ON THE EXPRESSION OF DURATION
AND TEMPORAL LOCATION THROUGH ADVERBIALS
CONTAINING PREDICATES OF AMOUNTS OF TIME[*]

Telmo Móia

*Faculdade de Letras da Universidade de Lisboa (tmoia@fc.ul.pt);
IMS, Universität Stuttgart (telmo@ims.uni-stuttgart.de)*

Abstract: In this paper, I discuss whether a clear-cut distinction between temporal measure and temporal locating adverbials can be drawn, taking into consideration the fact that some expressions are referred to in the literature as examples of overlapping of functions in one single phrase (e.g. *for the last two years*). I will defend that, except for indefinite expressions like *for two years*, which may express solely the duration of a situation, without locating it, all other adverbials containing predicates of amounts of time are locating expressions. What has to be taken into account is that some of them *inferentially* supply especially relevant information on the duration of the situations they locate.

Keywords: temporal adverbials, location, duration, categorisation, inference.

0. INTRODUCTION

I will discuss in this text aspects of the semantic analysis of non-punctual adverbials headed by a preposition (or a comparable expression[1]) that may have predicates of amounts of times as complements, or as part of their complements. I will concentrate on English *for-*, *during-* and *in-* adverbials, and their counterparts in German – *-lang*, *während-* and *in-*adverbials – and Portuguese – *durante-* and *em-*adverbials[2]. Henceforth, I will refer to them collectively as "*for-*, *during-* and *in-*type adverbials", or "FDI-adverbials", for short. Here are some examples:

(1)   *a.*   Mary has lived in Amsterdam {for two years / for the last two years}.
           A Mary viveu em Amsterdão {durante dois anos / durante os últimos dois anos}.
           Mary hat {zwei Jahre lang / während der letzten zwei Jahre} in Amsterdam
             gelebt.

     b.   Mary wrote this book {in two years / in the last two years}.
           A Mary escreveu este livro {em dois anos / nos últimos dois anos}.
           Mary hat dieses Buch {in zwei Jahren / in den letzten zwei Jahren} geschrieben.

The main issue I will be concerned with is whether a clear-cut **typology** of these adverbials can be defined, taking into consideration the fact that in some instances they are referred to in the literature as examples of (at least apparent) **overlapping of functions** in one single expression: location and temporal measurement of a given situation. Bennett and Partee (1978: 29), for instance, state that "in some cases, an adverbial phrase serves both as a durative adverbial phrase and as a frame adverbial phrase" (where "durative adverbial phrases" are those that "*indicate the duration of the described event* by specifying the length of time that it is asserted to take" – *ib.*, emphasis mine –, i.e. they correspond to Kamp and Reyle's (1993) "temporal measure adverbials"). As examples (among others, that are not relevant here), the authors give expressions like *for the last/next several hours* or *for the entire day*. Kamp and Reyle (1993: 650) also briefly discuss prepositional phrases containing a combination of a deictic adjective and a predicate of amounts of time – *for the last three years* –, and conclude: "their ambivalence seems to be unresolvable: they are locating phrases and measure phrases all in one"; more generally, these authors assume that "there are (...) adverbs which *simultaneously serve as location and as measure of the described eventuality*. So it is not easy to draw a

[1] German adverbials containing the expression *lang*, that does not classify as a preposition, will also be taken into account. For simplification of the exposition, however, I may ignore in some parts of the text the different (non-prepositional) status of *lang* and make a collective reference to the structures analysed as involving a preposition and a complement.

[2] In the structures analysed in this paper, *durante* covers the use of both *for* and *during*, in English, and *lang* and *während*, in German. The distribution of *for* and *lang*, on one hand, and of *during* and *während*, on the other hand, is not the same, as will be seen from the examples given – e.g. *for*, but not *lang*, takes complements containing a predicate of amounts of time combined with a deictical adjective: *for the last two years* vs. *die letzten zwei Jahre lang. I will not try to make in this (limited) study a description of the differences in distribution of the adverbials considered, although some of them will be referred along the text.

sharp dividing line between locating adverbs and measure adverbs." (Kamp and Reyle, *op.cit.*: 612-613, emphasis mine).[3]

I will try to show that the most economic and revealing typology of the adverbials in question is one that distinguishes just two basic categories – "temporal measure adverbials" and "temporal locating adverbials" (which is in fact a much wider class including also adverbials *that do not contain predicates of amounts of time*) – and places the so-called "ambivalent adverbials" in the second category. These two categories are essentially told apart by the fact that – in the latter, but not in the former – the predicates of amounts of time contained in the adverbials are combined with an expression that defines an interval of the time axis, which serves as a locating frame (cf. the basic concepts of temporal measure and temporal location of Kamp and Reyle (1993), described in next section). An important piece of evidence pointing in the direction of the analysis favoured here will be obtained by the proof that the information about duration conveyed by the so-called "ambivalent adverbials" is not directly asserted. In other words, I will hypothesise that inferentially extracted information about the duration of the located situation is what makes these adverbials look like ambivalent operators, but, as far as assertion is concerned, they are merely locating adverbials.

