Towards a unified account of degree achievements and change of location verbs: the case of Spanish verbs with *en-*[1]

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Abstract. This paper discusses Spanish verbs that are prefixed with *en-*, e.g., ***en-suciar*** 'to dirty' and ***en-carcelar*** 'to jail' (the former is a degree achievement and the latter is a change of location verb). The aim of this paper is to make explicit what the parallels between both kinds of verbal predicates are and provide a semantics that captures these parallels. To this end, I propose that the prefix *en-* has a core meaning, which is based on the locative preposition *en* in Spanish (which roughly translates in English as 'in/inside, on') that can be used in the domain of degrees (in the case of degree achievements) and space (in the case of change of location verbs). My account makes an initial attempt to bridge two different domains focusing on verbal predicates of change. This proposal is, in principle, extensible to (at least) other Romance languages, which display a similar pattern.

Keywords: degree achievement, change of location, base predicate, preposition, Spanish.

1. Introduction

This paper discusses Spanish verbs that are prefixed with *en-*. Verbs derived with *en-* are either degree achievements or change of location verbs. The former is exemplified in (1), a sentence that conveys the meaning that the theme increases in the degree to which it is dirtied. The latter is exemplified in (2), a sentence that conveys the meaning that the theme changes from not being in jail to being in it.

(1) a. **en-**suciar 'to dirty'
   b. Tania **en-**sució la mesa.
     Tania **en-**dirtied the table
     'Tania dirtied the table.'

(2) a. **en-**carcelar 'to jail'
   b. Daniel **en-**carceló a Gianfranco.
     Daniel **en-**jailed Gianfranco
     'Daniel jailed Gianfranco.'

This paper aims to make explicit what the parallels between degree achievements, as in (1), and change of location verbs, as in (2), are and provide a semantics that captures these parallels. This attempt is empirically motivated by the fact that both degree achievements and change of location verbs, as exemplified in (1)-(2), display the same derivational morphology, namely, they are derived by means of the prefix *en-*.

I propose that the prefix has a core meaning that can be used in the domain of degrees and the domain of space. The core meaning of *en-* will be grounded in the well-documented parallels between the prefix *en-* and the locative preposition *en*, which can be roughly translated as 'in/inside, on'. My account thus proposes an initial attempt to shorten the gap between two different domains in semantics focusing on verbal predicates of change, a task that has not

been undertaken thus far to the best of my knowledge—see Gärdenfors and Warglien (2012) and Krifka (2012) for approaches motivated by the same spirit of bridging different domains in formal semantics. The proposal developed here is, in principle, extensible to other languages, in particular, to other Romance languages where a similar phenomenon is attested—see Gehrke (2008) and references therein for relevant discussion.

The paper is organized as follows; in section 2, I discuss degree achievements with *en-*. In section 3, I address change of location verbs with *en-*. In section 4, I discuss the parallels between the prefix *en-* and the preposition *en* in order to motivate the prepositional nature of the prefix. Section 5 formalizes my proposal. Section 6 is the conclusion.

2. Degree achievements with *en-*

This section discusses degree achievements with the prefix *en-*. I will first introduce the (intuitive) meaning they convey and will then turn to the base predicates that are present in degree achievements with *en-*, which are gradable.

2.1. General meaning

Degree achievements with *en-* convey the meaning that the theme undergoes a change in that it increases in the degree to which the property meaning of the base predicate applies to it. In this sense, the degree achievements under discussion are very similar to what has been reported for English in, e.g., Dowty (1979), Abusch (1986), Hay et al. (1999), Winter (2006), Kennedy and Levin (2008), Pedersen (2015), among others. I provide two (additional) examples below— the translations provide the English sentences, which, as mentioned, convey a rather similar meaning when compared to the Spanish ones. In (3), the theme, the hair, changes in such a way that it increases in curliness; in (4), the theme, the chickens, increases in fatness.

(3)   a.   **en-**crespar 'to curl'
          b.   Meloddye **en-**crespó el   cabello.
               Meloddye **en-**curled the hair
               'Meloddye curled the hair.'

(4)   a.   **en-**gordar 'to fatten'
          b.   Tania **en-**crespó   los pollos.
               Tania **en-**fattened the chickens
               'Tania fattened the chickens.'

2.2. Gradable base predicates

Before discussing the restrictions on the bases that appear in degree achievements with *en-*, let me first briefly introduce gradable predicates more generally, which are the relevant ones for the discussion to follow in this section (Martínez Vera, 2016).[2] Following extensive literature

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[2]From a traditional perspective, bases in degree achievements with *en-* are adjectives and bases in change of location verbs with *en-* are nouns. From a semantic point of view, however, the relevant distinction is between gradable (for degree achievements) and non-gradable (for change of location verbs) bases—see section 3.3 for discussion on the latter. This is the distinction I adopt in this paper. See Martínez Vera (2016) for further discussion, including morphological evidence against the traditional view.

on the topic (Cresswell, 1976; Klein, 1991; Kennedy and McNally, 2005; Pedersen, 2015), gradable base predicates can be characterized in terms of scales, which are sets of linearly ordered degrees d along some dimension associated with a base predicate. A scale associated with a base predicate S_P is defined as follows:

(5) The scale associated with a gradable base predicate S_P is a pairing $\langle S_P, < \rangle$ or $\langle S_P, > \rangle$, where $<$ or $>$ is a linear order on S_P.

The minimal and maximal degrees in the scale associated with a gradable base predicate S_P are defined in (6)—note that if min_{S_P} or max_{S_P} exists, it is unique (since the scale is linearly ordered):

(6) a. min_{S_P}, the minimal degree in the scale associated with the relevant base predicate, is defined as the degree d such that no degree $d' < d$ (for $d, d' \in S_P$).
    b. max_{S_P}, the maximal degree in the scale associated with the relevant base predicate, is defined as the degree d such that no degree $d < d'$ (for $d, d' \in S_P$).

