THE GRAMMATICAL PROPERTIES OF *SINCE*[*]

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ABSTRACT. In this paper, I compare the grammatical properties of English *since* PPs, which have been analysed as perfect-level adverbials (Iatridou et al. 2001), with Catalan *des de* PPs. I argue against the claim that prepositions like *since* are ambiguous between a universal and an existential interpretation and show that an analysis based on the grammatical restrictions imposed by the temporal path denoted by *des de* or *since* determine the available readings of PrP sentences modified by *desde* or *since*.

Keywords. Present perfect, *since*, universal, existential

RESUMEN. En este artículo, comparo las propiedades gramaticales del complemento introducido por la preposición *since* en inglés, el cual ha estado analizado como un complemento adverbial del perfecto (Iatridou et al. 2001), con el complemento temporal encabezado por *des de* en catalán. Argumento en contra de la idea que el pretérito perfecto compuesto o las preposiciones como *since* son ambiguas entre una interpretación universal y existencial. Demuestro que un análisis basado en las restricciones gramaticales impuestas por la trayectoria temporal denotada por *des de* y *since* determina las lecturas de las oraciones de perfecto modificadas por este tipo de complementos en ambas lenguas.

Palabras clave. Pretérito perfecto compuesto, *desde*, universal, existencial

1. Introduction

There are three readings that have been traditionally posited in the literature on the perfect (Comrie 1976): the universal, the existential and the resultative. These readings are also available in Catalan, i.e., there are instances of an extistential, see (1a), a universal, see (1b), and a resultative reading, see (1c) (examples from Pérez Saldanya 2002: 2590-2591).

(1)   a. En Pere ha   estat a Chicago.
         the Pere have.3sg   been to Chicago
         'Peter has been to Chicago.'
    b. Sempre hem   viscut en aquest poble.
         always have.1pl lived   in this   town
         'We have always lived in this town.'
    c. En Pere se   n' ha   anat a Chicago.
         the Pere refl cl have.3sg   gone to Chicago
         'Pere has gone to Chicago.'

Catalan has also another reading which English does not have, i.e., the so-called hodiernal[1] reading (see Curell 1990, 2002, 2003; Curell & Coll 2007; Giorgi & Pianesi 1997; among others), cf. (2a) (from Pérez Saldanya 2002: 2593) and (2b).[2]

(2)   a. Hem   anat al   mercat avui a   lesdeu.
          have.1pl gone to.the   market today in the ten
       'We went to the market today at ten.'
    b. *We have gone to the market today at ten.

This paper focuses on universal and existential readings of PrP sentences, in particular, on PrP sentences modified by *since* PPs. I investigate whether the different components of the *since* Prepositional Phrase (PP), the prototypical perfect time adverbial in English, contributes to the availability of the existential or universal reading in English as well as in Catalan. The ambiguity between the universal and existential reading of the PrP of a sentence such as (3) in English has been amply discussed in the literature (example from Mittwoch 1988: 201).

(3)   Sam has been in Boston since Tuesday.

The example illustrated in (3) may have a universal reading, i.e., the eventuality stretches from Tuesday up to now, or allow for an existential reading, i.e., the eventuality of being in Boston may be located at some interval between *Tuesday* and now. Such an existential interpretation is enforced in (4) (from Iatridou *et al*. 2001: 169).

(4)   Since 1991, I have been to Cape Cod only once, namely, in the fall of 1993.

However, as Móia (2000a, 2001) points out for the case of Portuguese and their equivalents in Romange languages, and Martínez-Atienza, for the case of Spanish (2006, 2010), the existential interpretation with atelic predicates available in (3) does not arise in Romance languages. Example (5) only admits a universal interpretation:[3]

(5)   He   viscut a Boston des de   2000.
      have.1sg lived   in Boston since   2000
    'I have lived in Boston since 2000.'

The existential interpretation in PrP sentences modified by *des de*-phrases is always enforced by numerically quantified phrases (see Móia 2000a, 2001 for the case of Portuguese and other Romance languages; García Fernández 2000 and Martínez- Atienza 2006, 2010 for the case of Spanish), see (6).

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[1] From latin *hodiernus* 'fom the day of today' derived from *hodie* 'today' (Dahl 1985; NGRAE 2009).

[2] The hodiernal reading has been also attested in Standard Peninsular Spanish, in Limouzi, an Occitan dialect (Comrie 1985), in the Florentine dialect (Bertinetto 1986: 405) and in seventeenth-century French.

[3] The 'universal' and 'existential' readings correspond to the 'durative' and 'non-durative' readings, respectively, in Móia (2000a, 2001). Martíne-Atienza (2006, 2010) refers to these readings as 'universal' and 'experiential', respectively.

(6)   He   viscut a Boston dos   cops des de 2000.
           have.1sg lived   in Boston   two   times since   2000
           'I have lived in Boston twice since 2000.'

The nature of the right boundary of the *since* PP and the (un)availability of an explicit right-side delimiter differs cross-linguistically. Consider the following empirical contrast between Catalan and English.

(7)   a. Sam has lived in Boston since 1990 (*until now).
           b. He   viscut a Boston des de 2000   fins ara/ fa   poc.
               have.1sg lived   in Boston   since   2000   until now/make.3sg   little
               'Intended: I have lived in Boston since 2000 until now/recently.'

The reference time is inherent to the meaning of *since* in English (Hitzeman 1997b; Schaden 2005a, 2007), but, as Schaden (2005a, 2007) points out, an explicit specification for the right boundary cannot be overtly expressed. In contrast to English, the reference time is not part of the meaning of *des de* PPs, which allow for an explicit right-side delimiter (e.g., *fa poc* 'makes little').

In the case of *des de* in Catalan, additional elements such as *ençà* 'up.to.here', the marker *que* 'that' or the locating phrase *fa XP* 'makes XP' are required to anchor the temporal interval encoded by the preposition to the utterance time:

(8)   a. He   viscut a Boston de 2000 ençà.
               have.1sg lived   in Boston   of 2000 up.to.here
               'I have lived in Boston since 2000.'
           b. Des de diumenge que   plou /   ha   plogut.
               from   Sunday   that rain.3sg /   have.3sg   rained
               'It has been raining since Sunday'
           c. Treballa/ ha   treballat aquí des de   fa   dos anys.
               work.3sg   have3sg   worked   here since   makes two years
               'I have worked here since two years ago.'

Des de PPs are also used in spatial domains in Romance languages such as Catalan and I will consider the relevant parallels between the temporal and spatial uses of *des de* PPs to see if the available readings are related to the type of path encoded by the preposition, see (9).

(9)   Vam   caminar {des de/ * de}   Tossa.
           aux.2pl walk   from   of   Tossa
           'We walked from Tossa.'

The verbal predicate *caminar* 'walk' is a verb of motion that requires a directional PP as a complement. Example (9) only admits the compound preposition *des de*, which delimits the starting point of a spatial path that begins in *Tossa*. The presposition *de* lacks this property of delimitation and requires the explicit specification of the endpoint of the path, i.e., *de Tossa a Blanes* 'from XP to XP'.

The main goal of this paper is to investigate the semantic structure of *since* PPs and the so-called universal-existential ambiguity that arises with this PP cross-linguistically, in particular, in Catalan and in English. The grammatical properties of *since* PPs are known to differ across languages (see, for example, Mittwoch 1988;

Móia 2000a, 2001; Iatridou et al. 2001; von Stechow 2002; Schaden 2005a, 2005b, 2007; Martínez-Atienza 2006, 2010; Bosque & Bravo 2015, among others). I take into consideration the grammatical restrictions imposed by *since* and *des de* PPs to examine whether the available readings of PrP sentences can be derived from a single preposition (see Hitzeman 1995, 1997a, 1997b; von Fintel & Iatridou 2005; Schaden 2005a, 2005b, 2007; Bosque & Bravo 2015). I show that a compositional account that takes into consideration some properties of paths, namely, the property of delimitation, the relation between the figure and the ground and the nature of the right boundary determine the available readings of PrP sentences modified by *desde* or *since*.

The relevant analogies between spatial and temporal uses of *des de* reveal that *des de* encodes an egressive path in the temporal domain, i.e., a delimited path which sets the starting point of a temporal interval. In contrast to Catalan, English *since* PPs encode a two-sided temporal interval, which includes the reference time in its meaning (Hitzeman 1997b; Schaden 2005). I show that the type of temporal path that *des de* and *since* encode has relevant consequences for universal and existential interpretations in PrP sentences.

In the first part of the paper, I describe the grammatical properties of *since* PPs in a variety of Germanic and Romance languages, with a special focus on English and Catalan, see §2 and §3. I consider some similarities between the temporal and spatial uses of *since* PPs in §4. In §5, I study the role of *since* PPs in PrP sentences. To conclude, §6 summarises the paper.

2. Grammatical properties of *since*

The present section examines the main cross-linguistic differences between Catalan and English to find out which is the base meaning of the preposition *since*. As Schaden (2005a, 2007) shows for the case of Spanish, the main differences have to do with the nature of the right boundary of the *since* PP and the (un)availability of the preposition to appear in spatial domains. Like in Spanish, in Catalan, the right boundary of *des de* is not encoded in the base meaning of the preposition, and, unlike in languages such as English and German, Catalan allows for the presence of an explicit right-side delimiter. In addition, in contrast to English, Catalan allows for spatial uses of the preposition, which delimits the starting point of a spatial path.

2.1. English *since* PPs

Within the temporal domain, English has *since* which has been analysed as a frame adverbial (Bennett & Partee 1972/78), a perfect-level adverbial (Dowty 1979; Vlach 1993; Iatridou *et al.* 2001; among others) or a durational adverbial (McCoard 1978). The *Oxford Etymology Dictionary* defines it as 'thereupon; from then till now; ago; before now'. In English, *since* PPs can be defined as perfect-level adverbials because they can only combine with perfect sentences as illustrated in (10) (Iatridou *et al.* 2001: 163), or past, future and non-finite perfects as in (11) (from Quirk *et al.* 1999: 1017).

(10)   a. I have been sick since yesterday.
         b. *I am sick since yesterday.
         c. *I was sick since 1990.

(11)   a. It had revised its constitution twice, since the country had achieved independence.
       b. By tomorrow Daniel will have been in bed for a week since he caught the flu.
       c. He must have been sick since Christmas.

However, the presence of complements such as *long* allows *since* PPs to co-occur with the preterite as well (from McCoard 1978:135):

(12)   I {have/was} retired long since.

In colloquial American English as well as in colloquial British English, we can also find preterite sentences modified by *since* PPs (from Quirk *et al*. 1999: 1016).

(13)   a. I lost ten pounds since I started swimming.
       b. Since leaving home, Larry wrote to his parents just once.

Since PPs occur with durative predicates, i.e., states, see (14a), and activities, see (14b), accomplishments, see (14c). Punctual predicates such as achievements are odd, see (14d).

(14)   a. I have been sick since yesterday.
       b. I have played since seven.
       c. I have built this house since 1990.
       d. ?? I have arrived since seven.

According to Móia (2000a, 2001), even though the location of telic events by *since* PPs is very restricted, he assumes that it is possible in some contexts as in (15) (from Móia 2000a: 313).

(15)   Paulo has got married since 1980.

Moreover, the object of the preposition is restricted to localizing temporal expressions, which specify the left boundary of the perfect time interval: locating time adverbials, see (16a), time and event denoting noun phrases, see (16b), or clausal complements, see (16c). It is incompatible with numerically quantified phrases, like *two days*, see (17) (from Schaden 2005a: 88).

(16)   a. John has been in Boston since yesterday.
       b. John has been in Boston since his graduation ceremony.
       c. John has been in Boston since he graduated from school.
(17)   *John has been in Boston since two days.

Quantified temporal expressions can be used with *since* only in the presence of *ago* (i.e., *since XP ago*):

(18)   John has been in Boston since two days *(ago).

As for the right boundary of the *since* PP, it always stretches up to the point of reference (Schaden 2005, 2007), but an explicit specification for the right boundary is impossible, see (19a) (from Schaden 2005a: 91, 2007: 103) and (19b).

(19)   a. John has been in Boston since Friday (*until Monday).
        b. John has been in Boston since Firday (*until now).