In order to discuss the issue at stake, I will take into account all the adverbials that include predicates of amounts of time, although not all of them may be considered ambivalent[4], as we will see. These include: (i) adverbials headed not only by the preposition *for* but also by *during* and *in* (and their counterparts in German and Portuguese); (ii) adverbials (headed by the above-mentioned prepositions) containing predicates of amounts of time in combination not only with deictic adjectives (like *last* or *next*) but also with relative clauses (*the two years Mary lived in Amsterdam*), prepositional phrases (*the two years of Mary's training course*), demonstratives (*those two years*), nuclear nominal expressions (*the two-year training course*), etc. A general view of this class may – I believe – give a clearer insight into the problem of the overlapping of functions.

A second question that will be briefly addressed in this paper – in section 3 – is the **ambiguity** of some adverbial phrases, that can, in certain contexts, be both locating and temporal measure adverbials. This ambiguity relates directly, as we will see, to the (lexical) ambiguity of nouns like *month, year*, etc. which can express both amounts of time ("units of time measurement") and specific parts of the time axis ("units of calendar time")[5].

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[3] In fact, Kamp and Reyle (1993) do not reject an analysis of these expressions as basically temporal measure adverbials: "the *contributions of for three years and for the last three years* are clearly distinct for one involves reference to an amount of time and the other reference to some particular interval. But on reflection this might well be a distinction without a difference. Intuitively, the roles which the two for-phrases play (...) seem very similar indeed. Both, it might be thought, have the function of determining the duration of the states they serve to characterise. That the phrase **the last three years** also specifies – supererogatorily, so to speak – the temporal location of those states does not alter this. Once we think of **the last three years** as a measure phrase (...)." (*ib.*: 650). The data presented here in section 2.3 shows that this view is untenable, once adverbials containing *the last three years* headed by prepositions other than *for* are taken into account.

[4] Despite the underlying criteria, it is not absolutely clear in the texts just mentioned which adverbials (containing predicate of amounts of times, which are the only ones I am concerned here with) are to be considered ambivalent. For instance, *for-* adverbials, but not *in-*adverbials, are mentioned there as ambivalent adverbials. However, given that the latter also convey (or rather, may convey) information on the duration of the situation described in the main clause (cf. (8)*a*, below), I think they would be considered as such

[5] The terms "unit of time measurement" and "unit of calendar time" are from Leech (1969). Cf. section 3.

1. SOME BASIC NOTIONS: TEMPORAL MEASURE *VS.* TEMPORAL LOCATION AND SUBTYPES OF TEMPORAL LOCATION

Before discussing the issue of the categorisation of FDI-adverbials, it is important to clarify the basic notions of temporal measure (or duration) and temporal location that I will assume, since these concepts are not unanimously defined in the literature[6]. Basically, I will adopt the view expressed in Kamp and Reyle (1993) that **temporal location of situations** involves the association of situations to intervals of the time axis, while **temporal measure of situations** involves the determination of the amount of time they last, irrespective of their position on the time axis.[7]

The formal difference between these two concepts in the DRT framework of Kamp and Reyle (*op.cit.*) is as follows. Temporal measure is associated with a one-place functor **dur**, that "maps intervals and eventualities [α] on the amounts of time [**mt**] they last" (*ib.*: 648). This functor occurs in the DRS's in conditions such as [**dur** (α) = **mt**], [**dur** (α) $\leq$ **mt**], and so on. Formally, amounts of time – one year, three months, ten seconds, etc. – are (or may be) conceived of as "equivalence classes of intervals (and/or eventualities) under some suitable relation of «equal duration»" (*ib.*)[8].

Temporal location involves relating a given situation (ψ) to a given interval (t) – called "location time" –, which is defined in many cases by adverbial means. I will consider the following two subtypes of location, which seem of particular relevance with respect to the issues discussed in this paper (NB: henceforth, I will use ψ to represent the situation described by the structure to which the FDI-adverbial applies):

A. ***durative location:***

- only for states and activities: [t $\subseteq$ ψ].

    The situation described (ψ) occurs throughout the location time (t).

    E.g.: "John has been ill *for the last two days*"; one interpretation of the sentences "it rained *during the party*" and "John was ill *during his visit to Paris*".

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[6] In some texts, this distinction – in particular between "duration" and "durative location" – seems not to be taken into account, judging by the fact that it is not reflected (for instance) in the classification of temporal adverbials. In Vlach (1993), for example, the class of "durative temporal adverbials" contains the expressions headed by *for, since, until, from-to* and *during*, that, in Kamp e Reyle (1993), are grouped into two different classes: "temporal measure adverbials" and "locating adverbials".

[7] Cf. Kamp and Reyle (1993): "(...) phrases [like *in an hour* or *for an hour*] are not locating adverbs in any sense. Their function is not to locate the described eventuality along the temporal axis, but to determine its duration, its "temporal size"." (p. 612); "Semantically, locating adverbials and measure adverbials play quite different roles. Locating adverbials help to locate the described eventuality in time, measure adverbials like **for an hour** or **in an hour** specify the duration of the eventuality but do not locate it" (p. 647).

[8] Cf. similar analysis in Dowty (1979: 332ff.): "I will treat phrases like an hour and six weeks as basic expressions denoting sets of intervals; that is, six weeks denotes, at any index, the set of intervals that have exactly six weeks' duration." (p. 333).

B.   **non-durative location:**

- for events (achievements or accomplishments): [$\psi \subseteq t$]

  The situation described (ψ) is completely included in the location time (t) (the term "inclusive location" is also sometimes used to refer to it – cf. Vlach (1993), for instance).

