presupposition can participate as an argument of the eventive existence predicate BE.

15 There is an additional meaning component which I abstract away from, namely the potentiality of the possessive-like relation, rather than its actual instantiation. This meaning is arguably conveyed by the morpheme *able*. 
available have the same underlying semantics which is based on the structure in (19) (see (16) for the derivation of the truth conditions).

(19)

How is the second truth condition, (17b) which corresponds to the infinitival possibility clause (PC), introduced in the structure? The simplest assumption (the one considered so far) seems to be that it functions as an argument of available. In particular, I assume that it is the extension argument of the sub-predicate BE, which means that it is introduced in the sister of that predicate, just like BeP above is introduced as the extension argument (the sister) of AT. In order to distinguish the coda predicate BE from the one that takes an event extension argument, I use the subscript \( E \) for the latter.

(20)

There are three things to keep in mind in constructing the semantics of (20). First, we want to capture the intuition that the possibility clause (PC) is a sort of event extension of the existence state. This means that the \( \text{BE}_E \) predicate should have access to the highest event variable of the PC, i.e. the variable, whose value is characterized by the (complex) embedded predicate, \textit{read} in this case. Second, the event extension is not an ordinary one in that the embedded event is not guaranteed to take place in the world of evaluation. It is only possible that it takes place. This means that \( \text{BE}_E \) must have access to the world variable with respect to which the PC is evaluated and perform existential quantification over that variable. In other words, the predicate \( \text{BE}_E \) must be
4.2. Introducing availability

a modal. Last but not least, as noted in §4.2.1, the PC always contains a gap/variable, whose reference is identified with the participant argument of the predicate $BE_E$ — the book in this case. As usual, the identification is mediated by an operator located at the edge of the PC that binds the variable.

Taking these three aspects of the semantics into consideration, we can construct the semantics of the PC. It expresses a relation between a world $w$, an individual $x$, and a reading event $e$ such that $e$ takes place in $w$ and $x$ is a participant in $e$. In case $e$ is complex, as in our case, then $x$ is a participant in some subevent of $e$, rather than in $e$ itself. I will abstract away from this complication and will treat the embedded event $e$ as atomic and, accordingly, the individual $x$ as the participant in $e$. In order to distinguish between different participants of that event, I will use participant predicates like $Ag$, $Th$, instead of the variable $\theta$. Notice, however, that this is just a notational convention used for the sake of simplicity; no theta role constants such as agent and theme exist in the present system.

(21) for Dave’s children to read

$$\leadsto \lambda w \lambda x \lambda e [\text{Read}(w)(e) \land \text{Ag}(e) = dc \land \text{Th}(e) = x]$$

Knowing the semantics of the possibility clause—the extension argument of $BE_E$, we can formulate the semantics of $BE_E$ itself by the function in (22). It characterizes a relation between a world $w$, a three-place relation $Q$ (an expression of type $\langle s, \langle e, vt \rangle \rangle$, corresponding to the possibility clause), an individual $x$ (corresponding to the object in existence), and a complex event $e$ such that there is an atomic event $e'$ and $e'$ is a state of existence in $w$ and $x$ takes part in this state and there is a world $w'$ such that all the circumstances in $w'$ are just like in $w$, which is expressed by $w' \in C(w)$ (where $C(w)$ is a circumstantial modal base, i.e. a set of worlds “circumstantially accessible” from $w$), and there is an event $e''$ in $w'$ and the relation $Q$ holds of the world $w'$, the event $e''$, and the individual $x$, and the complex event $e$ equals the extension from $e'$ to $e''$.

(22) $BE_E/\Theta \leadsto \lambda w \lambda x \lambda Q \lambda e [\text{Exist}(w)(e') \land \theta(e') = x \land \exists w' \in C(w) : \exists e''[Q(w')(x)(e'') \land e = e' \rightarrow e'']]$

This semantics incorporates the three aspects just mentioned: the event variable of the possibility clause participates in the event extension introduced by $BE_E$, $BE_E$ existentially quantifies over the world variable with respect to which the PC is evaluated, i.e. it expresses the semantics of possibility, and finally, it unifies the denotation of the participant argument ($x$) with the denotation of the gap in the PC.16

16A fully explicit account of modality would include considerations related to another “conversational background”, besides modal base, namely the so-called ordering source, which imposes a degree of accessibility on the set of accessible worlds (see Kratzer 1983, 1991). However, as will become clear in the subsequent discussion, there seems to be no traceable ordering source, at least none of the “standard” types, defining bouletic, teleological, or deontic modalities.
Now we are ready to compute the truth conditions of the whole phrase. The book is available to Dave for his children to read, whose LF is represented in the tree [20].

\[(23) \quad 1 \rightsquigarrow \lambda w \lambda x \lambda e [\text{Read}(w)(e) \land \text{Ag}(e) = dc \land \text{Th}(e) = x] = [21]
\]

\[(2) \quad \lambda w \lambda Q \lambda x \lambda e \exists e'[\text{Exist}(w)(e') \land \theta(e') = x \land \exists w' \in C(w) : \exists e''[Q(w')(x)(e'') \land e = e' \rightarrow e'']] = [22]
\]

\[(3) \quad \lambda w \lambda x \lambda e \exists e'[\text{Exist}(w)(e') \land \theta(e') = x \land \exists w' \in C(w) : \exists e''[\text{Read}(w')(e'') \land \text{Ag}(e'') = dc \land \text{Th}(e'') = x \land e = e' \rightarrow e'']] = [23]
\]

\[(4) \quad \rightsquigarrow b]
\]

\[(5) \quad \lambda w \lambda x \lambda e \exists e'[\text{Exist}(w)(e') \land \theta(e') = b \land \exists w' \in C(w) : \exists e''[\text{Read}(w')(e'') \land \text{Ag}(e'') = dc \land \text{Th}(e'') = b \land e = e' \rightarrow e'']]]
\]

\[(6) \quad \lambda w \lambda x \lambda e \exists e''[\text{Reg}(w)(e'') \land \theta(e'') = x \land \exists e'''[\text{Exist}(w)(e') \land \theta(e') = b \land \exists w' \in C(w) : \exists e''''[\text{Read}(w')(e'') \land \text{Ag}(e'') = dc \land \text{Th}(e'') = b \land e''' = e' \rightarrow e'']] \land e = e'''' \rightarrow e'''']]
\]

\[(7) \quad \lambda w \lambda x \lambda e \exists e''''[\text{Reg}(w)(e''') \land \theta(e''') = d \land \exists e''''][\text{Exist}(w)(e') \land \theta(e') = b \land \exists w' \in C(w) : \exists e''''''[\text{Read}(w')(e'') \land \text{Ag}(e'') = dc \land \text{Th}(e'') = b \land e'''''' = e' \rightarrow e''] \land e = e'''''' \rightarrow e'''']] = [13]
\]

The truth conditions are in [9]. If we simplify the complex formalization, we can say that the sentence is true if the book is in Dave’s region of influence (in other words, if the book is available to Dave) and it is possible (if the relevant circumstances are satisfied) that there is an event of Dave’s children reading the book. Clearly, these truth conditions capture the intuition with which I started this subsection, i.e. [17]. Interestingly, the semantics captures even the weakly causal/conditional relation between the two propositions involved: the book is available to Dave and as a result Dave’s children can read the book. This is because the first proposition, expressing a circumstance that characterizes the world of evaluation, restricts the possibility modal which quantifies over the second proposition. This relation between the two proposition is reminiscent of Kratzer’s classical analysis of conditional antecedents as restrictors of universal modal quantifiers.

In this subsection, I provided a compositional semantics for the the predicate available in its full argument structure potential: relating two individuals and an event such that one individual is available to the other and it is possible that the event, involving the available individual, takes place. The account is formulated in terms of Ramchand’s-style event semantics, where predicates with more participants are decomposed into a hierarchically organized set of atomic single-participant predicates. Though this level of detail might seem superfluous now,
it will pay off when we turn to the semantic and syntactic variation in MEC-embedding predicates.

