Antonio Fábregas and Ángel L. Jiménez-Fernández*

# Extraction from gerunds and the internal syntax of verbs

**Abstract:** This paper provides an analysis of transparent gerunds in Spanish, as in *¿Qué llegó [silbando ~~qué~~] Juan?* 'What arrived [whistling ~~what~~] Juan?', using a decomposition of Aktionsart in a series of syntactic heads. A traditional analysis of these secondary predicates as adjuncts would undermine well-established syntactic principles restricting movement and extraction. We argue that these transparent gerunds should be analyzed as syntactic constituents merged as part of the syntactic projections associated with Aktionsart. More precisely, they qualify as RhemePs – assuming Ramchand's First Phase Syntax system – thus allowing their arguments to be extracted. Well-attested differences between Spanish and English gerunds will be explained in our analysis by proposing that the Spanish gerund projects as PathP (given it carries a path preposition), whereas English gerunds are simply RhemeP (lacking any sort of preposition).

**Keywords:** Aktionsart, extraction, complex predicates, gerunds, process, Spanish

## 1 The decomposition of Aktionsart

*Aktionsart* is one of the main criteria to classify lexical verbs in linguistic analysis. Throughout the years, it has become clear that rather than atomic notions, labels such as *activity*, *accomplishment* or *achievement* have to be decomposed at some level and treated as complex structures built with primitives like *causation*, *become*, etc. In Pustejovsky (1991), notions such as causation and result are independent primitives in the lexical semantics of predicates (cf. Jackendoff 1983; Levin and Rappaport-Hovav 1995). Harley (1995) proposes different flavors of heads, differentiated by the semantic contribution of the events they express. Other authors equally decompose Aktionsart, but do it syntactically: Pesetsky (1995), Kempchinsky (2000) and Ramchand (2008), among others. Beyond the disagreement, however, we find the common

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proposal that what we interpret as an event is in fact a structure with internal complexity.

This article uses event-decomposition to analyze a pattern of data that presents difficulties for standard approaches to how movement is restricted: cases where gerunds in Spanish, such as the underlined constituents in (1), allow extraction of one of their constituents (Borgonovo and Neeleman 2000).[1]

(1)    a. *¿Qué llegó      [silbando ~~qué~~] María?*
           what arrived-3SG Whistling       María?
           'What did María arrive whistling?'
    b. *¿Qué entró      [diciendo ~~qué~~] Juan?*
           what entered-3SG saying       Juan?
           'What did John came in saying?'

These gerunds do not have an argumental nature, nor are they analyzable as forming periphrases with the main predicate. Analyzing them as adjuncts would seriously undermine well-established syntactic principles: at least since Huang's (1982) *Condition on Extraction Domains* it has been established that adjuncts are islands, and the generalization seems to be robust in Spanish for true adjuncts (adverbial subordinate clauses):[2]

(2)    *\*¿Qué entró     Juan [para que María nos dijera ~~qué~~]?*
        what    entered-3SG Juan so      that María us   told-3SG
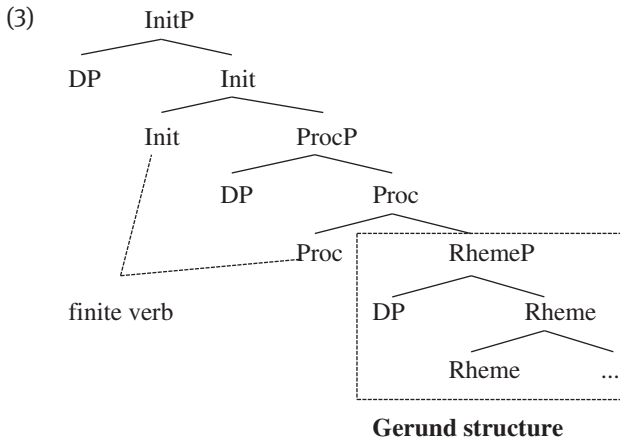        'What did John came in to say?'

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**1** As Liliane Haegeman (p.c.) points out, infinitival clauses can also show the same properties of extraction as gerunds: *What did you come back to do?* We are not dealing with infinitive clauses in this work. However, our intuition is that this type of clauses with a preposition *to* and an infinitive is also integrated in one single structural space with the finite verb (presumably as an argument of the head denoting the process of the event), thereby allowing extraction.
**2** The validity of CED has been called into question since it was proposed in the 80's. See Haegeman et al. (2014) for an overview of the problems that the CED has to face and for a proposal based on the decomposition of the island constraint into different rules. Also, Ignacio Bosque (p.c.) points out to us that there are sentences like *el juguete$_i$ que tu hija se pondrá muy contenta* [*si le compras* $t_i$] 'the toy$_i$ that your daughter will be very happy [if you buy her $t_i$]', which are apparent extractions from a conditional clause. However, we disagree with this claim. Such constructions are ungrammatical if the alleged extraction involved a prepositionally marked constituent *\*el chico al que tu hija se pondrá muy contenta si le presentas* $t_i$, 'the boy *a*-that your daughter will be very happy if you introduce her $t_i$'. This suggests that here we have no movement and that the analysis should involve base-generation of the putative antecedent in a peripheral position.

Borgonovo and Neeleman (2000) treat cases like (1), and argue for an analysis where the gerund – which, following Borgonovo (1994), is always an adjunct in Spanish – is L-marked; this L-marking makes extraction possible. Other accounts, such as Demonte (1987), posit an operation of reanalysis (Zwart 1993; Stowell 1995) and use a modified definition of c-command to account for similar cases. Finally, Truswell (2007) has proposed that the pattern should receive a purely semantic analysis.

Our account takes seriously the notion of event-decomposition and applies it to these cases to show that the gerund constituent is projected as one of the subevents in the verbal domain. In implementing this idea, we follow Ramchand's (2008) syntactic account of event structure, where each subevent corresponds to one head. We argue that this treatment accounts for cases like (1) without operations like reanalysis, and captures the Aktionsart restrictions and the argument restrictions of these constructions without the need to postulate independent (and additional) operations.

This is the core of our proposal. Assume that the maximal amount of aspectual material that can be syntactically projected inside the verbal domain is [Init [Proc [Rheme [Res]]]] (as in *John ran into the water*), as Ramchand (2008) proposes. We will argue that the Spanish transparent gerunds in (1) project as Path Phrases in the rheme position of that syntactic sequence. In (3) the gerund occupies the position of Rheme Object – an entity whose internal parts are identified with those of the main predicate.

(3)

InitP
DP  Init
    Init  ProcP
          DP  Proc
              Proc  RhemeP
              finite verb    DP  Rheme
                             Rheme    ...

**Gerund structure**

Morphophonologically, the gerund and the main verb look like two distinct verbs because there are two distinct lexical exponents, but as far as syntax is concerned, there is only one verbal structure. Thus, the gerund is not an adjunct

and it is not an auxiliary verb – because it is not lexicalizing functional structure above the lexical verb –.[3] Extraction of a constituent out of the gerund structure is allowed because it is movement of a constituent contained inside the structural space of the only verbal structure in the clause.

This is, in our account, the reason that there are transparent gerunds: the gerund can project as one of the members in the verbal sequence [Init [Proc [Rheme [Res]]]]. Language-specific differences depend on the nature of the gerund in each language. The Spanish gerund always involves a Path preposition, which only allows it to project as Rheme when integrated with the verb; the English gerund does not involve such preposition, so its distribution is more flexible.

The paper is structured as follows: in Section 2, we describe transparent gerunds in Spanish in more detail, and highlight their differences with English. In Section 3, we review a purely semantic analysis of the phenomenon and point out the problems that it faces in Spanish. In Section 4, we start with the analysis, identifying the syntactic heads that are necessary to define lexical verbs and gerunds in the syntax; we also present the differences between the Spanish and the English gerund in Subsection 4.4. In Section 5, we put the pieces together and in Section 6 we show how the resulting configurations can explain, without further assumptions, the constraints noted in Section 2.

# 2 Empirical data: Extraction from gerunds and its restrictions in Spanish

Let us concentrate on the structures in (1). In this section we show that the gerunds cannot be analyzed as part of a periphrasis or as arguments of the main verb.

These gerunds do not behave in the expected way if they formed a periphrasis with the main verb. The gerund is not selected by the main predicate, since its absence does not trigger any change in meaning or ungrammaticality (compare 4 with 5).

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**3** Another potential option would be that the gerund is treated as a Cinquean verbal head allowing restructuring (Rizzi 1982). There are two reasons why we do not find this approach plausible for our data. The first one is that given the hierarchical ordering (Cinque 1999), the gerund would precede the main predicate; however, the order between main verb and gerund is rigidly Verb-Gerund. The second is that, from what we know from *bona fide* restructuring cases, this would force at least one of the two predicates to acquire a semi-auxiliary flavour, aspectual or modal; this is not the case in our examples, where both verbs keep their conceptual meaning and cannot be reanalysed as modal or aspectual heads.

(4)  *Juan está   \*(fregando  los platos).*
    Juan is-3SG washing    the dishes
    'Juan is washing the dishes.'

(5)  *María llegó       (silbando  una  canción).*
    María arrived-3SG whistling a    song
    'María arrived whistling a song.'

Note also that if the main verb was selecting the gerund as an argument, its optionality would come as a surprise. For these reasons, these gerund constructions have been treated as adjuncts. But then we would not expect extraction from them, counterfactually. In the relevant literature (among many others, Huang 1982; Stepanov 2007; Chomsky 2004, 2008; Jiménez-Fernández 2009, 2012a and 2012b), there is a general consensus among scholars regarding the islandhood of adjuncts. When confronted with the data just presented, this gives us two basic options. The first is to dismiss the idea that the divide argument/adjunct plays any real role in grammar. This is the option that Truswell (2007) ultimately supports. The alternative is to treat these gerund constructions as the spell out of one of the internal constituents of the predicate. This is the option that we explore in the paper, concentrating on Spanish data.[4]

Before we start, a caveat is in order. These extractions are sometimes considered marked by native speakers, who prefer using other structures for the question. There is, at first sight, some disagreement among individual speakers with respect to how acceptable some of the extractions are; some want to add \*, some prefer??, some do not notice anything remarkable about them.

For this reason, and to make sure that our analysis is performed on solid empirical grounds, we have conducted an experiment in the form of an

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**4** An anonymous reviewer points out to us that some verb-modifying gerunds in Spanish can never be integrated with the main event, for instance (i).

(i)  *María se sentó   cruzando   las piernas.*
    María SE sat-3SG crossing   the legs
    'Maria sat and crossed her legs.'

Evidence that these gerunds do not integrate is that they tend to be pronounced with an intonational break at their left edge. Crucially, they denote events that cannot happen simultaneously with the main verb's event: (i) means that María sat, and once she was seated, she crossed the legs. We are grateful to the reviewer for this observation. In our account, as we will see in Section 5, projecting the gerund as one syntactic unit with the main verb forces an interpretation where both events overlap. Given that these two actions are ordered rather than simultaneous, this prevents the gerund from integrating with the main verb.

electronic questionnaire to assure that the contrasts are real in terms of language communities, above individual preferences. Speakers were presented with a number of question-answer pairs, such as (6), and were asked to grade them on a scale with 10 values (a forced choice scale, then), with 1 being *completely impossible* and 10 being *completely natural*. The answer was provided to make sure that speakers would interpret the question as it was intended, that is, with extraction from the gerund. This is illustrated in (6):

(6)    A:   *¿Qué llegó      silbando María?*
           What arrived-3SG whistling María
           'What did María arrive whistling?'

       B:   *María llegó      silbando la Marsellesa.*
           María arrived-3SG whistling the Marseillaise
           'María arrived whistling the Marseillaise.'

200 speakers answered the questionnaire; 90.40 % of them were speakers of European Spanish and the rest belonged to different American varieties, especially Argentina (2.53 %) and Peru (1.01 %). Let us then take a look to the specific restrictions, as they are reflected in the results of this questionnaire.