In (19), the *since* PP specifies a time interval whose left boundary is set up on *Friday* and whose right boundary necessarily stretches up to the reference time, which is cotemporal with the utterance time. Since the right boundary is identified with the utterance time, an explicit specification of the right boundary like *until Monday* is disallowed. However, even though this preposition has a deictic anchoring, it is not possible to identify it with an overt phrase such as *until now* in (19b).

According to Schaden (2005, 2007), the fact that the preposition encodes an interval that stretches up to the utterance time explains the reason why it cannot combine with time adverbials that refer to future, like *tomorrow* in (20) (from Schaden 2007: 105).

(20)   *I will do sports since tomorrow.

In English, *since* PPs are mostly restricted to temporal uses, it is only possible to find spatial uses occasionally in sentences such as (21) (from Schaden 2007: 106). All the other, more canonical spatial uses such as spatial localizing phrases, see (22a), or numerically quantified phrases, see (22b), are ruled out.

(21)   John hasn't said a word since Strasbourg.

(22)   a. *He walked since the school.
        b. *John walked since 10 km.

The spatial expression *since Strasbourg* in (21), which corresponds to an eventive interpretation (i.e., *since we left Strasbourg*) is the only one accepted by the preposition *since*.

2.2. Catalan *des de* *PPs*

In Catalan, *des de* PPs are complex prepositions that delimit the left boundary of a temporal interval. It can co-occur with tenses other than the perfect, see (23).

(23)   a. Viu   a Boston des de 2004.
           live.3sg in Boston since   2004
           Intended: 'I live in Boston since 2004.'
        b. Va   viure a Boston des de 2004.
           aux.3sg live   in Boston since 2004
           Intended: 'I lived in Boston since 2004.'
        c. Vivia   a Boston des de 2004.
           lived.imp.3sg in Boston since 2004
           Intended: 'I was living in Boston since 2004.'
        d. Havia   viscut   a Boston des de 2004.
           had.3sg lived   in Boston since   2004
           'He had lived in Boston since 2004.'
        e. Viurà   a Boston des de   demà
           live.3sg in Boston since   tomorrow
           Intended: 'He will live in Boston since tomorrow.'

In contrast to *since*, PrP sentences modified by *des de* PPs can combine with atelic predicates predicates, see (24a-b). As Móia (2000a, 2001) for the case of Portuguese and other Romance languages and Martínez-Atienza (2006, 2010, 2014) for Spanish show, the location of telic predicates is ruled out. This is also the case in Catalan, see (24c-d).

(24)   a. Ha   estat malalt des de   dimarts.
             have.3sg   been sick   since   Tuesday
             'He has been sick since Tuesday.'
        b. Ha   treballat   des de les   tres.
             have.3sg   worked   since   the   three
             'He has worked since three.'
        c. * Ha   escrit l'article   des d'aquest   matí.
             have.3sg   written the article since   this   morning
             'He has written the paper since this morning.'
        d. *Ha   arribat des de les   set   del matí.
             have.3sg arrived since   the   seven of.the morning

According to Móia (2000a, 2001) and Martínez-Atienza (2006, 2010), PrP sentences can combine with telic eventualities when they appear with indefinite phrases or numerically quantified phrases. (25) shows examples with numerically quantified phrases.

(25)   a. Ha   escrit   quatre pàgines des d'aquest   matí.
             have.3sg written four   pages since   this   morning
              'He has written four pages since this morning.'
        b. S' ha   casat   dues vegades des de 2000.
             cl. have.3sg got.married   two   times   since   2000
             'He has got married twice since 2000.'

Even though (24d) is ungrammatical, it is important to note that there are Spanish varieties, such as Mexican and Caribbean Spanish, which allow for punctual verbal predicates with *desde* (Kany 1945; García Fernández 2000; Bosque and Bravo 2015). According to Bosque & Bravo (2015: 6), *desde el lunes* 'since Monday' in (26) refers to an interval that is subsequent to the event time. These examples are with the past form of the verb.

(26)   a. Desde el   lunes   llegó.
             since   the   Monday   arrived.3sg
             Intended: 'He arrived since Monday.'
        b. Encontré las   llaves desde hace   una hora.
             found.3sg the   keys   since make.3sg one hour
             Intended: 'He found the keys since an hour ago.'
                                    (Mexican and Caribbean Spanish)

The complement to *des de* PPs, which specifies the left boundary of the time interval, can be a localizing temporal expression: a locating time adverbial (e.g.,

Tuesday), a noun phrase that describes a situation (e.g., *the meeting*), see (27a), or a clausal complement (e.g., *des que XP*), see (27b).[4]

(27) a. des de {dimarts/la reunió}
      since Tuesday/the meeting
      'since {Tuesday/the meeting}'
   b. des que va   començar la   reunió.
      since that aux.go.3sg start   the   meeting
      'since it started the meeting'

The properties of the Catalan counterpart of *since* PPs seem to be almost the same as in English. However, unlike English *since* PPs, the right boundary of *des de*-intervals is not encoded in Catalan and sentences presented in (28) allow for an explicit right-side delimiter (i.e., *fins XP* 'until XP'). In the case of the PrP, the delimiter can refer to a time interval different from the utterance time (i.e., *fins avui/aquest matí/les tres/fa poc* 'until today/this morning/the three/makes little'), see (28).

(28) a. Ha   estat   a Boston des de dimarts fins fa   poc.
      have.3sg   been   in Boston since   Tuesday until makes   little
      Intended: 'He has been in Boston since Tuesday until recently.'
   b. *He has been in Boston since Tuesday until recently.

Des de PPs can appear with the impersonal verb *fa* 'makes' in *des de fa* 'since makes'. The impersonal verb appears in the present, see (29), or imperfective, see (30), and restricts the tense used in the clause. When it appears in the present tense, it only allows for the use of the present or the PrP:

(29) a. Treballa/ ha   treballat aquí des de fa   dos   anys.
      work.3sg   have3sg worked here since   makes two   years
      'I have worked here since two years ago.'
   b. *Va   treballar aquí des de fa   dos anys.
      aux.3sg   work   here since   makes   two years

(30) Treballava/   havia   treballat   aquí des de feia   dos anys.
      worked.imp.3sg/had.3sg   worked   here since made.imp.3sg two years
      Intended: 'I worked/had worked here since two years ago.'

Apart from *des de*, there is a complex PP in Catalan *d'ençà XP/de XP ençà* 'of up to here XP/of XP up to here', which shares most of the relevant properties with the English *since*-interval. According to Solà (1999) this complex PP can only appear with the present tense or the PrP. Hence, like in the case of *since* PPs, the complement of the preposition specifies the left boundary of the time interval and the right boundary is set up by tense and also stretches up to the reference time, which is, in the case of the PrP or simple present, cotemporal with the utterance time. Consider the following example (from Sancho Cremades 2002: 1783):

(31) La Cecília es   va   doctorar el   1985. D'aleshores ençà
      the Cecilia cl.3sg aux.3sg graduate the   1985 of then   up.to.here

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[4] The preposition *de* is omitted when *des de* takes a clausal complement in Catalan.

és/   ha   estat professora de la   Universitat Pompeu Fabra.
be.3sg/ have.3sg   been teacher   of the   Universitat Pompeu Fabra.
'Cecilia graduated in 1985. She has been a teacher at Pompeu Fabra University since then.'

The preposition *d'aleshores ençà* 'of then up to here' in example (31) anaphorically refers to the left boundary (i.e., *1958*) introduced in the previous sentence and, at the same time, sets the right boundary of the time interval, which is the reference time. In the context of the PrP, the reference time is cotemporal with the utterance time.

There are other temporal-aspectual markers such as *que* in preposed time modifiers such as *des de XP que/d'ençà XP que* which require the presence of the present tense or PrP:

(32)   Des de diumenge que   plou / ha   plogut.
       since   Sunday   that rain.3sg /have.3sg rained
       'It has been raining since Sunday.'

For the case of temporal constructions such as *des de XP que*, the marker *que* 'that' in (32), which is identified as a temporal-aspectual marker in Rigau (2000, 2001a, 2001b), anchors the PP to the utterance time.

Last but not least, Catalan *des de* PPs are not specialised for temporal uses, they allow for spatial arguments too, see (33). The properties of spatial uses of *des de* are further discussed in §4.

(33)   Camina   des de l'   escola.
       walk.3sg   from   the school
       Intended: 'I walk since the school.'

2.3. Summary of section 2
This subsection has presented the main properties of *since* PPs in English and *des de* PPs in Catalan. The following table summarises the results so far:

(34)   The properties of *since* PPs in Catalan and English

Properties	*since*	*des de*
Other tenses apart from PrP	X	Ok
Localizing phrase	Ok	Ok
Numerically quantified phrase	X	X
Explicit RB	X	Ok
Spatial use	X	Ok

The main differences between Catalan and English *since* PPs have to do with the nature of the right boundary. In Catalan, the right boundary of *des de* PPs is left unspecified, it can combine with different tenses, see (23), and allow for an explicit right-side delimiter, see (28a). Catalan requires the *fa X time* 'makes', the adverb *ençà*

or a spatiotemporal marker *que* 'that' to denote a time interval whose right boundary has a deictic nature, see (29), (31) and (32). These complex PPs require the use of the present tense or PrP. In the case of English, the right-side delimiter of *since* PPs always stretches up to the reference time, and it cannot be overtly expressed, see (28b). Moreover, unlike *since* PPs, which are restricted to temporal uses, *des de* PPs can also be used with spatial complements, cf. (22) and (33).

3. More relevant cross-linguistic data

This section provides an overview of the grammatical properties of *since* PPs in German and French. In German, like in English, *seit* PPs are specialised for temporal uses, but in German the preposition can co-occur with different tenses and allows numerically quantified phrases. In French, *depuis* PPs can also combine with different tenses and allow numerically quantified phrases. However, in contrast to German, the preposition can also have spatial uses and it admits the presence of an explicit right boundary.

3.1. German seit PPs

In German, *seit* PPs can combine with different tenses, i.e., present tense, present perfect, preterite, pluperfect. Here are some examples:

(35) a. Hans ist   seit Freitag in Boston.
         Hans be.3sg   since Friday   in Boston
         Intended: 'Hans is in Boston since Friday.'
      b. Hans ist   seit Freitag in Boston gewesen.
         Hans be.3sg   since Friday   in Boston been
         'Hans has been in Boston since Friday.'
      c. Hans war   seit Freitag in Boston.
         Hans was.3sg since Friday   in Boston
         Intended: 'Hans was in Boston since Friday.'
      d. Hans   war seit Freitag in   Boston gewesen.
         Hans was   since Friday   in Boston   been
         'Hans had been in Boston since Friday.'

Like in English, *seit* PPs are restricted to temporal uses and can combine with durative predicates. However, consider example (36) (from Schaden 2005b: 289), which illustrates that in German, PrP sentences modified by *seit* PPs also allow for punctual predicates.

(36) Wolfang   hat   Diano   seit Freitag   verlassen.
      Wolfang   have.3sg   Diano   since Friday   left
      'Wolfang has left Diano (has been out of) Diano since Friday.'

In (36), the event of *leaving* is properly anterior to the interval specified by the *seit* PP.

Seit PPs can select quantified phrases as well as locating temporal expressions and event descriptions. An example of a *seit* construction with a quantified phrase and a

locating time adverbial is given in (37a) and (37b), respectively (from Musan 2003: 255):[5]

(37) a. Max hat   seit einer Stunde gegessen.
         Max have.3sg since an   hour   eaten
         'Max has been eating for an hour.'
      b. Max hat   seit heute morgen gegessen.
         Max have.3sg since today morning eaten
         'Max has eaten something in the time between today's morning and now.'

The numerically quantified phrase in (37a) covers the whole one-hour interval through which the eventuality holds. The locating time adverbial in (37b) delimits the starting point of the *seit*-interval in the morning of the current day, but, in contrast to (37a), it does not necessarily assert that the eventuality holds at every subinterval of the interval encoded by *seit*.

However, like in the case of English, *seit*-adverbials have to stretch up to the time of reference and do not allow an explicit right-side delimiter (from Schaden 2007: 103):

(38) ??/* Hans ist   seit Freitag bis nächsten   Montag in Boston.
            Hans be.3sg since Friday until next   Monday in Boston
            'Hans will be in Boston from Friday until next Monday'.