  E.g.: "John built a house *in 1980*", "John spent several hours in the Louvre *during his visit to Paris*".

- for states and activities: [ψ o t] and [$\neg[t \subseteq \psi]$]
  (cf. the schemes in (10); the symbol "o" stands for the overlapping relation)[9]

  The situation described (ψ) overlaps with the location time (t), but does not occur throughout it; it may exceed one of the borders of the location time – cf. Kamp and Reyle, 1993: 513).

  E.g.: one interpretation of the sentences "it rained *during the party*" and "John was ill *during his visit to Paris*".

2. THE CATEGORISATION OF FDI-ADVERBIALS CONTAINING PREDICATES OF AMOUNTS OF TIME

2.1. A two-class typology: (strictly) temporal measure adverbials vs. locating adverbials

As I said above, I think that a suitable categorisation of FDI-adverbials containing predicates of amounts of time (other types of FDI-adverbials will be considered later) is two-fold, distinguishing just between "temporal measure adverbials" and "temporal locating adverbials" (the latter including the so-called "ambivalent adverbials"). The dividing line is set by the fact that only the latter contains a combination of a predicate of amounts of time and another expression, which defines a locating frame on the time axis – e.g. *the last ten days*. Given that this combination results normally in a definite expression (at least when the predicate of amounts of time is in a nuclear position), the definiteness of the complement of the preposition ends up playing a crucial role in determining what the (basic) function of the adverbial is. According to what has been said, I am inclined to think that the following two basic categories constitute an appropriate partition of the class of FDI-adverbials containing predicates of amounts of time[10]:

> *A. (strictly) temporal measure adverbials;*
> *B. temporal locating adverbials.*

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[9] In combination with descriptions of atelic situations, certain locating adverbials only allow a durative reading (e.g. adverbials with *throughout*), whereas others allow both a durative and a non-durative reading (e.g. adverbials with *during, durante* and *während*). With respect to the latter, it is possible to represent their contribution to the location of ψ via a single condition – [ψ o t] –, that subsumes the durative and the non-durative interpretation. The strategy of not distinguishing the two readings in the representation is adopted, for instance, in Kamp and Reyle (1993) (cf. their analysis of *on Sunday* – p. 513ff.). Here, I choose to tell apart the two types of temporal location, since it is relevant for the issue under consideration.

[10] Note that adverbials headed by *during* seem to belong only in the second category (i.e. they are not used as strictly temporal measure adverbials) and adverbials with *lang* seem to belong only in the first.

Class A contains the adverbials with *indefinite* complements of the form [QN], where "QN" represents a predicate of amounts of time – e.g. *seven hours, two months*[11]. These adverbials may express solely the duration of a situation, without locating it. In DRT terms, they contribute to the DRS's of the sentences in which they occur the discourse referent in (2)*a* and the conditions in (2)*b-c*:

(2) *a.* mt   (amount of time specified by [QN])
     b. [QN (mt)]
     c. [dur (ψ) R mt] (where $R \in \{=, >, \geq, <, \leq\}$)

The following two sentences (in the interpretation given in the subsequent paraphrase) contain this type of adverbials:

(3) *a.* Mary read this book *in two months*.
          Paraphrase: "it took Mary an amount of time of two months to read this book".
     b. Mary was in her office *for seven hours*.
          Paraphrase: "Mary was in her office for an amount of time of seven hours".

Class B includes all other FDI-adverbials that contain predicates of amounts of time. Among them, the adverbials with *definite* complements of the form [(*the*) P QN] or [(*the*) QN P], where the predicate of amounts of time ("QN") is in a nuclear position and "P" represents properties of an interval of time, directly or indirectly (through reference to a situation); "P" may be instantiated by a deictic or anaphoric adjective, a relative clause, a situational or temporal PP, or a demonstrative – e.g. *the last/previous two years, the two years Mary lived in Amsterdam, the two years of Mary's training course, the two years between March 1980 and March 1982, those two years.*[12]

These expressions are always **locating adverbials**, although they contain an expression – the [QN] part of the complement – that represents an amount of time; the crucial thing to notice is

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[11] They consist typically of a combination of a noun that represents units of time measurement – like *hour, day, year,* etc. – with a cardinal quantifier (NB: quantifiers like *few* or *many* may be used, in which case the amount of time involved is only vaguely determined). They may also be more complex – as *many years as ..., so many years that... –* and/or contain different nuclear structures – *an eternity, a (very) long time, the same time, so long that...* Some of these expressions determine the amount of time only vaguely (*a long time*); others may (but need not) determine it precisely, but in an indirect way, via an anaphoric connection (*the same time*) or via reference to the (possibly unspecified) duration of another situation (*as many years as...*).