4.2.4 Conclusion

In this section, I investigated the properties of the English predicate *available*. Even though it is compatible with many different argument structure realizations, under one of which it is very close to the run-of-the-mill possessive predicate *have*, it particularly readily accommodates an internal infinitival argument. This argument, called here the possibility clause, characterizes an event that can take place if the other conditions expressed by that predicate are satisfied, i.e. if the possessive-like relation expressed by *available* is realized. The modal existential quantification is assumed to originate in the lexical entry of the lowest component of the predicate *available*, namely the stative existence predicate $BE_E$. This idea and its subsequent formal implementation becomes the basis for the upcoming argumentation. I will argue that there is a class of predicates that can behave just like the predicate *available*, in that they can accommodate an “additional” argument in the form of an infinitival clause—the possibility clause.

4.3 MEC-embedding predicates as availability predicates

In this section, I turn to MEC-embedding predicates and prepare the grounds for the definitive proposal, put forth in §4.4 concerning how they combine with MECs. For now, I will stick to English and consider the behavior of MEC-embedding predicates in combination with their objects and infinitival clauses.

The section is organized as follows. In §4.3.1 I investigate the behavior of so called purpose clauses. It has been argued before that despite their appearance of (infinitival) relative clauses, purpose clauses are in fact arguments (or very low adjuncts) of verbal predicates. What is important for the present purposes that the class of predicates that license them is almost identical to the class of MEC-embedding predicates. In §4.3.2 I explore the hypothesis that the relevant class of predicates that license them is almost identical to the class of MEC-embedding predicates. This existence predicate, corresponding to the predicate $BE$ defined above, is in turn responsible for a pragmatic inference, the meaning of which corresponds to the semantics of the possibility clause. In §4.3.3 I provide a formalization of this hypothesis, exploiting the system introduced above, and show a few examples of how dynamic MEC-embedding predicates can be decomposed. §4.3.4 concludes the section.
4.3.1 Purpose clauses

It turns out that there is a remarkable match between MEC-embedding predicates, as characterized by Grosu (2004) (remember also that Grosu bases his characterization on Szabolcsi's 1986 existential predicates), and predicates that can select so called purpose clauses, as characterized by Faraci (1974). Before I turn to the class of predicates, let me introduce the notion of a purpose clause. Faraci (1974) observes that infinitival clauses like the one in (24) are ambiguous between an infinitival relative reading, more clearly spelled out in (24a), and a purpose clause reading, spelled out in (24b).

(24) Faraci (1974:7)
Carol bought a rack to hang coats on.
   a. Carol bought a rack on which to hang coats.
   b. Carol bought a rack so that she can hang coats on it.

That these two infinitivals represent truly independent types is witnessed by the fact that they can cooccur in one sentence (RC in (25) refers to relative clause and PC in to purpose clause).

Carol bought a rack [RC to hang coats on] [PC to hang her dresses on].

Faraci (1974) argues that purpose clauses, unlike relative clauses, do not form a constituent with the DP that they are associated with (a rack in the examples above) to the exclusion of the verb. Nevertheless, as opposed to VP modifiers, they appear within the VP. This ingredient of the analysis has survived in the subsequent literature on purpose clauses, namely Bach (1982) and Chierchia (1989b), both of whom assume that the PC can in fact be an argument of the verb. One of a number of arguments against the constituent-hood of purpose clauses and their DP associates is that syntactic processes such as passivization or pseudocleft formation that target the DP leave the purpose clause intact.

Thus, the following two examples are not ambiguous: (26a) involves a relative clause and (26b) a purpose clause.

(26) Faraci (1974:12)
   a. A rack to hang coats on was bought by Carol.
   b. A rack was bought by Carol to hang coats on.

Purpose clauses have to be distinguished from what Faraci (1974) calls rationale clauses, illustrated in (27b). Unlike purpose clauses, (27a), rationale clauses do not contain a gap coreferent with a matrix DP and can be introduced by the connective in order.

\[17\] Purpose clauses have also been analyzed as low adjuncts, see Jones (1991).
4.3. MEC-embedding predicates as availability predicates

Faraci (1974:28)

a. Bill bought the piano (*in order) for Mary to practice on.
b. Bill bought the piano (in order) for Mary to practice on it.

Now, what is most relevant to the present purposes is that purpose clauses, unlike the related relative and rationale clauses, are very limited in distribution. In particular, they cannot be embedded under just any predicate. Consider the following contrast (based on Faraci 1974:35):

Faraci writes: “In general, purpose clauses are compatible with certain fairly broad classes of predicates in English. Among them are (1) predicates of trans-action, such as give, buy, sell, take, steal, borrow, lend, (2) transitive verbs of motion, such as send, bring, take, (3) verbs of creation, such as build, construct, devise, make, and (4) the verb use.” (35/36) Bach (1982), who builds on Faraci’s work, extends this class by the stative predicates be and have (in a place, on hand, available, at one’s disposal, in existence), and by the predicate choose. The match between purpose clause-embedding predicates and MEC-embedding predicates (see §2.2.1) is remarkable and can hardly be accidental.

Apart from the distribution, there are two more striking similarities between purpose clauses and MECs: the fact that they obligatorily contain a gap (putting PRO aside) and the fact that they have the same sort of modality. Take the example in (25), repeated below. Notice that after filtering out the relative clause construal, it can only have the interpretation in (29a) but not in (29b), i.e. its modality must be of existential force.

Faraci (1974:28)

(27) 

(a. *Mary repaired the board to play chess on. purpose  
b. Mary repaired the board (on which) to play chess (on). relative  
c. Mary repaired the board (in order) to play chess on it. rationale

Carol bought a rack to hang coats on.

a. Carol bought a rack. Now she can hang coats on it.
b. *Carol bought a rack. Now she has to hang coats on it.

Interestingly, the modal flavor of purpose clauses also matches the one of MECs. The modal can in (29a) (and the corresponding implicit modal in (29)) is interpreted in terms of pure circumstantial possibility, possibly as a result of the circumstances created by the activity of buying. The modality is certainly not deontic or epistemic.

It seems that we have found a construction that is very close in its syntactic and semantic behavior to MECs—the purpose clause. In order to capture the observed similarities, I hypothesize that the MEC and the purpose clause are both subtypes of the possibility clause.

18I have not been able to check whether all the predicates mentioned by Faraci (1974) can in fact embed MECs in some language. Nevertheless, they are clearly of the same type as the attested MEC embedders, unified under the existence/availability result state; cf. §4.3.2. The only notable outlier is the verb use. I do not know what to think about this.
Before I move on to the discussion of the embedding predicates, let me mention one reservation that could compromise this working hypothesis. It is not clear that MECs exhibit what appears to be a core aspect of the purpose clause semantics, namely the purpose meaning. There are two arguments that should help us disperse this worry. First of all, there are good reasons to believe that the purpose meaning does not constitute a core property of purpose clauses. Notice for instance that the purpose meaning is not sufficient to license purpose clauses. The example in (28a) is unacceptable even though there is a clear purpose meaning available: repairing something with the purpose of using it later makes perfect sense. After all, that such meaning can be easily expressed is witnessed by the felicity of the rationale clause in (28c). More importantly, however, it turns out that purpose meaning is not even a necessary part of purpose clauses. Consider the example in (30). Even though the infinitival clause qualifies as a purpose clause in all other aspects (and is treated by Bach [1982] as such), it seems very strange to assume that the state of being available is somehow purposeful. As both Faraci [1974] and Bach [1982] note, what is purposeful are activities that are under the control of agents. Thus, it seems safer to assume that the reading of War and Peace is a sheer possibility brought about by its availability.