I assume that gradable predicates denote relations of type $\langle d, \langle e, it \rangle \rangle$ (throughout this paper, I will use i for the type of eventualities) which are true of degree d, individual x and eventuality e if and only if x has d in the scale associated with the base in e; I assume that d is kept constant throughout e in this case—see Kennedy and McNally (2005), Morzycki (2015), among others.

The scale associated with a predicate could have (i) no minimal or maximal degree, i.e., open scales (7a), (ii) either a minimal or a maximal degree, i.e., partially closed scales (more specifically, bottom- and top-closed scales), as in (7b), or (iii) both a minimal and a maximal degree, i.e., closed scales, as in (7c) (Kennedy and McNally, 2005).[3] (7) illustrates the same dimensions, i.e., beauty in (7a), cleanliness/dirtiness and curliness/straightness (7b), and emptiness/fullness in (7c) but opposite orderings, as indicated in the parentheses next to each item.

(7) a. *Open scales*
       ugly $(>)$ beautiful $(<)$
    b. *Partially closed scales*
       clean $(>)$ dirty $(<)$
       curly $(>)$ straight $(<)$
    c. *Closed scales*
       empty $(>)$ full $(<)$

Degree achievements with *en-* are derived with gradable bases. In particular, bases that have open scales associated with them are possible in verbs with *en-*, as exemplified in (8):

(8) a. **en-**sanchar 'to widen'   *base:* ancho 'wide'
    b. **en-**friar 'to cool'   *base:* frío 'cool'

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[3]Kennedy and McNally (2005) distinguish these different kinds of scales based on the adjunction of adverbial expressions like *completely* or *100%* to the relevant gradable base. When it is possible to adjoin such expressions, the scale associated with the gradable base is closed on the end that is targeted. Take the antonyms *straight* and *curly* as examples, which share the same scale, but point towards different ends. Adjoining *completely* is possible with the former but not with the latter, as shown in (i). This suggests that the scale here is open on the curly end but is closed on the straight end.
(i) The hair is completely ??curly/straight.

Bases that have partially closed scales associated with them are also possible in verbs with *en-*, but only if they are bottom-closed, as exemplified in (9):

(9)   a.   **en-**suciar 'to dirty'   *base:* sucio 'dirty'
        b.   **en-**crespar 'to curl'   *base:* crespo 'curly'

Bases with partially closed scales that are top-closed or closed scales are not possible in verbs with *en-*, i.e., bases with a maximum are not possible in verbs with *en-* (Martínez Vera, 2016). This restriction is exemplified in the ungrammatical forms in (10):[4]

(10)   a.   *__en-__lisar 'to straighten'   *base:* liso 'straight'
           (cf. alisar 'to straighten')
        b.   *__en-__llenar 'to fill'   *base:* lleno 'full'
           (cf. llenar 'to fill')

3. Change of location verbs with *en-*

This section discusses change of location verbs with the prefix *en-*. I will first introduce the (intuitive) meaning they convey and will then turn to the base predicates that are present in change of location verbs with *en-*, which are non-gradable.

3.1. General meaning

Change of location verbs with *en-* allow two readings, namely, a location reading and a locatum reading (Gumiel et al., 1999; Gibert Sotelo and Pujol Payet, 2015; Martínez Vera, 2016). Informally, the location reading can be stated as 'to put *x* in *y*', for theme *x* and base predicate *y*, and the locatum reading can be stated as 'to put *y* in/on *x*', for theme *x* and base predicate *y* (I formalize these readings in section 5).[5] The examples in (11)-(12) illustrate these readings. (11) exemplifies a verb with a location reading, i.e., the bird (the theme) is put in a cage (the base); (12) exemplifies a verb with a locatum reading, i.e., a saddle (the base) is put on the horse (the theme).

(11)   a.   **en-**jaular 'to cage'
        b.   Daniel **en-**jauló el pájaro.
           Daniel **en-**caged the bird
           'Daniel jailed the bird.'

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[4]An account of telicity contrasts in verbs with *en-* lies beyond the scope of this paper. Let me point out, however, what the facts are: expressions with degree achievements with *en-* are very similar to expressions with English degree achievements in which no lexical maximum is present, i.e., when uttered out of the blue, they are compatible with atelic adverbials; telic adverbials are somewhat degraded—see, e.g., Hay et al. (1999), Kennedy and Levin (2008), among others for relevant discussion. (i) illustrates this contrast: while the atelic adverbial *durante dos minutos* 'for two minutes' is good, the telic adverbial *in cinco minutos* 'in five minutes' is (somewhat) degraded:

(i)   Meloddye **en-**crespó el cabello durante cinco minutos / ?en cinco minutos.
        Meloddye **en-**curled the hair   for   five   minutes   in five   minutes
        'Meloddye curled the hair for/?in five minutes.'

[5]More specifically, depending on the base, some verbs only allow a location reading, some verbs only allow a locatum reading and some verbs allow both readings. In this paper, I make a proposal that makes it possible, in principle, for every verb to be ambiguous (see section 5). Research with regard to the constraints on when each reading is available is left for a future occasion.

(12)   a.   **en-**sillar 'to saddle'
            b.   Victoria **en-**silló   el caballo.
                 Victoria **en-**saddled the horse
                 'Victoria saddled the horse.'

