The Functional Structure of Infinitive Relatives in Romance Consequences for the Cartographic Approach

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Abstract   In this article, we will show that the modal properties of infinitive relative clauses are a direct consequence of their defective functional periphery, namely that they just project a FinP in the case of prepositional relatives, but up to ForceP in *wh*-relatives. While this truncation analysis helps us explain the special properties of infinitive relatives, it offers new insights into the standard analysis of in situ focus as covert movement to FocP and of right-dislocation as left-dislocation plus remnant movement of TP.

Keywords   Infinitive relatives. Left periphery. Truncation. Modal adverbs. Topic. Focus.

Summary   1 Introduction. – 2 Infinitive Relatives. – 3 The Size of Infinitive Clauses. – 4 Consequences for Cartographic Approaches. – 5 Conclusions.

1   Introduction

Relative clauses have been a major concern in syntax, semantics, acquisition, and processing studies, however, the focus has been placed, for obvious reasons, on finite prototypical cases. In this paper, we are moving to a less explored terrain, infinitive relatives, with three main goals in mind. First, we will provide a description of left periphery of infinitival relatives in Romance, which is structurally defective in different degrees. Second, we will argue that the truncated left periphery of infinitival relatives in Romance helps us explain certain interpretive properties, namely their particular modal readings. Finally, we will discuss the consequences that our analysis of infinitive relatives has for cartographic analyses involving remnant movement to a rich left periphery.

2   Infinitive Relatives

In this section we present a description of the basic properties of infinitive relatives. First, we show the two main constructions: *wh-* and prepositional relatives (§ 2.1). Then we contrast them with other constructions with a similar pattern, but which they are not to be confused with. Then, in subsection 2.3, we describe the defective left periphery of infinitive relatives, and in 2.4, we show their modal properties.

2.1   Main Properties

Infinitive relatives are a major feature of Romance languages (cf. Germanic languages, Bhatt 2008; Sabel 2014; 2015). On the one hand, we have infinitive *wh*-relatives, as in (1), where the clause is headed by a relative pronoun (Giurgea, Soare 2010; Napoli 1976; Táboas 1995; Villalba 2017; 2019):[1]

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1   We follow the Leipzig Glossing Rules. Besides, languages are abbreviated as follows: Ca.=Catalan, EP=European Portuguese, It.=Italian, Fr.=French, Ge.=German, Ro.=Romanian, Sa.=Sardinian, Sp.=Spanish.

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(1) a. Cerca   una   ragazza   con   cui   uscire.
       seek.3SG   a   girl   with   whom   go.out.INF
       'He is looking for a girl to have a date with.' It. (Cinque 1988, 455)

     b. No   tenim   ni   un   tronc   en   què   reposar.
       not   have.1PL   neither   a   log   on   what   rest.INF
       'We don't even have a log to rest on.' Ca. (Alsina 2002, § 20.2.4.2)

     c. Necesita   (a)   un   hombre   en   quien confiar.
       need.3SG   DOM   a   man   on   who   rely.INF
       '(S)he needs a man to rely on.' Sp. (Hernanz 1999, ex. 349)

     d. Kirco   una   pinta   kin   sa   cale   iscríere   una   líttera.
       seek.1SG   a   pen   with   the   which write.INF   a   letter
       'I am looking for a pen with which to write a letter.' Sa. (Jones 2005, 298)

On the other hand, we also have infinitive relatives headed by a preposition-like element (Bianchi 1991; Cinque 2020; Duarte et al. 2015; Morales Carmona 1994; Napoli 1976; Schmitt Jensen 1973; Villalba, Planas-Morales 2020), as in the following examples:

(2) a. Les   livres   **à**   **lire**   sont   sur   la
       the   books   to   read.INF   be.3PL   on   the
       'The books to read are on the table.' Fr. (Giurgea, Soare 2010, 192)

     b. Cărtile   **de**   **citit**   sînt   pe   măsa.
       books-the   by   read.INF   be.3PL   on   table
       'The books to read are on the table.' Ro. (Giurgea, Soare 2010, 192)

     c. Cerco   un   libro   **da**   **leggere.**
       seek.1SG   a   book   by   read.INF
       'I am looking for a book to read.' It. (Cinque 1988, ex. 28a)

     d. Appo   fattu   tottu   sas   cosas   **de**   **fákere.**
       have.3PL   made   all   the   things   by   make.INF
       'They have done all the things to do.' Sa. (Jones 2005, 298)

While the former class is identified straightforwardly, the latter can be easily confused with causal or final prepositional structures. Hence, some methodological caveats are necessary.