(30)  \[\text{Bach (1982:38)}\]
\text{War and Peace is available to read to the students.}

That the purpose reading is just a pragmatic implicature which is based on world knowledge rather than a solid entailment is also suggested by [Bach (1982)] and even for dynamic verbs. Consider the following example:

(31)  \[\text{Bach (1982:50)}\]
\text{John bought The Golden Notebook for his children to read.}

Bach comments on (31) as follows: “[…] it’s not at all clear just what the intention is or that it is always the intention that the object have the property represented in the purpose clause. For example, suppose (31) [Bach’s (69)] is true. Can’t this be true in a situation where after months of clamoring, John finally gave in? Here he is merely making it possible for his children to read the book in question.” (50) Thus, Bach himself has doubts about the reality of the purpose reading in purpose clauses. Like myself, he suggests that what is asserted is a simple possibility.

The second argument to disperse the worry is that MECs in fact can involve purpose meanings. This is discussed by Grosu [2004], who considers the purpose meaning to be a pragmatic factor that contributes to the acceptability of predicates as MEC-embedders. Grosu writes: “Felicity thus depends not only on the possibility of a narrow-scope existential construal of the MEC […] but also on the extent to which the content of the matrix coheres with the purpose import of the MEC.” (433) One of the examples he gives involves the verb ‘be born’. Under normal circumstances, if a child is born, the result—its
4.3. MEC-embedding predicates as availability predicates

existence—does not infer any possibility. This is reflected by the fact that the predicate ‘be born’ is not such a good MEC embedder, Grosu argues. Yet, if such a possibility is made salient, for instance in terms of being born for a purpose, like Messiahs are, then the MEC is licensed (in Romanian). Consider the following example:

\[(32)\] Romanian \((\text{Grosu 2004:434})\)

\[S-a \text{născut in fine cine să ne } \{ \text{conducă țara } / \text{refl-has born } \text{at last who } \text{SBJ us rule country the } / \text{răscumpere păcatele} \}. \]

redeem sins:DEF

‘There has finally been born someone who can rule our country / redeem our sins.’

I will briefly return to this issue after the formal analysis is put in place. In the spirit of Grosu’s suggestion and following the observations made here, I will argue that the purpose meaning is a pragmatic inference that arises as a consequence of interpreting the matrix verb as a restriction of the modal quantifier BE_E.

In conclusion, I adopt the hypothesis that the syntactic and semantic similarities between purpose clauses and MECs are not accidental. I will capture these similarities by assuming that both types of clauses are subtypes of the possibility clause. A crucial part of the definition of a possibility clause is the selecting predicate—the predicate BE_E. How does this abstract predicate relate to the set of of MEC/purpose clause-embedders? I turn to this issue in the next subsection.

4.3.2 The common denominator of MEC-embedding predicates

What unifies the class of predicates that have the capacity to select MECs and purpose clauses? In this subsection, I would like to propose that it is the predicate BE_E as defined in §4.2.3, i.e. the predicate that predicates the existence of some object and at the same time expresses the possibility of that object’s involvement in some event.

Let us start with the stative predicates, i.e. be and have. In §4.2.2 and §4.2.3 I argued that the possessive predicate have is very closely related to the predicate available. I argued that both can be analyzed as complex stative predicates, composed of two subpredicates: AT and BE. The only difference between them is the argument structure of BE. In have, BE is an event coda, i.e. it has no syntactic complement corresponding to an event extension argument. In available, on the other hand, BE does have an event extension—the possibility clause. Now, notice that something like the possibility clause can be
present in be and have in the form of a pragmatic inference.

(33)  
   a. There’s a book.  
       ... It is possible to do something with the book, e.g. read it.  
   b. Dave has a book.  
       ... It is possible for Dave to do something with the book, e.g. read it.

I would like to suggest that these pragmatic inferences can materialize into semantic entailments by opening up an event extension argument slot and filling it with the infinitival possibility clause, as in (34).

(34)  
   a. There’s a book (available) to read.  
   b. Dave has a book (available) to read.

How about the dynamic predicates? Virtually all the dynamic predicates that are capable of embedding MECs (or purpose clauses) express a change of state, where the result state corresponds to the existence or availability of some object or individual. The following sentences represent a sample of MEC-selecting dynamic predicates. Just like above, the three dots introduce what I take to be an availability inference. (Here, of course, the same reservations expressed in footnote 19 apply.)

(35)  
   a. Dave found a key.  
       ... The key is available [for Dave to use].  
   b. Dave bought Mary some food.  
       ... The food is available [for Mary to eat].

Clearly, the presence of this inference is subject to all sorts of factors, especially worldknowledge. A sentence like David has a child, for instance, does not seem to infer that one can do something with the child. Such uses of have are then predicted to be bad purpose clause embedders, which is borne out by the oddness of sentences like David has a child to cook dinners. Yet, in an immoral world where it is normal to use children as slaves, this sentence would not sound strange at all. Notice also that in such a world David has a child to cook dinners can easily have the possibility inference. Thanks to Jan Koster for pointing this out to me.

The inference should not be mistaken for a part of the nominal argument’s lexical meaning in the sense of Pustejovsky (1995) (where e.g. book implies (the possibility of) reading). The reason is that this inference feeds the grammatical structure of the existence/availability predicates even in the absence of any nominal argument, as will become clear from the discussion of MECs. I am grateful to Hans-Martin Gärtner and Manfred Krifka for making me aware of this caveat.

This “materialization” of a pragmatic inference into a syntactically and semantically active component of a predicate is reminiscent of what McConell-Ginet (1982) called “natural extensions” or “augmentations” of predicates. What she notes is that a sentence like John spoke infers that John spoke to somebody (though this need not be true, of course). This inference can “materialize” into an explicitly expressed argument, giving rise to John spoke to somebody. See also Chierchia (1989b) for discussion.
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c. Dave got a car.
   ... The car is available [for Dave to drive].
d. Dave sent you the book.
   ... The book is available [for you to read].
e. A letter arrived.
   ... The letter is available [for somebody to read].
f. The opponent appeared.
   ... The opponent is available [for somebody to fight].

Roughly speaking, ‘finding a key’ results in ‘having a key’, ‘buying Mary food’ results in ‘Mary having food’, ‘the opponent’s appearing’ results in ‘there being an opponent’, etc. This recognition goes back to Von Wright (1963) and Dowty (1972). There is a solid tradition (cf. Larson 1988) that assumes an explicit syntactic and semantic treatment of this result state in a verbal decomposition (see also Beck and Johnson 2004, who argue specifically for an existence/possessive result state). In the context of MECs, the relevance of the relation between the class of MEC-selecting predicates and the stative predicates be and have was first noted by Izvorski (1998). Once be (BE) or have (AT+BE) are explicitly represented in the syntax and semantics of the dynamic predicates, the availability inference comes for free, at least to the extent that it “comes for free” with the stative predicates themselves.

Once again, I will assume that this pragmatic inference can in principle materialize into entailment by opening up the event extension argument slot of BE, effectively turning BE into BE_E. This argument is then filled by a possibility clause, i.e. an MEC or a purpose clause. Under which conditions, with which predicates, and in which languages this actually happens is a difficult issue to resolve and one that I leave open for now. In the next subsection I finally turn to a formalization of the class of predicates.