In fact, it is worth pointing out that the same change of location verb may allow both readings (which, in the case under discussion, vary depending on the context of utterance). This is exemplified (13). The location reading is given in (13a): in this case, the turkey (the theme) changes location, as it is put in vinegar (the base). The locatum reading is given in (13b): in this case, the vinegar (the base) is put on the turkey (the theme).[6]

(13)   Meloddye **en-**vinagró   el pavo.
           Meloddye **en-**put.vinegar the turkey
           a.   'Meloddye put the turkey in vinegar'   (location)
           b.   'Meloddye put vinegar on the turkey.'   (locatum)

3.2. Some comments about lexical aspect

The two different readings of change of location verbs with *en-* correspond with different lexical aspects.[7] Under the location reading (e.g., (11) or (13a)), expressions with change of location verbs with *en-* are accomplishments (i.e., eventualities where there is a change taking place in some non-instantaneous amount of time such that an endpoint is reached at the end of the change). Under the locatum reading (e.g., (12) or (13b)), expressions with change of location verbs with *en-* are achievements (i.e., eventualities where change is punctual or instantatenous). Although further discussion is needed in this regard, I will briefly illustrate this difference by means of the adjunction of three different adverbial expressions targeting the temporal constitution of the cases under discussion (Rothstein, 2004).

In particular, I will make use of a punctual adverbial, which locates an eventuality at a particular point in time. Adjoining a punctual adverbial is possible only if the relevant eventuality is an achievement. The test in English for this is *at α time*. The Spanish equivalent of this test makes use of the preposition *a* 'at' and the actual expression to be used is *a las 5 pm* 'at five pm'. I will also make use of an adverbial that locates the end of eventualities; specifically, I use the *in α time* test. Adjoining an adverbial of this kind is possible only if the relevant eventuality is an accomplishment. The Spanish equivalent of the test makes use of the preposition *en* 'in' and the actual expression to be used is *en cinco minutos* 'in five minutes' (i.e., there is some time span before the end of the eventuality is located). Finally, I will make use of an expression targeting duration (where no endpoint is reached), specifically, I make use of the *for α time*

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[6]In this paper, I mainly focus on concrete locations. However, it is worth pointing out that more abstract/metaphorical change of location verbs are also possible. This is exemplified in (i)—the base predicate in the verb is *dios* 'god':
(i)   a.   **en-**diosar 'to put in a pedestal'
        b.   Los profesores **en-**diosaron   a Tania.
            the teachers   **en-**put.in.pedestal Tania
            'The teachers put Tania in a pedestal.'
See Spalek (2014) for discussion regarding abstract/metaphorical uses of cases somewhat similar to (i) in Spanish.
[7]The literature on lexical aspect is too extensive to make justice to it in this paper. See Rothstein (2004) for an overview.

test. Adjoining an adverbial targeting duration is possible only if the relevant eventuality is an activity; for the cases under discussion, this test is relevant because it targets that a result state is extended in time, which is possible with achievements (but not with accomplishments, where the duration of the whole eventuality is targeted by this kind of adverbial). The Spanish equivalent of this test makes use of the preposition *durante* 'for' and the actual expression to be used is *durante cinco minutos* 'for five minutes'.

I add these adverbials to sentences (11)-(12)—they are to be understood as uttered out of the blue. (14) illustrates the location reading with a sentence with the verb ***en-**jaular* 'to cage'. The contrast between the felicity of the punctual adverbial and the infelicity of the adverbial locating the end of an eventuality shows that the change is instantaneous (i.e., (14) illustrates an achievement): while it is possible for the change to take place in an instant (i.e., *a las 5 pm* 'at 5 pm'), adjoining an adverbial that targets a time span reaching an endpoint (i.e., *en cinco minutos* 'in five minutes') is not. The use of the adverbial targeting duration (i.e., *durante cinco minutos* 'for five minutes') is possible, but the reading it gets is that the state of being caged lasts five minutes—i.e., the change is punctual; it has no duration. This reading is expected if the change taking place is instantaneous.

(14)   Daniel **en-**jauló al pájaro a las 5 pm / ??en cinco minutos / durante cinco minutos.
         Daniel **en-**caged the bird at the 5 pm / in five minutes / for   five   minutes
         'Daniel jailed the bird at 5 pm/??in five minutos/for five minutes.'

The case in (15) is different—aspectually, here we are dealing with an accomplishment. (15) illustrates the locatum reading with a sentence with the verb ***en-**sillar* 'to saddle'. In this case, the preferred adverbial is the one indicating that there is a time span in which an endpoint is reached (i.e., *en cinco minutos* 'in five minutes') The other two adverbials are less felicitous: the punctual adverbial (i.e., *a las 5 pm* 'at 5 pm') requires that the sentence be accommodated such that change takes place very quickly (which is unlikely given that saddling a horse is not an instantaneous change under normal circumstances); the adverbial targeting duration without reaching an endpoint is infelicitous, as the default reading of (15) is that saddling a horse is a change that ends with the horse being saddled. This discussion thus suggests that, aspectually, (15) illustrates an accomplishment.[8]

(15)   Victoria **en-**silló   el caballo ?en un segundo / en cinco minutos / ??durante cinco
         Victoria **en-**saddled the horse   in a second / in five minutes /   for   five
         minutos.
         minutes
         'Victoria saddled the horse ?in a second/in five minutos/??for five minutes.'

Of relevance for the current discussion is that the account of change of location verbs with *en-* that will be proposed in section 5 will make explicit this aspectual distinction, which arises when comparing location and locatum readings.

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[8]As the reader may have already noticed, the examples in (14)-(16) are relevant also with regard to telicity—as anticipated in footnote 4, two of the adverbials like the ones in (14)-(16), which are basically *in-/for*-adverbail expressions, are those used to test telicity contrasts. The discussion in the main text suggests that telic adverbials are the ones compatible with sentences with change of location verbs with *en-* by default. I leave aside an explicit account of this in this paper.

3.3. Non-gradable base predicates

The bases that appear in change of location verbs with *en-* are non-gradable (Martínez Vera, 2016). Here I assume that non-gradable bases denote relations of type $\langle e, it \rangle$ which are true of individual x and eventuality e if and only if x is a member of the extension of the base in e (Heim and Kratzer, 1998).