2.2   Methodological Caveats

When dealing with prepositional infinitival relatives, we must carefully distinguish them from causal or final adjunct PPs, which is not an easy matter sometimes. Consider the following case, provided by one anonymous reviewer:

(3)   Los   niños   buscan   libretas   para   pintar.   Sp.
        the   children   seek.3PL   notebooks   to   paint.INF
        'The children are looking for notebooks to paint.'

The infinitival sentence *para pintar* can be analysed either as a relative clause modifying *libretas* 'notebooks' ('notebooks that can be painted') or as an adverbial final clause ('with the intention of painting them'). When we separate the prepositional clause from the noun, the only surviving reading is that of a final adjunct:

(4)   Para   pintar   los   niños   buscan   libretas.   Sp.
        for   paint.INF the   children   seek.3PL   notebooks
        'For painting, the children are looking for notebooks.'

In contrast, when the prepositional clause follows a preverbal subject, we can only get the relative reading:

(5)   Las   libretas   para   pintar   son   caras.   Sp.
        the   notebooks   for   paint.INF   be.3PL expensive
        'The notebooks to paint are expensive.'

A second difference concerns the availability of a resumptive pronoun. While infinitive relatives do not allow a pronoun, since its function is already carried out by a null operator, adjunct infinitive clauses do not have such restriction:

(6) a. En   Castilla   hay   muchas   tierras   por   sembrar(*las).
        in   Castille   have.3SG.LOC   many   lands   by   sow.INF-them.F
        'In Castille there are many lands to be sown.' Sp.
    b. Se   queman   las   tierras   para   mantener*(las)   fértiles.
        REFL   burn.3PL   the   lands   for   maintain.INF-them.F   fertile
        'Lands are burnt to have them fertile.'

A third important test concerns the presence of a possessive pronoun. As a rule, the antecedent of a relative clause cannot be modified by a possessive:

(7)   Nos   enseñó   los/*sus   libros   que   se   había   comprado Sp.
        to.us   showed   the/her   books   that REFL   had   bought
        'She showed us the/his books that she had bought.'

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When we apply this test, we can find a clear contrast:

(8) a. *Avergonzada, escondió   sus   libros   por   leer   Sp.
         ashamed.F   hid.3SG   her   books   by   read.INF
         'Ashamed, she hid her books to read.'
     b. Avergonzada, escondió   sus   libros   por   no   discutir.
         ashamed.F   hid.3SG   her   books   by   not   argue.INF
         'Ashamed, she hid her books to avoid an argument.'

We see that prepositional relatives are incompatible with a posses-
sive modifier, as relatives in general, but adverbial PP are unaffect-
ed by the presence of a possessive.

A second source of confusion is predicative clauses, like the one
in (9), which Hernanz (1999, 2299) includes in the class of preposi-
tional infinitive relatives:

(9) Se   encontró la   casa   sin   fregar,   las camas por hacer
     REFL   found.3SG the   house   without scrub.INF the beds by make.INF
     y   el   vestido a   medio   planchar. Sp.
     and   the   dress   to   half   iron.INF
     'The house was found unwashed, the beds unmade, and the dress half ironed.'

Typical constituency tests like independent pronominalisation or
word order change show us that we are dealing with a subject-pred-
icate small clause, rather than with a noun plus relative construction:

(10) a. La   casa   se   la   encontró sin   fregar.   Sp.
         the.F   house   REFL   her   found.3SG without scrub.INF
         'The house, (s)he found unwashed.'
     b. Se   encontró sin   fregar   la   casa.   Sp.
         REFL   found.3SG without scrub.INF   the   house
         'She found the house unwashed.'

(11) a. *Las   tierras es   difícil   venderlas   por   sembrar. Sp.
         the   lands   be.3SG   difficult sell.INF-them by   sow
         'It is difficult to sell the lands to be sown.'
     b. *Es   difícil vender   por   sembrar   las tierras.   Sp.
         be.3SG difficult sell.INF by   sow.INF   the lands
         'It is difficult to sell the lands to be sown.'

Moreover, as expected, these constructions admit possessives, un-
like relatives:

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(12) a.	Se	encontró	su	casa	sin	fregar.	Sp.
	REFL	found.3SG	her	house	without	scrub.INF

'(S)he found his house unwashed.'

b.	*Es	difícil	vender	sus	tierras	por	sembrar.	Sp.
	be.3SG	difficult	sell.INF	her	lands	by	sow.INF

'It is difficult to sell her lands to be sown.'

Therefore, these constructions are not nominal modifiers, but secondary predicates, so they fall out of the scope of our research.

Yet, as pointed out by an anonymous reviewer, this does not mean that these prepositional sentences cannot be found in the typical context of prepositional infinitive relatives, as for example after a preverbal subject:

(13)	Las	camisas	sin	planchar	están	allí.	Sp.
	the	shirts	without	iron.INF	stay.3PL	there

'The shirts without ironing are there.'