According to Schaden (2007: 103), sentences such as (38) become acceptable only when both temporal phrases *seit Freitag* 'since Friday' and *bis nächsten Montag* 'until next Monday' are coordinated, see (39a). However, if the specified right boundary refers to a time before the utterance time, the sentence is agrammatical, see (39b):

(39) a. Hans ist   seit Freitag und bis nächsten   Montag in Boston.
         Hans be.3sg since Friday   and   until next   Monday in Boston
         'Hans will be in Boston from Friday and until next Monday'.
      b. *Hans ist   seit Freitag und bis gestern   in Boston.
         Hans be.3sg since Friday   and   until yesterday   in Boston

In German, it is also possible to find spatial uses in sentences such as (40) (from Schaden 2007: 106).

(40) a. John   hat   seit Straßburg   kein Wort mehr gesagt.
         John   have.3sg since Strasbourgh   no   word more said
         'John hasn't said a word since Strasbourgh.'
      b. John   hat   seit 100 km   kein Wort mehr gesagt.
         John   have.3sg since 100 km   no   word more said
         Intended: 'John hasn't said a word since 100 km.'

Like in the case of English *since* PPs, the complement selected by *seit* in (40a) has an eventive interpretation, i.e., *since we left Strasbourgh*. However, temporal as well as spatial numerically quantified phrases are available in German as illustrated in

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[5] Musan (2003) claims that in German there are two different types of *seit*-adverbials: *seit*-durational-adverbials, see (37a), and *seit*-positional-adverbials (i.e., pseudo-durative), see (37b).

(40b). The measure phrase *100 km* covers the whole extension through which the subject is in silence.

3.2. French depuis PPs

   Apart form localizing temporal phrases, *depuis* PPs can combine with numerically quantified phrases (from Schaden 2005a: 90), cf. (41a) and (41b).

(41)   a. Il   est   à Paris   depuis   deux   mois
          he   be.3sg   in Paris   since   two   months
          Intended: 'He is in Paris since two months.'
       b. Il   est   à Paris   depuis   hier
          he   be.3sg   in Paris   since   yesterday
          Intended: 'He is in Paris since yesterday.'

   Like in the case of German, *depuis* PPs can co-occur with any type of *Aktionsart* : states, see (42a) (from Schadem 2007: 87), activities, see (42b) (from Schaden 2007:119), accomplisments and achievements, see (42c) and (42d), respectively (from Schaden 2007:113).

(42)   a. Jaques   a   vécu seul   depuis   la   mort de son père.
          Jaques   have.3sg   lived alone   since   the   death of his father
          'Jaques has lived alone since his father died.'
       b. Jean   a   écrit   depuis   six   heures   du   matin.
          Jean   have.3sg   written   since   six   hours   of   morning
          'Jean has written since 6 in the morning.'
       b. Cunégonde   a   mangé   trois pommes   depuis   midi.
          Cunégonde   have.3sg   eaten   three apples   since   midday
          'Cunégonde has eaten three apples since midday.'
       c. Cunégonde   est   partie   depuis   midi.
          Cunégonde   be.3sg   left   since   midday
          'Cuéngonde has left since midday.'

   Moreover, they can also combine with different tenses, i.e., with the present tense, see (43a), the PrP, see (43b), the past imperfective, see (43c), and the past perfect, see (43d).[6]

(43)   a. Jaques   vit   à Paris   depuis   2000.
          Jaques   live.3sg   in Paris since   2000
          'Intended: Jaques lives alone since 2000.'
       b. Jaques   a   vécu à Paris   depuis   2000.
          Jaques   have.3sg   lived in Paris since   2000
          'Jaques has lived alone since 2000.'
       c. Jaques   vivait   à Paris   depuis   2000.
          Jaques   lived.imp.3sg   in Paris since   2000
          'Intended: Jaques lived alone since 2000.'

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[6] According to Gerhard Schaden (p.c.), the interpretation of (43c) and (43d) require some contextual reference point between 2000 and now.

    d. Jaques   avait   vécu à Paris depuis   2000.
      Jaques   had.3sg lived in Paris since   2000
      'Intended: Jaques had lived in Paris since 2000.'

Like in the case of Catalan, in French, *depuis* PPs do not have to stretch up to the point of reference and allow for an explicit right-sided boundary (from Schaden 2005a: 92), see (44).

(44)   Le Chan conserve   et   communique   les   archives de la France
         the Chan conserve.3sg and communicate.3sg the   archives of the France
         depuis   les   Mérovingiens jusqu'en 1958.
         since   the   Merovingians up.to   1958
         'The Chan conserves and communicates the archives of France from the time of the Merovingians up to 1958'

Moreover, in French, the future reference is only possible with an explicit right-delimiting expression (from Schaden 2007: 105):

(45)   Octave sera   absent depuis Demain jusqu'à lundi   soir.
         Octave will.be.3sg absent since   Demain up.to   Monday evening
         Intended: 'Octave will be absent since Demain up to Monday evening.'

Like in Catalan, *depuis* PPs also allow spatial uses (from Schaden 2007: 107, cited in Grevisse & Goose 1993):

(46)   La   France s'   étend depuis les Alpes   jusqu'à l'   Océan.
         the   France cl.refl extend since the Alps   up.to   the   Ocean
         'France stretches from the Alps up to the Ocean.'

3.3. Summary of section 3

This section has presented the main properties of *since*-intervals in German and French. The results so far are summarised in the following table:

(47)   The properties of *since*-intervals in German and in French.

Properties	*seit XP*	*depuis XP*
Other tenses apart from PrP	Ok	Ok
Localizing phrase	Ok	Ok
Numerically quantified phrase	Ok	Ok
Explicit RB	X	Ok
Spatial use	Ok	Ok

The main differences between *seit* PPs and *since* PPs have to do with the tenses they can combine and with the type of argument that the preposition can take. *Seit* PPs can co-occur with other tenses apart from the perfect, see (35). Moreover, *seit* PPs can take, apart from localizing temporal expressions, numerically quantified phrases, see (37). This latter type of phrases admits spatial uses, see (40b). *Depuis* PPs can also

combine with different tenses, see (43), and allow for numerically quantified phrases, see (41a). Like in the case of *des de* PPs, *despuis* PPs allow for an explicit right-side delimiter, see (44), and they are also compatible with spatial arguments, see (46).[7] In §4 discuss the grammatical properties of *since* that admit spatial uses.

4. Spatial uses of *des de*

As was introduced in §2, one of the main contrasts between *since* PPs in English and *des de* PPs in Catalan is that the latter is not specialised for temporal uses, and they can also be used in the spatial domain. I discuss the type of source path that *des de* and *de* encode in the spatial domain following Pantcheva's (2011) typology of paths.

4.1. Since PPs

As I have outlined above, English *since* PPs are mostly restricted to temporal uses. They only accept expressions that have an eventive interpretation (e.g., *since we left Strasbourg*), which is comparable to a clausal complement, see (48a) (=(21), from §2, from Schaden 2007: 106). In this context, *since* PPs also disallow the specification of an explicit right boundary, see (48b).

(48)   a. John hasn't said a word since Strasbourg.
        b. *John hasn't said a word since Strasbourg until Frankfurt.

Schaden (2007) shows that the impossibility to legitimate an explicit spatial argument that specifies the right boundary in English is not straightforwardly connected to the necessity of having a deictic spatial centre (i.e., *here*), which would be equivalent to the reference time in the temporal domain. For instance, consider the following example provided by Schaden (2007: 108):

(49)   George Bush has been speaking to us since the White House.

The PP *since the White House* in (49) disallows a pure spatial physical use, which we would interpret as the deictic centre from which the subject is located at the utterance time, i.e., *he is speaking from the White House*. The only interpretation available corresponds to an eventive interpretation of the complement of *since* (i.e., *the White House*), which corresponds to a clausal phrase *since we left the White House*. The same applies to German.

In English, proper spatial uses of sentences such as (50) require the preposition *from*, which is used to encode the source of spatial trajectories and it is classified as a source preposition (see Jackendoff 1983). The *Oxford Etymology Dictionary* defines *from* as a preposition which originally meant 'forward'. Consider the following example provided in Zwarts & Winter (2000: 201):

(50)   The letter was sent from the office.

The preposition *from* in (50) specifies the starting point of the path. Zwarts & Winter (2000: 201) analyse the preposition *from* as a directional preposition, which is 'used to describe a change in location with respect to the reference object'. They note that there are relevant analogies between directional and locative prepositions (see

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[7] The properties of *despuis* PPs summarised in (47) also apply to Italian.

Jackendoff 1983) that allow them to define the meaning of directional prepositions. The directional preposition *from* is connected to the locative preposition *at* (Jackendoff 1983; Zwarts & Winter 2000), as illustrated in the following entailment:

(51)   The letter was sent from the office   ⇒   The letter was at the office.

The preposition *from* in (50) specifies the starting point of the path, and the reference object (i.e., *the letter*) is located at this initial point.

According to Gehrke (2008), the source preposition *from* is different from the rest of source prepositions (i.e., *off*, *out of*). She shows that this preposition needs an additional directional component to be licensed. Consider the following examples (from Gehrke 2008: 256).

(52)   a. ?? John drove from New York.
         b. John drove from New York to Boston.

The verbal predicate 'to drive' in (52) requires a directional PP. Gehrke (2008) shows that *from*-paths cannot license a spatial trajectory on their own as in (52a) and require other elements such as the goal phrase *to Boston* in (52b) to express directionality. Gehrke (2008: 256) suggests that source paths encoded by *from* license directional paths under certain conditions that are similar to the ones required by locative prepositions such as *in*, *on*, *under* or *behind*. Locative prepositions also require additional elements that encode directionality to license a spatial trajectory. For example, *into* in English is a complex preposition formed by the locative preposition *in* and the goal path *to* to encode a directional reading.

The property of delimitation is also relevant for the description of source oriented paths. Pantcheva's (2011) thesis on the decomposition of spatial paths is one of the most recent works that provides a typological classification of different types of transitional oriented source paths based on the property of delimitation. She defines *from* as a non-delimited coinitial path. Consider the graphic representation of a coinitial path (from Pantcheva 2011: 30).

(53)   Coinitial path (i.e., *from*-path)   ++++++---------
                                                     0   1

The path represented in (53) corresponds to a prototypical transitional source path, as illustrated in (50). Graphically, 0 represents the starting point of the path and 1, its endpoint. The office in (50) is the ground (i.e., the entity from which the figure moves) and is the source of motion. The figure (i.e., the entity that moves) is the letter. Transitional source paths impose a locative condition on the starting point of the path (Pantcheva 2011), i.e., the figure is located within the ground at the starting point. The plusses (i.e., ++++) are positions in which the letter is at the office, and the minuses (i.e., -----) are positions in which the letter is not at the office. I follow Pantcheva's (2011) classification of transitional source paths to show the differences between *de* PPs and *des de* PPs in Catalan, see §4.2.

4.2. Des de PPs

In this subsection, I illustrate that the preposition *des de* shows the same type of restrictions in the temporal as well as in the spatial domain: (i) *des de* PPs allow for localizing phrases and reject numerically quantified phrases, and (ii) they also admit

an explicit right boundary to delimit spatial paths. In addition to *des de* PPs, I show that *de* PPs also express the source of spatial trajectories in Catalan. The preposition *de* encodes origin, whereas the compound preposition *des de* delimits the left boundary of a path. Following Pantcheva's (2011) and Romeu's (2014) classification of source paths, I illustrate that *de* PPs pattern with coinitial paths like *from*-paths, whereas *des de* PPs, by contrast, encode an egressive path, which is a delimited path that fixes the initial point of the trajectory.

Although in contemporary Catalan, *des* is used in combination with *de* or *que* (i.e., *des de* or *des que*), Coromines in his *Dictionary of Catalan Etymology* (1980), notes that *des*, which originates from the Latin prepositions *de + ex* 'from + out of', could be used freely as an independent preposition in archaic Catalan, although it was mostly used in verses. This preposition is equivalent to *des de*, see (54).