4.3.3 Formalizing MEC-embedding predicates

The main idea behind my proposal is that the existential/possessive predicates be and have in languages with MECs can be interpreted just like the English predicate available in that their argument structure can be extended in order to accommodate a possibility clause. This means that have is interpreted just like available as defined in (12.27) — it corresponds to two subpredicates, AT and BE_E, an assumption we can express in terms of lexicalization (36a), where the semantics of AT and BE_E are as in (36b) and (36c), respectively.

\[
\begin{align*}
(36) & \\
   & \quad \text{a. AT} \cup \text{BE}_E \iff \text{have} \\
   & \quad \text{b. AT} \rightsquigarrow \lambda w \lambda E_{(s,v,t)} \lambda x \lambda e \lambda v \exists e' \left[ \text{Reg}(w)(e') \land \theta(e') = x \land \exists e'' \left[ E(w)(e'') \land e = e' \rightarrow e'' \right] \right] \\
\end{align*}
\]

\[22\] In order to support her assumption, Izvorski cites Burford (1995). Unfortunately, I failed to get hold of this dissertation.
c. \( \text{BE} \xrightarrow{\text{E}} \lambda w \lambda Q \langle s, \langle e, \text{vt} \rangle \rangle \lambda x \lambda v \exists e'[\text{Exist}(w)(e') \land \theta(e') = x \land \exists w' \in C(w) : \exists e''(Q(w')(x)(e'') \land e = e' \rightarrow e'')] \)

The structure of a sentence like "Dave has a book for his children to read" is then virtually identical to the one proposed in (20) for the sentence "The book is available to Dave for his children to read." The only differences are in the morphological realization of the arguments. The to-phrase (to Dave) of the predicate available corresponds to the nominative subject (Dave) of the predicate have and the nominative subject (the book) corresponds to an accusative object (a book). The possibility clause itself (for his children to read) remains structurally intact—it is merged as the extension argument of BE.

\[
\text{(37)} \quad \text{AtP} \quad \text{Dave} \quad \text{At'} \\
\text{AT} \quad \text{BeP} \\
\text{a book} \quad \text{Be'} \\
\text{BE}_E \quad \text{PC} \\
\text{for his children to read}
\]

There is no point in repeating the semantic derivation, since it is identical to the one given for the predicate available in (23).

The syntax and semantics of be is a proper subset of this complex predicate. It corresponds simply to the atomic predicate \( \text{BE}_E \), (38a), whose lexical semantics is identical to (36b).

\[
\text{(38)} \quad \text{a. } \text{BE}_E \leftrightarrow \text{be} \\
\text{b. } \text{BE}_E \xrightarrow{\text{E}} \lambda w \lambda Q \langle s, \langle e, \text{vt} \rangle \rangle \lambda x \lambda v \exists e'[\text{Exist}(w)(e') \land \theta(e') = x \land \exists w' \in C(w) : \exists e''(Q(w')(x)(e'') \land e = e' \rightarrow e'')] = (22)
\]

The structure of a sentence like "There is a book for Dave’s children to read" is given in (39). Notice that it is a proper subset of (37).
4.3. MEC-embedding predicates as availability predicates

(39) BeP

\[ \begin{array}{c}
\text{a book} \\
\text{Be'} \\
\text{BE}_E \\
\text{PC} \\
\text{for Dave's children to read}
\end{array} \]

The predicates be and have typically impose an indefiniteness requirement on their (internal) argument, in the present terms the participant argument of BE/BE\(_E\). This requirement is most often referred to as the definiteness restriction and is illustrated in (40) for ordinary uses of the existential predicates and in (41) for its availability uses.

(40) a. There is a/*the book on the shelf.
   b. I have a/*the sister in Paris.

(41) a. There is a/*the book for Mary to read.
   b. I have a/*the book to read.

One of the traditional ways of dealing with this restriction (see e.g. [Milsark 1974]) is to assume that the relevant argument of these predicates is semantically not an individual (the book on the shelf, the sister in Paris), but rather a property of individuals expressed by the corresponding (modified) nominals. The lexical semantics of the predicates then contains an existential quantifier, which closes off the variable introduced by the property. These existential versions of BE and BE\(_E\), superscripted by \(\exists\), are in (42) and (43). Notice that the semantics is closely related to (14) and (38b) except that the participant argument slot is filled by a property (type \(\langle s,el \rangle\)) and that the variable \(x\) introduced by this property is existentially quantified over.

(42) \(\text{BE}^\exists \lor w_s^x \lambda p_{(s,el)} x e_v^x \exists x [\text{Exist}(w(e)) \wedge \theta(e) = x \wedge P(w)(x)]\)

(43) \(\text{BE}_E^\exists \lor w_s^x \lambda q_{(s,el)} \lambda p_{(s,el)} x e_v^x \exists x [\text{Exist}(w(e')) \wedge \theta(e') = x \wedge P(w)(x) \wedge \exists w' \in C(w) : \exists e''_v [Q(w')(x)(e'') \wedge e = e' \rightarrow e'']]\)

Let us now turn to the formalization of the class of dynamic predicates. I have assumed that these predicates are syntactically and semantically complex and contain an implicit be or have as their subpart. Let us consider the predicate buy as an example. This predicate expresses a process of buying, whose participant

---

23See [McNally 1998] for an alternative proposal, under which these so called existential predicates do not introduce existential quantification at all. The existential predicate simply takes a property (or more generally a “nonparticular”) as its argument and states that the property is instantiated. For a recent overview of competing proposals for existential predicates and sentences, see McNally (to appear).
is the individual active in this process. This process extends into the complex result state of having some object, which can in turn turn out in its extended version, i.e. $\text{AT} + \text{BE}_E$.

The syntactic structure of a sentence like (44) is given in (45).

(44) Sue bought Dave the book for his children to read.

(45) \[
\begin{array}{c}
\text{BuyP/} & \\
\text{Sue/} & \text{Buy'/} \\
\text{BUY/} & \text{AtP/} \\
\text{Dave} & \text{At'} \\
\text{AT} & \text{BeP}_E \\
\text{the book} & \text{Be'} \\
\text{BE}_E & \text{PC} \\
\text{for his children to read} & \end{array}
\]

The lexical item buy therefore corresponds to three atomic predicates, (46a). The semantics of BUY, the processual part of the complex predicate, is given in (46b). The semantics of AT and BE$_E$ is already familiar.

(46) a. $\text{BUY} + \text{AT} + \text{BE}_E \leftrightarrow \text{buy}$

b. $\text{BUY} \rightsquigarrow \lambda w, s, v \lambda x, v \lambda e' [\text{Buy}(w)(e') \land \theta(e') = x \land \exists e'' [\text{BE}(w)(e'') \land e = e' \rightarrow e'']]$

Now we can compute the truth conditions of (45). For the sake of simplicity, I do not unwrap the full complex semantic representation of AtP (node ❶) until the end of the derivation (node ❼). Instead, I use the standard notation—[[AtP]]—where [] is an alternative notation of the interpretation function $\rightsquigarrow$. What is important is that [[AtP]] is of the right type, i.e. $(s, vt)$ and can thus function as the extension argument of BUY (node ❷). When they combine, they give rise to a complex event which equals the extension of the buying process to the state of Dave having a book for his children to read. The participant of the buying process, Sue (node ❸), combines with its predicate in a straightforward way, yielding the characteristic function over events (node ❼), as usual.

---

24 Possibly, the predicate consists not only of the process and the result state but also of the initiation state, expressing causative semantics (Ramchand, 2008). I abstract away from this complication and conflate the initiating and the processual subevents.
4.3. MEC-embedding predicates as availability predicates

Let us now make a small digression and look into the problem of the purpose meaning, discussed in §4.3.1. What is interesting about the resulting truth conditions is that the whole cascade of subevents that leads to the possibility statement effectively functions as a restrictor of the possibility modal. This is because the restrictor of the modal introduced by BE\(E\) (i.e. \(C(w)\)) corresponds to the intersection of all the propositions that express the circumstances in the world of evaluation. Apart from a set of contextually supplied circumstances, there is a set of explicitly expressed subevents—the subevent of buying (BUY), of constituting a region (AT), and of the state of existing (BE), all of which contribute to the characterization of the world \(w\) and hence also the accessibility predicate \(C(w)\). Because these event-circumstances are explicitly expressed (and not just present in the common ground), they are also among the most salient ones. It seems reasonable to assume that salient propositions that are present in the restrictor of a modal participate in a pragmatic enrichment of that modal. Thus, if Dave’s children can read a book in the worlds where it matters that this book was bought by Sue and if we know that Sue’s buying the book was intentional and purposeful, then we can infer that the possibility of Dave’s children reading the book was the purpose of Sue’s buying the book. This reasoning is similar to the one put forth in Bach (1982), however, here it gains further support from an explicit (yet underspecified) semantic relation between the buying process (and the having state) and the potential reading process, namely the modal accessibility relation \(C\). Notice also that the presence or absence of the purpose meaning is predicted to correlate with the predicate that selects the possibility clause. Whenever the predicate contains a (typically processual) subevent whose participant’s behavior can be construed as intentional and purposeful, the purpose meaning can arise. On the other hand, if there is no such participant, as in the case of the stative predicates be, have, or available, the purpose meaning is correctly predicted not to occur.