However, it is unclear whether we are dealing with wholesale relative clauses. While the resumptive pronoun is not allowed, it is possible to use a possessive modifier, and the clause can be separated from the noun:

(14) a.	*Las	camisas	sin	plancharlas	están	allí.	Sp.
	the	shirts	without	iron.INF-them.F	stay.3PL	there

b.	Mis	camisas	sin	planchar	están	allí.	Sp.
	my	shirts	without	iron.INF		stay.3PL	there

'My shirts without ironing are there.'

c.	Las	camisas	están	allí	sin	planchar.	Sp.
	the	shirts	stay.3PL	there	without	iron.INF

'The shirts are there without ironing.'

Besides, these infinitival clauses, unlike relative infinitive clauses, lack a modal reading and have a perfective value: what we understand is not that the shirts must or can be ironed, but only that they have not been ironed. As we will see in section 2.4, prototypical infinitive relatives have an inherent modal reading and a prospective temporal interpretation.

Finally, we must bear in mind that the whole gamut of infinitive relatives in Romance is richer and more complex than the picture we are offering. To illustrate the point, consider *a* 'to' and *para* 'for' relatives in European Portuguese (Duarte, Santos, Alexandre 2015). Relatives headed by *a* behave like the examples we have just seen:

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they display enclisis, lack an overt subject and involve an uninflect-
ed infinitive.

(15) a. O   livro   a   lerlhes   está   na   prateleira. EP
         the book to read.INF.to-them stay.3SG on.the   shelf
         'The book to read to them is on the shelf.'
     b. Os   potros a alimentar(*em) amanhã   são   de raça lusitana.
         the colts to feed.INF (3PL) tomorrow be.3PL of race Portuguese
         'The colts to feed tomorrow are of Portuguese breed.'

In contrast, *para* relatives show proclisis, and allow overt preverbal
subjects and inflected infinitives, which suggests they involve a dif-
ferent, richer clausal structure.

(16) a. O   livro   para eu/ele lhes ler   está   na   prateleira. EP
         the book   for   I/he   to-them read.INF stay.3SG on.the shelf
         'The book which I/he will read to them is on the shelf.'
     b. Os   atletas para correr(em) na   maratona chegaram ontem.   EP
         the athletes for   run.INF (3PL) on.the marathon arrived.3PL yesterday
         'The athletes who will run the marathon arrived yesterday.'

What we are proposing will be valid for prototypical infinitive prep-
ositional and *wh*-relatives, but surely not for cases like those in (16).

2.3   Defective Left Periphery

As a rule, Romance infinitive clauses do not easily allow for clitic left-
dislocation (CLLD), as we can appreciate in the following Spanish ex-
amples from Hernanz (2011):[2]

(17) a. *Juan niega **a María** haberle   dado   el premio. Sp.
         John deny.3SG to Mary   have.INF-to.her given the prize
         'John denies having given the prize to Mary.'
     b. *Pepe no se   acordaba   de esta novela haberla   ya   leído. Sp.
         Pepe not REFL reminded.3SG of this novel have.INF-her already read.PTPC
         'Pepe did not remind having already read this novel.'

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[2] As for the cases of CLLD in infinitives discussed in Fernández-Sánchez (2016), we
will follow the suggestion by Hernanz (2011) that they should be considered parenthet-
icals, rather than true cases of CLLD.

The same behaviour is found with infinitive relatives, either prepositional or *wh*-:[3]

(18) a. *Las cosas por/para **a Juana** decirle son numerosas. Sp.
the things by/for to Joan say.INF.to-herbe.3PL numerous

b. *Els llibres per **a col·legi** portar-hi són aquí. Ca.
the books by to school bring.INF-LOC be.3PL here

c. *Cerco un uomo da **domani** presentare a Maria. It.
(Rizzi 1982, 103)
seek.1SG a man by tomorrow introduce.INF to Mary

d. ?*Cerco qualcosa **a voi** da regalare per Natale. It.
(Cinque 2020, 198)
seek.1SG something to you by give.INF for Xmas

(19) a. *Necessitem una causa per la qual **als carrers** lluitar-hi. Ca.
need.1PL a cause for the which at-the streets fight.INF-LOC

b. *Busca un amigo a quien **sus secretos** confiarlos. Sp.
seek.3SG a friend to whom his/her secrets trust.INF-them

c. *Sto cercando una persona con cui **questa proposta** discuterla. It.
(Bianchi 1991, 119)
be.1SG seeking a person with who this proposal discuss.INF-her

This restriction on CLLD is not found in finite relatives, as the following examples show:

(20) a. Tinc un amic amb el qual d'aquests temes
have.1SG a friend with the which of-these subjects
no en parlem mai.
not PART talk-1PL never
'I have a friend with whom we never talk about these matters.' Ca.
(Villalba 2000, ex. 26c)

b. Busca un socio que **estos asuntos** los solucione bien. Sp.
seek.3SG a partner that these matters them solve.3SG well
'(S)he is looking for a partner that solves these matters well.'

c. Un uomo a cui, il premio Nobel, lo daranno senz'altro.
a man to whom, the prize Nobel it give.FUT.3PL without.other
'A man to whom, the Nobel Prize, they will give it undoubtedly.' It.
(Rizzi 1997, ex. 12a)

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3 Against most of the literature, Cinque (2020, 198) suggests that CLLD is indeed possible with Italian *wh*-infinitive relatives, and offers the following example:

(i) Cerco un argomento di cui/del quale **a voi** poter parlare con calma.
'I am looking for some topic I can talk to you about calmly.'

When it comes to focalisation, neither prepositional nor *wh-* infinitive relatives allow fronted foci (even though, as we will see in § 4, *in situ* focus is possible):

(21) a. *Las tierras por **solo en verano** sembrar están en Soria. Sp.
the lands by only in summer sow.INF stay.3PL in Soria

b. *Els llibres per **només a col·legi** llegir són aquí. Ca.
the books by only at school read.INF be.3PL here

(22) a. *Las tierras en las que **solo en verano** sembrar están en Soria. Sp.
the lands in the that only in summer sow.INF stay.3PL in Soria

b. *Els llibres amb què **només a col·legi** treballar són aquí. Ca.
the books with what only at school work.INF be.3PL here

The same paradigm reproduces with negative fronting:

(23) a. *Las tierras por **nunca jamás** sembrar están en Soria. Sp.
the lands by never ever sow.INF stay.3PL in Soria

b. *Els llibres per **mai de la vida** llegir són aquí. Ca.
the books by never of the life read.INF be.3PL here

(24) a. *Las tierras en las **que nunca jamás** sembrar están en Soria. Sp.
the lands in the that never never sow.INF stay.3PL in Soria

b. *Els llibres amb què mai **de la vida** treballar són aquí. Ca.
the books with what never of the life work.INF be.3PL here

Again, the restriction is not found in finite relatives:

(25) a. Las tierras en las que solo en **verano se puede** sembrar
the lands in the that only in summer REFL can.2SG sow.INF
están en Soria. Sp.
stay.3PL in Soria

b. Els llibres amb què **mai de la vida** has de treballar
the books with what never of the life have.2SG to work.INF
són aquí. Ca.
be.3PL here

The emerging pattern is very clear: none of the constructions standardly associated with the higher left periphery of the sentence (TopicP and FocusP in standard cartographic approaches, and PolarityP or SigmaP in other proposals) are allowed in infinitive relatives. In section 3, we will suggest this occurs because of their impoverished functional clausal structure.

2.4 Restricted Modal Readings

Infinitive relatives are commonly described as inherently modal constructions (Kjellmer 1975; Napoli 1976; Bianchi 1991; Hernanz 1999; Giurgea, Soare 2010). See the following examples from French by Berthelot (2017):

(26) a. Je   lui   ai   présenté   une personne à   qui   confier
       I   to.her have.1SG   presented   a   person   to whom   leave.INF
       ses   enfants. Fr.
       her   children
       'I have introduced her a person to baby-sit.'

     b. Elle   lui   a   donné la   liste des   choses à   faire
       she   to.her have.3SG   given the   list   of   things to   do.INF
       avant   de   partir.   Fr.
       before of   leave.INF
       'She gave her the to-do list before leaving.'

As the author remarks, infinitival relative clauses involve a modal interpretation lacking in their tensed variants: a deontic modality of possibility in (26a) and one of necessity in (26b).

Sticking to prepositional infinitive relatives, Bianchi (1991, 121; 2007, fn. 7) argues that the modal reading must be deontic, as in the following case:

(27)   Un   cane da   addestrare ha   morsicato l'istruttore.
         a   dog   by   train.INF   have.3SG   bitten   the-instructor
         'A dog to be trained bit the instructor.'

This description is pervasive in the literature (Morales Carmona 1994; Hernanz 1999; Bhatt 2008; Giurgea, Soare 2010; Cinque 2020). Indeed, Cinque (2020, 200) offers examples with *potere* 'can', and *dovere* 'must' auxiliaries:

(28) a. Ho   trovato   un   libro da   **poter**   leggere in   vacanza.
       have.1SG   find.PCTP a   book   by   can.INF   read.INF on   holiday
       'I have found a book I can read during my holidays.'

     b. C'è   solo   una cosa   da   **dover**   fare   per   domani.
       LOC-be.3SG only   one thing by   need.INF   do.INF   for   tomorrow
       'There's only one thing we must do by tomorrow.'