## 2.1 Restriction I: Aktionsart restrictions

The first requisite in Spanish, and the one which is most relevant to our purposes, has to do with the Aktionsart of the main predicate. The extraction is possible with achievement main verbs (see all the previous acceptable examples). Accomplishments (7) produce ungrammatical results, as do activities (8).

(7)    a. *Juan adelgazó      comiendo arroz blanco.*
         Juan slimmed-3SG eating     rice    white
         'Juan lost three kilos of weight eating plain rice.'
     b. *\*¿Qué adelgazó     [comiendo ~~qué~~] Juan?*
         what slimmed-3SG eating        Juan
         'What did Juan lose three kilos eating?'

(8)    a. *El    tonel rodaba    por el monte perdiendo aceite.*
         The barrel rolled-3SG by   the mount losing    oil
         'The barrel rolled down the hill losing oil.'

b. *¿*Qué rodaba* 　 *[perdiendo ~~qué~~]* el 　 *tonel?*
what 　rolled-3SG losing 　　　　 the 　barrel?
'What was the barrel rolling down the hill losing?'

With respect to states, extraction is not possible simply because a gerund construction is ungrammatical with them. The examples in (10) show that these verbs are statives: they are ungrammatical as complements of perception verbs and in combination with progressive periphrases, two tests that classically identify states (avoid a relative clause interpretation of the gerund, which is anyway marked in Spanish).

(9)　*\*María odia* 　　*las acelgas [hirviendo en la olla].*
　　María 　hate-3SG the chards 　boiling 　　in the pot
　　'María hates chards boiling in the pot.'

(10)　a. *\*Vi* 　　*a María odiar las acelgas.*
　　　　saw-1SG to María hate 　the chards
　　　　'I saw Mary hate chards.'
　　b. *\*María está* 　*odiando las acelgas.*
　　　　María 　be-3SG hating 　　the chards
　　　　'Mary is hating chards.'

The conclusion is that extraction is only possible for speakers when the finite verb is an achievement. A simple statistical analysis performed over the speakers' judgements shows that this difference is quite sharp. A question-answer pair like (6) above received high grades (mean = 7.2732, median = 8, standard deviation (sd) = 2.99, and a variation coefficient (vc) = 0.41). In contrast, a pair like (11), with an activity as main predicate, was considered ungrammatical (mean = 2.16, median = 1, sd = 2.06, vc = 0.95).

(11)　A:　*\*¿Qué corría* 　*escuchando María?*
　　　　What 　ran-3SG listening 　　María?
　　　　'What did María run listening?'

　　B:　*María corría* 　*escuchando la radio.*
　　　　María ran-3SG listening 　　the radio
　　　　'María was running listening to the radio.'

Since Maienborn (2003, 2005), alongside the 'classical' activities represented by (11), a class of non-dynamic activities (also known as Davidsonian states) has

been distinguished (eg., *wait, shine*). As illustrated in (12), the ungrammaticality is also sharp with Davidsonian states (mean = 2.32, median = 1, sd = 2.06, vc = 0.99), showing that with respect to this phenomenon there is no need to differentiate the two subgroups.

(12)   *¿Qué esperaba    leyendo María?*
        What   waited-3SG reading María?
        'What did María wait reading?'

We also ran a Pearson's chi-square test with Yates' continuity correction to compare the number of positive answers (6 or more) vs. the number of negative answers (5 or less) in the group formed by the sentences whose finite verb was an achievement, vs. the group with accomplishments or activities. This was made, of course, to assess the likelihood that the difference in answers was not due to chance. As chi-square does not measure the effect size, we ran over those results a Cramér's V test.

   The comparison shows that there is a significant tendency, and that the effect is big (chi-squared = 1059, 594; degrees of freedom (df) = 1, p-value < 2.2e-16, V value = 0.78). The following boxplot representation summarizes the contrast between the two groups, which is visually sharp; notice, however, that individual speakers are outliers (Figure 1).
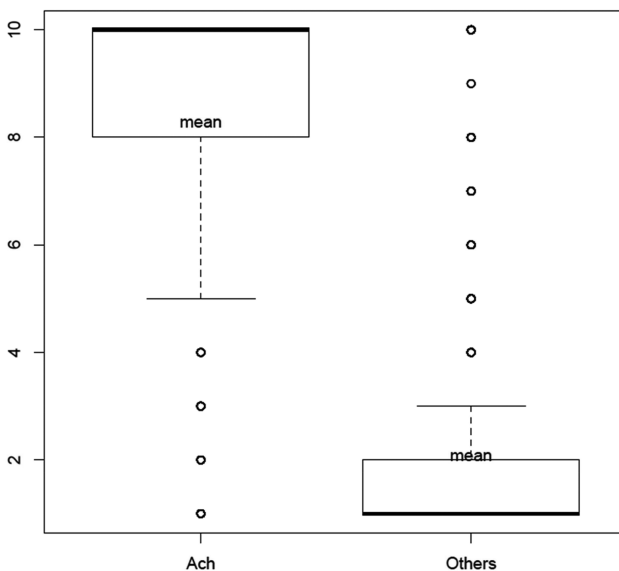


**Figure 1:** Grammaticality of extractions with achievements vs. other classes.

These results confirm the intuitions of the authors of this paper and show that they can be extended to a wider community of non-biased speakers.

Note that the results show a language-particular difference with English: in English, unlike Spanish, the transparent gerund can combine with a verb like *lie* (*What was John lying in bed reading?*, taken from Truswell [2007: 1360]). This verb belongs to the class that Maienborn (2003) calls Davidsonian states: they share properties with states and activities, but they are definitely not achievements. We address this difference in Section 6.3, where we argue that the contrast is due to a difference in the internal structure of the gerund in the two languages.

## 2.2 Restriction II: Adjacency

The possibility of extraction in Spanish tends to be dependent on the immediate adjacency of the main verb to the gerund. Contrast the previous sentences with those in (13). Without adjacency, these forms are degraded.

(13)  a. *¿Qué llegó        María [silbando q̶u̶é̶]?*
          What  arrived-3SG  María  whistling
          'What did María arrive whistling?'
       b. *¿Con quién volvió       María [cantando c̶o̶n̶ ̶q̶u̶i̶é̶n̶]?*[5]
          with   whom  returned-3SG María singing
          'Who did María return singing with?'

The results of the test confirm this. (6) above contrasts with (13a), minimally, in the position of the subject. If the results for (6) were high, (13a) received much lower grades, with a significant dispersion, suggesting that the sentence is also degraded for speakers (mean = 5.31, median = 5, sd = 3.47, vc = 0.65). Again, a Persons' chi-square shows a distribution that is unlikely to be due to chance (chi-squared = 16.53, df = 1, p-value < 4.787e-05), although with a moderate effect size (V = 0.22). The following graphical exploration shows the differences (Figure 2).

Here we find, again, a contrast with English, where adjacency is not required (cf. *What did John arrive home whistling?*). Moreover, in English, a

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**5** Note that the preposed operator starts within the gerund clause. The example in (8) can be grammatical if the fronted constituent is part of the argument structure of the main predicate *llegar* 'arrive' or *volver* 'return'. This is not the reading that we are focusing on here.
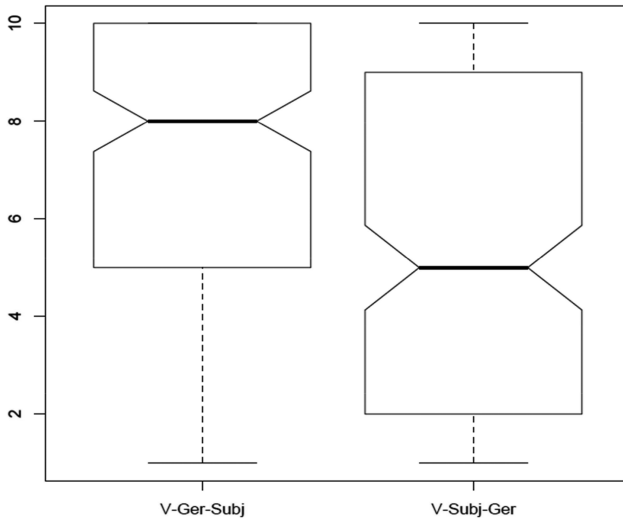
**Figure 2:** Grammaticality of extractions with a gerund adjacent to main verb vs. an intervening subject.

transparent gerund can receive another reading: a causative interpretation, noted in Truswell (2007), as in *What₍ᵢ₎ did John enrage his neighbors [whistling t₍ᵢ₎]?* This construction is different from the one that we are studying in this section in three respects: (a) first, it is not accepted by most speakers that we have interviewed in English, and its Spanish equivalent is radically ungrammatical; (b) second, the gerund is not predicated of an internal argument: the person that whistles is the person that enrages the neighbors. We will ultimately derive these language-particular differences from the internal structure of gerunds in English and Spanish, cf. Sections 4.3 and 6.3.

## 2.3 Restriction III: Absence of resultatives

In the grammatical sentences in Spanish, the prepositional complement expressing the result location of movement does not appear in the sentence with the extraction out of the gerund, as in (14a). This cannot be due only to adjacency. Even when the goal phrase can be separated from the main predicate, the result is worse than the version where the goal is implicit, as illustrated respectively in (14b) and (14c).

(14) a. *¿Qué llegó        a casa    [silbando ~~qué~~] María?
        what  arrived-3sɢ to home  whistling       María?
     b. * ¿Qué llegó       [silbando ~~qué~~] a casa  María?
        What  arrived-3sɢ whistling        to home María
     c. ¿Qué llegó        [silbando ~~qué~~] María?
        What arrived-3sɢ whistling       María?
        'What did María arrive whistling?'

Again, the statistical analysis confirms this. A sentence like (14b), vs. (14c) – identical to (6) – got lower grades (mean = 2.79, median = 1, sd = 2.69, vc = 096). A chi-square comparison of the same sentences with and without an overt goal gives x-squared = 87.48, df = 1, p-value < 2.2e-16, with V = 0.52, that is, a highly significant difference with a considerable effect. Note that there are, however, some outliers (Figure 3).
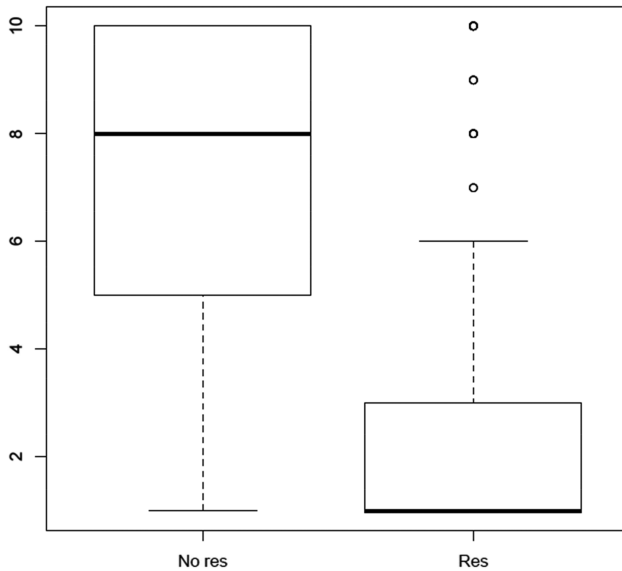


**Figure 3:** Grammaticality of extractions without an overt result vs. with an overt result.

This contrasts again with English, where an overt result can appear (*What did John come home whistling?*, taken from Truswell [2007: 1366]). In Section 6.2 we

suggest that this difference can be related to the availability of strong resultative phrases in English, but not in Spanish.[6]

## 2.4 Restriction IV: The secondary predicate must refer to an internal argument

A final condition that has been identified has to do with the argument structure of the main predicate. This property is uncontroversial in Spanish, as reported by Demonte (1987/1988), and in English according to Truswell (2007): only if the main predicate has an internal argument is the extraction possible. Contrast in this respect (15a), containing an unergative verb, with (15b), involving an unaccusative.