Below I provide some examples of change of location verbs with *en-* in which it is made explicit what the non-gradable base predicates are.

(16)   a.   **en-**carcelar 'to cage'   *base:* cárcel 'jail'
           b.   **en-**jaular 'to cage'   *base:* jaula 'cage'
           c.   **em-**botellar 'to bottle'   *base:* botella 'bottle'
           d.   **en-**sillar 'to saddle'   *base:* silla 'saddle'
           e.   **en-**vinagrar 'to put vinegar'   *base:* vinagre 'vinegar'

4. Parallels between the prefix *en-* and the preposition *en*

An extensive literature on Spanish verbs with *en-* points out that the prefix *en-* is similar to the locative preposition *en*, which can be roughly translated to English as 'in/inside' or 'on'—see, e.g., Mateu (2002, 2012) and Fábregas (2010, 2015) for relevant discussion. I will assume this position in this paper and capitalize on it for my proposal; in particular, I will propose that the prefix *en-* has a preposition-like meaning. In this section, I will make explicit in what sense expressions with the prefix *en-* and with the preposition *en* are parallel.[9]

Romeu (2013, 2014) shows that the preposition *en* has a flexible locative meaning which corresponds with the English locative prepositions *in/inside* or *on*. These uses are exemplified in (17)-(18)—for clarity, I underline the English equivalent of the preposition in the translation. Thus, (17) conveys the meaning that the thief is <u>in</u> jail and (18) conveys the meaning that a saddle is put <u>on</u> the horse.

(17)   El ladrón está **en** la cárcel.
        the thief is **en** the jail
        'The thief is <u>in</u> jail.'

(18)   El jinete   puso la silla   de montar **en** el caballo.
        the horseman put   the saddle of mount **en** the horse
        'The horseman put the saddle <u>on</u> the horse.'

Interestingly, change of location verbs with *en-*, discussed in section 3, display the same flexibility in that they can convey both location and locatum readings. In particular, one can construct examples that are very similar to (17)-(18) with change of location verbs with *en-*. Thus, (19), with the prefix, is very similar to (17), with the preposition, in that the thief is (put) <u>in</u> jail in both cases; (20), with the prefix, is very similar to (18), with the preposition, in that a saddle is put <u>on</u> the horse in both cases.

(19)   El policía   **en-**carceló al ladrón.
        the policeman **en-**jailed   the thief

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[9]It should be noted that not all uses of the preposition *en* are attested in the verbs with the prefix *en-*. See Romeu (2013, 2014) for discussion.

'The policeman jailed the thief.'

(20) El jinete   **en-**silló   el caballo.
      the horseman **en-**saddled the horse
      'The horseman saddled the horse.'

Although the previous parallels hold very well when change of location verbs are considered, a question remains with regard to degree achievements (see section 2): in what sense do the parallels discussed in this section hold in this case (if they hold at all)? In section 5, I argue that there is in fact a link between the preposition *en* and the prefix *en-* when degree achievements are considered. In particular, I will link the locative meaning of the prefix *en-* as discussed in this and the previous sections with the ban on top-closed and closed scales in gradable base predicates in degree achievements with *en-*. I will tie this restriction to the fact that the locative preposition *en* cannot indicate a goal or a terminal point—see Romeu (2013, 2014) for discussion regarding the preposition *en* and its inability to convey a goal or terminal point. This is shown in (21): in the presence of *en*, the sentence cannot mean that the girl went to Lima—in this case, the appropriate means to convey the intended meaning of (21) is the preposition *a*.

(21) *La chica fue   **en** Lima.
       the girl   went **en** Lima
       Intended: 'The girl went to Lima.'

I will propose that the impossibility of indicating a goal or a terminal point is translated into the verbal domain—degree achievements specifically—as a ban on the presence of an absolute endpoint (a lexical maximum) in the scale associated with the gradable base under consideration (i.e., why verbs such as *en-lisar* 'to straighten' are ungrammatical, but verbs such as *en-crespar* 'to curl' are good).

5. Proposal

This section provides a compositional account of degree achievements and change of location verbs with *en-*. Section 5.1 summarizes the discussion up to this point, emphasizing the issues that I will account for. Section 5.2 makes explicit what my assumptions are with regard to the spatial domain, an issue that has not been explicitly addressed. Section 5.3 discusses my core proposal making explicit what the parallels between degree achievements and change of location verbs with *en-* are, which suggests that the unified account is, in principle, possible. Section 5.4 addresses the issue with regard to the fact that degree achievements with *en-* are only derived from bases whose scale does not have a lexical maximum.

5.1. Interim summary

The discussion up to this point can be summarized as follows:

(22) Degree achievements with *en-*
      a. They convey the meaning that the theme increases in degree along the scale associated with the gradable base in the relevant verb.
      b. Bases in these verbs are gradable; more specifically, the scale associated with the base can be open or partially closed; if the latter is the case, it has to be top-open (i.e., scales with a lexical maximum do not derive degree achievements with *en-*).
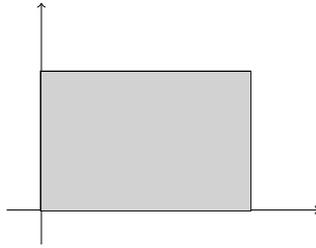
Figure 1: Region of *this piece of paper*

(23)   Change of location verbs with *en-*
    a.   They can yield location (informally, 'to put *x* in *y*' for theme *x* and base predicate *y*) and locatum (informally, 'to put *y* in/on *x*' for theme *x* and base predicate *y*) readings.
    b.   From a lexical aspect point of view, expressions with these verbs are accomplishments (which corresponds with locatum readings) or achievements (which corresponds with location readings).