(47) 1 = \([\text{AtP}]\)
2 \(\Rightarrow \lambda w \forall \lambda x \lambda e \exists e'[\text{Buy}(w)(e') \land \theta(e')] = x \land \exists e''[\exists e'[E(w)(e'') \land e = e' \rightarrow e'']]\)
3 \(\Rightarrow \lambda w \forall \lambda x \lambda e \exists e'[\text{Buy}(w)(e') \land \theta(e')] = x \land \exists e''[[\exists e'[E(w)(e'') \land e = e' \rightarrow e'']]\)
4 \(\Rightarrow s\)
5 \(\Rightarrow \lambda w \forall \lambda x \exists e']\text{Buy}(w)(e') \land \theta(e') = s \land \exists e''[[\exists e'[E(w)(e'') \land e = e' \rightarrow e'']]\)

\[\\exists e_3[\text{Read}(w')(e_2) \land \text{Ag}(e_2) = x \land \text{Th}(e_2) \land e_1 \rightarrow e_2][e_6 = e_3 \rightarrow e_4] \land e_7 = e_5 \rightarrow e_6]\]

The full truth conditions are given in 6. Informally, the sentence Sue bought Dave a book for his children to read is true if Sue was involved in a buying process which extended to (brought about) the state of Dave having a book, which in turn extends to the possibility of Dave’s children reading the book.
I conclude that the present analysis provides a tentative but promising solution to the problem of the purpose meaning in purpose/possibility clauses.

In our previous example, subevents map to participants in a neat one-to-one fashion: BUY–Sue, AT–Dave, BE_E–the book. However, the situation can get more intricate very easily. Consider the example in (48), in which there is no recipient of the buying process, i.e. no participant of AT:

(48) Sue bought the book for Dave’s children to read.

What structural description does this sentence map to? There are two options, both of which might be needed for different purposes. The first option is that the AT predicate is completely missing. This is illustrated in (49).

(49) \[
\begin{array}{c}
\text{BuyP} \\
\text{Sue} \quad \text{Buy'} \\
\text{BUY} \quad \text{BeP}_E \\
\text{the book} \quad \text{Be'} \\
\text{BE}_E \quad \text{PC} \\
\text{for Dave’s children to read}
\end{array}
\]

In this case, the process of buying the book simply leads to the existence of the book: the existence is not assigned any particular region, i.e. no possessive-like relation is established. Note that the composition can proceed just like before because \(\text{BeP}_E\) is of the right semantic type for \(\text{BUY}\) to be able to select it.

This option, i.e. the direct embedding of \(\text{BeP}_E\) (or simply \(\text{BeP}\)) by a processual event, is independently needed for dynamic unaccusative predicates like \(\text{appear}\), where existence, but no spatial attribution/possession, is entailed. Thus, the syntax of \(\text{appear}\) can be represented as in (50). It seems reasonable to assume that the processual predicate \(\text{APPEAR}\) has no participant, it simply characterizes an event of appearing extending in the existence of some object, predicated by \(\text{BE}_{(E)}\).

(50) \[
\begin{array}{c}
\text{AppearP} \\
\text{APPEAR} \quad \text{BeP}_{(E)} \\
\ldots
\end{array}
\]
Another way to deal with (48) is to assume that the predicate AT is present in the structure and the possessive relation therefore is asserted, but the participant is not explicitly supplied. The structure then looks as follows:

(51) 

\[
\begin{array}{c}
\text{BuyP/} \oplus \\
\text{Sue} \\
\text{BUY} \\
\text{AT} \\
\text{the book} \\
\text{BE_E} \\
\text{for Dave’s children to read}
\end{array}
\]

This structure raises two issues: First, how is the reference of the participant of AT determined? Second, given that the participant argument slot of AT is not saturated, AtP is of a different type than what BUY is able to absorb. Let us address the latter issue first. It seems inevitable that the semantics of BUY is modified in such a way that it is capable of selecting expressions of type \( \langle s, \langle e, v_t \rangle \rangle \). Notice that this modification is not completely arbitrary, since there is already one atomic predicate that selects expressions of type \( \langle s, \langle e, v_t \rangle \rangle \), namely BE_E (selecting the possibility clause). Now, suppose that the two predicates in fact have more in common in that the variable that corresponds to the participant of the lower predicate—AT, picks up its reference from the participant of the higher predicate—BUY, just like the variable in the possibility clause picks up the reference of the participant of BE_E. This solves our first issue—the determination of the reference of AT’s participant argument. The modified lexical entry of BUY (call it \( \text{BUY}^+ \)) is in (52). The usual event extension argument \( E \) (of type \( \langle s, v_t \rangle \)) is replaced by the argument \( Q \) (of type \( \langle s, \langle e, v_t \rangle \rangle \)) and the individual-argument slot of \( Q \) is filled by \( x \)—the participant argument of BUY.

(52) 

\[
\text{BUY}^+ \leadsto \lambda w. \lambda Q(s, \langle e, v_t \rangle) \lambda e. \lambda e'. [\text{Buy}(w)(e') \land \theta(e') = x \land \exists e''[Q(w)(x)(e'')(e = e' \rightarrow e'')]]
\]

Let us skip the computation and come to the predicted truth conditions of (51).

4.3. MEC-embedding predicates as availability predicates
An event-extension analysis of MECs

(53) \( \lambda w \exists e_7 \exists e_5 [\text{Buy}(w)(e_5) \land \theta(e') = s \land \exists e_6 [\exists e_3 [\text{Reg}(w)(e_3) \land \theta(e_3) = s \land \exists e_4 [\exists e_1 [\text{Exist}(w)(e_1) \land \theta(e_1) = b \land \exists w' \in C(w) : \exists e_2 [\text{Read}(w')(e_2) \land \text{Ag}(e_2) = \text{dc} \land \text{Th}(e_2) = b \land e_4 = e_1 \rightarrow e_2] \land e_6 = e_3 \rightarrow e_4] \land e_7 = e_5 \rightarrow e_6]]] \rightarrow e_2]

Because the participant argument of AT gets identified with the participant argument of BUY, the sentence is true iff \textit{Sue} was active in an event of buying which resulted in \textit{Sue} having the book and that in turn resulted in the possibility of Dave’s children reading the book. It seems to me that these truth conditions match the intuition. I conclude that both (49) and (51) are feasible ways of analyzing sentences like \textit{Sue bought the book for Dave’s children to read.}

Once the type of meaning like \textit{BUY} in (52) is in place, it can be used more generally, i.e. whenever two participants of two adjacent subevents share reference. We can hypothesize, for instance, that this is the proper analysis of another unaccusative MEC-embedding predicate—\textit{arrive}. The hypothesized structure of \textit{arrive} is given in (54). Suppose that \textit{Sue} is the participant argument of the processual event of arriving. At the same time, the result of this process is that \textit{Sue} is in the state of being existent. Once again, we can model this by letting the participant argument slot of \textit{BE} unsaturated and let its reference be identified with the participant argument of \textit{ARRIVE}.