(15)   a. *What did Mary dance whistling?
       b. What did Mary arrive whistling?

However, one could blame the contrast on the different aspectual nature of each predicate. We have to concentrate, therefore, on transitive achievement verbs to be sure that this property holds. In (16) the extraction is accepted and the gerund clearly takes the internal argument as its subject.

(16)   a. *Encontré   a  Juan  hablando  con   María.*
          found-1SG to Juan talking     with María
          'I found Juan talking to María?'
       b. *¿Con  quién  encontraste  hablando  a  Juan?*
          with  whom  found-2SG     talking   to Juan?
          'Who did you find Juan talking to?'

Contrast this with (17), where the gerund has to take the external argument as its subject and the extraction is impossible. All speakers that were consulted for

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6 An anonymous reviewer points out to us that s/he finds a transparent gerund more grammatical with a verb like *caer* 'fall' when there is no *se* form attached to it, as in *caer-se* 'fall-SE'. Although *se* does not trigger ungrammaticality whenever it appears (we find equally grammatical an extraction with *morir* 'die' and one with *morir-se* 'die-SE'), we would like to suggest that with the verb *caer* it is an instance of an aspectual marker that introduces a result component. The verb *caer*, as the reviewer notes, can denote a durative process (*Los precios cayeron durante dos meses*, 'The prizes fell during two months'), but not when combined with se (#*Juan se cayó durante dos horas*, 'Juan fell during two hours'), which suggests that this *se* is introducing an extra subevent. If so, the rejection of transparent gerunds with *se* in combination with *caer* might be an instance of the same constraint on projecting overt material associated to ResP. For a more detailed analysis of verbs such as *caer* in terms of subevents, see Jiménez-Fernández and Tubino (2014).

this in the preliminary phase of this investigation has sharp judgements about this, and the question is uncontroversial in the literature, so we did not include this contrast in the questionnaire.[7]

(17)  a.  *Encontré  el  error  hablando con  el  técnico.*[8]
          found-1sg the mistake talking   with the technician
          'I found the mistake talking to the technician.'
     b.  *\*¿Con  quién  encontraste habland el  error?*
          with   whom  found-2sg    talking  the mistake?
          'Who did you find the mistake talking to?'

## 2.5 Interim summary

Let us summarize the conditions under which extraction from inside a gerund is possible in Spanish:
–   The gerund secondary predicate tends to be immediately adjacent to the main predicate when extraction is possible.
–   For extraction to be possible, the main predicate must have an internal argument, which is the subject of the gerund.
–   The main verb must be an achievement.
–   Constituents expressing the result location must be absent.

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**7** Adolfo Ausín and Ad Neeleman (p.c.) point out to us that for them, respectively in Spanish and English, extraction of an adjunct is worse than extraction of an argument. If true, this would replicate the asymmetries found with weak islands in several domains (Cinque 1990). However, the results of our questionnaire do not suggest that adjuncts are more difficult to extract than arguments in this context. The answer to (i) made it clear that *cómo* 'how' was extracted from the gerund, as *\*llegar con todas sus fuerzas* 'arrive with all her strength' is impossible.

(i)    A:  *¿Cómo llegó      gritando María?*
           How   arrived-3sg shouting María?
           'How did María arrive shouting?'

       B:  *María llegó      gritando  con todas sus fuerzas.*
           María arrived-3sg shouting  with all   her strength-pl
           'María arrived shouting with all her strength.'

This sentence had high grades (mean = 8.32, median = 9, sd = 2.39, vc = 0.28), and although a chi-square comparing adjunct extraction with argument extraction was significant (chi-squared = 9.49, df = 1, p-value < 0.002), the V value shows a small size effect (V = 0.17), suggesting there is no real difference between adjunct- and argument-extraction in these cases.
**8** Note that in this example we do not have the judgement interpretation of *encontrar* 'to find', as in *I found your story to be badly written.*

Equally relevant are the differences between the results that we have obtained here and the facts reported by Truswell (2007) for English (as opposed to Spanish):

- English allows transparent gerunds which denote the cause of the main verb; these gerunds take the main verb's external argument as subject.
- In English, the main verb can be a Davidsonian state like *lie*.
- In English, the constituent expressing the result location can be present.

# 3 Against a purely semantic account of the phenomenon

Before we move to our own analysis, we will briefly review the influential previous account in Truswell (2007), which is semantically oriented.

This author analyses the pattern of data with gerund-clauses in English and rejects the idea that syntactic domains are the proper level where restrictions on extraction are to be analyzed. He proposes that semantics is ultimately what decides; the extraction is possible when the two predicates can be semantically integrated as part of the same event. More specifically, the condition in order to allow this kind of extraction is that the event denoted by the gerund structure should be integrated with the finite verb's event in one single semantic representation. As a result, the gerund structure is understood as a subevent of the situation denoted by the finite verb; under these conditions, extraction of the complement becomes possible. One example of such integration arises when the secondary predicate is understood as the cause of the matrix event, which as we said earlier is a possible construction in English but not in Spanish:

(18)   *What did John enrage his neighbors [whistling ~~what~~]?*

The relation between the event described by the gerund structure *whistling what* and the matrix event *John enrage his neighbors* would be $e_{gerund}$ causes $e_{finite\ verb}$. It is identical to the one that is obtained between the causing (sub)event and the caused (sub)event in a standard decompositional analysis of Vendlerian accomplishments (see e. g., Dowty 1979; Pustejovsky 1991; Ramchand 2008) – $e_1$ causes $e_2$ – (cf. Truswell 2007: 1366). Another eventive relation, equally possible to integrate in one single situation, shows up when the gerund predicate describes a preceding event, that is, an event occurring immediately before the change of state denoted by an achievement:

(19)   *What did John arrive [whistling ~~what~~]?*

Here, according to Truswell (2007), the relation between the two events ($e_{secondary}$ R $e_{matrix}$) is interpreted with R denoting immediate temporal precedence; this is not far away from the meaning of many achievements that have the structure $e_1$ then $e_2$ (Truswell 2007: 1366). The gerund denotes a temporally extended preparatory stage, temporally preceding the change of state expressed by the achievement (Truswell 2007: 1368).

The semantic analysis is argued by Truswell to be more successful than a syntactic treatment on the basis of fundamentally one contrast, which we will revise here. What we will propose, in contrast to Truswell's analysis, is an account where the conditions for extraction are mainly syntactic, but where the semantic requisites that Truswell notes are also integrated. Our analysis will not deny the importance of the semantic factors, but will highlight the intricate connection between structure and meaning, with structure being responsible here for the restrictions identified in the previous section.

Consider first (20a) and (20b). In the second example, which is more acceptable than the first one, more syntactic structure has been added. Truswell argues (2007: 1358) that this is an argument against a syntactic account, because syntax would not expect extraction to become better when more structure is added; if structural complexity defines notions like phase or domain, when more structure is added, extraction is expected to be more difficult, not easier.

(20)  a. *What did John drive Mary crazy [fixing ~~what~~]?
      b. What did John drive Mary crazy [trying to fix ~~what~~]?

Indeed, speakers interviewed by us in writing this article confirm that (20b) is better than (20a), but we do not see how this is an immediate problem for a syntactic analysis. The source sentence in (20a) is already unacceptable for the speakers interviewed (??*John drove Mary crazy fixing the TV*).

However, alongside the presence of more structure, another difference between the predicates in (20) is that the first builds the gerund over a telic predicate – *fix* – while the second does so over an atelic one – *try*. The contrast might be due, then, to an independent aspectual requisite of the gerund morpheme involved in this construction. Truswell's own suggestion about the restriction is that this kind of gerund must be built over an atelic event (2007: 1369): *fix* is a telic action, as it entails arriving to the endpoint when the object is fixed, but *try to fix* is an atelic one, as it does not entail the culmination.

Once we accept that (20a) might be ungrammatical because of the aspectual information required by the gerund, all that is left from the contrast as support for a non-syntactic treatment is the claim that the addition of structure should not facilitate movement. However, this claim is not accurate either, as recent

work on the subject has shown. Relevant examples are contrasts such as (21), where the presence of the copula is necessary to allow the predicate to move over the subject. Den Dikken (2006) relates this to the proposal that the extra layers of structure define a landing site for a head, with subsequent phase extension that makes otherwise inaccessible material accessible. Thus, under certain conditions, more structure improves movement.

(21)   a. *She does not consider Ryan the best candidate.*
       b. *She does not consider the best candidate *(to be) Ryan.*

Other relevant examples are those cases, noted in Fortuny (2008) and Gallego (2010a), where monoclausal examples are reluctant to yield an acceptable outcome, whereas biclausal examples are ready to allow extraction:

(22)   ? *¿De  qué  autor  han       conseguido vario   libros*
         Of    which author have-3PL obtained   several books
         *premios  internacionales?*
         prizes    international-PL?
         'Of which author have several books got international awards'

(23)   *¿De  qué  autor  parece   que han       conseguido varios*
         of    which author seem-3SG that have-3PL obtained    several
         *libros  premios  internacionales?*
         books prizes    international-PL?
         'Of which author does it seem that several books have got international awards?'

Note that in (23) more syntactic structure is used and yet the result of extraction is fine. This lends further support to our idea that a syntactic account of subextraction is plausible in our putative adjunct islands (see Jiménez-Fernández 2009, 2012b; Haegeman et al. 2014 for different factors influencing extraction and a syntax-based account).

The strength of Truswell's account is that it is designed to explain the Aktionsart restrictions between the main predicate and the apparent adjunct. Note that what the main two Aktionsarten not being able to occur as main predicates with the extraction (accomplishments and activities) have in common is that they contain a dynamic process part. States and achievements, on the other hand, lack this ingredient, but states are not compatible with it, because they express states of affairs without internal development. Now, if this gerund denotes a dynamic process, the answer for how to account for the restriction that

suggests itself is that whenever the main predicate denotes a process and the gerund denotes the same kind of object, they cannot be integrated in the same event representation because then we would have two competing objects with the same denotation. It is clear that the proposal that the two predicates must integrate in the same event structure is able to capture a big deal of the data, and as such it should be kept in alternative analyses.

Given that the account is strictly semantic and does not make reference to the hierarchy of projections in the syntactic tree, it is not clear, however, how some of the structural conditions for extraction are met. What explains, in Truswell's account, the impossibility of projecting syntactically the result location in Spanish, which we have seen makes the extraction significantly worse for native speakers?

The condition that forces the finite verb to have an internal argument in order to allow extraction from a gerund is also, as far as we see, unaccounted for in Truswell's proposal. Although the author mentions this restriction at the beginning of his work, the property does not directly follow from his analysis. It is true that in the causative gerund construction (cf. footnote 5), which is not grammatical in Romance languages, this restriction is not active, but still the fact that extractions are possible cross-linguistically with gerunds predicated of an internal argument requires some sort of explanation. In the proposal that we put forth in this article, the semantic compatibility reduces to a form of structural compatibility that, at the same time, accounts for the syntactic restriction of having an internal argument.

A final problem which Truswell's account does not address is that matrix and gerund predicates must be adjacent when extraction applies, at least for languages like Spanish where the subject can occur either before or after the gerund. However, when extraction is at stake, sentences where the subject occupies a pre-gerund position are fully ill-formed, as the examples in (24) show, repeated below:

(24)   a.   *¿Qué   llegó       María [silbando ~~qué~~]?
          what   arrived-3SG María whistling
          'What did arrive María whistling?'
   b.   *¿Con quién volvió      María [cantando ~~con quién~~]?
          with   whom   returned-3SG María singing
          'Who did María return singing with?'