(24)   The prefix *en-* incorporates the core locative meaning of the preposition *en* (which roughly corresponds with the English prepositions *in/inside* and *on*).

(24) is the crucial issue that I will build upon to suggest that degree achievements and change of location verbs with *en-* should be analyzed along similar lines.

5.2. Assumptions in the spatial domain

In addition to the assumptions I made with regard to the degree domain, which were discussed in section 2.2, with regard to the spatial domain, I assume a two-dimensional Euclidean space *V* over the positive real numbers whose center is 0 (Zwarts and Winter, 2000)—I assume a two-dimensional space instead of a three-dimensional one for simplicity. I assume that each coordinate is a point and use *p* for the type of points. I further assume a region function *R* that takes individual *x* and eventuality *e* as input and gives as output the set of points *x* occupies in space (Wunderlich, 1991) in *e* (Nam, 1995)—I assume, for simplicity, that the region of *x* is kept constant throughout the run time of *e*. $R(x,e)$ has a boundary and an interior. The boundary of $R(x,e)$ equals the intersection of the closure of $R(x,e)$ with the closure of its complement. The interior of $R(x,e)$ equals the closure of $R(x,e)$ without its boundary (Nam, 1995). For instance, the region of *this piece of paper* in an eventuality could be represented as in Figure 1. The bold line corresponds with the boundary and the grey area, with the interior. Since I am limiting myself to a two-dimensional space, the region equals the area of the entity.

5.3. Compositional account

In what follows, I will assume the L(ogical) F(orm)s in (25). (25a) is the LF I assume for degree achievements with *en-*; (25b) is the LF I assume for change of location verbs with *en-* (the proposal is restricted to the VP level).

(25)   a.   [[[en-$_{DA}$ INCREASE] gradable base] theme]

b.   [[[en-$_{\text{CL}}$ PATH] non-gradable base] theme]

Some comments are in order with regard to (25). I assume that *en-* is a locative element (see (24))—in what sense *en-* is a 'locative element' in the case of degree achievements will become apparent below. I will distinguish two *en-*s, namely, *en-*$_{\text{DA}}$ for the *en-* that appears in degree achievements and *en-*$_{\text{CL}}$ for the *en-* that appears in change of location verbs. The two will be discussed in tandem, so the parallels between the two become apparent. I further assume that there are two (abstract) lexical items that combine with *en-*$_{\text{DA}}$ and *en-*$_{\text{CL}}$ to derive a degree achievement and a change of location verb respectively. These are INCREASE for degree achievements (Hay et al., 1999; Kennedy and Levin, 2008; Pedersen, 2015) and PATH for change of location verbs (Zwarts and Winter, 2000; Gehrke, 2008; Svenonius, 2010)—these are intended to capture (22a)-(23a) respectively, as will be made explicit below. The intuition that the split between the prefix and INCREASE/PATH captures is that the latter derives a path from the former, which is common in the treatment of locative and directional prepositions (Zwarts and Winter, 2000).

As anticipated in (24), the crucial issue for my account is to make explicit in what sense the core locative meaning of the preposition *en* applies when the prefix of the same phonological shape is considered. In particular, to characterize *en-*$_{\text{DA}}$ and *en-*$_{\text{CL}}$, I will combine the approaches to gradable bases, as in Kennedy and McNally (2005)—see also Kennedy (2007), Piñón (2008), Spalek (2014) and Pedersen (2015)—and to prepositions, as in Zwarts and Winter (2000)—see also Zwarts and Winter (2000), Gehrke (2008) and Svenonius (2010). Intuitively, there is a core prepositional meaning that would be applying in the case of degree achievements and in the case of change of location verbs. I assume as baseline that the core prepositional meaning of the prefix is the denotation that the literature gives for the locative English preposition *in/inside*, namely, that this preposition denotes a ternary relation between individuals x, y and eventuality e such that the region of x is a subset of the region of y in e—see Zwarts and Winter (2000) for relevant discussion.

Making things more precise, with regard to *en-*$_{\text{DA}}$, I propose that the prefix takes gradable base P, degree d, individual x and eventuality e as arguments and denotes a relation, which I label in_{DA}, that holds if and only if x has degree d in the scale associated with P in e. The intuitive prepositional meaning of *en-*$_{\text{DA}}$ here is that there is an individual that has a degree <u>in</u> the scale of the base (in an eventuality). With regard to *en-*$_{\text{CL}}$, I propose that the prefix takes non-gradable base P, set of points X, individual x and eventuality e as arguments and denotes a relation in_{CL} that holds if and only if the region of x is a subset of X, which is in the region of P,[10] in e. As can be readily noted, this denotation is very similar to the denotation of *in/inside* discussed above in that the subset relation between the regions of two individuals is crucial. The denotations of *en-*$_{\text{DA}}$ and *en-*$_{\text{CL}}$ are thus constructed in a parallel way, the differences being the type of the base ($\langle d, \langle e, it \rangle \rangle$ for the former and $\langle e, it \rangle$ for the latter), and whether there is a degree argument (for the former) or a set of points argument (for the latter).[11] These differences, I suggest, are the ones present due to the differences in domains, which basically are reduced to the presence of degrees vs. regions and points in space.

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[10]I come back to what the region of non-gradable base P is below.