(54) a. … des   ton   alt   Palau   (Aribau, Oda V)
           from your high Palace
           'from your high Palace.'
      b. … des   la   vall   fonda   (Costa i Llobera, L'Ogre de la terra, 77)
           from the   valley deep
           'from the deep valley'

As in the temporal domain, both types of prepositions allow for localizing phrases and reject numerically quantified phrases, cf. (55a) and (55b). In Catalan, the source of a spatial trajectory can be expressed by the preposition *de* and *des de*. The preposition *de* encodes origin when it takes spatial complements, whereas *des de*, the onset of a spatial trajectory (Sancho Cremades 2002: 1781).

(55) a. En   Joan   ve   de/   des de   Madrid.
           the Joan come.3sg   of   from   Madrid
           'John comes from Madrid.'
      b. *En   Joan   ve   de/   des de   100   quilòmetres.
           the Joan come.3sg   of   from   100   kilometres

As example (55a) shows, both types of source prepositions are available if the directional component of the path is encoded in the meaning of the verbal predicate. The meaning of *venir* 'come' expresses direction with respect to an endpoint that coincides with the speaker, and allows for both types of source prepositions.

However, *de* and *des de* are not always interchangeable. Consider the following example.

(56) Vam   caminar {des de/ *de} Tossa.
      aux.2pl walk   from   of Tossa
      'We walked from Tossa.'

The verbal predicate *caminar* 'walk' is a verb of motion that takes a directional PP complement, and, hence, example (56) cannot appear with *de*, which encodes the origin of a spatial path, but not a direction. (56) only allows for the compound directional preposition *des de* 'from', which delimits the starting point of a spatial trajectory that begins in Tossa.
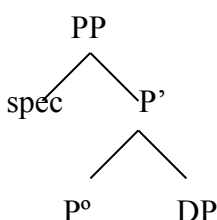
The PP *de Tossa* becomes grammatical in (57) when it combines with the PPs *a XP* 'to XP' or *fins (a)*[8] 'until (to)':

(57) Vam   caminar de Tossa fins a Blanes.
     aux.2pl walk   of Tossa until to Blanes
     'We walked from Tossa to Blanes.'

The directional path in (58) is expressed by the addition of the goal path *fins a Blanes* 'until to Blanes', which can be used without the specification of the source path:

(58) Vam   caminar fins a Blanes.
     aux.2pl walk   until to Blanes
     'We walked to Blanes.'

The directional path illustrated in (57) is obtained by syntactic means. The literature on the syntax of prepositions has generally assumed that PPs are internally complex (see den Dikken 2003, 2006; Svenonius 2004; among others).[9] The structure of a PP is shown below.
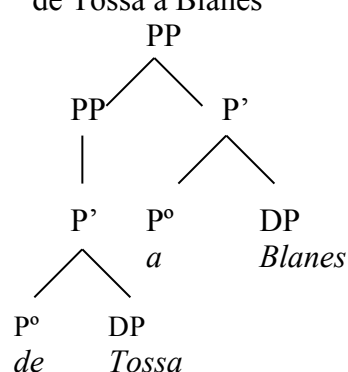
(59)

```
         PP
        /  \
     spec   P'
           /  \
         Pº    DP
```

The minimal structure of a PP in (59) consists of a head (Pº), which takes a complement DP and can introduce an optional specifier (spec).

The syntactic analysis that I suggest for *de Tossa a Blanes* and *de Tossa fins a Blanes* is given in (60) and (61), respectively.
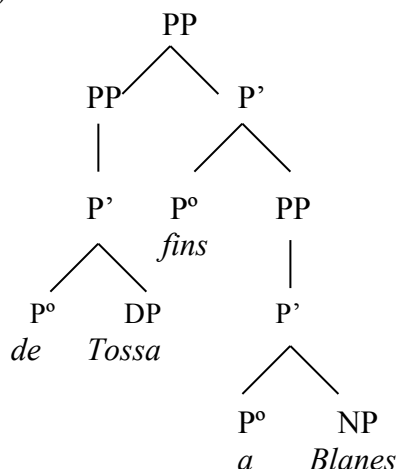
(60)   de Tossa a Blanes

```
              PP
            /    \
         PP       P'
          |      /  \
         P'    Pº    DP
        / \    a     Blanes
      Pº   DP
      de   Tossa
```

---

(61)   de Tossa fins a Blanes

```
                    PP
                 ╱╲
            PP╱    ╲ P'
             │      ╱╲
             │     ╱   ╲
            P'   P°     PP
                fins    │
                        │
        P°    DP        P'
        de   Tossa      ╱╲
                       ╱   ╲
                     P°     NP
                     a    Blanes
```

The PP *de Tossa* 'of Tossa' sets the origin of a spatial trajectory and it cannot license directional paths by itself, but it can combine with other PPs, as in (60) and (61). In (60), the PP *a Blanes* 'to Blanes' encodes a goal path and is the head of the complex PP. The PP *de Tossa* 'of Tossa' is the specifier of this complex PP and cannot stand on its own, as shown in (56). In (61), the head is the PP *fins a Blanes* 'until to Blanes', which encodes the right boundary of a spatial trajectory. This head phrase combines with a specifier in (61), where the path *de Tossa* 'of Tossa' encodes the source of the spatial trajectory, but it can also appear without it, as shown in (58).

As was pointed out in the previous subsection for the case of *from*-paths, Pantcheva (2011) classifies different transitional source oriented paths on the basis of the property of delimitation. She distinguishes between non-delimited (i.e., coinitial), and delimited (i.e., egressive) transitional source oriented paths. Consider the following graphic representations given in Pantcheva (2011: 30).

(62)   Types of transitional oriented source paths:
        a. Coinitial (*from*-path)   ++++--------
                                                0   1
        b. Egressive (*starting from*-path)   +-------------
                                                0   1

Coinitial paths are non-delimited, whereas egressive paths are delimited, cf. (62a) and (62b). Graphically, both types of paths differ in the number of plusses at the starting point of the path, where the locative relationship between the figure and the ground is obtained. Coinitial paths contain a sequence of plusses reflecting positions in which the figure is located within the ground. Egressive paths, by contrast, set the start of the path at the first point where the ground is located and include just one plus. As Pantcheva (2011) claims, egressive paths explicitly set the left boundary of the path.

Pantcheva (2011: 26) supports the distinction above with data from some Uralic languages which use case morphemes to encode spatial paths. Here I use two examples from Komi Permyak[10], which uses an egressive or an elative cases[11] to

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[10] Komi Permyak is a variety of Komi which is an Uralic language.
[11] Elative is a locative case that indicates movement out of a place, whereas egressive case marks the limit of a trajectory.

encode a coinitial or egressive path, respectively.

(63)   a. Céljadj   lóktënï   škóla-išj.
        children   *come*   *school-elative*
        'The children are coming from school.'
   b. Volgograd-šjanj   Eljba vá-ëdz
        Volgograd-egressive   *Elba river-terminative*
        'from Volgograd to Elba river.'

The elative case in (63a) encodes a coinitial path in which the figure (i.e., *the children*) moves out of the ground (i.e., *school*). The relation of containment between the figure and the ground is graphically represented in the positive phase of the path by a whole sequence of positive locations as in (62a). In example (63b), the egressive case corresponds to an egressive path, which delimits the starting point and indicates that the ground (i.e., *Volgograd*) sets the left boundary of a spatial path. This interpretation is graphically represented in (62b): the starting point involves just one point in the positive phase before the transition.

More empirical support from the Komi language is found in (64) (examples from Kuznetsov 2012: 375-376, his translation):

(64)   a. Mijan sikt-ö kar-ys'(elative) voöm velödys' jasyd (...).
        'The teachers who have arrived to our village <u>from a city</u>.'
   b. Dar' ja bereg-sjan'(egressive) vidzödö.
        'Darja is looking <u>from the direction of the coast</u>.'

The elative case in (64a) encodes a coinitial path in which the ground (i.e., *a city*) is the source of the motion, and the figure (i.e., *the teachers*) moves out of the ground. In (64b), by contrast, the egressive case corresponds to an egressive path in which the ground (i.e., *the direction of the coast*) sets the left boundary of the path, where the figure (i.e., *Darja*) is located.

Romeu (2014: 190) shows that Spanish also uses different prepositions to encode (non)-delimited source paths: the preposition *de* exemplified in (65a) patterns with the coinitial path (i.e., *from*-path). *De*-paths establish a locative relation of containment between the figure and the ground, i.e., the figure is located at the ground and it moves "out of" it. In contrast, *des de*-paths encode the egressive type, i.e., the figure moves "from out of" the ground, cf. (65b).

(65)   a. Juan cayó   {de/#desde}   la   silla.
        Juan fell.down.3sg   of/ from   the   chair
        'Juan fell down from the chair.'
   b. Juan saltó   {#de/desde}   la   ventana.
        Juan jumped.3sg   of/ from   the   window
        'Juan jumped from the window.'

The locative relationship of containment between the figure and the ground is clearly expressed in (65a): the subject is sitting down on the chair and falls off this location. By contrast, the location encoded by the complement of the locative preposition in example (65b) is interpreted as the initial boundary of a trajectory and, in this context, the use of *desde* is more appropiate.

I suggest that the same analysis can be applied to Catalan. Consider example (56)

illustrated above, where the PP headed by *de* encodes a containment relation between the figure (i.e., the subject) and the ground (i.e., *Tossa*). The path encoded by *de* moves the figure out of the ground, but this leads to an ungrammatical result in (56). The predicate is a verb of motion (i.e., *caminar* 'walk') that requires a directional PP rather than a PP such as *de Tossa*, which merely indicates the source of the motion. Example (56) requires the source path encoded by *des de* 'from', which sets the initial point of a trajectory. The onset of the path is lexically encoded in the preposition *des*. The PP *des de* locates the figure (i.e., the subject) at the ground (i.e., *Tossa*) and sets the limit for movement, i.e., the figure moves 'from out of' Tossa.

4.3. Summary of section 4

Section 4 has examined the relevant properties of spatial uses of (*des*) *de*-paths that set them apart from *since* in English. In English, *since* PPs are specialised for temporal uses and only admit spatial complements that have an eventive interpretation, see (48a). I have shown that *since* PPs contrast with *from* PPs in that the latter allows for proper spatial uses. The preposition *from* expresses directionality and encodes a coinitial source path (Pantcheva 2011). The source of a spatial path can be expressed by *des de* and *de* in Catalan. *Des de* has a more complex structure than its counterpart prepostion *de*. In addition to origin, *des de* also has a directional component and sets the initial boundary of a spatial path. Following Pantcheva's (2011) and Romeu's (2014) classification of source paths, I have illustrated that *de* PPs pattern with coinitial paths. They encode a non-delimited trajectory in which the figure establishes a relation of containment with the ground at the initial point of the path. *Des de* PPs, by contrast, encode a directional path, which is a delimited path that fixes the initial point of the trajectory. Empirical evidence comes from examples such as (56), which show that verbs of motion (e.g., *run*, *walk* or *carry*) require oriented paths, and, hence, do not combine with *de* PPs. With *de* PPs, the orientation of the path can be obtained by syntactic means, i.e, the directional PP *fins a XP* 'to XP' is the head of the complex PP *de XP fins a XP* 'from XP until to XP' in (57). In §5, I discuss whether the grammatical properties of *des de*-paths also hold in the temporal domain.

5. The present perfect and *des de* PPs

In this section, I study the source of the universal and existential interpretation with PrP sentences modified by *since* PPs, which have been prototypically analysed as perfect time span adverbials in English. I look into the ingredients of these modified PrP sentences, and I focus on the conditions imposed on the left boundary and the right boundary of *since* PPs in Catalan and English.

5.1. Previous attempts to derive the universal-existential ambiguity with since PPs

It has been claimed in the literature that a possible source of the universal-existential ambiguity in perfect sentences modified by *since* PPs could be the lexical ambiguity of *since*-type of adverbials (Mittwoch 1988; Vlach 1993; Iatridou *et al.* 2001; among others). In this subsection, I review the main claims about *since* in Mittwoch (1988), Demirdache & Uribe-Etxebarria (2002, 2004), Móia (2000a, 2001), Iatridou *et al.* (2001), von Fintel & Iatridou (2005), Martínez-Atienza (2006, 2010) and Schaden (2007). In particular, I illustrate that (i) in an existential interpretation, the time interval that specifies the left boundary does not always exclude all the set of possible intervals in which the eventuality holds, (ii) universal interpretations may arise with other tenses and the presence of other time adverbials, (iii) the initial

position of the time adverbial does not always yield a universal interpretation and (iv) proposals that derive the different readings from structure and the type of modification, i.e., event time vs. reference time modification, cannot account for the properties of the time intervals asserted by the preposition *since*, which always have a fixed position on the timeline.