Interestingly, they point out that "only those restructuring predicates which are lower than *potere/dovere* are possible. All higher ones (ac-

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cording to Cinque's 2006 hierarchy) are impossible". Among the higher ones are epistemic modals, namely those involving alethic necessity and possibility (Palmer 1986 subsumes them under *propositional* modality). This traces a clear distinction in the expression of modality in prepositional infinitive relatives: root modals are possible, but epistemic ones are excluded. Moreover, this contrast may follow from the structural deficiency of the construction.

Yet, the evidence provided by modal auxiliaries is quite scarce. A search in the Spanish CORPES XXI corpus (Real Academia Española, s.d.) only returns examples with *poder* 'can', as in the following example:

(29) | **El** | **dinero** | **para** | **poder** | **hacer** | **esto** | no | salió |
      | the | money | for | can.INF | do.INF | this | not | came.out.3SG |
      | de | la | billetera | de | Kiyosaki. | | | |
      | of | the | wallet | of | Kiyosaki | | | |

'The money to be able to do this didn't come from Kiyosaki's wallet.'

The corpus offers no examples with epistemic modals, as expected, but occurrences with root modals of deontic necessity are not found either, and Catalan and Spanish speakers systematically reject them, for unclear reasons.[4] Therefore, since the availability of modal auxiliaries is severely limited in infinitive relatives, we can find more reliable evidence in modal adverbs.

As a rule, root modal adverbs are always possible:

(30) a. | Os | potros | a | alimentar | **necesariamente** | amanhã |
         | the | colts | to | feed.INF | necessarily | tomorrow |
         | são | de | raça | lusitana. | | |
         | be.3PL | of | breed | Portuguese | | |

'The colts to necessarily feed tomorrow are of Portuguese breed.' EP

(Duarte, Santos, Alexandre 2015)

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4 An anonymous reviewer suggests that the impossibility of epistemic auxiliary modals in cases like (i) follows from the syntactic impossibility of combining *ser posible* 'be possible' with an infinitive, unlike what happens with *poder* 'can'.

(i) | *No | quedan | sitios | para/por | ser | posible | ir. |
     | not | remain.3PL | places | for/by | be.INF | possible | go.INF |

Yet, if this were the explanation of the ill-formedness of (i), we would expect the following sentence to be grammatical:

(i) | *No | quedan | sitios | para/por | ser | posible | que | yo | vaya. |
     | not | remain.3PL | places | for/by | be.INF | possible | that | I | go.SBJV.1SG |

Here we don't find the presumed infinitive incompatibility, but the result is equally bad.

b. Els   libres   per   llegir   **obligatòriament** demà   són   aquí.
the   books   to   read.ɪɴꜰ   obligatorily   tomorrow be.3ᴘʟ here
'The books to obligatorily read tomorrow are here.' Ca.

In contrast, epistemic adverbs are totally excluded in prepositional infinitive relatives either in postverbal or preverbal position in Catalan (28) and Spanish (29):

(31) a.   *Els libres   per   llegir   **possiblement**   són   aquí.   Ca.
the   books   to   read.ɪɴꜰ possibly   be.3ᴘʟ here
b.   *Els libres   per   **possiblement**   llegir   són   aquí.   Ca.
the   books   by   possibly/maybe   read.ɪɴꜰ be.3ᴘʟ here

(32) a.   *Los   resúmenes   por   revisar   **quizás**   están   aquí.   Sp.
the   abstracts   by   review.ɪɴꜰ maybe   stay.3ᴘʟ here
b.   *Los   resúmenes   por   **quizás**   revisar   están   aquí.   Sp.
the   abstracts   by   maybe   review.ɪɴꜰ stay.3ᴘʟ here

We can conclude that prepositional infinitive relatives clearly reject epistemic modal adverbs in Catalan and Spanish.

In contrast, things are less clear for *wh*-relatives. In Spanish and Catalan, we find the same restrictions on epistemic modal adverbs (not a single corpus example is found), but a contrast is perceived regarding the position of the adverb: native speakers consulted found the examples with a preverbal epistemic adverb much better than the ones with a postverbal adverb.