[11]With regard to this second issue, the parallels could be made even stricter if, instead of degrees, sets of degrees are used (Schwarzschild and Wilkinson, 2002). I stick to the simpler version following the literature on gradable bases and degree achievements

An issue that needs to be addressed, in particular, regarding change of location verbs, concerns the following: what is the region of a non-gradable base? This question arises, since in the literature about prepositions (Nam, 1995; Zwarts and Winter, 2000; Gehrke, 2008; Svenonius, 2010), prepositions denote relations between the regions of entities (not of base predicates)— recall that the denotation of the preposition *in* above is stated as a relation between the region of an entity being a subset of the region of another entity in an eventuality. The only approach I know of that provides an explicit account of what it means for a predicate to have a region is Mador-Haim and Winter (2015), who address the semantics of locative indefinites.[12] The proposal in this section loosely follows their approach in that the region of a base predicate is to be understood in terms of the region of the entities in its extension. The venue I take is to analyze the region of a non-gradable base in terms of the region of a token of such base. In particular, I propose a choice function f that picks out a token of the non-gradable base. Within the account pursued in this section, my proposal is that f applies to (the denotation of) a non-gradable base and gives as output one element in its extension. For example, take non-gradable *jail*, which denotes a relation that holds of individuals that are jails in an eventuality. f picks out one such individual (then, this individual will be mapped to its region). I assume that this choice function will be used as a last resort mechanism, which in this case means that it will appear whenever the region of the a non-gradable base needs to be computed—this is the case in change of location verbs with *en-*. Note that the choice function under discussion does not apply in the case of degree achievements with *en-*, as no regions (in space) are involved.

The denotations of *en-*$_{\text{DA}}$ and *en-*$_{\text{CL}}$ appear below in (26)-(27) respectively. Consider (26) first, the case of *en-*$_{\text{DA}}$. $[\![\text{en-}_{\text{DA}}]\!]$ takes gradable base P, degree d, individual x and eventuality e as arguments and is true if and only if relation in_{DA} holds, which is the case if and only if x has d in the scale of P in e. Consider now (27), the case of *en-*$_{\text{CL}}$. $[\![\text{en-}_{\text{CL}}]\!]$ takes non-gradable base P, set of points X, individual x and eventuality e as arguments and is true if and only if relation in_{CL} holds, which is the case if and only if x's region is a subset of X, where X is the (relevant) region of a token of P (as picked out by choice function f) in e. Thus, (26)-(27) are parallel: they share a core denotation where the main difference lies in whether it is applied in the degree or in the spatial domain.

(26)   a. $[\![\text{en-}_{\text{DA}}]\!] = \lambda P_{\langle d, \langle e, it \rangle \rangle} \lambda d \lambda x \lambda e [in_{DA}(x, d, P, e)]$

        b.   For any predicate $P_{\langle d, \langle e, it \rangle \rangle}$, degree d, theme x, and eventuality e, $in_{DA}(x, d, P, e)$ holds iff $P(x, d, e)$ holds, i.e., iff x has $d \in S_P$ in e.

(27)   a. $[\![\text{en-}_{\text{CL}}]\!] = \lambda P_{\langle e, it \rangle} \lambda X \lambda x \lambda e [in_{CL}(x, X, P, e)]$

        b.   For any predicate $P_{\langle e, it \rangle}$, set of points X, theme x, and eventuality e, $in_{CL}(x, X, P, e)$ holds iff x's region is a subset of X in e, where X is a subset of the region of a P-token as picked out by choice function f.

What is now missing is the denotation of INCREASE and PATH (see (25a)-(25b)). Their role is to derive a 'path' from a 'locative' expression. In the case of degree achievements, it will derive a predicate in which there is a change (an increase) in degrees in an eventuality (Hay et al., 1999; Kennedy and Levin, 2008; Pedersen, 2015)—this is (22a) in the summary in section 5.1. In

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[12]More generally, this issue falls under the discussion of what the denotation of a kind or property is, which can be traced back to Carlson (1977) and, more recently, to Chierchia (1998). What is relevant for my purposes is how to treat predicates in locative expressions, which is part of the task Mador-Haim and Winter (2015) undertake.

the case of change of location verbs, it will derive a path, i.e., an individual will change from one location to some other location (Zwarts and Winter, 2000; Beavers, 2011)—this is (23a) in the summary in section 5.1. The denotations of INCREASE and PATH are shown below—G is a variable of the type of en_{DA} and F is a variable of the type of en_{CL}.

(28) $\llbracket \text{INCREASE} \rrbracket = \lambda G \lambda P_{\langle d, \langle e, it \rangle \rangle} \lambda x \lambda e \exists d, d'[G(P,d,x,ini(e)) \wedge G(P,d',x,fin(e)) \wedge d < d']$

(29) $\llbracket \text{PATH} \rrbracket = \lambda F \lambda P_{\langle e, it \rangle} \lambda x \lambda e \exists X[\neg F(P,X,x,ini(e)) \wedge F(P,X,x,fin(e))]$

I will now exemplify the proposal. Consider the example in (30a) (which repeats (3b)), with a degree achievement. Its LF and denotation appear below.

(30)   a.   Meloddye **en-**crespó el   cabello.
                Meloddye **en-**curled the hair
                'Meloddye curled the hair.'
         b.   [[[en-$_{DA}$ INCREASE] curly] the hair]
         c. $\llbracket (30b) \rrbracket = \lambda e \exists d, d'[in_{DA}(h,d,curly,ini(e)) \wedge in_{DA}((h,d',curly,fin(e)) \wedge d < d']$
         d.   In words, (30b) is true of eventuality e if and only if the hair increases in curliness in e.

Consider now example (31a) (which repeats (2)), with a change of location verb. Its LF and denotation appear below. Note that (31) presents an example of the location reading only (in this example, this is the reading in which the theme is put in jail)—see (23b) in the summary in section 5.1. In terms of lexical aspect, the example below instantiates the achievement case, in which there is a change that takes place in a very short period of time.

(31)   a.   Daniel **en-**carceló a Gianfranco.
                Daniel **en-**jailed   Gianfranco
                'Daniel jailed Gianfranco.'
         b.   [[[en-$_{CL}$ PATH] jail] Gianfranco]
         c. $\llbracket (31b) \rrbracket = \lambda e \exists X[\neg in_{CL}(g,X,jail,ini(e)) \wedge in_{CL}(g,X,jail,fin(e))]$
         d.   In words, (31b) is true of eventuality e if and only if Gianfranco changes from not being in a jail to being in it in e.