[12] Notice the following:

(i) the expressions containing a combination of a predicate of amounts of time and a deictic or anaphoric adjective (such as *last, next, previous* or *following*) define an interval by referring to a specific point on the time axis – through the deictic/anaphoric adjective – and stating a quantity of time stretching forwards or backwards from it – through the predicate of amounts of time; consequently, in these structures, the predicate of amounts of time is essential to the definition of the locating interval, no other of its properties being referred to;

(ii) the expressions containing a combination of a predicate of amounts of time and a relative clause, or a situational or temporal PP define an interval on the time axis by referring to a given situation that occurs in it, or by referring to purely temporal properties of it, such as its boundaries; since this situation, or these temporal properties, define the locating interval uniquely, the predicate of amounts of time (contrary to what happens in the previous case) states a property of that interval that is not essential to its definition;

(iii) demonstratives may anaphorically refer to intervals specified in both these ways.

that *this amount of time represents the size of the location time, not the duration of the situation represented in the main clause* (cf. (4)*d* below). In DRT terms, they contribute to the DRS's of the sentences in which they occur the discourse referents in (4)*a-b* and the conditions in (4)*c-f*:

(4) *a.* mt — (amount of time specified by [QN])

b. t — (interval that serves as "location time" for ψ, appearing in conditions of the form [ψ ⊆ t] – inclusive location – or [t ⊆ψ] – durative location –, for instance)

c. [QN (mt)]

d. [dur (t) R mt] — (a condition defining the size of the location time; **R** is as in (2)*c*)

e. [P (t)] — (abbreviation that stands for one or more conditions imposing restrictions on t, triggered by the predicates – adjectives, relative clauses, etc. – contained in these adverbials);

f. [ψ ⊆ t], [t ⊆ ψ], or a similar condition — (temporal location condition, varying according to the preposition and the aktionsart of ψ)

The following two sentences (in the interpretation given in the subsequent paraphrase) contain this type of adverbials:

(5) *a.* Mary read this book *in the last two months*.
  Paraphrase: "Mary read this book within the period stretching backwards from the utterance time two months".

b. Mary has been in her office *for the last seven hours*.
  Paraphrase: "Mary was in her office during the whole of a period stretching backwards from the utterance time seven hours".

This second class of locating adverbials also includes FDI-adverbials containing predicates of amounts of time in a non-nuclear position, i.e. with complements of the form [(Det) P QN] or [(Det) QN P], where "QN" is as above and occurs in a subordinate position within the NP and "P" is a nominal expression containing the head of the complement – e.g. *the two-hour (history) exam*.[13] These adverbials are on a par with those referred above (within class B) in the aspects which are relevant to this discussion (cf. (7)*c* below), but need be distinguished, since they may also occur with indefinite complements (*a two-hour exam, two-hour exams*).

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[13] As some of the adverbials mentioned before (cf. previous footnote), (i) these adverbials define an interval on the time axis by referring to a given situation that occurs in it and (ii) the predicate of amounts of time they contain states a property of this interval that is not essential to its definition. (Note, however, that the last statement is true only if the predicate of amounts of time is not used as a modifier of the head noun; if it used as a modifier , than it contributes to identifying the situation referred to and, through it, the location time – cf. *the* two-hour *exam was easy, but the* four-hour *exam was complicated*.) The specificity of these structures is that the complement of the preposition refers directly not to an interval of time but rather to a situation (δ), whose temporal location is taken as the locating interval ([t = loc (δ)]). Note still that, since the predicate of amounts of time does not state a property essential to the definition of the location time and does not occupy a nuclear position, it may be omitted without changing the truth value of the sentence.

2.2. Locating adverbials and inferred duration of situations

Note that I included in class B the adverbials referred in the literature as involving overlapping of functions – location and temporal measure –, and therefore as ambivalent temporal adverbials. I assume, therefore, that they should be regarded as basically locating (or frame) adverbials. As I already said, an important piece of evidence pointing in this direction will be obtained by the proof that the information these adverbials convey about the duration of the described eventuality is not directly asserted. An argument in favour of this view is, hopefully among others, the effect of negation with sentences exhibiting the so-called ambivalent operators at stake, which shows that, given a true negative sentence, the falsity of the corresponding positive necessarily carries over to the temporal location predication, but not to the temporal measurement, which can still apply[14]. Observe that the first, but not the second, of the following two sequences is a contradiction (NB: take the end of 1997 as utterance time):

(6) *a.* Mary hasn't lived in Amsterdam for the last three years, but she has lived
           in Amsterdam *throughout 1995, 1996 and 1997.* [contradiction]
     b. Mary hasn't lived in Amsterdam for the last three years, but she has lived
           in Amsterdam *for (at least) three years.*

If this trend can be pursued, the information about duration at stake can be treated in terms of well-known inferential mechanisms that impregnate numerous domains of natural language semantics. The required inferential reasoning is based on the (locating) relation between ψ and t and on the explicit definition of the size the location time t (by the predicates of amounts of time contained in the adverbials). In these terms, the measure function of these adverbials is "subsidiary" (cf. opposite view in Kamp and Reyle, mentioned here in footnote 3) since it is directly related to – and dependent on – the locating conditions they are associated with. The following two types of location seem of particular relevance with respect to inferences about the duration of ψ:

(7) *durative location of states/activities*[15]: $[t \subseteq \psi] \rightarrow [\text{dur} (\psi) \geq \text{dur} (t)]$
     (NB: if the location is exact – i.e. $[\text{loc} (\psi) = t]$ –, which, for Gricean reasons, is in many cases the preferred reading, then an inference about the *exact* duration of the situation described in the main sentence is obtained: $[\text{loc} (\psi) = t] \rightarrow [\text{dur} (\psi) = \text{dur} (t)])$

(7) *a.* Mary was ill for the last two months.
           $\rightarrow$ Mary was ill for at least two months.

     b. Mary was in Paris for the two years John lived in Amsterdam.
           $\rightarrow$ Mary was in Paris for at least two years.

     c. Mary was in a bad state during the whole two-hour exam.
           $\rightarrow$ Mary was in a bad state for at least two hours.