(54) \begin{center}
\begin{tikzpicture}

\node (ArriveP) at (0,0) {ArriveP};
\node (Sue) at (-1.5,-1) {Sue};
\node (Arrive) at (1.5,-1) {Arrive'};
\node (ARRIVE) at (-2,-2) {ARRIVE};
\node (BeP) at (2,-2) {BeP};
\node (BE(A)) at (0,-3) {BE(A)};
\node (PC) at (1,-3) {PC};
\node (e3) at (0,-4) {...};

\draw[->] (Sue) -- (Arrive);
\draw[->] (Arrive) -- (ARRIVE);
\draw[->] (ARRIVE) -- (BeP);
\draw[->] (BeP) -- (BE(A)) -- (PC);
\end{tikzpicture}
\end{center}

Some readers might already have noticed that this mechanism of argument identification is highly reminiscent of control, as construed in so-called property/predicate-analyses of control (see e.g. Williams 1980; Chierchia 1984; Dowty 1985). This similarity is certainly not accidental. I will come back to the issue of cross-event argument identification and control in \S6.4 and provide more evidence for treating control constituents as properties.

In conclusion, I provided a formalization of three types of MEC-embedding predicates: the stative predicates \textit{be} and \textit{have}, dynamic transitive predicates such as \textit{buy}, and dynamic unaccusative predicates such as \textit{appear} or \textit{arrive}. The basic idea is that all these predicates are unified under containing a common result state, the existence predicate \textit{BE}, which can “mutate” into its extended version—\textit{BE}\_\textit{E}—which is different from the ordinary \textit{BE} in that it accommodates an event extension argument. This argument corresponds to the possibility clause. Finally, I introduced some more flexibility into the system
of argument structure, in order to account for cases of cross-event participant argument identification. In such cases, the event extension does not only characterize a set of events, but rather a set of participant-event pairs. The predicate that selects this extension then identifies the participant of that pair with the participant of its own.

4.3.4 Conclusion

The class of MEC-embedding predicates is unified under a single common property—the presence of the existence atomic predicate BE (or the more complex AT+BE, i.e. *have*) in the position of the result state. It is this result state and its paradigmatic association to the analogous predicate *available* that brings about the possibility to extend the argument structure of MEC-embedding predicates and integrate possibility clauses. The analysis receives some independent support from previous analyses of so called purpose clauses (Faraci 1974; Bach 1982; Chierchia 1989b), which have been argued to occupy a VP-internal position and function as verbal arguments. I also attempted to show that purpose clauses can in fact be reduced to a special case of the possibility clause. In the next section, I finally turn to the core proposal of this chapter. I will argue that MECs form a subtype of the possibility clause.

4.4 The event-extension analysis of MECs

The previous two sections introduced the semantics of availability, first for the English predicate *available*, then as an enriched inference-based semantics the stative predicates *be* and *have*, and finally for dynamic predicates like *buy* or *appear*, which were argued to contain a silent availability *be*. In this section I turn to the core proposal of this chapter and show how these predicates interact with MECs. I will argue that contrary to the generally accepted belief, MECs are not introduced as ordinary internal arguments (such as *a book* in *I have/bought a book*), rather, they enter the argument structure as event extensions of the availability predicate BE₉ (such as *to read* in *I have/bought a book [to read]*)

The ordinary internal argument position, normally filled with an overt DP (*a book*), is completely eliminated, by a process akin to antipassivization. This, together with the fact that the operator is realized overtly in MECs—by a wh-word, brings about the misguided free-relative appearance of MECs.

In order to be able to fully develop the account of MECs, I need to introduce some preliminary assumptions about wh-movement semantics. It turns out that the predicted semantic shape of MECs highly constrains the possibilities of analyzing fronted wh-words.

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25In §6.5 I will show that an alternative analysis is possible, one in which the position is filled by a phonologically empty nominal. I will argue that both alternatives might be needed in order to capture the whole range of facts.
4.4.1 Semantics of fronted wh-words

There are many different ways of interpreting wh-words—as existential quantifiers (e.g. Karttunen 1977; May 1977), as Heimian indefinites, i.e. restricted individual variables (e.g. Berman 1991; Beck 2006), as sets of individuals (e.g. Hamblin 1973; Kratzer and Shimoyama 2002), as lambda-operators, i.e. expressions without a semantic type (e.g. Groenendijk and Stokhof 1984; Heim and Kratzer 1998), or, almost equivalently, as type-preserving functions contributing a restriction on the variable introduced by the wh-word (Caponigro 2003).

Which of these analyses is well fit for the present purposes?

What we already know is the desired semantics of MECs, including their semantic type. The idea has been that MECs are just like possibility clauses, i.e. of type $\langle s, (e, vt) \rangle$, and that the wh-word in MECs corresponds to the empty operator in the possibility (or purpose) clause, binding the variable that is to be identified with the participant argument of the embedding predicate. This assumption in itself significantly reduces the possible denotations of fronted wh-words. They cannot denote quantifiers (Karttunen 1977), individuals (Berman 1991), or sets of individuals (Hamblin 1973). This is because the function application that would follow the wh-movement would immediately saturate the individual-argument position created by the movement (by the rule of lambda-adjunction; see §1.4.1) and consequently change the type of the MEC from $\langle s, (e, vt) \rangle$ to $\langle s, vt \rangle$. But an expression of this type cannot be selected by the MEC-embedder.

This leaves us with the last two options: wh-words as type-preserving functions (Caponigro 2003) or wh-words as syncategorematic expressions that correspond to $\Lambda$ (Groenendijk and Stokhof 1984). Opting for Caponigro’s analysis is prima facie problematic because the object that is the sister of the wh-word after its movement in MECs is not of the right type, i.e. $t$. Hence, the wh-word function, which is of type $\langle et, et \rangle$ could not apply. It seems inevitable that fronted wh-words can be sisters to expressions of various types. These should include $t$ (or $\langle st \rangle$), for the purpose of relative clauses and wh-questions, but also $\langle s, et \rangle$, for multiple wh-questions (see §6.3), or $\langle s, vt \rangle$, as assumed here. If this is right, then there are two ways out for an account like Caponigro’s. Either wh-words are multiply ambiguous or their semantics is defined in terms of variables over types and is therefore intrinsically flexible. The first solution seems ad hoc and therefore suboptimal. The second solution, though attractive, does not work. Let us see why. Say that the movement of wh-words can target expressions of type $t$, or $\langle et \rangle$, as in double questions, or $\langle e, et \rangle$, as in triple questions. After wh-movement and lambda adjunction, these types will correspond to $\langle et \rangle$, $\langle e, et \rangle$, and $\langle e, (e, et) \rangle$, respectively. Assume further that wh-words are type-preserving functions of type $\langle e\sigma, e\sigma \rangle$, for any type $\sigma$. Now, suppose that what combines with a single wh-clause, which is of type $\langle e, et \rangle$ (after lambda-adjunction). In this case, $\sigma = \langle et \rangle$. The sample derivation is in (55).
4.4. The event-extension analysis of MECs

(55) \[[\text{what}]([\text{wh-clause}]) = [\lambda P_{(e')} \lambda x[P(x) \land \text{Thing}(x)](\lambda y[\lambda z \{Q(z)(y)\}] = \lambda x[\lambda z \{Q(z)(x)\}] \land \text{Thing}(x)]\]

The problem with (55) is that it is an illicit logical object: the object \(\lambda z \{Q(z)(x)\}\) cannot enter into a conjunction, since it is not of type \(t\), but of type \(\langle e't\rangle\). Intersection (\(\cap\)) cannot be used either because \(\text{Thing}(x)\) is of type \(t\).

The impossibility to define Caponigro-style semantics in a flexible way leaves us with the solution of Groenendijk and Stokhof (1984) and Heim and Kratzer (1998), who treat wh-words as syncategorematic expressions (i.e. expressions without a type) which correspond to lambdas (\(\Lambda\); see §1.4.1).

(56) \(\text{what}_i = \Lambda_i\)

The question is how to treat the restriction on the variable that is contributed by the wh-word (i.e. \(\text{Thing}\) for \(\text{what}\)). There are two options. Either the restriction is treated as a presupposition (Heim and Kratzer 1998) or it is interpreted in the trace position, in the form of a definite description (Rullmann and Beck 1998; Sauerland 1998; Johnson to appear). Without going into the technicalities, I tentatively adopt the latter option. This is because I will assume that the world variable with respect to which the restriction is interpreted can be bound by expressions in the clause, something that is impossible to achieve with the presupposition account.