Why would linear order have any saying in the acceptability of the structure, if the only relevant level of analysis was semantic? In contrast, if semantics plays a role but the semantic conditions are read from a restricted range of syntactic structures,

linear order possibilities would follow from the configurations that make extraction possible. In our syntactic analysis, which we present in the next section, we intend to offer a principled account of these problems while keeping the semantic characterisation that Truswell's has correctly identified as part of the analysis.

# 4 Identifying the units

Let us first summarize the logic that we follow in the analysis and then we will concentrate, step by step, on how to derive each of its parts.

The core of our proposal is that the cases where the extraction is possible out of the gerund are those where this predicate is in the same verbal structural space as the finite verb. This means that the subeventive heads that the main predicate introduces must be different from those that the gerund lexicalizes. Otherwise, at least one subeventive head would appear twice, and two Aktionsart structures would be defined. We will motivate the following hypotheses:

– Following Ramchand (2008), the maximal expansion of one single Aktionsart structure is [Init [Proc [Res]]].
– Proc can additionally take a Rheme projection, which contains material – paths or other entities – whose internal structure will be identified with the event described in Proc.
– Gerunds that allow extraction are introduced as RhemeP, with the result that the unbounded event they express is identified with the event expressed by the main verb.
– Consequently, the gerund and the main predicate can integrate in one single Aktionsart only if the main predicate does not have its Rheme position already occupied.
– Conditions on linear order, unavailability of result locations and the restriction that the gerund must be predicated of an internal argument directly follow from the integration we propose.

## 4.1 The structure of Aktionsart in a first phase syntax

The first piece of the puzzle is to spell out our assumptions about the decomposition of Aktionsart inside a constructionist approach to lexical aspect. Here we will basically follow Ramchand (2008: 38–56) in her proposal that the three main subevents independently identified in the tradition (Dowty 1977, 1979; Pustejovsky 1991, among others) correspond to distinct syntactic heads. Ramchand's proposal is that there are three event-related heads. They are:

- *Initiation*: the head that codifies the cause component inside an eventuality. A predicate that has an argument expressing an initiator –cover term used by Ramchand to group agents and causers – contains this projection; that is, *John broke the glass* has it, but *The glass broke* does not have it.
- *Process*: the head that provides the eventuality with the event part, denoting a dynamic part. Verbs that denote events have it; that is, *John learnt English* has it, but *John knows English* does not have it.
- *Result*: the head that expresses the subsequent state after a telic event has arrived to its endpoint. This head is only present when the verb must compulsorily be telic and is able to license result interpretations of prepositions and other items that do not express change in themselves. That is, in *The glass broke into one thousand pieces* there is a ResP that licenses the reading of *into one thousand pieces* as the subsequent state attained after the breaking event; in contrast, there is no ResP in *John ate the ham*.

It is important to note that a fourth head can be involved in the structure. Process can take a Rheme argument as its complement (25), which in turn could take a ResP as its complement (for instance, when Rheme is interpreted as Path, as in *John ran into the water*).
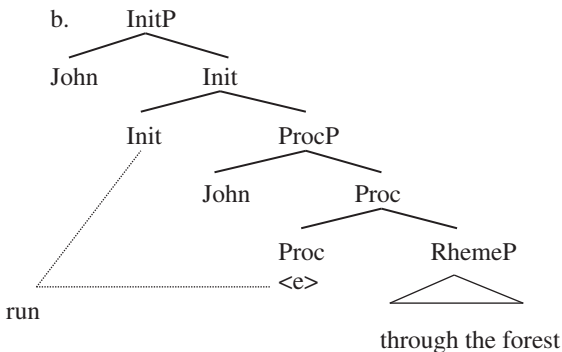
(25)   [ProcP [RhemeP ([ResP])]]

This rheme introduces an entity which defines part of the properties of the event denoted by Proc. Rhemes do not introduce individuated, referential arguments that are predicated over, but entities whose internal topological properties are identified with the event described by the main verb; rhemes are descriptors or modifiers of the main event that must unify their properties with the internal topological properties of the event (Ramchand 2008: 46).

Paths are the most studied instantiations of rheme arguments, but not the only ones. A path is an entity with internal mereological structure, bounded or unbounded. When combined with an event, the internal mereology of the path identifies one-to-one with the internal parts of the event, codescribing it. Although gerunds are not paths proper, they also have an internal mereology; our contention in this section and the following is that in the cases where the gerund allows for subextraction, the gerund occupies a rheme position: it codescribes the event, and identifies its internal mereology – the unbounded process it denotes – with the event of the main verb, giving rise to an interpretation of simultaneity (Section 4.3).

A natural consequence of the idea that rhemes act as modifiers of the event expressed by Proc is to propose that there is a division of labor between Proc and Rheme. Proc introduces the event argument <e>, but Proc, by itself, does not
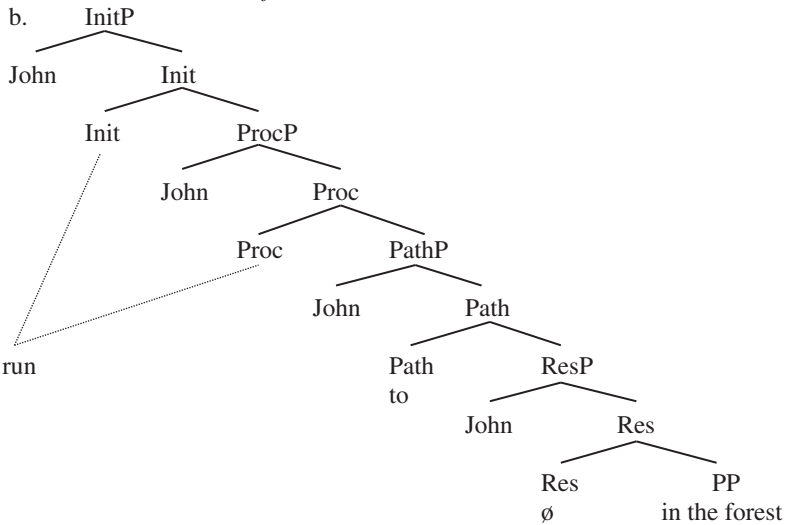
fully define the event's internal mereological properties. Rhemes are syntactic positions that, given a head-complement configuration, transfer further descriptive properties to the event through identification with their internal mereological structure. Consider the case of paths: (26a) denotes an event because it contains ProcP, but we interpret that this event occupies an extended time period (specifically, movement across some space that takes some time to take place) because Proc takes a PathP as a complement (26b), which gives extension to the event. This is possible, to begin with, because the path (through the forest) has an internal composition that is itself extended; mapping the event to that extended structure forces a reading of the event where it denotes an extended period of time itself. This is independent of whether PathP is spelled out overtly or not; that is, we assume that in any case where an event has internal temporal extension there is structurally a PathP (an instance of Rheme), independently of whether it is spelled out or not.[9]

(26)   a.   *John run (through the forest).*
       b.   InitP



The direct consequence of this idea is that some Aktionsart classes will necessarily project Rheme in order to define the internal development of the event. The presence of Rheme is going to be compulsory if one must have activities – which emerge when the Rheme defines a path which does not have any natural boundary, as in (26b) – or accomplishments – if the Rheme is a path that has a natural boundary or is itself followed by ResP. This is what happens in (27), where the transition arrives to some specific point once it is concluded; see also Krifka (1989), Verkuyl (1993), Rothstein (1999) and Mateu (2002), among many others, for how (un)boundedness in other domains is transferred to verbal aspect.

---

**9** Note that in (26) we are following Ramchand (see also Brody 2000) in the proposal that single exponents materialise sets of adjacent heads – through *spanning*. More about this and its consequences for the materialisation of result locations in our constructions will come later.

(27)  a.    *John ran into the forest.*
      b.    InitP

```
            InitP
           /     \
        John      Init
                 /    \
              Init     ProcP
                      /     \
                   John      Proc
                            /    \
                         Proc     PathP
                                 /     \
                              John      Path
                                       /    \
                                    Path     ResP
                                     to     /    \
                                         John     Res
                                                 /    \
                                              Res      PP
                                               ø     in the forest

              run  (Init, Proc connected by dotted lines)
```

In contrast, other Aktionsart classes do not occupy through the main predicate the Rheme position, which will then be available for a gerund structure to fill it.

Rhemes, of course, do not need to be defined in the spatial domain. It is accepted at least since Tenny (1986) and Krifka (1987) that individuals denoted by noun phrases with different quantifiers and determiners can also be used to define the internal mereological properties of an event (*to eat an apple; to eat apples*), and the scale structure of adjectives can also be used to measure a change through the different degrees below and above the standard value (*to whiten, to become red*, etc.). This notion of generalized rheme explains that verbs other than movement verbs can denote temporally extended transitions, provided that their Proc takes as its complement a noun (28a) or an adjective (28b) with properties able to identify with an event.

(28)  a. *John ate apples/John ate an apple.*
      b. *Mary whitened the clothes/Mary lengthened the pants.*

A structure like (29a) is the maximal syntactic instantiation of an event (for instance, to derive the accomplishment in [29b]).

(29)  a. [Init [Proc [Rheme [Res]]]]
      b. *John ran into the water.*

Note that (29a) contains a causation component, a process of running which happens along the path that starts in the original position of the subject and ends

in the position of the water, and finishes with John in the water. Rheme and Res do not need to co-occur: an achievement verb like *enter* (*John entered the room*) allows a construction [Init [Proc [Res]]], that is, where there is no extended path leading to the inside of the room, as the relevant point is only the moment in which John crosses the door of the room. However, Rheme and Res co-occur when the process leading to the result location happens along an extended path.

Structures like (30), where the spine of the tree contains two identical heads in strict adjacency are impossible:

(30)  a.  *[Init [Init [Proc [Res]]]]
      b.  *[Init [Proc [Proc [Res]]]]
      c.  *[Init [Proc [Res [Res]]]]
      d.  *[Init [Proc [Rheme [Rheme [Res]]]]]

These configurations are impossible due to vacuous projection: at some point in the structure we would have a head that selects itself; even assuming that its selectional requisites would be somehow satisfied in that situation, the result would be that two contiguous levels of the structure would have identical properties. Any property satisfied by the second head would be redundant with the satisfaction of the same properties by the first head. The second reason is that such repetition would not allow for selection. In (30b), for instance, the lower instance of Proc could not be selected by Init, making it unclear which syntactic property of Init it is satisfying.

What could be possible, because it avoids vacuous projection and allows for univocal selection, is a recursive structure like (31).

(31)  [Init [Proc [Res [Proc [Res]]]]]

Init would combine with the first (leftmost) Proc as its causation component, and Proc with Res as its result, but Res would not be able to identify with the second Proc because it has already been integrated in a structure with the first Proc, and the same result cannot be the consequence of two distinct processes. Thus, the second Proc would integrate with the second Res, and the result would be two distinct complex event structures.

## 4.2 Achievements do not spell out Rheme

The next piece in the puzzle is to show that achievements – which are the only verbs that allow extraction from a gerund clause – do not fill the Rheme position available inside the verbal structure, and as a result they do not denote changes

that occupy a temporal extension co-described through the mereological proper-
ties of another entity. Two pieces of evidence, originally due to Piñón (1997),
support the idea that achievements lack internal duration. Both accomplish-
ments and achievements allow *in*-phrases setting a limit.

(32) a. *Juan escribió la carta en dos horas*.
       Juan wrote-3SG the letter in two hours
       'Juan wrote the letter in two hours.'
    b. *Juan alcanzó la cima en dos horas*.
       Juan reached-3SG the summit in two hours
       'Juan reached the summit in two hours.'

It seems, however, that these two modifiers behave differently. In (32a), with an
accomplishment, the modifier measures the duration of the event, which is
possible because the event has some internal duration – because it contains
path, we claim, here manifested as the cumulative DP *la carta* 'the letter'. In
contrast, in (32b), as the event lacks any internal duration, the same modifier
measures the time that elapsed between some arbitrarily set point in time,
previous to the beginning of the event, and the single point in time where the
summit is reached. Consequently, in (32b) the meaning is identical to an after-
modifier, which can substitute it without change in meaning, but in (32a) the
substitution means something else.