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[14] This argument was given to me by João Peres.

[15] *for*-adverbials (contrary to *during-, durante-,* or *während*-adverbials) seem to express only this kind of location.

(8) *inclusive location of events*: $[\psi \subseteq t] \to [dur (\psi) \leq dur (t)]$

(8) *a.* Mary wrote this book in the last two months.
$\to$ Mary wrote this book in at most two months.

In sum, I hypothesise that inferentially extracted information about the duration of the located situation is what makes these adverbials look like ambivalent operators, but, as far as assertion is concerned, they are merely locating adverbials.

2.3. Advantages of the two-class typology

I take it that some positive consequences can be drawn for an interpreted grammar from the typology proposed here (as opposed to a three-class typology, distinguishing the so-called "ambivalent operators"). The first is the possibility of classifying all the expressions referred to in B in the same category, regardless of the types of sentences in which they occur, rather than in different categories according to some characteristics of those sentences. This has to do with the existence of structures where (some of) these expressions clearly do not contribute information about the temporal size of the situation they locate (although, in other contexts, they may behave as ambivalent operators). The existence of such structures (I will refer to two of them below) clearly precludes a unified classification of the adverbials in B as ambivalent temporal measure-temporal location adverbials.

One structure where adverbials of class B (although containing predicates of amounts of time that explicitly define the size of the location time) do not behave as ambivalent operators involves the non-durative location of states and activities (cf. definition in the end of section 1); mainly *during-*, *durante-* and *während*-adverbials occur in these structures. Consider the following sentences in their non-durative reading:

(9) *a.* Mary was ill during the last two months.[16]
A Mary esteve doente durante os últimos dois meses.
Mary war während der letzten zwei Monate krank.

b. Mary was ill during the two months she was travelling through Europe.
A Mary esteve doente durante os dois meses em que esteve a viajar pela Europa.
Mary war während der zwei Monate, in denen sie durch Europa gereist ist, krank.

In the referred reading, these sentences do not seem to exclude an interpretation where the state of Mary being ill exceeds one of the borders of the location time. For sentence (9)*b*, for instance, this would be the case if Mary had fallen ill somewhere within the two months she

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[16] On the ambiguity of *during* – as durative or non-durative locating adverbial – in this type of structures, see, for instance, Quirk *et al.* (1985: 536, fn. [b]):
"(...) phrases with *during* are ambiguous (...):
He'll be staying here *during the next month.*
The adjunct here could either mean 'for some period falling within the month' or 'for the whole of the month'."

was travelling through Europe and continued to be ill in some period following (and abutting) that period, as is made explicit in the following discourse:

(9) *b'*. Mary was ill during the two months she was travelling through Europe. In fact, she fell ill in the last week of her vacation and it took her several months to recover.

In general, the non-durative location of atelic situations is compatible with any of the following schemata[17] (although contextual information may exclude some possibility):

(10) |---------------t---------------|
(i) |-----------ψ-----------|
(ii) |-----------ψ-----------|
(iii) |--------ψ--------|

Consequently, when expressions such as *during the last two months* are used to locate atelic situations non-duratively, no inference about the duration of the situation represented in the main clause can in principle be drawn – unless the interpretation of scheme (10)(iii) is imposed on the context, in which case an inference like (8) is valid (this is in contrast to what happens when they are used to locate situations duratively, in which case an inference like (7) is valid):

(11)   Mary was ill during the two months she was travelling through Europe.
         (non-durative)
         -/→ Mary was ill for (at most / at least) two months.

Since in these cases we do not (necessarily) have temporal measure – not even inferred – of the situation represented in the main clause, the adverbials at stake do not seem to qualify, under any criteria, as temporal measure ones. This fact seems clearly due to the specificity of the temporal location of atelic situations, rather than to the adverbials themselves. So, classifying all definite FDI-adverbials as locating and considering its temporal measure function as a parallel function that may or may not be "in force" (depending on the type of location) allows a unified treatment of expressions like *during the last two months*. Otherwise, these expressions would have to be grouped into two different classes – strictly temporal locating or ambivalent –, merely depending on the type of location represented in the sentence in which they occur.

A second type of structure where adverbials of class B do not behave as ambivalent operators involves their use in the (inclusive) location of punctual situations; *in-/during-, em-/durante-* and *in-/während-*adverbials occur in these structures. Observe the following sentences:

(12) *a.* Mary fell ill {in / during} the last two weeks. I don't know exactly when.
           A Mary adoeceu {em / durante} as últimas duas semanas. Não sei exactamente quando.

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[17] Cf. observations of Kamp and Reyle (1993: 513-514) on "the question how a described state can relate to the time denoted by the temporal adverb", and in particular on the non-durative reading of sentence *Mary was ill on Sunday*.