This account of fronted wh-words, necessitated by the general account of MECs and possibility clauses, has one interesting consequence. In particular, wh-movement is predicted to be completely semantically unconstrained. It can target any expression because wh-words are completely inert with respect to the type theory. I will explore this consequence in Chapter 5 and will show that thanks to freedom of wh-movement, MECs can be of various syntactic sizes (corresponding to different semantic types).

4.4.2 Formalizing MEC-embedding

Let us now turn back to MECs and the way they are integrated into the argument structure of the embedding predicates. In §3.3 I introduced two versions of the stative predicate \(\text{BE}_E\). One version, repeated in (57), takes an entity-type object \(x\) as its participant argument. The other, repeated in (58), is an existential version of \(\text{BE}_E\), designated as \(\text{BE}^E\). Instead of an entity-type object \(x\) that this property introduces. The very same variable is construed as the participant of this predicate.

(57) \(\text{BE}_E \leadsto \lambda w_x \lambda Q_{(x,(e,v)t)} \lambda x_e \lambda v_{(e,v)} \exists e'_v \{\exists(w)(e') \land \theta(e') = x \land \exists w' \in C(w) : \exists e''_v \{Q(w')(x)(e'') \land e = e' \rightarrow e''\}\} = \{22\}\)

(58) \(\text{BE}^E \leadsto \lambda w_x \lambda Q_{(x,(e,v)t)} \lambda P_{(x,(e,v)t)} \lambda x_e \exists e'_v \exists v_e \{\exists(w)(e') \land \theta(e') = x \land P(w)(x) \land \exists w' \in C(w) : \exists e''_v \{Q(w')(x)(e'') \land e = e' \rightarrow e''\}\} \)}
The expression that fills the participant argument slot of BE is scopally and referentially independent of the verb; it could be definite as well as (specific) indefinite. The expression that fills the argument slot of BE, on the other hand, is referentially backgrounded and scopally very restricted: it provides a description but lacks any referential properties; moreover, the variable it introduces gets existentially closed by the predicate and can therefore never outscope it.

What is the nature of MEC-embedding predicates? I would like to suggest that these predicates go even further in reducing the participant argument, in fact, they go to the extreme and get completely rid of that argument position. All that remains is the existential quantification over the variable that corresponds to the argument. Thus, we arrive at the semantics in (59). It is possible to assume that the representation in (59) is derived from the basic representation in (57) by the application of a silent arity-reducing morpheme, whose denotation is given in (60). Notice that (60) closely resembles the antipassive morpheme (cf. Dixon 1994), which eliminates the participant argument position and at the same time existentially quantifies over the variable that corresponds to the participant argument in the representation of the predicate. (The simplified notation sevt corresponds to \( \langle s, \langle e, vt \rangle \rangle \).)

\[
(59) \quad \text{BE}_{MEC} \Rightarrow \lambda s.\lambda Q(s,\langle e,vt \rangle) \lambda e.\exists e'.\exists w.\exists v.\exists e''.\exists x.(\text{Exist}(w)(e') \land \theta(e') = x \land \exists w' \in C(w) : \exists e''[Q(w')(x)(e'') \land e = e' \rightarrow e''])
\]

\[
(60) \quad \text{ANTIPAS} \Rightarrow \lambda s.\lambda X(s,\langle sevt,\langle e,vt \rangle \rangle) \lambda Q(s,\langle e,vt \rangle) \lambda e.\exists x.[X(w)(Q)(x)(e)]
\]

The derivation of BE from BE proceeds by simple function application, as in (61). Notice that this ingredient of the analysis crucially depends on the assumption that BE is a lexical predicate and not just a functional existential quantifier with no lexical content.

\[
(61) \quad [\text{BE}_{MEC}] = [\text{ANTIPAS}]([\text{BE}])
\]

In view of previous approaches to the syntax and semantics of MECs, the representation of the MEC-embedding predicate in (59) raises an obvious question: How does the MEC enter the derivation if the participant argument position is eliminated? The answer to this question should already be obvious from the preceding sections: the MEC enters the derivation in the position of the event extension argument of the BE predicate. It turns out that MECs have precisely the right properties in order for this to be possible. Firstly, they are relative clause-like in that they involve a gap bound by a wh-operator and for that reason they can be analyzed as properties (or, more precisely, relations between individuals and events). Secondly, they are typically in the infinitive or subjunctive—a dependent mood which is well fit to be selected by predicates with a modal component.

---

See Bok-Bennema (1991) for arguments that antipassivization is standardly accompanied by existential quantification.
Now that the background assumption about wh-semantics is settled, let us come back to MECs. Consider the following simple MEC example from Spanish.

\begin{equation}
\text{Spanish}
\end{equation}

\begin{equation}
\begin{array}{l}
Pablo\text{ tiene con quién hablar.} \\
Pablo\text{ has with who speak:INF} \\
\text{‘Pablo has somebody to speak with.’}
\end{array}
\end{equation}

For the sake of notational parsimony, I will abstract away from a lot of detail in the composite event semantics of the embedded predicate \textit{hablar (con) ‘speak (with)’} and treat it essentially as a predicate with more participant arguments. The two participant role predicates that it is associated with are represented as $\textit{Ag}$ (agent) and $\textit{With}$. For now, I sidestep the issue of how exactly the reference of the PRO is determined and will just assume that it is bound by the matrix subject ($\lambda z$). See §6.4 for discussion. The truth conditions of (62) are computed as follows. The MEC (node ①), denoting a relation between individuals and events, is selected by the MEC-version of the predicate \textit{BE} (node ②).

\begin{equation}
\begin{array}{c}
\text{with who}_1 \text{ PRO}_1 \text{ to speak t}_1
\end{array}
\end{equation}

The predicate existentially quantifies over the variable bound by the wh-word and equates this variable with the participant role of the existence predicate. The participant argument itself remains unrealized, due to the antipassivized nature of $\textit{BE}_E^\textit{MEC}$. The BeP is further selected by AT (node ④) as its extension argument and finally, the participant of AT—Pablo (node ⑨)—is introduced.

\begin{equation}
\begin{array}{c}
\text{with who}_1 \text{ PRO}_1 \text{ to speak t}_1
\end{array}
\end{equation}
The truth conditions of (62) are in $\Theta'$. The sentence is true in $w$ iff there is some $x$ in Pablo’s region in $w$ such that $x$ is in the state of being existent/available in $w$ and as a result, it is possible (if all circumstances are like in $w$) that Pablo speaks with $x$.

The exact same reasoning applies to other types of predicates, such as buy. In §4.3.3 I argued that the syntactico-semantic representation of these dynamic MEC-embedding predicates contains a silent be or have, expressing the result state. I proposed that the result state predicate can be of the ordinary (BE) as well as extended (BE$_E$) flavor. I take it to be a null hypothesis that this incorporation is quite mechanical, i.e. the predicate BE contained in buy is just like the predicate BE in isolation. (The only difference is their lexicalization.) There is nothing in principle that should prevent dynamic predicates from incorporating the antipassivized version of BE—BE$_E^{MEC}$.