(33) a. *Juan escribió la carta tras dos horas*.
       Juan wrote-3SG the letter after two hours
       'Juan wrote the letter after two hours.'
    b. *Juan alcanzó la cima tras dos horas*.
       Juan reached-3SG the summit after two hours
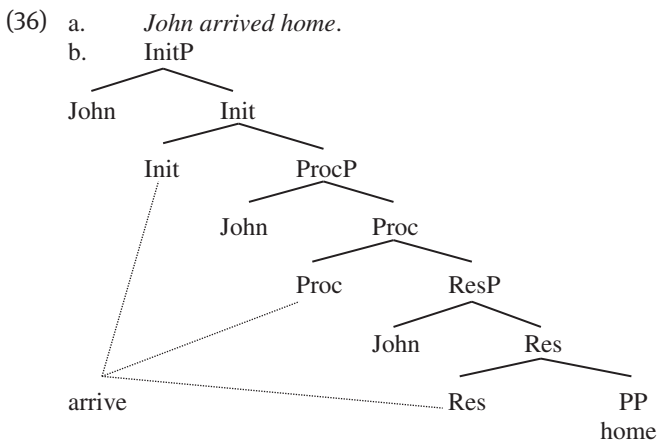       'Juan reached the summit after two hours.'

This follows if (32a) does not have any internal duration, and therefore, if
the event does not contain internal topological properties that need to be
identified.
    A second piece of evidence is the meaning of the progressive form. With
verbs like (32a), here (34a), since there is internal duration, the progressive
denotes any point during the progression of the event; in (32b), here (34b), the
verb does not have an internal progression that can be denoted and the
interpretation that obtains is a *preparatory stage reading* (cf. also Marín and
McNally 2011), where we denote any point in a period defined between an
arbitrary point previous to the event and the event itself. As a consequence of

it, (34b) denotes the same as (35b), with an inceptive periphrasis, but (34a) is distinct in meaning from (35a).

(34) a. *Juan está escribiendo la carta.*
    Juan be-3SG writing the letter
    'Juan is writing the letter.'
  b. *Juan está llegando.*
    Juan be-3SG arriving
    'Juan is arriving.'

(35) a. *Juan está a punto de escribir la carta.*
    Juan be-3SG to point of write the letter
    'Juan is about to write the letter.'
  b. *Juan está a punto de llegar.*
    Juan be-3SG to point of arrive
    'Juan is about to arrive.'

In Ramchand's theory, this means that with achievements Proc does not spell out RhemeP; consequently, the internal argument of an achievement will not co-describe the event. Achievements are punctual transitions, and as such they do not contain internal topological properties that require identification with another entity. As can be seen in (36), an achievement combines directly with a Result state as the argument of Proc; the result of this is that, instead of identifying the internal topological properties of the event, the process is inter-preted as lacking internal structure and leading immediately into a result state: hence the punctuality.

(36) a. *John arrived home.*
  b. InitP

```
              InitP
             /    \
         John      Init
                  /    \
              Init      ProcP
                       /    \
                  John       Proc
                            /    \
                       Proc       ResP
                                 /    \
                            John       Res
                                      /    \
      arrive                       Res      PP
                                            home
```

Now, if achievements do not fill the Rheme position (advancing a bit of Section 5.1), what this means is that an achievement defines a non-maximal event space where there is still room for a RhemeP projection. If transparent gerunds can be projected as RhemePs, a gerund structure would be able to integrate in the same structural space as an achievement finite verb, yielding (37) as a result. With achievements, then, there is a possibility of merging gerund and finite verb in the same structure, which makes extraction possible.

(37)   [Init [Proc [Rheme [Res]]]]

In contrast, with activities or accomplishments, the main verb already fills the RhemeP position, because a path is required to define the internal development of the event. Consequently, trying to integrate a gerund in the same predicate structure in Spanish would produce a structure like (38), which is ungrammatical because two rhemes are projected: a path and a gerund.
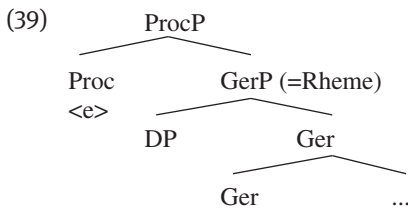
(38)   *[Init [Proc [Rheme(path) [Rheme(gerund) ([Res])]]]]

Since (38) is impossible, when the main verb already requires a Rheme, the gerund has to be introduced as an adjunct, which makes – as expected – extraction impossible.

The next step is, thus, to show that gerunds are plausible materializations of RhemePs.

## 4.3 Gerunds as RhemePs

In this section we argue that there are reasons to support the idea that in the Spanish transparent gerund constructions studied here, gerunds are introduced as RhemePs. Take a structure like (39). where the gerund fills the Rheme position (Ger is for the time being a descriptive label; we will be more specific about its internal structure in Section 4.4).

(39)
```
                  ProcP
              _____
             Proc        GerP (=Rheme)
             <e>       _____
                      DP          Ger
                               _____
                              Ger       ...
```

If our proposal is right, we would expect the situation denoted by the gerund to co-describe the event. However, given that the achievement verb does not select

for the gerund (in contrast with, say, an aspectual auxiliary), we would not expect there to be event identification between the gerund and the main verb. As one anonymous reviewer points out to us, it is possible to say *John carefully cleaned the table sloppily singing the Marseillaise* without contradiction, which means that the two actions are not necessarily identified in the interpretation component.[10]

But first we need to address the question of what kind of internal structure a gerund has. It is relatively uncontroversial that gerunds are the designated form in the verbal paradigm to express the ongoing event denoted by the verbal predicate. That is, in informal terms, gerunds express a series of points that correspond to the process denoted by the predicate they select, excluding in principle the possible initial and final boundaries of that process. Several pieces of evidence have been provided in favor of this idea. Consider (40), which is a contrast first noticed – to the best of our knowledge – in Vendler (1967).

(40)  a.  *John saw Mary {stealing/steal} the jewel.*
      b.  *John spotted Mary {stealing/\*steal} the jewel.*

---

**10** Note, however, that when the gerund is transparent, manner modification is less grammatical (i), as one reviewer points out to us.

(i)     ??¿*Qué  llegó        silbando qué  fuerte?*
        What    arrived-3sɢ whistling     strong?
        Intended: 'What did he arrive whistling loudly?'

The same reviewer notes that when the gerund projects more than one argument it is also difficult to allow the extraction:
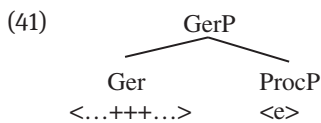
(ii)    a.  ¿*Qué  murió      cocinando qué?*
            what   died-3sɢ cooking?
            'What did he die cooking?'
        b.  \*¿*Qué  murió      cocinándole qué  a  su  madre?*
            What   died-3sɢ cooking-her       to  his  mother?
            \*'What did he die cooking to his mother?'

This suggests, as the reviewer points out to us, that the internal structure of the verb that projects inside the gerund has to be impoverished (that is, lacking projections with respect to its non-transparent version), rejecting manner modification and becoming unable to introduce some arguments. This could be taken as an indication that there is event identification at some level: the set formed by the main verb and the gerund has a maximal number of arguments that they can allow. We have not conducted an in-depth study of these argument restrictions; further research will help clarify the nature of this constraint.

With a perception verb that has a temporal duration, like *see*, both the infinitive and the gerund are possible as complements expressing the perceived event, but with a subtle difference in meaning. When the infinitive is used, it is strongly implied that John witnessed the whole series of actions that Mary performs in order to steal the jewel, culminating with the moment in which Mary puts it in her pocket. On the other hand, when the gerund is used, the sentence just means that John saw Mary at some point during the ongoing action of stealing, but it does not follow that he actually saw her putting the jewel in her pocket, or begin to open the safe. The idea is that the infinitive codifies the whole sequence of subevents, while the gerund focuses on the process subevent (which might eventually conclude with Mary getting to possess the jewel, or not).

Given this reasoning, the contrast in (40b) receives a natural explanation. As *spot* is an instantaneous perception verb, without temporal extension, it is not possible to combine it with the infinitive, because the latter denotes a sequence of event phases and it is impossible to perceive that sequence in an instant. In contrast, the gerund is possible because it denotes an ongoing process and any instant in the series of temporal points defined by the gerund denotes a part of the process.

What does this mean for the internal structure of gerunds? We propose that gerunds are projections of an aspectual head with imperfective value. This head selects the event denoted by the base verb and focuses on a time interval that excludes the initial and (when available) the culmination point of the event.

(41)

                           GerP

          Ger               ProcP

      <…+++…>        <e>

Thus, the temporal trace of the gerund is an interval (represented by <... + + + ... >) describing the progression part of an event, excluding its initial and final boundary (Dowty 1977; see also Bolinger 1971; Borer 2012). This is consistent with a number of existing proposals about the semantics of the progressive form: Vlach (1981) analyses the truth conditions of the progressive as true in world *w* at time *i* if in *w* at *i* there is an ongoing process which would eventually attain a culmination. However, the culmination is not included in the denotation, and the truth value is independent of whether the event is interrupted before the culmination or not: Landman (1992) proposes that the progressive is true in *w* if in some world on the continuation branch of *w* (cf. Dowty's 1979 concept of *inertia worlds*) some event realizes the event type of

the predicate. What is crucial for our purposes is that the denotation of the gerund does not include an initial or a final point in the event's internal structure.

Given this situation, consider a sentence like (42):

(42) *Juan  entró        [cantando  la    Marsellesa].*
     Juan  came.in-3sg  singing     the  Marseillaise
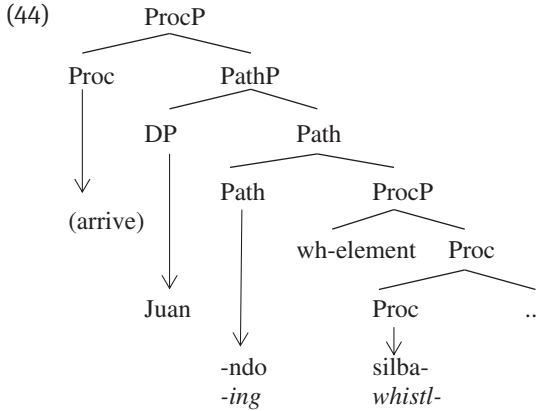     'Juan came in singing the Marseillaise.'

The interpretation of this sentence is that, at a particular point in time, two events have co-occurred in the same situation: Juan's entrance and Juan's singing the Marseillaise. This is precisely what is expected if the gerund acts as a rheme inside the event's internal structure. The situation expressed by the gerund consists of a series of extended points, while the main predicate – lacking a path – denotes a punctual transition. This punctual transition defines a point in time, call it $t^e$. Becoming one single verbal structure, we propose, involves identifying this $t^e$ with one of the points inside the interval denoted by the gerund (tg):

(43)  Main verb:              $t^e_i$
      Gerund:      ...(tg tg tg) $tg_i$ (tg tg tg tg tg tg)...

The result is that the truth conditions only require that at the precise moment of entrance, Juan was singing; nothing is entailed about whether Juan was singing before or after that event. Notice that this procedure, in fact, is more successful than Truswell's at accounting for the semantic interpretation of the gerund. In Truswell's analysis, as we noted earlier, the relation between the gerund and the main verb was one of immediate temporal precedence: the gerund described a preparatory phase of the main event. However, it is not clear what 'preparatory phase' means in this context: *whistling* is difficult to categorize as a preparation for the arriving event. Our analysis, in contrast, precisely predicts that the entailment will be only that the subject was whistling at the point of arriving.