McCoard (1978), Bennett & Partee (1972/78), Dowty (1979), Vlach (1993), von Stechow (1999), advocate the idea that the representation of the perfect crucially includes a temporal interval called Extended Now (XN), which begins at some point in the past and includes the utterance time. Dowty (1979:344) identifies *since* as an Extended Now adverbial and derives the meaning of a sentence such as (66a) in the following analysis:

(66) a. John has slept since midnight.
      b. $\forall t_2 [[\text{midnight} < t_2 \wedge \text{XN}(t_2)] \rightarrow [\text{XN}(t_2) \wedge \text{AT}(t_2, \text{sleep}(j))]]$

The temporal adverbial *midnight* is placed at some time before the eventuality and the eventuality of *sleeping* ranges over all the subintervals of the Extended Now interval denoted by *since*. According to Alexiadou, Rathert & von Stechow (2003), the aspectual analysis of *since* shown above cannot account for examples such as (67) (from Alexiadou, Rathert, von Stechow 2003: xxxiii).

(67) I have lost my glasses three times since last month.

The predicate of *losing my glasses* does not hold at all subintervals of the interval asserted by *since*. *Since* licenses readings such as the one shown in (67) where the noun phrase *three times* multiplies the number of occurrences of the described eventuality.

Although Dowty (1979) does not posit the lexical ambiguity of *since* PPs, this has been claimed to be one possible source of the universal-existential ambiguity in the literature (Mittwoch 1988; Vlach 1993; Móia 2000a, 2001; Iatridou *et al*. 2001; among others). For instance, Mittwoch (1988: 207) argues that *since* has two different meanings. The first sense corresponds to a durational adverbial, which means *from XP till now*, and is expressed by means of a universal quantifier. The second meaning is an extended time or frame adverbial, which can be paraphrased by *between XP and now*, and corresponds to an existential quantifier, cf. (68a) and (68b).[12]

(68) Sam has been in Boston since Tuesday.

      a. *Since* $\forall$:   Tuesday is asserted to be part of the interval throughout which Sam is in Boston.

      b. *Since* $\exists$:   Tuesday is not included in the set of possible intervals at which the state of Sam's being in Boston holds.

Along similar lines, Iatridou *et al*.'s Perfect Time Span (PTS) theory, one the main descendants of the XN analysis, posits that *since* is a perfect-level adverbial that can introduce a universal or existential quantification over the PTS, yielding universal or existential perfects, respectively. The formal representation given in (68a)

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[12] Vlach (1993) calls the universal and existential interpretations 'inclusive' and 'exclusive', respectively.

corresponds to a universal perfect that is derived by the universal interpretation of the *since* PP, which introduces a universal quantifier. In (68b), the existential quantifier is provided by the existential variant of *since*, yielding an existential perfect:

(69)   Since 1990 I have been sick.
      a. $\exists i$ (LB= 1990 & RB = NOW & $\forall t \in i$ (Eventuality (t)))
      b. $\exists i$ (LB= 1990 & RB = NOW & $\exists t \in i$ (Eventuality (t)))

According to Iatridou *et al*. (2001: 175), the temporal representation of the PrP crucially includes a PTS interval in/throughout which there is a telic/atelic eventuality.[13] The Left Boundary (LB) of a PTS is set by context or adverbials. The Right Boundary (RB) is set by tense. The LB of the PTS in example (69) is specified by the time adverbial *1990,* and the RB by the present tense of the auxiliary verb of the compound verbal form, which is cotemporal with the utterance time. The eventuality of *being sick* stretches throughout the whole PTS up to now in (69a), and, in (69b), there is an eventualty of *being sick* in the PTS.

Móia (2000a, 2001) for the case of Portuguese and other Romance languages as well as Martínez-Atienza (2006, 2010) for the case of Spanish claim that *since* is ambiguous between a universal and an existential interpretation.[14] However, Schaden (2007) argues against the lexical ambiguity of *since*. He takes into account the role of the complement of the preposition *since* to provide empirical support against the distinction of two different types of *since*, i.e., existential vs. universal. Consider example (70) (from Schaden 2007: 91).

(70)   a. Bruno has been married since 2000.
      b. Bruno has been married since 2001.

Schaden (2007: 91) shows that, in a situation in which Bruno was married in February 2000, only (70b) could be analysed as a universal *since* on Mittwoch (1988) and Iatridou *et al*.'s (2001) view. According to Mittwoch (1988) and Iatridou *et al*. (2001), the universal meaning of *since* requires the interval *2001* to be part of the interval throughout which Bruno is married as in (70b). By contrast, this is not the case in (70a), where the starting point of the interval encoded by *since*, which is specified by *2000*, does not assert that the eventuality of being married holds throughout the whole time interval that includes *2000* (i.e., the subject is married in February 2000). However, even though there is a subinterval of *2000* that is not asserted to be part of the interval through which the eventuality holds, i.e., the month of January, the PrP sentence (70a) has a universal interpretation.

Schaden (2007) also considers French, German and Spanish *since* PPs. Let us consider Spanish *desde* PPs in present tense sentences. Schaden (2007: 91) provides the same context as in (70) and concludes that *desde 2000* in (71a), like in the case of *desde 2001* in (71b), allows for a universal interpretation even in the context in which there is a lapse of time of the interval asserted by *2000* which is not asserted to be part of the interval through which the eventuality of *being married* holds.

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[13] Iatridou et al. (2001) use the term bounded and unbounded to refer to telic and atelic eventualities, respectivelty. An eventuality is described as unbounded when it is not asserted to have reached an endpoint and it is bounded when it is asserted to have completed/terminated.

[14] Universal and existential interpretations of *since* correspond to 'durative since' and 'non-durative since', respectively, in Móia (2000a, 2001). Martínez-Atienza (2010) refers to the existential as '*desde inclusivo*'.

(71)   a. Bruno   está   casado desde   2000.
          Bruno   be.3sg   married from   2000
          'Bruno has been married since 2000.'
       b. Bruno   está   casado desde   2001.
          Bruno   be.3sg   married from   2001
          'Bruno has been married since 2001.'

(Spanish)

However, I claim these differences are mainly dependent on the type of complement selected by *desde* or *since*. If this preposition selected other type of locating time adverbials such as punctual time adverbials, these differences could not be elucidated. In contrast to punctual time adverbials, which denote a moment in time, *2000* asserts a temporal interval. In (71a), *desde 2000* 'from 2000' encodes the starting point of the temporal trajectory that takes place at some point in the time interval denoted by *2000*, it may be January or February. A universal interpretation is obtained when there is an eventuality that holds throughout a time interval that starts at some point in the temporal period denoted by *2000* and holds up to now. If *desde* 'from' selected *las tres* 'the three', for example, the eventuality would be wholly located at the starting point of the path. It is not possible to exclude a subinterval of *las tres* 'the three'.

Schaden (2007: 91-92) also illustrates that *since* PPs that yield an existential reading do not necessarily exclude the interval or temporal location specified by the left boundary. The same applies to French, German and Spanish. Consider (72) and (73) now.

(72)   Bruno has sold four cars since last year.

(73)   Bruno ha   vendido cuatro   coches   desde   el   año   pasado.
       Bruno have.3sg   sold   four   cars   from   the   year past
       'Bruno has sold four cars since last year.'

(Spanish)

According to Schaden (2007), Mittwoch's (1988) proposal that an existential *since* excludes *last year* as the set of possible intervals at which the event time holds cannot account for the sentences illustrated above. The starting point of the *since* PP, which is specified by *last year*, is included in the set of possible intervals in which the eventuality of *buying four cars* takes place. In the context in which the first occurrence of *buying a car* is located on the month of September from last year, the interval denoted by *since* and *desde* does not assert that the whole time interval *last year* is excluded, but only a subinterval of *last year*.

As shown above, I claim that the possibility of exluding or including a time interval has to do with the semantics of the locating time adverbial selected by *since*. In (72), the eventuality of *selling a car* is multiplied and it takes place four different times between the temporal period that starts *el año pasado* 'the year past' and now. If *desde* selected a punctual time adverbial such as *las tres* 'the three', the time adverbial would assert that the initial point of the path starts at the temporal point denoted by *las tres* 'the three'. An existential interpretation would be obtained regardless of the inclusion or exclusion of the first occurrence of *selling a car* at the starting point of the path (i.e., *las tres* 'the three').

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Apart from *since* PPs, there are other time adverbials which can have both a universal and an existential reading as illustrated in (74).

(74)   He was at home between 4 and 5.

According to Iatridou *et al*. (2001: 164), the time adverbial *between 4 and 5* has two different interpretations, i.e, a universal and an existential one.[15] The existential reading in (74) corresponds to a situation when the subject is at home at some time between the time interval that starts at 4 and ends up at 5. The universal is obtained when the eventuality of *being at home* holds throughout the whole time interval, i.e., the subject is at home between 4 and 5.

The universal/existential dichotomy observed with different type of time adverbials and positing a lexical ambiguity to all of them has the disadvantage of being uneconomical (see Hitzeman 1995, 1997a; von Fintel & Iatridou 2005). Von Fintel & Iatridou (2005) follow the PTS theory and propose a more economical solution for deriving the existential and universal readings taking into account the function of the *Aktionsart* as shown in (75) and (76).

(75)   a. Tony has been living on Cape Cod since 1990.
        b. [$_{TP}$ Present [$_{Perf}$ since 1990 [$_{AspP}$ Imperfective [$_{VP}$ Tony live on Cape Cod]]]]
        c. $\exists$t: RB (u,t) & (LB (1990,t) & $\exists$t'$\supseteq$ t : Tony live on Cape Cod at t'

(76)   a. Tony has visited Cape Cod since 1990.
        b. [$_{TP}$ Present [$_{Perf}$ since 1990 [$_{AspP}$ Perfective [$_{VP}$ Tony visit Cape Cod]]]]
        c. $\exists$t: RB (u,t) & (LB (1990,t) & $\exists$t'$\subseteq$ t : Tony visit on Cape Cod at t'

Imperfective aspect gives rise to a temporal relation of containment in which the eventuality forms parts of the whole temporal interval denoted by PTS (i.e., t' $\supseteq$ t), and perfective aspect, to a temporal relation of containment in which the PTS contains an interval in which the eventuality holds (i.e., t' $\subseteq$ t). The universal reading of (75) is derived as follows. There is a PTS specified by the time adverbial that starts in 1990 and reaches up to now, which is part of the potentially larger interval at which *Tony lives in Cape Cod*. As for the existential meaning illustrated in (76), the same PTS modified by *since 1990* is claimed to contain an interval at which *Tony visits Cape Cod*.

Moreover, predicates that have the subinterval property also allow for an existential reading even though they are more marginal. This reading can be enforced by explicit existential operators, cf. (77a) and (77b) (from von Fintel & Iatridou 2005: 6).

(77)   a. Tony has lived on Cape Cod since 1990.
        b. Tony has lived on Cape Cod at least once since 1990.