Let us consider the Russian example below.

\[(64)\quad \text{Russian}\
\text{Dima kupil} \quad \text{ˇcem} \quad \text{pisat’.}\
\text{Dima bought something to write with.}’\]
Let us go through the steps of the semantic derivation. Like before, the MEC (node ❶) denotes a relation between individuals \( x \) and events \( e \), such that \( e \) is an event of writing, \( x \) is the instrument of that writing event, and there is some agent \( y \) in that event (I treat it as a variable for convenience; see §6.4 for discussion). This structure is selected by the MEC-embedding \( \text{BE} \) predicate (node ❹), which states the existence of some instrument of the embedded event \( x \). The resulting characteristic function (node ❾) is fed into the processual predicate \( \text{BUY} \) (node ❸). This predicate states that the existence state is an extension of some process of buying, in which \( \text{Dima} \) (node ❸) is active.

\[
\begin{align*}
\text{(65)} & \quad \begin{array}{ll}
0 & \quad \lambda w \lambda x \lambda e [\text{Write}(w)(e) \land \text{Inst}(e) = x \land \text{Ag}(e) = y] \\
1 & \quad \lambda w \lambda Q \lambda e \exists e' \exists x [\text{Exist}(w)(e') \land \theta(e') = x \land \exists w' \in C(w) : \\
& \exists e''[\text{Write}(w)(e'') \land \text{Inst}(e'') = y] \land e = e' \to e''] \\
2 & \quad \lambda w \lambda e \exists e' \exists x [\text{Exist}(w)(e') \land \theta(e') = x \land \exists w' \in C(w) : \\
& \exists e''[\text{Write}(w)(e'') \land \text{Inst}(e'') = z] \land \text{Ag}(e'') = y] \land e = e' \to e''] \\
3 & \quad \lambda w \lambda x \lambda e \exists e'' [\text{Buy}(w)(e'') \land \theta(e'') = z \land \exists e''' \exists e'' [\text{Exist}(w)(e'') \land \\
& \theta(e'') = x \land \exists w' \in C(w) : \exists e'''' [\text{Write}(w')(e'') \land \text{Inst}(e'') = x] \\
& \land \text{Ag}(e''') = y] \land e''' = e' \to e''] \land e = e''' \to e''''] \\
4 & \quad d \\
5 & \quad \lambda w \lambda e \exists e'' [\text{Buy}(w)(e'') \land \theta(e'') = d \land \exists e''' \exists e'' [\text{Exist}(w)(e'') \land \\
& \theta(e'') = x \land \exists w' \in C(w) : \exists e'''' [\text{Write}(w')(e'') \land \text{Inst}(e'') = x] \\
& \land \text{Ag}(e''') = y] \land e''' = e' \to e''] \land e = e''' \to e''''] \\
6 & \quad \lambda w \lambda e \exists e'' [\text{Buy}(w)(e'') \land \theta(e'') = d \land \exists e''' \exists e'' [\text{Exist}(w)(e'') \land \\
& \theta(e'') = x \land \exists w' \in C(w) : \exists e'''' [\text{Write}(w')(e'') \land \text{Inst}(e'') = x] \\
& \land \text{Ag}(e''') = y] \land e''' = e' \to e''] \land e = e''' \to e'''']
\end{array}
\end{align*}
\]

The node ❶ represents the truth conditions of (64). The sentence is true (in informal terms) iff there is an event of buying such that Dima is active in that event and such that the result of this event is the existence of some \( x \) and
it is possible (given that all circumstances are like in \( w \)) that \( x \) serves as an instrument in some event of writing. As discussed above for purpose clauses, this semantics can give rise to a pragmatic strengthening due to which the process of buying may be interpreted as being purposeful, where the goal to be achieved is the event of writing.

### 4.4.3 Conclusion

The semantics of sentences containing MECs falls out quite naturally from the previous discussion. MECs behave simply as possibility clauses, i.e. extension arguments of BE\(_E\). The only challenge that MECs present for the account is their “headlessness”, i.e. the lack of an overt participant argument. I formalized this property by applying a silent antipassive morpheme to the “transitive” BE\(_E\), giving rise to the “unaccusative” BE\(_EMEC\). As standardly assumed, the antipassivization process is accompanied by an existential closure of the backgrounded argument. Interestingly, this very fact gives rise to what has always been considered one of the core properties of MECs—their strictly narrow scope. In the present account, this property need not be stipulated, it falls out from an independently needed process of argument reduction. Notice also that the account lends support to the set of background assumptions introduced in \( \S \)4.2.2. Sentences containing MECs are, effectively, existential sentences that lack their core component—the nominal pivot. As far as I can see, getting rid of the pivot in theories where it is the main (or even the only) lexical component of existential sentences would be particularly difficult. In a theory like the one proposed here, i.e. a theory where the pivot is “just” an argument of a lexical predicate—the existence predicate—removing the pivot simply reduces to removing an argument.

### 4.5 Conclusion

At the beginning of this chapter, we were facing a problem inherited from previous analyses and stated particularly clearly in Chapter \( \S \)4. MECs appeared to be constructions that have no properties besides being A-bar constructions of the wh-type. The fact that this “minimal” style of analysis fails to account for two very specific but core properties of MECs—their distribution and their modality—clearly indicated that more needs to be said about the nature of MECs. The hypothesis I started out with is that the source of MECs’ highly specific behavior is the structure in which MECs are embedded. After all, this is precisely what we observe for other types of A-bar constructions like free relatives or wh-questions, whose syntax and semantics is based on the general A-bar pattern, but is further obligatorily specified by the selecting material: the D-head and the Qu-head respectively. In a similar fashion, I proposed the defining property of MECs is that they are embedded under a particular predicate—the existence predicate BE\(_E\), which manifests itself most clearly in the predicate.
available, but is present in all verbs whose result state corresponds to the existence of some object. The MEC is integrated into the structure of this predicate as its event extension argument, which is present in the argument structure by virtue of materializing a pragmatic inference of possible events.

The event-extension analysis has a range of welcome predictions, often quite detailed ones. Most of them will be discussed in the subsequent two chapters. For now, let me mention that it resolves the two long-standing open issues of MECs—distribution and modality—in a particularly elegant and non-stipulative way. It is the existence predicate that is responsible for both properties. MECs can only be selected by predicates that include the existence/availability predicate as their subpart, in particular as their result states. The existence/availability predicate is also responsible for the particular kind of modality used in MECs. The existence of objects makes it possible for some event (involving that object) to happen, it makes it by no means necessary. Moreover, the possibility is one that refers to the circumstances of the world rather than obligations (deontic modality), knowledge (epistemic modality), or other types of modal bases.

Another significant aspect of the event-extension analysis is that it attributes MECs a new place in the taxonomy of A-bar constructions. Perhaps even more interestingly, I found a construction which constitutes MEC’s immediate sister in the taxonomy, to the exclusion of all other A-bar constructions—the purpose clause. I argued that both MECs and purpose clauses share the structural description in (66)—the construction that I have throughout referred to as the possibility clause.

\[
(66) \quad \textbf{The possibility clause}
\]

\[
\begin{array}{c}
\text{BeP} \\
\vdots \\
\text{Be'} \\
\text{BE}_E \\
\text{CP} \\
\text{OP}_1 \\
\vdots \\
\text{tp}_1 \\
\end{array}
\]

The MEC and the purpose clause are subtypes of this construction. They differ in two important respects: (i) the MEC makes obligatory use of overt wh-operators, whereas the purpose clause makes obligatory use of an empty operator; (ii) the BE$_E$ that selects the MEC has a reduced participant argument slot, making the MEC what has been called “free” or “headless”\(^\text{27}\) whereas the BE$_E$ that selects the purpose clause uses a full-fledged argument structure. The two constructions are schematically represented below:

\(^{27}\text{However, see the discussion in §6.5 where I argue that Spanish MECs allow for their corresponding participant arguments to be overtly expressed.}\)
Interestingly, the shape of these two subtypes of the possibility clause are not completely arbitrary. All in which they seem to differ is the position where the restriction on the variable bound by the operator is expressed: the MEC uses the operator itself to do this, while the purpose clause relies on the participant argument. These two strategies do differ in their expressive power. Because of the restrictions on wh-word complexity (see §2.2.2), MECs are less flexible than purpose clauses in descriptive characterization of the object in existence. On the other hand, thanks to the overtness of the operator, MECs allow for sluicing (see §5.5 for discussion). Apparently, both subtypes of the possibility clause have their advantages and disadvantages. I have not yet been able to find out whether there are languages that have both the MEC and the purpose clause; however, there is no a priori reason why this should not happen.