We propose the specific structure in (44) for a Spanish gerund introduced as a Rheme: the gerund contains verbal structure, but is introduced as Rheme via an additional head. This head, following among others Fábregas (2008) and Gallego (2010b), is a relational head, and more specifically a preposition. Thus, as other Rhemes, like Path Phrases, the gerund projects as a PP. That preposition introduces the subject of the gerund in its specifier (cf. Bowers 2000), and defines the aspectual value of the gerund as imperfective (see Hale

1986 and Hale and Keyser 2002 for the view of prepositions as aspectual-denoting heads).[11]

(44)

ProcP
- Proc → (arrive)
- PathP
  - DP
    - Path → Juan
  - Path
    - Path → -ndo / *-ing*
    - ProcP
      - wh-element
      - Proc
        - Proc → silba- / *whistl-*
        - ...

Unlike Gallego (2010b), we propose here that the gerund's preposition in Spanish is a Path preposition, not a Central Coincidence Preposition. The difference between our proposal and Gallego's might be, to some extent, purely terminological: Gallego's proposal is couched in a theory where imperfectivity has to be associated with Central Coincidence relations (cf. Hale 1986); the opposite kind of P, Terminal Coincidence, defines a change of state and triggers telicity, which is clearly the wrong value for a gerund. In this system there is no, per se, Path preposition as denoting an extended sequence of points (but see Koopman [1997]; den Dikken [2003]; Ramchand [2008] and Svenonius [2010] for a different view of this kind of element).

While all transparent gerunds introduced as Rhemes are projections of this PathP in our proposal, not all gerunds are the same, and we in fact would like to propose that most of the empirical differences between Spanish and English

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**11** Note that under the gerund head there are the Aktionsart projections of the 'gerund' verb, allowing for a gerund-inside-gerund recursion, as one anonymous reviewer points out (*I saw John [arriving [eating a sandwich]]*). As will become clear later, it is unclear whether the main verb's ResP is projected in this structure in Spanish. If projected (as seems to be the case in English), the main verb's ResP would be a second complement of RhemeP, or in set-format (Gärtner 2002), merge of {Path {Path, Proc}} (the gerund) with {Res {Res, X}} (belonging to the main verb), following projection of Path as a label of the whole, as in {Path {{Path {Path, Proc}} {Res {Res, X}}}}, following combination with the main verb's Proc as in {Proc {Proc, {Path {{Path {Path, Proc}} {Res {Res, X}}}}}}. If the ResP is a second argument, we expect it to c-command, and then linearly precede, the gerund, which is the first argument: this is confirmed. When English spells out the result location, it is between the main verb and the gerund: *What did John arrive home whistling?*

derive from differences in the internal structure of gerunds in each language. This is the topic of the next section.

## 4.4 Gerunds in Spanish and English

It is well known that English gerunds can be used as nominal arguments; in contrast, Spanish gerunds cannot (Borgonovo 1994). Borgonovo (1996) has argued that gerunds with perception verbs are never arguments. Consider the two pairs of sentences in (45) and (46).

(45)  a. *Juan vio      a   María correr*.
          Juan saw-3SG ACC María run
          'Juan saw Maria run.'
      b. *Juan vio      a   María corriendo*.
          Juan saw-3SG ACC María running
          'Juan saw María running.'

(46)  a. *Juan vio      llover*.
          Juan saw-3SG rain
      b. \**Juan vio      lloviendo*.
          Juan  saw-3SG raining
          Intended: 'I saw it raining.'

Borgonovo's explanation is the following: the infinitive in (45a) and (46a) heads a constituent that is taken as an argument by the perception verb. In contrast, the gerund in (45b) is an adjunct; in (45b), the argument of the perception verb is the DP *María*. The reason for the ungrammaticality of (46b) is that the perception verb does not have an internal argument: the gerund is an adjunct, and its subject, being non-referential and expletive, cannot be used by *ver* 'see' as its internal argument (see also Di Tullio 1998).

This difference is also confirmed by a contrast like (47):

(47)  a. *John fears being alone*.
      b. \**Juan teme     estando solo*.
          Juan  fear-3SG being    alone
          'Juan fears being alone.'
          (cf. *Juan teme estar solo*, Juan fears to be alone)

As one anonymous reviewer points to us, this suggests that English gerunds are themselves nominal constituents (although the label is orthogonal to our purposes, NPs), whereas Spanish gerunds are always PPs, as Fábregas (2008) and Gallego (2010b) have argued, and specifically, in our approach, PathPs. The proposal that follows was suggested by the anonymous reviewer, to whom we are indebted.

What this means for our purposes is that, when projected as Rheme, the English gerund is the NP complement of a phonologically empty Path preposition (48a), while in Spanish the gerund morphology itself spells out that PathP (48b):

(48)  a. [PathP Path<ø> [NP -ing [ProcP *whistl*-]]]
      b. [PathP Path <ndo>          [ProcP *silba*-]]

In other words, this means that a Spanish gerund will contain PathP in any context, while the English gerund is expected to have a more flexible syntax: as NP it will be able to combine as an argument with a verb, and also to combine with different sets of (empty) prepositions. We will see how this difference explains the empirical contrasts between English and Spanish with respect to transparent gerunds in Section 6.3, but for the time being let us show one additional piece of evidence that PathP is *hardwired* in the Spanish gerund, but not in the English one. Consider (49).

(49)  a. *La farmacia   está    girando a la    derecha.*
          the pharmacy  be-3sg  turning  to the  right
          'The location of the pharmacy is reached after turning to the right'
      b. *The pharmacy is turning to the right.*

The interpretation of (49a) is the expected one if a Spanish gerund is always a projection of PathP. It is interpreted as a Creswellian-location (Creswell 1978): it introduces a place which is reached after traveling through a path, which is the standard interpretation of Path prepositions embedded under locative verbs, as in (50).

(50)  *Mi casa   está   hacia    el   parque.*
      my house  be-3sg  towards  the  park
      'The location of my house is reached after moving towards the park.'

In contrast, if the English gerund does not encode a PathP, the ungrammaticality of (49b) is expected. In Section 6.3 we will see how these differences account for the distinct properties of Spanish and English transparent gerunds.

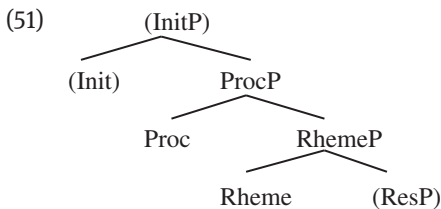# 5 Putting everything together in Spanish gerunds

In this section, we argue that gerund structures are combined with the verb as RhemePs (more precisely, in Spanish as PathPs). This has two immediate consequences which, as we will see, are consistent with the data.

–   If the main verb already fills RhemeP – in the form of a Path – because of their internal mereology, the gerund will not be able to integrate as one single syntactic predicate with the finite verb (therefore, no extraction from the gerund structure will be possible).

–   On the other hand, if the main verb does not spell out a RhemeP as it is the case with achievements, the gerund can be introduced as RhemeP in the structure and form a single sequence with the main verb; as far as syntax is concerned, there is only one verbal predicate and extraction is possible, as an argument of the gerund counts as an argument of the single verbal structure
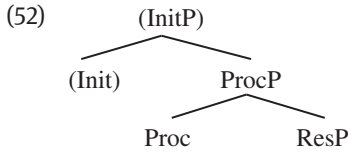
Section 5.1 discusses this; in Section 5.2 we say a few words about stative verbs, where the gerund structure is impossible with or without extraction.

## 5.1 Extraction is only possible when the main verb does not spell out RhemeP
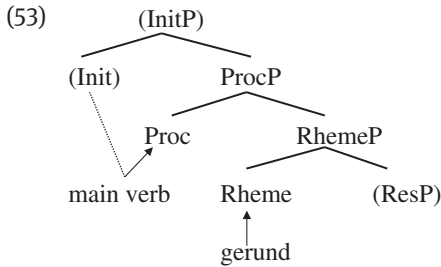
Recall that extraction from the gerund construction is not possible in Spanish when the main predicate is an accomplishment or an activity. What these two classes have in common, in terms of the syntactic decomposition of the verbal constituent, is that they fill RhemeP with a path, which gives their events internal development and therefore identifies their temporal extension. InitP is present only if the event is causative, and ResP only if it culminates in a result state. In such cases, the RhemeP position the gerund would occupy is already filled.

(51)
```
          (InitP)
         /      \
     (Init)    ProcP
             /      \
          Proc    RhemeP
                 /      \
             Rheme    (ResP)
```
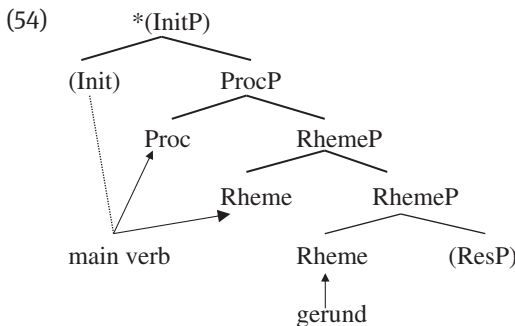
Conversely, extraction is possible if the event is an achievement, which, as we have seen, lack internal duration. In such cases RhemeP is filled in Spanish by the gerund construction.

(52)
```
            (InitP)
           /      \
      (Init)      ProcP
                 /     \
              Proc     ResP
```

Gerund constructions are projected as RhemeP. Given this, a gerund can combine with an achievement, as in (53), in one single verbal structure, because the main verb does not project Rheme.

(53)
```
             (InitP)
            /       \
       (Init)       ProcP
           ⁚       /      \
           ↗    Proc     RhemeP
                        /      \
   main verb      Rheme      (ResP)
                     ↑
                  gerund
```

In the case of accomplishments and activities, the integration is not possible, because two RhemeP would have to be projected. Either we get a tree like the one in (54), which is illicit because the same label is duplicated and the event would only unify with the closest Rheme, or two distinct verbal constituents have to be defined. In either case, the gerund cannot integrate with the finite verb in one structure, and extraction of an argument of the secondary predicate is expected to be ungrammatical.

(54)
```
             *(InitP)
            /        \
       (Init)        ProcP
           ⁚        /      \
           ↗     Proc     RhemeP
                         /      \
                     Rheme     RhemeP
                        ↗      /      \
   main verb ─────────    Rheme      (ResP)
                            ↑
                         gerund
```

Beyond the general ban on having a head selecting itself, one distinct problem in this configuration would be that the rheme's nature as a co-describer of the event could not be performed by the lower projection of RhemeP, given that it is not the complement of the head Proc.

This accommodates, in our syntactic analysis, Truswell's (2007) generalizations about why Aktionsart delimits the acceptable and unacceptable extractions: as his analysis made clear, the two verbs must be part of the same event structure inside the same syntactic expansion of the verbal phrase. Here we capture the restriction structurally. There is, therefore, no need to postulate an operation of semantic reanalysis that acts independently of syntax. The two predicates, as far as syntax is concerned, are only one verb, because the maximal expansion of the verbal domain is filled by both forms at the same time. We can, thus, propose the informal principle in (55), which explains what reanalysis tried to explain in previous accounts:

(55)  For two verbs to integrate in one single syntactic space, the combination of the projections of both constituents must not exceed the maximal structural space of a single verbal event structure.

## 5.2 Stative verbs do not license gerunds

Remember that pure stative verbs do not license gerund clauses, making it (vacuously) impossible to extract arguments from them. Of course, the fact that pure stative verbs reject depictive predicates – as well as other modifiers and adjuncts – has been repeatedly noted in the literature (e. g., Demonte and Masullo [1999: 2475–2477]), but our analysis can suggest an explanation to this restriction.[12]
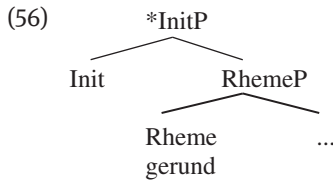
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**12** An anonymous reviewer notes a contrast that we were not aware of previously: in some stative-looking cases, it is possible to have a transparent gerund (it is not accepted by all speakers, but some do).