Mary ist {in den / während der} letzten zwei Wochen krank geworden. Ich weiß nicht genau wann.

b. Mary accidentally found a coin {in / during} the two hours she was walking on the beach.
A Mary encontrou acidentalmente uma moeda {em / durante} as duas horas em que esteve a passear na praia.
Mary hat {in den / während der} zwei Stunden, in denen sie am Strand gelaufen ist,züfällig eine Münze gefunden.

When the located event is punctual, the (possible) inferences about the (maximal) duration of ψ are totally irrelevant, since punctual events are conceived of as having no duration. Therefore, it would be odd to classify such adverbials as ambivalent locating-measure adverbials in these cases, given that its measure function is, so to speak, void. Note, incidentally, that the combination of achievements with strictly temporal measure adverbials is ungrammatical, unless some aktionsart shift mechanism (cf. Moens, 1987) converts these punctual events into extended ones. Contrast, for instance, (12)*b* with the following ungrammatical sentences:

(13)   *Mary accidentally found a coin in two hours.
*A Mary encontrou acidentalmente uma moeda em duas horas.
*Mary hat in zwei Stunden züfällig eine Münze gefunden.

The categorisation proposed here has the advantage of not requiring the classification of adverbials like *in the last two months* sometimes as ambivalent (cf. (8)*a*), sometimes as only locating (as in (12)), merely according to the aktionsart nature of the structures to which they apply.

Another favourable result of classifying the so-called ambivalent adverbials (or more generally, all the definite FDI-adverbials containing predicates of amounts of time) in a category that is clearly distinct from that of temporal measure adverbials is the possibility of better accounting for important linguistic differences between these two groups of adverbials. Observe the following sentences:

(14) *a.* Mary was ill {for / *during / *in} five days.
A Mary esteve doente {durante / *em} cinco dias.
Mary war {fünf Tage lang / während fünf Tagen / *in fünf Tagen} krank.

b. Mary was ill {for / during / ?in} the last five days.
A Mary esteve doente {durante / em} os últimos cinco dias.
Mary war {*die letzten fünf Tage lang / während der letzten fünf Tage / in den letzten fünf Tagen} krank.

(15) *a.* Mary wrote two essays {*for / *during / in} five days.
A Mary escreveu dois artigos {*durante / em} cinco dias.
Mary hat {*fünf Tage lang / *während fünf Tagen / in fünf Tagen} zwei Aufsätze geschrieben.

> *b.* Mary wrote two essays {*for / during / in} the last five days.
>
> A Maria escreveu dois artigos {durante / em} os últimos cinco dias.
>
> Mary hat {*die letzten fünf Tage lang / während der letzten fünf Tage / in den letzten fünf Tagen} zwei Aufsätze geschrieben.

Notice the differences concerning:

(i) the aktionsart restrictions connected to the use of each preposition (or heading expression)

As is well-known, in English − and in many other languages, such as German and Portuguese − the preposition (or the expression) that heads a (strictly) temporal measure phrase is conditioned by the aktionsart of the situation that is being measured: *for* is used for atelic situations and *in* for accomplishments (in Portuguese, *durante* and *em*, and in German *lang/während* and *in*, are, respectively, used) − cf. sentences *a*. These selectional restrictions seem not to apply to (i) definite *in*-adverbials, and their German and Portuguese counterparts, which are compatible with descriptions of atelic situations[18] − cf. (14)*b* − and (ii) definite *durante-* and *während-* adverbials, which are compatible with descriptions of telic situations − cf. (15)*b*.

NB: the contrast between (12) and (13) above illustrates another (general) difference concerning aktionsart restrictions: definite (*in-*)adverbials combine with descriptions of *achievements*, whereas the strictly temporal measure (*in-*)adverbials do not.

(ii) the set of prepositions (or expressions) that may head these adverbials

The preposition *during* cannot be applied directly to expressions denoting predicates of amounts of times (i.e. it seems not to be able to head strictly temporal measure adverbials) − cf. English sentences *a*. However, it may head definite FDI-adverbials containing predicates of amounts of time, and, furthermore, exhibits no aktionsart restrictions parallel to those of *in* and *for* in (strictly) temporal measure adverbials − cf. English sentences *b*.

The expression *lang* (contrary to what happens with preposition *for*) can only occur in (strictly) temporal measure adverbials (in the type of structures considered); its *combination with definite adverbials containing predicates of amounts of time leads to* ungrammaticality − cf. German sentences *b*.

I think that the differences in behaviour between strictly temporal measure adverbials and those that I am here classifying as locating adverbials (containing predicates of amounts of time) are possibly accounted for in a simpler way by assuming that they belong to completely distinct *independent categories.*

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[18] English sentences seem to be (slightly) odd, according to some speakers consulted, although they are good in the interrogative version: ?*Mary was ill in the last five days* vs. OK*Was Mary ill in the last five days?*.

Yet another possible advantage of the categorisation proposed here is the possibility of a unified analysis – as members of the same class (of locating expressions) – of adverbials that differ only with respect to the presence of a predicate of amounts of time explicitly defining the size of the location time, as those in the sentences below.

(16) *a.* I was in Paris for/during the two years Mary lived in Amsterdam.
    b. I was in Paris ?for/during the period Mary lived in Amsterdam

(17) *a.* I was in a bad state during the (whole) two-hour exam.
    b. I was in a bad state during the (whole) exam.

Note that the adverbials in *b* – contrary to those in *a* (in the durative reading) – cannot be taken as ambivalent operators, since no information about the duration of ψ is conveyed.