The eventuality of *living in Cape Cod* in (77a) may hold at some time interval of the interval asserted by 1990. In (77), this reading is explicitly expressed by the quantificational phrase *at least once*. According to von Fintel & Iatridou (2005), the existential interpretation in (77a) can be obtained via (i) adding another Perfect

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[15] Iatridou et al. (2001) refer to 'durative' and 'inclusive' interpretations of the time adverbial rather than universal and existential interpretations.

projection on top of the subinterval predicate even if it has imperfective aspect or (ii) positing an extra layer of existential quantification analogous to *at least once*, which quantifies over parts of the perfect time interval.
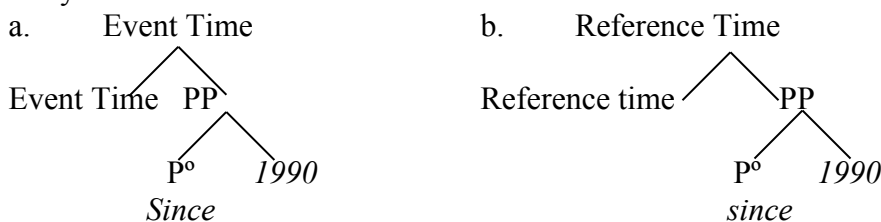
The position of time adverbials has also been claimed to be relevant for the availability of the universal reading of the perfect. It has been claimed that PrP sentences modified by *for* PPs at the end of the sentence can yield universal or existential readings, whereas PrP sentences modified by *for* PPs only have a universal reading if the PP appears at the beginning (Dowty 1979; Mittwoch 1988; Hitzeman 1995, 1997a, 1997b; among others).[16] However, the correlation between the initial position of the time adverbial, and the universal reading is not absolute. Consider example (78) in English (from Iatridou et al. 2001: 167).

(78)   Since 1990, I have read "The Book of Sand" five times.

Since always has a fixed position on the timeline in initial and final position. The initial time adverbial in sentence (78) denotes an interval that stretches up to the reference time, which is cotemporal with the utterance time. However, the event time does not necessarily hold throughout all the subintervals of the given interval asserted by *since*. The sentence can have an existential interpretation in which there are five occurrences of *reading "The Book of Sand"* that take place within a time period that starts in 1990 and holds up to now.

Some proposals in the literature try to solve the universal/existential ambiguity found in PrP sentences modified by *since* PPs on the basis of the type of modification, i.e., event time vs. reference time modification. This is the analysis given in Demirdache & Uribe-Etxebarria (2002, 2004). In their neo-Reichenbachian framework, prepositions are analysed as spatiotemporal predicates that take two arguments. For *since* PPs, Demirdache & Uribe-Etxebarria (2004: 160) show that they set the initial bound of a temporal trajectory by establishing a relation of non-central centrifugal coincidence between the event time or the reference time[17] and the time denoted by the complement of the preposition. Thus, the PP in (79) can locate the event time or reference time after/from 1990. The PP *since 1990* specifies the trajectory of the figure (i.e., the event time or the reference time), which begins at the ground (i.e., *1990*).

(79)   Tony has lived in Boston since 1990.
        a.   Event Time   b.   Reference Time

        Event Time   PP   Reference time   PP

            P°   *1990*   P°   *1990*
          Since   *since*

The syntactic structures illustrated in (79) yield different readings when the event time and the reference time do not corefer, as is the case of perfect sentences. PrP sentences modified by *since PPs* give rise to an existential reading of the PrP when the PP specifies the starting point of the trajectory of the event time, whereas the

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[16] The existential and universal readings correspond to 'non-position-definite' and 'position-definite' readings, respectively, in Hitzeman (1995, 1997a, 1997b).

[17] The Reference Time corresponds to the Assertion Time in Demirdache & Uribe-Etxebarria (2000; 2002; 2004).

universal interpretation is obtained when the PP specifies the reference time (Demirdache & Uribe-Etxebarria 2002). However, this analysis cannot capture the meaning of *since*, which has a position definite reading on the timeline, i.e., it is anchored to the utterance time in PrP sentences. *Since*-paths in English assert a two-sided time interval that includes its right boundary, which is directly related to the utterance time in PrP sentences.

Summing up, this subsection has shown that analyses based on the lexical ambiguity of *since* (see Mittwoch 1988; Móia 2000a, 2001; Iatridou *et al*. 2001; Martínez-Atienza 2006, 2010; among others) miss a generalization. A universal *since* as well as an existential *since* do not always assert the inclusion of the entire time interval, see (71) and (73), and the universal and existential reading may arise with different type of time adverbials as in (74). Moreover, there is no absolute relation between the position of the time adverbial and the universal interpretation, see (78). Thus, following Hitzeman (1995, 1997a), von Fintel & Iatridou (2005), Schaden's (2007), among others, I adopt the claim that the universal/existential ambiguity of PrP sentences cannot be due to the lexical ambiguity of time adverbials such as *since* PPs. I have also considered a proposal that solves the universal/existential ambiguity at the structural level, i.e., event time vs. reference time modification (Demirdache & Uribe-Etxebarria 2002, 2004). However, this analysis cannot fully explain the deictic component of the preposition *since*, which encodes a two-sided interval that stretches up to the utterance time in PrP sentences. In the following subsections, I attempt to determine the source of the universal/existential dichotomy with *des de* PPs in Catalan by having a closer look into the grammatical properties of the interval asserted by *des de* in comparison with the type of interval encoded by *since* and *from* PPs.

5.2. Universal and existential readings with *des de* PPs

In this section, I test the empirical consequences that the grammatical properties of *des de* and *since* PPs have for the available readings of the PrP. I make use of different grammatical properties of paths, namely, (i) the property of delimitation, (ii) the relation between the figure and the ground, and (iii) the nature of the right boundary.

5.2.1. The property of delimitation

The main purpose of this section is to test whether the property of delimitation of source oriented spatial paths encoded by *de* PPs and *des de* PPs in Catalan is also available in the temporal domain. I show that *de* PPs are cointial paths which cannot delimit the starting point of a temporal interval. By contrast, *des de* PPs encode egressive paths as in the spatial domain. The interval asserted by *des de* states an initial boundary of a temporal trajectory. In English, apart from *since* PPs, *from* PPs also license temporal trajectories. The main difference between the two is that *from* patterns with coinitial paths, whereas *since*, like in the case of *des de*, shares more similarities with egressive paths.

In Uralic languages such as Komi, the egressive morphological case used to encode spatial paths is also used in the temporal domain. Consider example (74) (data from Kuznetsov 2012: 385, his translation).

(80)   va vylö **petöm-sjan'**(egressive) kolis nin časys' undžyk.
        '...more than an hour has expired <u>since</u> [the moment of] <u>going</u> to the water'.

The egressive case also encodes the egressive-type path and can also be graphically represented by (81) (=(62b), from §4), repeated again below.

(81)   Egressive (*starting from*-path)   +-------------
                                                  0   1

The egressive case (i.e., *sjan*) is attached to a word which has an eventive interpetation (i.e., *petöm* 'going'). The egressive case in (81) sets the beginning of the interval at the moment in which the figure starts moving along the path towards the water. In the temporal domain, the egressive path encoded by the egressive morphological case refers to a moment in time and delimits the starting point of the path, i.e., it sets the figure (i.e., the *expiring* time eventuality) at the first point where the ground (i.e., *the moment of going to the water*) is located and it includes just one plus.

In §4, I illustrated that *des de* encodes a delimited oriented path. In contrast, *de* only sets up the origin. The typological classification provided by Pantcheva (2011) allows for a more fine-grained description of *desde* and *de* in Spanish (Romeu 2014), which, by hypothesis, encode different types of spatial source paths, i.e., coinitial and egressive. The same applies to Catalan, cf. (82) and (83) (=(56) and (57), from §4, respectively).

(82)   Vam   caminar {des de/ *de} Tossa.
        aux.2pl walk   from   of Tossa
        'We walked from Tossa.'
(83)   Vam   caminar de Tossa fins a Blanes.
        aux.2pl walk   of Tossa until to Blanes
        'We walked from Tossa to Blanes.'

In (82), *des de Tossa* 'from Tossa' sets the initial point of the spatial trajectory. The *de*-path, by contrast, is ruled out, because *de Tossa* 'of Tossa' only encodes origin and the locative relation of containment between the figure (i.e., the *walking* event) and the ground (i.e., *Tossa*) at the initial point of the path clashes with the directional PP required by the predicate. As example (83) shows, the path encoded by the *de* PP is licensed in the presence of an explicit goal phrase such as *fins a XP* 'until to XP'. In (83), the goal path *fins a Blanes* 'until to Blanes' is the head phrase of the complex prepositional construction *de XP fins a XP* and hosts the directional component of the path (see the syntactic structure given in (60)). Similar observations hold in the temporal domain:

(84)   a. Hem   caminat de les tres *(a   les cinc/ fins a les cinc).
           have.2pl walked of the three to   the five/ until to the five
           Intended: 'We have walked of three *(to five).'
        b. Hem   caminat des de les   tres (a les cinc/fins a les   cinc).
           have.2pl walked since   the three to the five until to the   five
           Intended: 'We have walked from three (until five).'

As in (82), the temporal path *de les tres* 'of the three' in example (84a) is blocked. The preposition cannot establish a relation of inclusion between the event of *walking* (the figure) and the punctual time adverbial *les tres* 'the three' that asserts a moment in time (the ground). The PP *de les tres* 'of the three' in (84a) is licensed with an

explicit delimiter such as *a les cinc* 'to the five' or *fins a les cinc* 'until the five', which is the head of the complex prepositional phrase *de les tres a les cinc/fins a les cinc*. The PP *des de les tres* 'from the three' in (84b) delimits the starting point and excludes its endpoint.

A temporal bound such as *fins a XP* 'until to XP' is optional. This example shows that the optionality of the *a* PP or *fins (a)* PP is the main empirical factor that shows that *des de*, in contrast to *de*, encodes the onset of a temporal trajectory and patterns with egressive paths, see (81). Like in the spatial domain, the preposition *des de* specifies the limit of a temporal trajectory, which starts at three in (84b). The graph given in (81) illustrates that the first positive portion (i.e, +) corresponds to the position in which the event of *walking* coincides *at three*, and the minuses (i.e., ----) are positions in which the *walking* event occurs at times other than at three.

De PPs can be found in fixed temporal expressions such as *de dia* 'of daytime' or *de nit* 'of night'. Let us consider (85).

(85) Hem   caminat   {*des de/ de}   dia
      have.2pl walked   from   of   daytime
      Intended: 'We have walked of daytime.'

In (85), the preposition *de* imposes a relation of inclusion on the starting point of the path. The figure, that is, the eventuality of *walking*, is wholly contained within the ground (i.e., *dia* 'daytime') and starts moving along the path during the daytime. In contrast to the preposition *de*, the PP headed by *des de* cannot combine with this type of noun phrase. The noun phrase *dia* 'day' in (85) cannot be used to set up a limit of a temporal trajectory. The preposition *des de* would require a definite noun phrase instead (i.e., *el dia que vam arribar* 'the day that we arrived').

From-paths in English are also used in the temporal domain. Consider the following pair of examples in (86).

(86) a. We have been at the office from three *(until now).
      b. We have been at the office since three.

From PPs encode a coinitial source path that imposes a locative relation of inclusion at the starting point of the path. However, this relation is not available in (86a) since the ground (i.e., *three*) refers to a moment in time and the interval encoded by the punctual time adverbial cannot contain the figure (i.e., *being at the office*). Like *de*-paths, *from three* in (86a) requires a PP such as *until now* to be licensed, which is the head of the complex prepositional phrase *from XP until XP*. The source path *from three* specifies the left boundary and *until now*, the right boundary of a temporal interval. *Since* PPs do not impose such a locative relationship between the figure and the ground, and *since three* in (86b) asserts the starting point of the temporal interval that refers to a moment in time.

It is important to note that *from* PPs can combine with noun phrases as in (87a) (from Declerck *et al*. 2006: 230). *Since* PPs can also take this type of complements, see (87b).

(87) a. From childhood, she has had a timid character.
      b. Since childhood, she has had a timid character.

In (87a), the coinitial path encoded by *from* is licensed because the relation of inclusion between the figure (i.e., *having a timid character*) and the ground (i.e., *childhood*) holds. The eventuality of *having a timid character* starts moving along the path while being within the time interval denoted by *childhood*. According to Declerck *et al*. (2006), *from* PPs specify a time interval that starts at some time in the past and holds up to now and at the same time they indicate the duration of the event time.[18] By contrast, *since* seems to pattern with egressive paths. The PP illustrated in (87b) asserts an interval whose figure (i.e., *having a timid character*) delimits the starting point of the path at the ground (i.e., *childhood*). The context in (88) elucidates the differences between *from* and *since* that have been outlined above.

(88)   A: How long have you had a timid character?
        B: Since childhood. / *From childhood.