(i)   ¿*Qué es*    *feliz*    *cantando qué  María?*
      what be-3SG  happy  singing          María
      'What is happy María singing?'

Interestingly, this predicate has unexpected properties for a state. *Ser* in Spanish is the copula for Individual Level predicates, which normally reject temporal quantification (Kratzer 1995), as illustrated in (iia). However, the use of the copula in (i) allows it, as in (iib).

(ii)  a.  \**Cada vez  que viene,*    *Juan es*    *alto.*
          each    time   that come-3SG,  Juan be-3SG  tall
          'Every time he comes, Juan is tall.'

Pure stative verbs, like *hate, know* or *exist*, lack an event argument; this means that they lack ProcP. If the gerund construction – perhaps, more in general, all depictive secondary predicates – is introduced as RhemeP, and the role of Rheme is to co-describe the situation expressed by the main verb, then we expect gerunds not to be available as Rhemes of stative verbs. In other words, (56) is expected to be ungrammatical.

(56)

```
            *InitP
          /        \
      Init        RhemeP
                 /       \
             Rheme        ...
             gerund
```

Why would this be so? We have seen that gerunds (Section 4.3) denote extended time periods. Being in a rheme position, this would force the main predicate to be co-described by the gerund, identifying one-to-one the internal parts of the event's development with at least a subset of the gerund's internal properties. However, the stative verb does not contain an event, and therefore there is no dynamic part that can be mapped into the gerund's extended time period. The homomorphism that needs to take place between the state and its rheme would not be attained. This could explain, in general, why stative verbs reject co-descriptors, gerunds or other kinds of secondary predicates, as in (57): if these elements are projected as rhemes, and given their internal properties they have an extended temporal structure, they are incompatible with states because they do not share a mereological structure that can be unified.

---

  b. *Cada vez que canta,   María es   feliz.*
     each  time that sing-3SG, María be-3SG  happy
     'Every time she sings, María is happy.'

Moreover, what is interpreted in (iib) is that María gets happy whenever she starts singing, not that she starts singing when she is already happy, in sharp contrast with (iii), meaning that she starts singing when she is already sick.

(iii)   *Cada vez que canta,   María está   enferma.*
        each time that sing-3SG, María be-3SG  sick
        'Every time she sings, María is sick.'

These facts suggest to us that perhaps the predicate, despite appearances, should be characterised as a predicate denoting the initial boundary of a state, which would approach them to achievements, defined as boundaries as well. Although we lack a formal analysis of this class, it seems to us that they are not states.
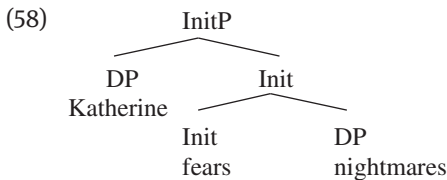
However, we will not elaborate on this any further and leave it for future investigation.

(57) *\*Juan sabe inglés contento.*
Juan know-3sg English happy
Intended: 'John knows English while he is happy.'

In order to better understand the nature of the restriction, consider what kinds of rhemes a stative verb can combine with. Ramchand (2008: 55–56) observes that in a structure like (58), the rheme is a complement to Init, a stative projection, not Proc, an event projection. In a situation like this, any element that co-describes the eventuality (a state) will have to denote a location of sorts, and its internal mereological structure, if any, would need to be ignored, because there is no internal development or punctual change that can be identified with that extended structure.

(58)

```
                InitP
         _____/_____
        DP            Init
     Katherine     ___/\___
                  Init      DP
                  fears   nightmares
```

The crucial problem with a gerund – perhaps also with an adjectival predicate – in this context is that their internal extended structure cannot be ignored: they denote precisely situations that hold of entities for non-trivial time intervals. And, in any case, there is no event to identify that extended temporal structure with, so the result is that they just cannot be introduced as rhemes of states.

# 6 Deriving the other properties of the Spanish transparent gerund

In this section we will explore the other properties of the structures that allow extraction and show how they follow from our analysis. Our claim is that extraction is possible with achievements because in such cases it is possible to integrate the gerund structure as part of a single syntactic verbal structure; this can only happen when the finite verb does not include a RhemeP among the heads it spells out, because

transparent gerunds project as Paths in the Rheme position. If the finite verb already fills a RhemeP, the gerund – itself a RhemeP – cannot be integrated in the same syntactic structure, so the only option is to merge it as an adjunct. As expected, extraction is then impossible. In this section we will address the following consequences of the proposed structure:

– Extraction is only possible when the gerund is predicated of an internal argument of the finite verb simply because of the position that PathP occupies with respect to Proc and Init: in order to introduce an external argument, the gerund would have to violate shortest move. The linear order also follows from this configuration (Section 6.1).

– Given spanning as a procedure to spell out series of heads, we expect that, because RhemeP intervenes between Proc and Res, once the gerund is present result locations should not be licensed in the structure (Section 6.2).

– The different availability of the gerund construction in extraction contexts in English and Spanish is explained if Spanish gerunds must project as PathPs (Section 6.3).

## 6.1 Extraction is only possible if the gerund modifies the internal argument
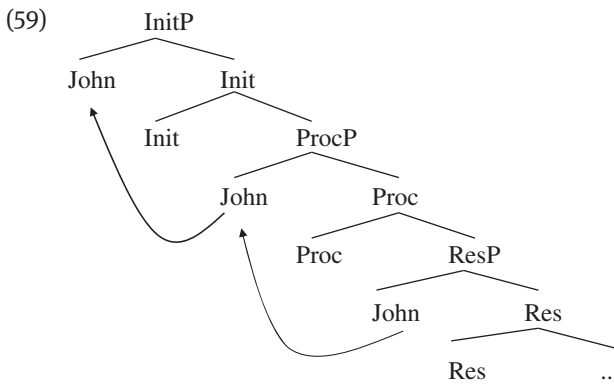
A property noted in Demonte's (1987/1988) analysis of adjectival secondary predicates that allow extraction and noted but not analyzed in Truswell (2007) is that the extraction is possible in Spanish if the secondary predicate modifies the internal argument of the main verb.[13]

---

**13** Demonte (1987/1988) and Demonte (1991) focus on extraction from depictive adjectival secondary predicates. She provides evidence that the extraction from secondary predicates should be treated syntactically. For instance, she shows that the extraction is sensitive to *wh*-islands (1987: 22).

(i)  a.  *¿Con  quién  no  sabes     [si      Lola  llegó      [enfadada con quién]]?
         with    whom   not  know-2sg  whether  Lola  arrived-3sg  mad
         'Who don't you know whether Lola arrived mad at?'

     b.  *¿Con  quién  no  Sabes     [si      María  encontró
         with    whom   not  know-2sg  whether  María  found-3sg
         [enfadado con quién]  a    Pepe]?
                       angry  to   Pepe
         'Who don't you know whether María found Pepe angry with?'

Demonte's syntactic approach is to analyse the depictives that allow for extraction as weak-adjuncts, that is, constituents placed inside the VP and being weakly c-commanded by VP (specifically, by one segment of VP). The two differences with respect to adjunct adverbials are that (a) these weak-adjuncts assign a theta-role to the NP they are predicated of, and (b)

We show now that this restriction naturally follows from the structure proposed. Consider, first, what it means to be an internal argument. In a system like Ramchand's (2008), one and the same argument can occupy more than one theta-position through movement (see also Boeckx et al. 2010 for evidence in favor of movement from one theta-assigning position to another). In her analysis, the only argument of a verb like *arrive* occupies the three specifier positions in (59). The argument is generated in the lowest available position of the structure and moves up to fill the other positions, where it gets new entailments about its involvement in the event: an entity that triggers some displacement, is displaced itself and ends up in a result location.
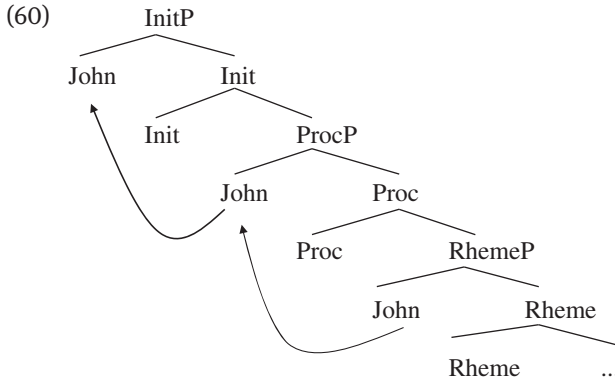
(59)



In this system, being an internal argument roughly means this: being in spec, ProcP (independently of whether the same element eventually moves to spec, InitP – as in *arrive* – or a different element is introduced in that position); being an external argument, in contrast, is being base-generated in InitP, without previous merge in spec,ProcP.
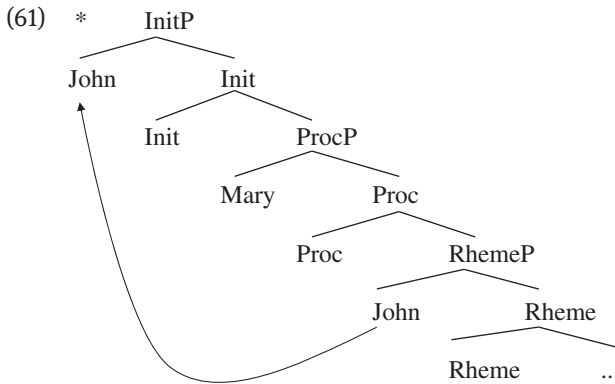
Given this, the reason why gerund structures must take the internal argument as subject follows from an intervention effect. As RhemeP is lower than

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they have to meet this weak c-command requirement within VP. This explains why depictives allowing extraction are only object-oriented predicates. On the other hand, the fact that subject-oriented predicates do not allow extraction is accounted for by proposing that they are generated outside VP. Only if the assumption is that by hypothesis depictives taking as subject the external argument have to be introduced outside the VP is the analysis tenable. However, as far as we can see, there is no way to keep this assumption in the present framework, where argument structure is derived from configurational properties. We leave the discussion of depictive adjectives at this point, pending further research.

ProcP, the specifier of RhemeP can become the specifier of ProcP by movement. From there it can further move to spec,InitP or not, as in (60).

(60)

```
              InitP
           ／        ＼
        John          Init
         ↑         ／      ＼
        │      Init          ProcP
        │              ／          ＼
        │          John             Proc
        │           ↑           ／       ＼
        │           │        Proc          RhemeP
        │           │                  ／        ＼
        │           │              John           Rheme
        │           │                            ／     ＼
        │           └─────────────────────  Rheme        …
        └──────────────────────────────┘
```

What is impossible, however, is that spec,RhemeP moves directly to spec,InitP without landing first in spec,ProcP. If ProcP and RhemeP have different specifiers, then the one in spec,ProcP will land in InitP, since that movement is more local. Otherwise, intervention yields the ungrammatical structure in (61):

(61)   *   InitP

```
      *      InitP
           ／      ＼
        John        Init
         ↑       ／     ＼
         │    Init        ProcP
         │            ／        ＼
         │        Mary           Proc
         │                   ／       ＼
         │               Proc          RhemeP
         │                          ／        ＼
         │                      John           Rheme
         │                                    ／     ＼
         └──────────────────────────  Rheme        …
```

Consequently, we derive the restriction that gerunds only allow extraction if they are predicated of internal arguments.[14] If the extraction happens, the gerund

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14 One prediction of this analysis, which we have not explored, is that if the spec, ProcP position is unavailable for some reason there would be no intervention between InitP and RhemeP, and the gerund could be predicated of the external argument. An anonymous reviewer points out to us that if the main verb's internal argument is heavy a transparent gerund predicated of the external argument of the main verb becomes more acceptable:

construction must be integrated in the same syntactic structure as the main verb. As the gerund construction projects Rheme, ProcP will always be closer to Init than the gerund. Thus, if the specifiers of Rheme and Proc are different, the one belonging to Proc will always move to spec,InitP.