A final advantage is the possibility of a unified categorisation of the "ambivalent" adverbials that contain predicates of amounts of time and the locating adverbials that – although not containing this type of predicates – also have a (clearly "subsidiary") measure function.

(18) *a.* Mary wrote this paper in the first two months of the year.[19]
    → Mary wrote this paper in (at most) two months.
    b. Mary wrote this paper in July and August.
    → Mary wrote this paper in (at most) two months.
    c. Mary was ill during the summer of 1980. (in the durative reading)
    → Mary was ill for (at least) three months.
    d. Mary built a house in the summer of 1980.
    → Mary built a house in (at most) three months.
    e. Mary wrote a letter to her boyfriend during the football game.
    → Mary wrote a letter to her boyfriend in (at most) ninety minutes.
       (if the match had no extra-time)

All the adverbials in these sentences allow, in some way or other, inferences about the duration of the situation described in the main clause[20]. They show that the inferential mechanisms alluded to before are not restricted to the adverbials containing predicates of amounts of time, but rather involve a much wider range of temporal adverbials (including some that are normally referred to as merely locating or frame adverbials). The specificity of those that contain predicates of amounts of time is simply that they state explicitly the size of the locating interval, whereas with other adverbials (cf. (18)) that information is obtained in a different way (e.g. via the lexical content of the temporal nouns, or via world-knowledge of the typical duration of certain situations).

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[19] This sentence does not contain a predicate of amounts of time; the noun *month* represents here "months of the calendar" and not "units of time measurement" (cf. note 22).

[20] Note, though, that they are not classified as "ambivalent operators" in the texts mentioned. Cf., however, Bennett and Partee (1978) for a relatively wide concept of "ambivalent adverbials", including some expressions that do not contain predicates of amounts of time.

3. AMBIGUOUS TEMPORAL MEASURE / TEMPORAL LOCATING ADVERBIALS

It has been noted that nouns like *day*, *month* or *year* are ambiguous[21], representing either specific sectors of the time axis or quantities of time, which are independent of position on the time axis. This corresponds to the opposition "unit of calendar time" (UCT) / "unit of time measurement" (UTM) – in Leech's (1969) terminology[22] – or "predicate of times" / "predicate of amounts of time" – in Kamp and Reyle's (1993) terminology (henceforth, I will use the terms "UCT-nouns" and "UTM-nouns" to distinguish them). A sequence like *two months*, for instance, is ambiguous, and can represent either (i) sets of two months of the calendar, i.e., intervals that have specific beginnings and ends (January, February,...), or else (ii) a time duration (property of intervals), i.e. periods of sixty days, irrespective of where they begin and end, or even irrespective of their (des)continuity.

This lexical ambiguity may lead to ambiguity at the level of the adverbials containing this type of nouns. A sequence like *in the last two months*, for instance, may have two different readings: (i) "in the sixty days that precede the utterance time (note that this period may overlap three different months of the calendar)", if *month* is taken as an UTM-noun; (ii) "in the two calendar-months that precede the utterance time", if *month* is taken as an UCT-noun. Note that, in the typology proposed here, this adverbial would be categorised as a temporal locating adverbials in both cases[23]. However, there are (more interesting) cases where the category of the adverbial changes according to the homonym that is chosen. These cases involve a combination [preposition-quantifier-noun], as in the sequence *in two years*. I will consider them here in some more detail, since their distinction is relevant for the clarification of the typology proposed in this text.

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[21] It has also been noted that the ambiguity at stake seems more salient with nouns like *day*, *month* or *year* – that can be designated by single proper or common nouns (*Monday, January, 1980,...*) – than with nouns like *second, minute* or *hour* (these generally representing units of time measurement, rather than units of calendar time). Therefore, a sequence like *in two years*, for instance, is more likely to be taken as ambiguous than *in two hours*.

[22] Leech (1969: 113-114): "(...) nouns like *hour* and *day* can designate either (a) units of time measurement, or (b) units which not only have a given length, but also begin and end at a given point. A 'year' in the first sense (*e.g.* in 'twelve years ago') is any period of twelve months; a 'year' in the second sense (as in 'this time last year') not only consists of twelve months, but begins on Ist January.".

[23] In Kamp and Reyle's system, which I basically assume here, the adverbials containing nouns of calendar time as heads are locating and not temporal measure, since they represent sectors of the time axis (they occur in conditions of the type [month (t)] or [year (t)], rather than [Q months (mt)] or [Q years (mt)]). However, as results from the relationship between an x-unit of calendar time and its homonymous x-unit of time measurement, inferences about the duration of the described eventualities may also be derived generally from the use of this type of adverbials (and so, they may also have a general behaviour as "ambivalent operators" – cf. (18)*a*). This relationship is as follows: a unit of calendar time represented by x has always the duration expressed by the homonymous unit of time measurement, while a unit of time measurement represented by x can be associated with sectors of the time axis other than the one represented by the homonymous unit of calendar time. In other words, a month-unit of calendar time, for instance, has always the duration of one month, but a month-unit of time measurement can apply to intervals that are not months of the calendar (e.g. to the period between March 15, 1980 and April 15, 1980). So, the following inference rule (where N is a predicate of times like *month, year*, etc. and N' its homonymous predicate of amounts of time) applies:

(i) $[N (t)] \rightarrow [[dur (t) = mt] \wedge [N' (mt)]]$

The ambiguity at stake is more salient with telic sentences with *in* (and its German and Portuguese counterparts)[24], but it also occurs with atelic sentences with *durante* and *während* (although not with *lang*); it does not occur with atelic sentences in English, because different prepositions are used for "UCT-nouns" and "UTM-nouns" (*during* and *for*, respectively). Observe the following sentences, where *months* may be ambiguously interpreted:

(19) *a.* Mary made a trip around France *in* two months [UCT or UTM].
       A Mary fez uma viagem pela França *em* dois meses [UCT or UTM].
       Mary hat *in* zwei Monaten eine Reise durch Frankreich gemacht [UCT or UTM].

     b. Mary was employed in this company {*during* two months [UCT] /
           for two months [UTM]}.
       A Mary esteve empregada nesta firma *durante* dois meses [UCT or UTM].
       Mary war {*während* zweier Monate [UCT or UTM] / zwei Monate *lang* [UTM]}
           in dieser Firma angestellt.

Note, incidentally, that, when the head noun represents units of calendar time, the quantifier may imply quantification over the eventualities represented in the main sentence (cf. reading B1 below) or not (cf. reading B2 below). So, a sentence like (19)*a* can in principle have (at least) the following three readings:

    A.   It took Mary an amount of time of two months to make a trip around France;
    B1.   Mary made a trip around France in each of two different months of the calendar
          – March and August, for instance (i.e. there are at least two trips involved);
    B2.   Mary made a trip around France in a period formed by two months of the
          calendar – March and April, for instance (i.e. it is possible that no more than
          one trip was made in the period referred by the temporal adverbial).

The two readings B seem much less prominent than the reading A; B2, in particular, appears very marginal. However, these types of readings seem not to be completely ruled out, provided an appropriate context is given (and especially if a specific reading of *two months* is involved). Observe the following sentences with *in two months* (or a Portuguese or German counterpart), that explicitly suggest a reading like B1 (sentences *a*) or B2 (sentences *b*)[25]:

(20) *a.* There is a "Kleines Oktoberfest" in München in July. So, this year the Oktoberfest
          will take place *in two months* (July and October).
       Vai haver uma "Kleines Oktoberfest" em Munique em Outubro. Por isso, este ano
          a Oktoberfest realiza-se *em dois meses* (Julho e Outubro).
       Es gibt ein "Kleines Oktoberfest" in München im Juli. Also, wird dieses Jahr das
          Oktoberfest *in zwei Monaten* (Juli und Oktober) stattfinden.

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[24] Several factors, that I will not consider here, may affect this ambiguity: for instance, when combined with a quantifier like *less than one*, a noun like *month* expresses (in principle) units of time measurement, and the adverbial containing this combination is, therefore, only a temporal measure one – e.g. *Mary read this book in less than one month*; on the other hand, the "calendar time-reading" may be made more salient, or even the only one available, by the use of certain operators, such as the adjective *different*, or the quantifier *both* – e.g. *Mary read this book {in two different months / in both months}.*

[25] For some speakers, the addition of an adjective like *different*, or the inclusion of an apposition specifying the relevant months involved, considerably improves the grammaticality of the sequences.

    b. (?)If the Oktoberfest started this year in September, it would for the first time take place *in two months* (September and October).

        (?)Se a Oktoberfest começasse este ano em Setembro, realizar-se-ia pela primeira vez *em dois meses* (Setembro e Outubro).

        (?)Wenn dieses Jahr das Oktoberfest im September anfangen würde, würde es zum ersten Mal *in zwei Monaten* (September und Oktober) stattfinden.

Note also that readings parallel to B1 and B2, above, are unproblematically obtained in sentences where the *in*-adverbial contains "calendar terms" integrated in clearly definite complements (not homonymous of temporal measure phrases), or proper names of months. The following sentences have clearly two readings: one involving necessarily (at least) two trips – one in each of the relevant two months –, the other involving (possibly only) one trip – in the two-month interval referred:

(21) *a.* Mary made a trip around France in July and August.

     b. Mary made a trip around France in the first two months of the year.

     c. Mary made a trip around France in those two months.

     d. Mary made a trip around France in the last two months.

4. CONCLUSION

Briefly, I have claimed here that the best typology of FDI-adverbials is one that considers just two basic categories: (strictly) temporal measure adverbials, including those that merely contain a predicate of amounts of time as complement, and locating adverbials, including all the others. The distinction of subtypes of the latter is certainly required to account for several linguistic differences among members of the class, some of which were pointed out along the text – e.g. (i) differences with respect to the inferences about the duration of the situations described in the main clause: the subtype of locating FDI-adverbials containing predicates of amounts of time generally – with some exceptions analysed – allows such inferences, whereas the others may not; (ii) differences in the distribution of the various prepositions (these seem to require quite fine-grained distinctions, whose definition is beyond the scope of this study). I have tried to show that a postulated third subclass of ambivalent adverbials (simultaneously temporal measure and temporal locating) is not only unnecessary – once some general inferential patterns are acknowledged – but also disadvantageous, inasmuch as reduces the generalisation power of the system, by precluding a homogeneous characterisation of closely related groups of adverbials.

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