The speaker B in (88) can use only the preposition *since* to encode a delimited temporal path that sets the lower bound of the temporal trajectory, i.e., *childhood* is the temporal period that is used to delimit the starting point of the path that stretches up to now. In this context, the use of *from* is ruled out, i.e., its locative relation of inclusion between the figure and the ground clashes with the temporal trajectory required by the question.

This subsection has shown that there are relevant analogies between spatial and temporal uses of *des de*. Crucially, I have provided empirical data to support the view of analysing *des de* PPs as instances of egressive paths in the temporal domain: (i) *des de* PPs delimit the starting point of a temporal interval, (ii) in contrast to *de* PPs, the expression of the right boundary of the temporal trajectory is optional (i.e., *a/fins a les cinc* 'to/until the five'), cf. (84a) and (84b). I have also considered *from* PPs and shown that, in contrast to *since* PPs in English, they encode a cointial path, whereas the latter patterns with a type of egressive path in the temporal domain like in the case of *des de*, see (88). However, as I discuss in §5.2.3., the temporal path encoded by *since* is more complex than the egressive path illustrated in (81), because it also includes the right boundary in its denotation. In the following subsection, I further look into the locative relation between the figure and the ground of these types of paths.

5.2.2. The relation between the figure and the ground

As shown above, coinitial (i.e., *from* paths) and egressive paths (i.e., *des de* paths) differ with respect to the property of delimitation, which is illustrated by the portion of the path where the locative relation between the figure and the ground holds. I take into account the relation between the figure and the ground to show that only coinitial paths (i.e., *from*-paths), in combination with PrP sentences in English, allow for unequivocal universal readings. This reading is ensured via the locative relation of inclusion between the figure and the ground at the starting point of the path. As for *since* and *des de* PPs, they delimit the starting point of a temporal trajectory and do not impose such a relation, i.e., the figure and the ground merely coincide at the starting point of the path, so that both universal and existential readings are allowed. In *des de* PPs in Catalan, the existential interpretation is obtained by means of explicit quantified phrases.

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[18] Declerck et al. (2006: 133) refers to this type of PP as a 'bifunctional adverbial', which has a double function: it functions 'as time-specifying adverbial and duration adverbial at the same time'.

From PPs license coinitial temporal paths, see (87a), which, in contrast to *since* PPs, impose a locative relation of inclusion between the figure and the ground. Declerck *et al*. (2006: 630) show that *from* PPs occur with the PrP and always yield a universal interpretation, see (89).

(89)   I {*was/have been} fascinated by insects from childhood.

As Declerck *et al*. (2006) put it, *from* PPs always yield universal interpretations and do not allow for existential interpretations with an indefinite noun phrase or an explicit quantified phrase as in (90a) and (90b), respectively (from Declerck *et al*. 2006: 600).

(90)   a. *I've seen a dragonfly from childhood.
        b. *I've been in France exactly six times from childhood.

In Declerck *et al*. (2006), the unambiguous universal reading in examples (89) and (90) is connected to the non-specification of the right boundary. The temporal interval encoded by the preposition *from* is not bounded and the described eventuality cannot come to an end before the utterance time.[19]

In this paper, the underspecification of the right boundary is necessary, but not sufficient. I claim that an unequivocal universal reading is ultimately available due to the containment relation of inclusion imposed by coinitial paths. In (89), the *from*-path asserts a temporal path in which the figure (i.e., the state of *being fascinated*) is contained within the ground (i.e., the subject's *childhood*). This relation of containment is obtained at the starting point of the path, where the figure starts moving, and holds up to now. This path was graphically represented in (62a), which is shown again in (91):

(91) Coinitial (*from*-path)   ++++-------------
                                      0   1

The locative relation between the figure and the ground is obtained at the starting point of the path where the plusses are located. The positive portions of the path are time intervals in which the figure (i.e., the state of *being fascinated*) is contained within the ground (i.e., the subject's *childhood*). By contrast, the minuses correspond to intervals in which the figure is not within the ground, i.e., the state of *being fascinated* is not located within the subject's childhood.[20]

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[19] Declerck *et al*. (2006: 600) refers to *from* PPs as 'situation-unbounding' adverbials, i.e., the endpoint of the adverbial is unspecified.

[20] A reviewer points out that if a relation of containment between the figure and the ground holds in (83), we should be able to obtain something like the temporal structure of the imperfective. This graph +++[+++++]+++ corresponds to the imperfective aspect. The plusses represent the event time which is located within the brakets, which correspond to the reference time. This graph could represent the fact that the event time in (89) starts when the subject is a child and holds up to now. It is important to draw special attention to this point because the representation of the coinitial path in (89) is not equivalent to the imperfective structure given above. (89) shows that *from*-paths encode a transition. The figure is located within the period of the subject's childhood at the beginning of the temporal trajectory, but it is not located within the period of the subject's childhood at the endpoint of this path, which is identified with the utterance time in (89). I leave for further research the study of the semantics of transitions and the link between the hypothesis of the locative relation of containment of temporal paths and the imperfect.

From PPs can also be licensed in complex delimited paths being specifiers of a complex temporal trajectory, i.e., *from X until Y*, see (86a). This type of temporal path allows for a universal reading of the PrP in (92a).[21] However, in contrast to example (89), it is a two-sided interval that allows for an existential reading by means of explicit quantified phrases, see (92b) (from Declerck *et al*. 2006: 599).

(92) a. From the beginning of May until now I have been ill.
       b. From the beginning of May until now I have been ill three times.

In (92), the PP *until now* is the head of the complex temporal path. It specifies the right boundary of the perfect time interval and the PP *from*, which is the specifier of the complex temporal path, sets the left boundary. In contrast to (89), the delimited nature of the complex temporal path allows for existential readings, which are enforced via the explicit presence of quantified phrases (i.e., *three times*).

As was shown above, *des de* PPs share more grammatical properties with *since* PPs, cf. (84b) and (86b). However, the right boundary of *des de* PPs, like *from* PPs, is left unspecified. Declerk *et al*. (2006) point out that the unspecification of the endpoint of the interval encoded by *from* is directly connected to the ability of universal interpretations of PrP sentences modified by *from* PPs, cf. (89) and (90). However, it does not suffice because *des de* PPs allow for universal as well as existential readings. I claim that the type of locative relation between the figure and the ground is what ultimately matters to derive the different readings.

Des de PPs encode an egressive path, i.e., they assert a delimited temporal path that sets the intial boundary of a temporal trajectory. As (93) shows (=(62b), from §4), an egressive path includes 0 (i.e., the starting point of the path) and excludes 1 (i.e., the endpoint of the path).

(93)   Egressive (*starting from*-path)   +-------------
                                                 0   1

I claim that the reason why PrP sentences modified by *des de* can give rise to universal or existential interpretations is connected to the egressive temporal path encoded by the preposition. In (94) (=(5), from §1), the egressive path encoded by *des de* is a time interval that yields a universal interpretation:

(94)   He   viscut a   Boston des de 2000.
       have.1sg   lived   in   Boston since   2000
       'I have lived in Boston since 2000.'

In (94), the egressive path sets the left boundary of a temporal interval whose endpoint is left unspecified. The figure (i.e., the eventuality of *living*) is located at the ground (i.e., *2000*) at the starting point of the path. This is graphically illustrated by a

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[21] According to Declerck (2006: 123), a sentence modified by *from X to Y* as in (i) may have two different interpretations:

(i) From 5 to 5.30 John was running his usual two miles before breakfast.

The event time of *running* is homogeneous, and the complex PP *from 5 to 5.30* specifies the duration of the event time. The event time may coincide with the initial and final boundaries *from 5 to 5.30* or it may be included within a larger time interval, i.e., the event time may start earlier than 5 and/or stop after 5.30.

plus in (93). The minuses in (93) correspond to intervals in which the figure (i.e., the event time) is not in a locatie relation with the ground (i.e., *2000*).

In contrast to *from* PPs, *des de* PPs lack the locative relation of inclusion between the figure and the ground, and, hence, they can enforce an existential quantification over times via the presence of quantified phrases, cf. (90) and (95) (=(6), from §1).

(95) He   viscut   a Boston dos   cops des de 2000.
      have.1sg   lived   in Boston two   times since   2000
      'I have lived in Boston twice since 2000.'

The fact that the universal/existential ambiguity does not arise with *des de* PPs in combination with atelic predicates has been already attested for Portuguese and other Romance languages (see Móia 2000a, 2001) and Spanish (see Martínez-Atienza 2006, 2010). According to Martínez-Atienza (2006, 2010), *desde* in Spanish is a durative preposition, which allows for an existential interpretation of the PrP with the presence of an explicit indefinite phrase or a quantified phrase, see (96) (from Martínez-Atienza 2010: 186).

(96) He   vivido en Nueva York   (únicamente   dos   meses) desde 1982.
      have.1sg   lived   in NY   only   two   months since 1982
      'I have lived in New York for only two moths since 1982.'

                                                                                (Spanish)

Since PPs seem to pattern with egressive paths like *des de* PPs, i.e., they state the initial boundary of a temporal trajectory. However, they are prepositions that also include the endpoint of the path in its meaning, involving containment in a temporal area. This two-sided interval encoded by *since* allows for universal and existential interpretations, see (97) (=(1), from §1, from Mittwoch 1988: 201).

(97)   Sam has been in Boston since Tuesday.

The *since* PP in (97) can locate the figure (i.e., the eventuality of *being in Boston*) at the first point where the ground is located (i.e., *Tuesday*), yielding a universal interpretation of the sentence. The *since* construction asserts a two-sided interval which also allows for an existential reading in which the figure is contained in an interval that starts on Tuesday and reaches up to now.

In this subsection, I have derived the universal and existential readings in PrP sentences modified by prepositions that encode source paths taking into account their grammatical properties. The following table summarises the results.

(98)   Grammatical properties of temporal paths and the universal / existential reading

Temporal path	Delimitation	Relation F & G	QP	RB	U/E
from XP	non-delimited	F within G	-	-	U
from X until Y	delimited	F at G	+	+	U / E
des de XP	delimited	F at G	+	-	U / E
since XP	delimited	F at G	+	+	U / E

Unequivocal universal readings are available with cointial paths. *From* PPs assert a non-delimited source path that establishes a locative relation of inclusion between the

figure and the ground, see (89). Such a locative relation blocks the existential quantification over times or quantified phrases, see (90). *From* PPs can license delimited intervals when they specify the initial boundary of a complex temporal path, i.e., *from X until now*, see (92a). This two-sided path can enforce an existential reading with quantified phrases, see (92b). In contrast to *from*-paths, *des de* PPs encode an egressive path in the temporal domain, i.e., they state the initial boundary of the path and do not impose a locative relation of inclusion between the figure and the ground. The lack of this locative condition allows for existential quantification over times in the presence of explicit quantified phrases, see (95). *Since*-paths, in contrast to *des de*, have a more complex internal structure, i.e., *since* has a predetermined right boundary. The nature of the right boundary in *des de* PPs and *since* PPs is further discussed in the following section.

5.2.3. The nature of the right boundary

As pointed out above, one of the most relevant differences between *des de* and *since* has to do with the nature of the right boundary. In this subsection, I illustrate that *since* has a more complex meaning. I follow Schaden's (2005a, 2007) claim for the case of French and Spanish that *depuis* and *desde* lack the denotation of a right-delimiter, and show that *since* and *des de* also differ due to the absence of the right boundary in the meaning of the preposition. In this subsection, I also show that the specification of the right boundary, which in the context of PrP sentences corresponds to the reference time, does not necessarily need to be coextensitve with the utterance time to obtain a universal reading of PrP sentences modified by *des de*. The anchoring of the eventuality to the utterance time is mainly due to the interaction of the subinterval property of the predicate and the grammatical properties of temporal adverbials. In the case of *des de* in Catalan, additional elements such as *ençà* 'up.to.here', the marker *que* 'that' or the locating phrase *fa XP* 'makes XP' ensure the anchoring of the temporal path to the utterance time.

Since PPs, in contrast to *des de*, assert a two-sided interval. According to Hitzeman (1997b), the reference time is part of the meaning of *since*. In PrP sentences, the interval asserted by *since* refers to a time interval that is anchored to the utterance time. As shown before, it is not possible to identify the deictic anchoring of the right boundary of *since* with an overt phrase as in (99) (=(19b), from §2).