The question remains as to how to account for locatum readings—see (23b) in the summary in section 5.1. Here I sketch an approach that exploits how parts of the theme are mapped into parts of the event (Krifka, 1998; Beavers, 2011, 2012). The proposal to follow is rather tentative, but illustrates how this can be done (restricting to the cases at hand). Further research into this topic, I believe, will show how the cases under discussion could be made compatible with more general theories like the ones in the references above.

To account for the locatum readings, I propose to derive PATH$'$ from PATH in (38). The denotation of PATH$'$ appears in (32). It conveys the meaning that the theme starts out somewhere that is not in the region of the relevant token of the base. It then changes in that its parts transition to being in the relevant region of the token of the base in possibly different parts of the event. I make the simplifying assumptions that all (contextually relevant) parts of the theme end up in such region and that events are formed by subevents which represent (temporal) stages such that a (temporal) precedence relation can be established among them—I represent the precedence

relation as $\prec$ and the part-whole relation as $\sqsubseteq$ (Krifka 1998).[13]

(32) $\quad \llbracket \text{PATH}' \rrbracket = \lambda F \lambda P_{\langle e, it \rangle} \lambda x \lambda e \forall y [y \sqsubseteq x \rightarrow \exists e'[e' \sqsubseteq e \wedge ini(e) \prec e'$
$\qquad\qquad \wedge \exists X [\neg F(x, X, P, ini(e)) \wedge F(y, X, P, e')]]]$

As example, consider the case in (33) (which repeats (13)), which includes the verb **en-***vinagrar* 'to put vinegar'. Here I illustrate the locatum reading.[14] In this case, there is an accomplishment-like change in that vinegar is poured on (different parts of) the turkey—under my account, this reading is reached by saying that all parts of the turkey are put in vinegar in different parts of the relevant eventuality. This proposal thus makes explicit why locatum readings and accomplishments go together in the cases under discussion.

(33) a. Meloddye **en-**vinagró   el pavo.
         Meloddye **en-**put.vinegar the turkey
         'Meloddye put vinegar on the turkey.'
     b. [[[en-$_{\text{CL}}$ PATH$'$] vinegar] the turkey]
     c. $\llbracket (33b) \rrbracket = \lambda e \forall y [y \sqsubseteq t \rightarrow \exists e'[e' \sqsubseteq e \wedge ini(e) \prec e'$
         $\qquad\qquad \wedge \exists X [\neg in_{CL}(t, X, vinegar, ini(e)) \wedge in_{CL}(y, X, vinegar, e')]]]$
     d. In words, (33b) is true of eventuality e iff the turkey starts out as not being in vinegary substance at the beginning of e; then all parts y of the turkey end up being in vinegary substance in parts e' of e.

5.4. The ban on lexical maximal degrees in degree achievements

The proposal in the previous section with regard to degree achievements has accounted for (22a) in the summary in section 5.1, but has not accounted for why verbs with *en-* do not allow bases with lexical maxima—i.e., (22b) in the summary in section 5.1. This is the issue that will be discussed in this section. The claim made here is that this ban follows from the core prepositional meaning of the prefix. I state this in terms of non-triviality, specifically, that the interior of the base is non-trivial—see Gajewski (2002) for discussion of (non-)triviality in natural language. The proposal made here for degree achievements with *en-* is that it should be possible to make use of the interior of the scale. Here I assume that a scale has a boundary and an interior (just as in the spatial domain; see section 5.2). The boundary of a scale corresponds with lexical maximal degrees; the interior of a scale corresponds with all non-maximal degrees. Relevant in this discussion is the consideration of the principle of Interpretive Economy (Kennedy, 2007; Kennedy and Levin, 2008), which states that lexical means are maximized. In the case under discussion, this means that, whenever the scale associated with a base has a lexical maximum, it would be preferred over any other degree, thus cancelling out the interior of the base. I take non-triviality in degree achievements with *en-* to mean that maximal degrees are excluded; otherwise, interior degrees would be treated as if they are not there (by default)—i.e., they will

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[13] In my proposal for change of location verbs with *en-*, the locatum readings are derived, in the sense that the item that is tied to them, namely, PATH$'$, is derived from another one, namely PATH, which is involved in the location readings. As pointed out to me by Jaume Mateu, this is perhaps a welcome result. For instance, in French, the change of location verbs derived with *en-*, e.g., **em-***prisonner* 'to jail', only yield location readings (locatum verbs undergo a different process). Although tentative, this would suggest that location readings are in fact basic, the Spanish cases displaying a further diachronic step in that locatum readings have also become available (in some cases at least).

[14] The location reading is parallel to the example in (31) above.

not be used if the relevant scale has a maximal degree. More formally, following a common use in the representation of combinatorial restrictions in the account of word-formation—see Pustejovsky (1995), Asher (2011) and Spalek (2014) for relevant discussion—, I capture non-triviality as a domain (combinatorial) restriction in the denotation of en-$_{\mathrm{DA}}$ stating that if the relation denoted by en-$_{\mathrm{DA}}$ holds, then the relevant scale does not have a lexical maximal degree, i.e., interior degrees can in fact be used. Under this approach, top-closed and closed scales cannot appear in degree achievements with en-, because their lexical means (i.e., the maximum) cannot be used. I thus revise the denotation of en-$_{\mathrm{DA}}$ in (26a) in (34), so that the domain condition is added.