(33) a.   ?La   Maria   és   una   persona
the   Mary   be.3ꜱɢ a   person
en   qui   **possiblement**   confiar.   Ca.
in   which possibly   rely.ɪɴꜰ
'Mary is a person on which to maybe/possibly rely.'
b.   *La   Maria   és   una   persona
the   Mary   be.3ꜱɢ a   person
en   qui   confiar   **possiblement**.   Ca.
in   which rely.ɪɴꜰ   possibly

(34) a.   ??Las   empresas   en   las   que   **quizás**   invertir
the   companies   in   the   that   maybe   invest.ɪɴꜰ
son   escasas.   Sp.
be.3ᴘʟ   scarce
'The companies to maybe invest on are scarce.'

b. *Las empresas en las que invertir **quizás**
the companies in the that invest **maybe**
son escasas. Sp.
be.3PL scarce

A clearer pattern is found in Italian, where epistemic modal adverbs are reported to be possible in preverbal position, suggesting that the slight contrast we have reported for Catalan and Spanish might be real:

(35) a. Cerco un uomo al quale **possibilmente** **/se possibile**
seek.1SG a man to-the which probably /if possible
/forse presentare Maria.
/maybe introduce.INF Mary
'I am looking for a man to whom probably/if possible/maybe to introduce Mary.' It.
(Rizzi 1982, 103)

b. Ho trovato qualcuno a cui **probabilmente /evidentemente**
have.1SG found somebody to whom probably /evidently
affidare questo tipo di incarico.
assign.INF this kind of duty
'I found somebody to whom probably/evidently to assign this kind of duty.' It.
(Belletti 2009, 60-1)

c. *?Ho trovato qualcuno a cui affidare **probabilmente**
have.1SG found somebody to whom assign.INF probably
questo tipo di incarico.
this kind of duty
It. (Belletti 2009, 60-1)

To sum up, the availability of epistemic modal adverbs is not excluded by the non-finite nature of the clause: they are not possible in prepositional relatives, but they are in *wh*-relatives. Moreover, the position of epistemic adverbs clearly contrasts with that of root adverbs in *wh*-relatives: the former must precede the infinitive, while the latter must follow it. This pattern suggests itself a solution in terms of the availability of the different structural positions hosting these adverbs, which we are developing in the next section.

3 The Size of Infinitive Clauses

We have seen that infinitive relative clauses have severe limitations in the expression of material standardly encoded in the left periphery of the sentence proposed by Rizzi 1997, which is reproduced in (33) (see also Poletto, Bocci 2016; Rizzi 2001; Rizzi, Bocci 2017 for refinements):

(36)   [$_{\text{ForceP}}$ [Force' Force [$_{\text{TopP}}$ [Top' Top [$_{\text{FocP}}$ [Foc' Foc [$_{\text{TopP}}$ [Top'Top [$_{\text{FinP}}$ [Fin' Fin [TP …]]]]]]]]]]

Since infinitive relatives can express neither CLLD nor fronted fo-
cus, which are moved to TopicP and FocusP, respectively, we can fol-
low the proposal by Villalba (2019) that they lack these functional
projections. If we follow standard approaches to sentence defectivity
based on truncation (Authier, Haegeman 2015; Friedemann, Belletti,
Rizzi 2021; Haegeman 2013), we must assume that all the functional
structures above TopicP must be missing, namely we have just FinP:

(37)   [FinP [Fin' Fin [TP …]]]

Alternatively, we can think of this structural defectivity in terms of
a more selective operation, like exfoliation (Pesetsky 2021), so that
only TopP and FocP are pruned from the tree:

(38)   [ForceP [Force' Force [FinP [Fin' Fin [TP …]]]]]

As far as we agree that we lack TopP and FocP, the choice is not cru-
cial for our purposes, but it does matter when we consider modal ad-
verbials.

    We have seen that root modal adverbs are fine in all infinitive rel-
atives, but only *wh*-relatives admit epistemic ones in preverbal posi-
tion. We will argue that this is a direct consequence of the kind of re-
duction involved. Cinque (1997, § 4.1) shows that root modal adverbs
surface in low positions within the sentence, close to the VP, where-
as epistemic modal adverbs appear in the left periphery of the sen-
tence, above tense and negation (see also Picallo 1990 for the strict
ordering between epistemic and root modal verbs in Catalan, and
Hacquard (2009, 285-6) for the contrast between root and epistem-
ic modals regarding interactions with aspect):

$\text{Mood}_{\text{speech act}} > \text{Mood}_{\text{evaluative}} > \text{Moode}_{\text{vidential}} > \boxed{\text{Mod}_{\text{epistemic}}} > \text{T(Past)} > \text{T(Future)} >$
$\text{Mood}_{\text{irrealis}} > \text{Asp}_{\text{habitual}} > \text{T(Anterior)} > \text{Asp}_{\text{perfect}} > \text{Aspr}_{\text{etrospective}} > \text{Asp}_{\text{durative}} >$
$\text{Asp}_{\text{progressive}} > \text{Asp}_{\text{prospective}} / \boxed{\text{Mod}_{\text{root}}} > \text{Voice} > \text{Asp}_{\text{celerative}} > \text{Asp}_{\text{completive}} > \text{Asp}_{\text{(semel)repetitive}}$
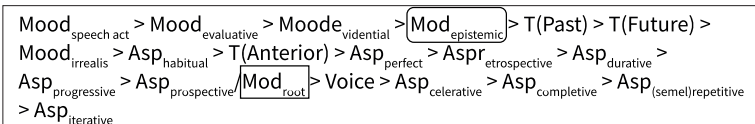$> \text{Asp}_{\text{iterative}}$