For the same configurational reason, the adjacency between the main verb and the gerund that is necessary when the gerund allows for subextraction in Spanish also follows trivially: they are the two members inside the same structure, so, by virtue of the restricted syntactic space they share, they are expected to be adjacent to each other. We just need to assume that no movement operations take place in such a way that RhemeP moves above InitP, for instance – and as far as we know, nobody has made such proposal.
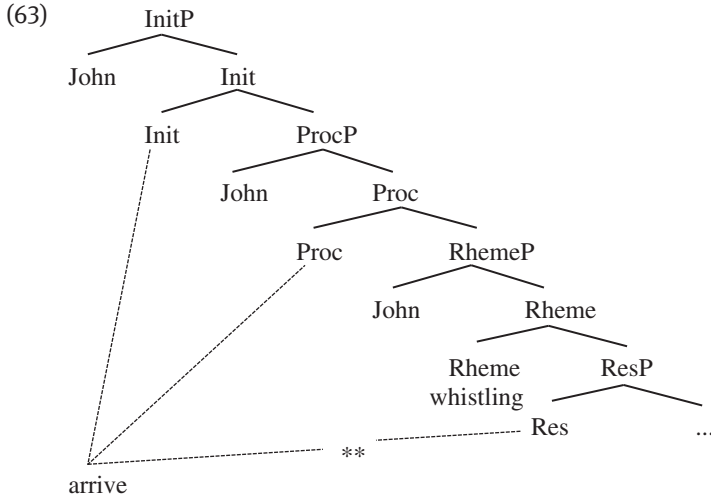
## 6.2 Absence of overt result phrases

As the reader will have certainly noticed by now, there is no linear adjacency between the three heads required by a predicate like *arrive*. RhemeP, lexicalized by the gerund, is projected between ProcP and ResP (cf. for instance 59). In a Ramchandian system, when a lexical item lexicalizes a series of heads, the procedure used in order to lexicalize several heads with a single exponent is *spanning*, which is defined as in (62).

(62)  A morpheme may lexicalize a single head or a series of heads that take each other as complement

Obviously, this procedure cannot be applied in our case to lexicalize achievements, because Proc does not take ResP as complement if RhemeP is in between. If we try using a different procedure to capture the synthetic expression of a series of heads – such as standard head movement, morphological fusion (Halle and Marantz 1993) or phrasal spell out (Caha 2009) – the same problem arises. The situation is illustrated in (63).

---

(i)
　　?¿*Con quién encontraste hablando* ~~con quién~~ *hasta el más mínimo error?*
　　with whom　found-2SG　talking　　　　　even the more slight mistake?
　　'Talking with whom did you find even the slightliest mistake?'

The reviewer suggests to us that if the internal argument undergoes heavy NP shift, spec, ProcP would be unavailable and the gerund's subject could become the external argument of the main verb.
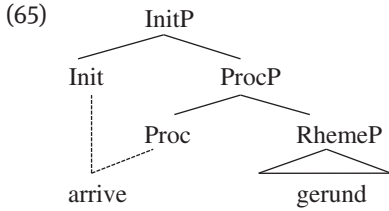
(63)

```
               InitP
          ┌──────┴──────┐
       John           Init
                  ┌─────┴─────┐
                 Init        ProcP
                        ┌──────┴──────┐
                      John          Proc
                               ┌──────┴──────┐
                             Proc          RhemeP
                                       ┌──────┴──────┐
                                     John          Rheme
                                              ┌──────┴──────┐
                                            Rheme          ResP
                                           whistling   ┌─────┴─────┐
                                                      Res         ...
                               **
        arrive
```

In other words: the exponent *arrive*, which is generally associated also with a ResP, will not be able to lexically spell out that head in the syntactic configuration where a gerund is in the rheme position.

This situation, in fact, is consistent with our data. If *arrive*, in the configuration, cannot identify the ResP layer, then we have an explanation for why, in structures where the gerund is integrated with the main verb, to overtly express as a syntactic constituent the result location is ungrammatical (cf. the contrast between (64a) and (64b)).

(64)  a. *¿Qué  llegaste     [silbando ~~qué~~]?*
　　　　 What  arrived-2sɢ  whistling
　　　　 'What did you arrive whistling?'
　　 b. **¿Qué  llegaste     [silbando ~~qué~~] a  casa?*
　　　　 What  arrived-2sɢ  whistling       to  home
　　　　 'What did you arrive home whistling?'

Although the analysis of this particular fact is still unclear to us, we would like to suggest an explanation that connects it precisely with the spell-out procedure. The idea is that, in fact, ResP is not projected in the structure in cases where Rheme is projected as a gerund with an achievement verb. The impossibility of overtly expressing a result is explained because the projection that licenses it, ResP, is not projected in the structure.

(65)

```
              InitP
             /    \
          Init    ProcP
           |     /    \
           |   Proc   RhemeP
           |    |    /    \
        arrive      gerund
```

One argument in favor of this account is that English does allow overt result locations in our contexts (*What did John arrive home whistling?*). Note, crucially, that English is also able to license strong result adjectival phrases, something that is impossible in Spanish.

(66) a. *John hammered the metal flat*.
　　 b. *\*Juan amartilló　　 el　 metal plano*.
　　　　 Juan　 hammered-2sg　the　metal flat
　　　　 'Juan hammered the metal flat.'

Ramchand (2008) argues that this contrast is due to English having a phonologically-zero Res head, while in Spanish Res has to be spelled out as part of the verb exponent. Thus, in both languages the gerund would interrupt the relation between Proc and Res, making it impossible for the main verb to spell out Res; but in English, Res would be projected as an independently available zero head, and an overt result phrase can be introduced. In Spanish, since such head is not available, overt result phrases would be unavailable because the gerund prevents the main verb from spelling the relevant head out.

　　An independent question, raised by two anonymous reviewers, is why if ResP is not projected in Spanish we still associate with the main verb the entailments that the process must have culminated and has a result component, whereby the subject ends in the intended result location. Here we can only speculate. One option is to treat this entailment as an effect of the main verb's lexical entry, that is, as part of the lexical information that the verb exponent brings with it when it is introduced in the structure. This could in principle resolve the tension between the presence of a semantic entailment and the impossibility of projecting in the syntax the constituent that would express overtly that entailment. However, it would bring up questions about the relation between the truth conditions of a lexical item and its syntactic licensing conditions: it would seem that an item can be introduced in a configuration where not all its semantic ingredients have been structurally expressed. We are not ready to present a theory of the mapping between syntax and semantics where this would be a natural result; we would be forced to admit a

relatively arbitrary mismatch between the information of a lexical entry and the syntactic structure where it is introduced.

Another alternative would be to propose a slightly different structure for our gerund constructions, where the Res head is introduced as an adjunct to the Proc head, and RhemeP is the only complement of the Proc head ([InitP Init [ProcP [Proc + Res] [RhemeP]]]); sharing one single projection, Res would be unable to project its own complement, but the result component would be expressed in the structure.

For the time being, though, we consider that this aspect of the analysis is not settled and we hope that further research on the licensing conditions of result secondary predicates in Spanish will be able to throw light on this problem.

## 6.3 The differences between English and Spanish

It is now time to compare Spanish with English. There are noticeable differences between English and Spanish when it comes to these structures:

–   With gerunds subordinate to perception verbs, English accepts, but Spanish rejects, the extraction:

(67)  a.  *Who did you hear him speaking to?*
      b.  *¿Con quién le     oíste     hablando?*
          With  whom  him  heard-2sg  speaking?
          'Who did you hear him speaking to?'

–   In causative constructions where there is no adjacency between the gerund and the main verb and the subject of the transparent gerund is the main verb's external argument, English accepts, but Spanish rejects, the extraction (cf. 68, previously 18)

(68)  a.  *What did John enrage his neighbours [whistling ~~what~~]?*
      b.  *¿Qué enfadó      silbando Juan a   sus vecinos?*
          What  angered-3sg  whistling Juan acc his  neighbors?
          'What did John enrage his neighbors whistling?'

Following a suggestion by one anonymous reviewer, we have proposed that English gerunds are NPs that, when projecting as Rhemes, combine with an empty Path preposition; in contrast, Spanish gerunds are always headed by a

Path prepositions. This has two automatic consequences: the first is that English gerunds, as NPs, will be able to be selected as arguments by verbs, as in (67), where the extraction is expected. Spanish gerunds, not being nominal, will not be able to combine with the verb as arguments, so the equivalent of (67) is correctly expected to be ungrammatical.

Second, as the anonymous reviewer points out, this difference can be behind the rejection in Spanish of transparent gerunds denoting the causing subevent, as in (68). Assume that in the same way that the gerund has to be headed by a Path preposition to project as Rheme, in order to project as the causing subevent and integrate with the main verb, it has to be headed by a Source preposition – treating causation as the initial boundary of the event, or in other words the starting point where it is initiated. As the English gerund is NP, it can combine with an (empty) Source preposition and project as the causing subevent. Due to locality, its closest argument will be the verb's external argument, and being at a higher position, the material in the specifier of the main verb will be able to break the adjacency between the transparent gerund and the main verb.

In contrast, in Spanish, the gerund is a PathP; given that it is already headed by a preposition, we expect correctly that another preposition will not be able to select it, as prepositions take nominal complements. Hence, the Spanish gerund will not be able to project as a Source preposition inside the spine of the tree, and it will not be transparent.

But as another anonymous reviewer points out to us, treating English gerunds as nominal arguments does not straightforwardly account for all contrasts. Consider (69), from Truswell (2007: 1360), where the main verb is what Maienborn (2003) describes as a Davidsonian state (a verb with some stative properties that, however, accepts place and manner modification): the gerund combined with such verbs is not transparent in Spanish, but it is in English:

(69)   *What was John lying in bed reading?*

The problem is that the internal structure of D-states is unclear; if it is more complex than the one of pure stative verbs, then we could argue that the gerund is not projecting as Rheme here, but introduced as an argument of one of the heads forming the internal structure of D-states. This would explain why Spanish rejects the equivalent sentence. However, lacking a proposal for the structure of D-states, we leave the matter open for further research.

# 7 Conclusions

To summarize, in this paper we have argued that gerunds can be integrated inside the syntactic domain of events in the form of Rheme Phrases, sharing the syntactic domain where events are defined with the main verb. This integration makes any kind of reanalysis unnecessary as an operation.

The proposal that we have put forth is that transparent gerunds are projections of a subevent of the predicate, and belong to the same syntactic domain as the main verb:

- We have shown that a treatment where gerund constructions project RhemeP (specifically in Spanish, PathP) and the finite verb projects InitP and ProcP can account, without further assumptions, the extraction possibilities without giving up the idea that adjuncts are islands.
- This approach can also explain, with no additional assumptions, the requisite that in Spanish the gerund only allows extraction when it is predicated of an internal argument, and why adjacency between verb and gerund is preferred in such constructions.
- Semantic integration also follows, and is a necessary part of the construction, but against Truswell, we derive it from the syntactic configuration.

This integration of two lexical verbs inside the same syntactic structure follows strict restrictions imposed by well-known syntactic conditions, but when it happens it is possible to extract the constituents introduced by the gerund, since for syntax they form part of the predicate. Given our analysis, Huang's (1982) CED – and equivalent principles that ban extraction from adjuncts – is preserved.

At the same time, our analysis predicts that further differences across languages with respect to the availability of transparent gerunds stems from the different way in which gerunds are built in each language. Specifically, we have argued that Spanish gerunds always involve a Path preposition, something that has the effect of severely restricting the syntactic context where they can be introduced. In contrast, English gerunds, we have argued, are projections of a nominal head, and can combine with different empty prepositions, producing as a result a higher degree of flexibility.

of *Linguistics* for the numerous suggestions they have made, which have considerably improved the paper. All disclaimers apply.

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