(34) $[\![en\text{-}_{\mathrm{DA}}]\!] = \lambda P_{\langle d,\langle e,it \rangle\rangle} : \forall x,d,e[in_{DA}(x,d,P,e) \rightarrow d \neq max_{S_P}].\lambda d\lambda x\lambda e[in_{DA}(x,d,P,e)]$

Since this restriction is added in (34), the denotation of INCREASE in (28) needs to change accordingly, making it defined when the argument of the type of the prefix (variable G below) is defined. This revision is undertaken in (35).

(35) $[\![\text{INCREASE}]\!] = \lambda G\lambda P_{\langle d,\langle e,it \rangle\rangle} : P \in dom(G).\lambda x\lambda e\exists d,d'[G(P,d,x,ini(e))$
          $\wedge G(P,d',x,fin(e)) \wedge d < d']$

Recall the account of example (30a), which is repeated below. In (36), I incorporate the changes made in (34)-(35). Now it is explicitly stated that the scale associated with the base lacks a lexical maximun.

(36)   a.   Meloddye **en-**crespó el   cabello.
                Meloddye **en-**curled the hair
                'Meloddye curled the hair.'
         b.   [[[en-$_{\mathrm{DA}}$ INCREASE] curly] the hair]
         c. $[\![(36b)]\!]$ is defined if and only if $\forall x,d,e[in_{DA}(x,d,curly,e) \rightarrow d \neq max_{S_{curly}}]$
                When defined, $[\![(30b)]\!] = \lambda e\exists d,d'[in_{DA}(h,d,curly,ini(e))$
                                    $\wedge in_{DA}(h,d',curly,fin(e)) \wedge d < d']$
         d.   In words, (36b) is defined if and only if the scale associated with curly does not
                have a maximum. When defined, (36b) is true of eventuality e if and only if the
                hair increases in curliness in e.

Having stated how to account for the combinatorial restrictions in the degree achievement case, the question now is: how does this apply in the case of change of location verbs? I take that the domain restriction stated above applies capturing the intuitive idea that the interior of the region of the (non-gradable) base is not empty (this is the sense of non-triviality in this case). More formally, I propose a domain (combinatorial) restriction in the denotation of en-$_{\mathrm{CL}}$ stating that if the relation denoted by en-$_{\mathrm{CL}}$ holds, then the interior of the set of points argument (which is in the region of a token of the base as picked out by choice function f) is not empty. This application in the spatial domain is similar in spirit to an observation made by Zwarts and Winter (2000): they point out that, in expressions such as *the food in the bowl*, the interior of the region of the bowl is technically empty; however, in these expressions it is understood as non-empty in the sense that such region is taken to be convex, i.e., the region of the bowl includes its walls (i.e., the boundary) and the space within those walls (i.e., the interior). I thus revise the denotation in en-$_{\mathrm{CL}}$ to incorporate this domain restriction. This is done in (37).

(37) $[\![en\text{-}_{\mathrm{CL}}]\!] = \lambda P_{\langle e,it \rangle} : \forall x,X,e[in_{CL}(x,X,P,e) \rightarrow int(X) \neq \emptyset].\lambda X\lambda x\lambda e[in_{CL}(x,X,P,e)]$

As done with regard to INCREASE, PATH and PATH′ also have to change accordingly. They are defined when the argument of the type of the prefix (variable *F* below) is defined. These revisions are undertaken in (38)-(39) respectively.

(38) $[\![\text{PATH}]\!] = \lambda F \lambda P_{\langle e,it \rangle} : P \in dom(F).\lambda x \lambda e \exists X[\neg F(P,X,x,ini(e)) \wedge F(P,X,x,fin(e))]$

(39) $[\![\text{PATH}']\!] = \lambda F \lambda P_{\langle e,it \rangle} : P \in dom(F).\lambda x \lambda e \forall y[y \sqsubseteq x \rightarrow$
       $\exists e'[e' \sqsubseteq e \wedge ini(e) \prec e' \wedge \exists X[\neg F(x,X,P,ini(e)) \wedge F(y,X,P,e')]]]$

I leave it to the reader to check how the domain restriction in (37) applies in the case of examples (31a) (which illustrates the location reading) and (33a) (which illustrates the locatum reading) in section 5.3, which basically says that if the relation denoted by *en*-$_{\text{CL}}$ holds of its arguments, the interior of a token of the base (of which the set of points argument is a subset) is not empty.

6. Conclusion

The main contribution of this paper has been to make explicit what the parallels between degree achievements and change of location verbs are to shorten the gap between these two domains. Focusing on one particular case, namely, verbs with the prefix *en-* in Spanish, which empirically motivates the task undertaken in this paper, I have provided an account that has made explicit how the the core meaning of the prefix under discussion is involved in deriving both degree achievements and change of location verbs.

Although the focus in this paper has been on Spanish, the discussion is of relevance cross-linguistically, the present work constituting the first explicit semantic account in this realm. Here I briefly mention some remaining issues within Romance for illustration. The patterns discussed in this paper are actually similar to what happens in other Romance languages, such as French or Italian. These languages also have elements like *en-* in Spanish that appear in the derivation of degree achievements and change of location verbs. This is exemplified in (40). This suggests that the account developed in this paper may be extensible to other Romance languages (at least).

(40) a. *Degree achievements*
          Fr. **en-**durcir / It. **in-**durire 'to harden'   *bases:* Fr. dur / It. duro 'hard'
      b. *Change of location verbs*
          Fr. **em-**prisonner / It. **in-**carcerare 'to jail'   *bases:*Fr. prison / It. carcere 'jail'

Variation within Romance can be further explored. For instance, while French, Italian and Spanish display the restriction with regard to not allowing top-closed and closed scales (Di Sciullo, 1997; Martínez Vera, 2016), Catalan does not have it. For example, in Catalan, **em-***plenar* 'to fill', with base *ple* 'full', which has a closed scale associated with it, is possible.

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