Figure 1   Cinque's 1997 hierarchy of adverbs: epistemic vs. root modality

From this independent hierarchy, we can expect root modal adverbs
to be unaffected by the size of the reduction: they will appear in a
ModRootP close to the VP.

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(39) a. els   llibres   per   llegir   **necessàriament**
     the   books   by   read.INF   necessarily

   b. [FinP [Fin'[TP [T' *llegir* [ModRootP **necessàriament** [ModRoot' ModRoot
      [VP …t…]]]]]]]

The infinitive verb moves to Tense across the root modal adverb, and the structure will be built as a prepositional or a *wh*-relative.

Crucially, epistemic adverbs will behave differently, for they are placed in the left periphery of the sentence, above FinP, which makes the kind of truncation involved relevant. Since they are not found in prepositional relatives, we can conclude that no more space is involved above FinP (truncation).[5] If we assume a raising analysis of relatives (Kayne 1995; Bianchi 2000; Bianchi 1999), we obtain the following derivation for a prepositional relative:[6]

(40) a. els libres per llegir **necessàriament**
      'the books to be read necessarily'

   b. [$_{DP}$ [$_{D'}$ *els* [$_{FinP}$ *llibres* [$_{Fin'}$ *per* [$_{TP}$ PRO [$_{T'}$ *llegir* [$_{ModRootP}$ *necessàriament* [$_{ModRoot'}$ ModRoot [$_{VP}$ …t_V t_{NP}…]]]]]]]]]]

The verb moves to Tense, and the noun moves to the specifier of FinP. Finally, the determiner head is merged.

In the case of *wh*-relatives, we need more space above FinP for hosting epistemic adverbs, so we suggest that, following Cinque's (1997) insights, MoodEpistP is placed between ForceP and FinP. Then the derivation of infinitive *wh*-relatives proceeds as follows:

(41) a. un uomo al quale forse presentare Maria
      'a man to whom maybe to introduce Mary.'

   b. [$_{DP}$ [$_{D'}$ *un* [$_{ForceP}$ [$_{PP}$ *uomo$_i$ al quale t$_i$*] [$_{Force'}$ Force [$_{ModEpisP}$ *forse* [$_{ModEpis'}$ ModEpis [$_{FinP}$ t_{PP} [$_{Fin'}$ Fin [$_{TP}$ PRO [$_{T'}$ *presentare* [$_{ModRootP}$ [$_{ModRoot'}$ ModRoot [$_{VP}$ …t_V *Maria* t_{PP}…]]]]]]]]]]]]]]

---

5 Confirmation that such an analysis might be on the right track comes from root infinitives, which show a similar behaviour regarding modal adverbs (Grohmann, Etxepare 2003): they admit root modal adverbs (ia), but reject epistemic ones (ib).

(i) a. Pedro comprar eso **necesariamente**?!
        'Peter necessarily buy that?!'
     b. *María **probablemente** ir allí?!
        '*Mary probably go there?!'

6 The choice of a raising analysis of relatives instead of a matching one (Hulsey, Sauerland 2006; Cinque 2020) is orthogonal to the proposal on the size of relative clauses that we are defending.

The PP *al quale uomo* moves to the specifier of FinP, and then to the specifier of ForceP across the position of *forse* in the specifier of ModEpisP. Finally, the noun *uomo* is fronted to the specifier of the PP, and the determiner is merged.

To sum up, the resultant picture involves different clausal sizes for prepositional and *wh*-relatives. Moreover, it offers us an interesting playground for testing analyses of phenomena involving a rich left periphery, as we will see in the next section.

4 Consequences for Cartographic Approaches

We have seen that infinitive relatives do not project a full left periphery, and particularly, they do not project either TopP or FocP. This fact has interesting consequences for standard cartographic analyses making crucial use of these projections.