(99)   John has been in Boston since Friday (*until now).

The explicit presence of a right boundary is ruled out because it is already encoded in the meaning of this preposition.[22]

Schaden (2005a: 91) provides the following formalization of *since* that corresponds to English:[23]

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[22] According to a reviewer, it is not clear the reason why it is not possible to specify the deictic anchoring of *since* with an explicit temporal expression like *until now*. The reviewer points out that a verb such as 'fall', for example, intuitively encodes a left boundary of the movement, which can be explicitly identified with an overt phrase such as 'fall from above'. This question may also be connected to the properties of *since* which is restricted to temporal uses and disallows pure spatial physical ones. Schaden (2007) points out that the fact that *depuis* in French and *desde* in Spanish can have a right-delimiter different from the reference time is connected to the spatial use of the preposition. However, he does not focus on the reason why a phrase such as *until now*, which refers to the moment of the reference time, cannot appear with *since* in English. This question is still not solved and I leave it for further research.

(100) $[\text{since}] = \lambda p \lambda q \lambda i \exists i' \exists i''[i \subseteq i' \wedge LB(i') = i'' \wedge RB(i') = i \wedge p(i'') \wedge q(i')]$

According to Schaden (2005a), the preposition *since* encodes an interval *i'*, which takes the interval *i''* as first argument (i.e., a locating temporal phrase such as *Friday* in (99)) that specifies the left boundary of the interval *i'*. The second argument taken by *since* is the interval *i*, which is the reference time and it is valued by *Tense*.

The hypothesis that *since* in English encodes an egressive path is not compatible with Schaden's (2005a) definition. As has already been mentioned, the semantics of *since* is more complex than *des de*. *Since* has been analysed as a perfect-level adverbial, which, apart from setting the left boundary of a temporal path, it also includes a deictic endpoint. The graphic shown below illustrates a path that includes both its intial and final boundaries, i.e., 0 and 1, and is compatible with Schaden's formalization.

(101)   *Since*-path

```
+------------+
0            1
```

In (101), the locative relation between the figure and the ground is obtained at the starting point of the path (i.e., 0) as well as at the endpoint of the path (i.e., 1). The figure of a *since*-path is the reference time, which begins at the ground (e.g., a temporal interval such as *Friday*), and ends at the moment of utterance in PrP sentences. According to Móia (2000a, 2001), since-phrases define a 'frame for temporal location' that allows for a universal as well as an existential reading.

Schaden (2007: 109) argues that the meaning of *desde* PPs in Spanish and *depuis* PPs in French do not provide any specification of a right-delimiter.[24] I propose that this claim can also be extended to Catalan. Then, following Schaden's formalization of the meaning of *since* in English, *des de* corresponds to the following lexical entry:[25]

(102) $[\text{des de}] = \lambda p \lambda q \exists i' \exists i''[LB(i') = i'' \wedge p(i'') \wedge q(i')]$

The preposition *des de* encodes an interval *i'*, which takes the interval *i''*, which is a locating temporal phrase. The right boundary is not denoted in the lexical entry of *des de* and is unspecified. The temporal path does not establish any relation to the reference time and it is set up by the syntacticosemantic context. This definition is compatible with the properties of the egressive path outlined above, see (93).

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[23] In (100), p.q are propositional variables; *i*, *i'* and *i''* stand for intervals, more specifically: here *i* is the reference time of the sentence, *i'*, the interval encoded by *since* that has a LB and a RB, and *i''* is the denotation of the locating temporal expression.

[24] Schaden (2007) distinguishes the utterance time and the point of perspective, which was introduced by Kamp & Reyle (1993). He provides a formal representation of the meaning of *desde* in Spanish and proposes that the right boundary of a *desde* PP is specified by the point of perspective. In this study, I do not distinguish the utterance time and the point of perspective.

[25] In (101), p.q are propositional variables; *i'* and *i''* stand for intervals, more specifically: here *i'* is the interval encoded by the preposition that denotes a LB, and *i''* is the denotation of the locating temporal adverbial.

Schaden (2007: 109) points out that *desde* in Spanish and *depuis*-adverbials in French can take any type of interval as its right boundary. Consider the following examples in Spanish, cf. (103a) (from García Fernández 2000: 117) and (103b) (from Martínez-Atienza 2010: 196).

(103) a. He   trabajado en   esa obra desde   abril hasta junio.
          have.1sg worked   on   this work from   April until June
          Intended: 'I have worked on this work from April until June.'
      b. He   estado   enfermo   desde   1992   hasta 1995.
          have.1sg been   sick   from   1992   until 1995
          Intended: 'I have been sick from 1992 until 1995.'

The PrP as well as the past can be used in examples illustrated in (103). However, with PrP sentences as (103a), the perfect time interval encoded by the perfect overlaps with the reference time, i.e., the month of June overlaps with the current time unit, and locates the right boundary of the temporal path at the closest month of *June* before the utterance time. As for (103b), it seems that this sentence could only be accepted in a list-reading in which the subject is enumerating the events that took place between 1992 and 1995. It could be accepted as an answer to a question like *Qué te ha pasado desde 1992?* 'What has happened to you since 1992?'.

Let us consider now the following examples in Catalan, see (104) (example (104b) corresponds to (28a), from §2.2).

(104) a. Ha   estat a casa des de les tres fins les   set.
          have.3sg been in home from   the three until the   seven
          Intended: 'He has been at home from three until seven.'
      b. Ha   estat a Boston des de   dimarts fins (ara) fa   poc.
          have.3sg been in Boston from   Tuesday until now   makes   little
          Intended: 'He has been in Boston since Tuesday until som time ago.'
      c. Hem   treballat junts   des del gener fins al març.
          have.1pl worked   together from.the January to.the March
          Intended: 'We have worked together from April to June.'

In PrP sentences, *des de* allows for the specification of a right boundary that refers to the closest relevant period before the utterance time, i.e., the preceding seven o'clock, a short time ago or the closest month of March, see (104a)-(104c), respectively.

However, we cannot find contexts that allow for the presence of temporal intervals that refer to a past time:

(105) a. *Ha   estat a Boston des de   dimarts fins ahir.
            have.3sg been in Boston from   Tuesday until yesterday
      b. *Ha   estat a Boston des del 2000 fins el   2005.
            have.3sg been in Boston from.the 2000 until the   2005

The past time adverbials *ahir* 'yesterday' in (105a) or *2005* in (105b) specify a right boundary that precedes the present reference time and rules out the use of the PrP. It is important to note that there is variation among speakers, and a sentence such as (105a) could be accepted. However, it seems that (105b) is less acceptable in an out of the blue context. The PrP could only be accepted as a list-reading, as in (103b).

In Catalan, some additional elements such as the adverb *ençà* 'up.to.here', the spatiotemporal marker *que* 'that' or the adverbial *fa XP* 'makes XP' are needed to ensure that, in PrP sentences, the perfect time interval is anchored to the utterance time. In §2, I pointed out that the presence of these markers require the use of the present tense or PrP and the right boundary always overlaps with the utterance time. In these contexts, the explicit specification of the right boundary is quite restricted. Consider (106).

(106) D'   aleshores ençà   fins ara   ha   estat professor.
      from then   up.to.here until now have.3sg been   teacher
      Intended: 'Since then until now he has been a teacher.'

The explicit expression of the right boundary with PPs such as *d'aleshores ençà* 'from then up to here' refers to the same moment of the utterance or to a moment linked to the day of speaking (i.e., *fins {ara/avui}* 'until now/today').

Likewise, an explicit expression specifying the right boundary is not likely to occur in sentences with preposed time modifiers such as *des de XP que* 'from XP that', see (107).

(107) ?? Des de   diumenge fins ara   que ha   plogut.
      from   Sunday   until now that have.3sg rained

The marker *que* 'that' in (107) is identified as a temporal-aspectual marker in Rigau (2000, 2001a, 2001b), and asserts a time interval that is anchored to the utterance time. As in (106), the right boundary may be accepted if it expresses that the interval encoded by *des de* reaches up to the same moment of the utterance or to a certain time linked to the present (i.e., *fins {ara/avui}* 'until now/today').

As has been noted for the case of Spanish (García Fernández 1999: 3196, 2000: 103; Schaden 2007: 104), locating time adverbials such as *hace XP* 'makes XP' or *hacía XP* 'made XP' cannot appear with an explicit rightward boundary. For my present purposes, I consider *des de fa* PPs 'from makes' in PrP sentences in Catalan.

(108) a. *Ha   estat professor des de fa   deu anys fins fa   poc.
         have.3sg been teacher   from make.3sg ten years until make.3sg little
      b. Ha   estat professor des de fa   deu   anys   fins   ara.
         have.3sg been teacher   from make.3sg ten   years until now
         'He has been a teacher for ten years up to now'

Fa deu anys 'makes ten years' in (108) measures the event time of *being a professor* from the utterance time and, hence, disallows the presence of an explicit-right side delimiter like *fa poc* 'makes little', which refers to a moment different from *now*, see (108a). It is not logical to delimit the right boundary at some time before the utterance time, because the measure phrase selected by the locating time adverbial *fa X time* 'makes X time' locates the event time ten years backwards from the utterance time. It can only admit a right boundary that includes the moment of the utterance as in (108b).

The main conclusion of this subsection is that the lexical entries of *since* PPs differ cross-linguistically. The egressive path is clearly encoded by *des de* PPs, but *since* has a more complex semantic structure, see (101). It is a perfect-level adverbial and, apart from the left boundary, the right boundary, which in PrP is identified with the

utterance time, is also inherent to the meaning of the preposition. In Catalan, some additional elements are needed to anchor *des de* to the reference time. *Ençà* 'up.to.here' presupposes the right boundary, *que* 'that' anchors the perfect time interval with respect to the utterance time and *fa* XP measures a temporal period backwards from the utterance time. An explicit specification of the right boundary is, hence, less likely to occur in these cases. If it is available, it mainly refers to the same moment as the utterance time (i.e., *fins ara* 'until now') or to some interval linked to the day of speaking (i.e., *fins avui* 'until today'), see (106), (107) and (108).

6. Conclusion

This paper has described the main grammatical properties of *since*-type of adverbials in a variety of Germanic and Romance languages. In particular, I have focused on Catalan and English. In contrast to *des de*, *since* includes the right boundary in the meaning of the preposition and it is set up by the present tense of the auxiliary verb in PrP sentences. One of the main empirical differences between *since* and *des de* is related to the nature of the right boundary, which it is left unspecified with *des de* PPs. In Catalan, *des de* PPs can combine with different tenses, see (23), and allow for an explicit right-side delimiter, see (28). Catalan requires additional elements such as the durational phrase *fa XP* 'makes XP', see (29), the adverb *ençà* 'up to here', see (31), or the spatiotemporal marker *que* 'that', see (32), to anchor the PP to the utterance time.

There are relevant analogies between spatial and temporal uses of *des de*. In particular, *des de* encodes an egressive path in the temporal domain that delimits the left boundary of a time interval, see (62b). The temporal path locates the figure (i.e., the described eventuality) at the first point where the ground is (i.e., delimited temporal interval). In English, *since* PPs also encode the starting point of a temporal path, i.e., its left boundary is a delimited temporal interval and its right boundary is encoded in the path asserted by the preposition *since*.

I have further investigated the source of the universal and existential interpretations of PrP sentences modified by *since* and *des de* PPs by looking at the contribution of the type of temporal path they encode. I have shown that, unlike *from*-paths, *des de*-paths lack the locative relation of inclusion, i.e., the figure does not 'continue' within the ground at the starting point of the path, and, hence allow for existential quantification over times, which is contributed by indefinite phrases or quantified phrases, see (95).

As for *since*-phrases, they are deictic PPs that encode the left and the right boundaries in the meaning of the preposition. I propose that the path encoded by *since* has a more complex structure than an egressive path, see (101). They are perfect-level adverbials that modifiy the reference time, which is the figure of the temporal path. The locative relation between the figure and the ground is obtained at the starting point of the path, i.e., the figure begins at a specific temporal interval, and this relation also holds at the end, i.e., the figure ends at the moment of utterance in PrP sentences.

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