One interesting case is the mainstream analysis of *in situ* focus, as involving covert movement to the FocusP in the left-periphery. In this regard, an influential proposal was made by Rizzi (1997, 287) and a similar idea is suggested by Rizzi and Bocci (2017, fn. 6):

> Here too Italian seems to possess a lower focalization, involving focal stress (possibly contrastive, but not necessarily so) on an element *in situ* (see Antinucci, Cinque 1977; Belletti, Shlonsky 1995; Calabrese 1982; Cinque 1993):
>
> (7)   Ho letto IL TUO LIBRO (, non il suo)
>   ''I read YOUR BOOK, not his''
>
> But it is conceivable that at LF (7) will have a representation involving (6) if the focal element must be moved to a peripheral position, as Chomsky's (1976) classical analysis of Weak Cross-over implies.

The representation mentioned in the previous citation is the following:

(6)   (FocP)
           /   \
         ZP   Foc'
                 /   \
              Foc^0 WP

ZP = Focus
WP = Presupposition
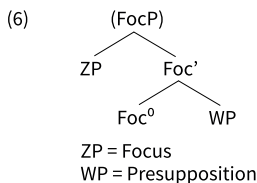
The prediction that follows from this analysis is that contrastive or corrective focus *in situ* should be impossible in infinitive relatives, for

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there is no place for the focus constituent to move to at LF. Yet, this prediction is incorrect: while infinitive relatives don't allow fronting focus (see section 2.3 above), they do admit contrastive and corrective focus *in situ*. Witness the following Catalan examples:

(42) a.

Els	libres	per	llegir	**només**	**demà**	són	aquí.
the	books	by	read.INF	only	tomorrow	be.3PL	here

'The books to be read only tomorrow are here.' Ca.

b.

Els	libres	per	llegir	**a**	**classe**,	i
the	books	to	read.INF	in	class	and
no	pas	a	casa,	són	aquí.	
not	NEG	at	home	be.3PL	here	

'The books to be read in class, not at home, are here.' Ca.

c.

Les	persones	amb	qui	parlar	**només**	**d'això**
the	persons	with	who	talk.INF	only	of-this
són	difícils	de	trobar.	Ca.		
be.3PL	difficult	of	find.INF			

'The persons to talk to about this are difficult to find.'

These are clear examples of *in situ* contrastive or corrective focus, but since we lack any left-peripheral FocusP, Rizzi's analysis involving a left peripheral criterial head plus LF-movement cannot be sustained. Therefore, infinitive relatives give support to alternative analyses involving a lower FocP in the vP periphery (Villalba 2000; Belletti 2004) or to true *in situ* focus (Samek-Lodovici 2005; Samek-Lodovici 2015; Szendröi 2004).

A similar problem arises when we consider analyses of (clitic) right-dislocation (CLRD). While some authors claim that CLRD is placed in a low vP periphery, plus remnant movement of the VP (Villalba 2000; Villalba 2009; López 2009), other authors propose that it involves movement to a left peripheral TopP plus remnant movement of the TP (Cardinaletti 2002; Cardinaletti 2016; Samek-Lodovici 2006). Again, infinitive relatives offer us a playground for testing these two hypotheses. Since infinitive relatives don't allow CLLD altogether, the analysis involving a low TopP will predict that CLRD would be possible; on the contrary, the analysis involving a higher TopP in the left periphery will predict that CLRD would be impossible altogether. The behaviour of CLRD in Catalan seems to support the latter hypothesis, for CLRD is refused by all consulted speakers, unless a parenthetical reading is enforced:

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(43)   A col·legi necessiten llibres.   Ca.
       'They need books at school.'

a. *Precisament,   els   llibres   per   portar-hi,
     precisely   the   books   by   bring.INF-LOC
     a col·legi,   són   aquí.
     to school   be.3PL   here

b. *Precisament,   els   llibres amb   què   anar-hi,
     precisely   the   books   with what   go.INF-LOC
     a   col·legi, són   aquí.
     to   school   be.3PL here

This behaviour is expected if CLRD necessarily involves movement to a left peripheral TopicP.

Finally, let us consider infinitive *wh*-interrogatives, which have been suggested to allow CLLD by several authors:

(44) a. No   sé,   d'aquest   pernil,   on   comprar-ne.
          not   know.1SG of-this   ham   where   buy.INF-of.it
          'I don't know where to buy some of this ham.' Ca. (Villalba 2009)

b. No   saben   al   gobernador cuándo   destituirlo.
     not   know.3PL DOM-the   governor   when   depose.INF-him
     'They don't know when to remove the governor.' Sp. (Hernanz 2011)

While Villalba (2019) argues that the selected nature of interrogative clauses involves ForceP necessarily, hence allowing for a higher TopP, and hence for CLLD, some Catalan speakers consulted suggest that a parenthetical intonation is necessary to admit (41a). Besides, similar sentences are systematically rejected by all Italian speakers consulted. Moreover, the proposal by this author did not consider modal adverbs. When we place them on the picture, we obtain a different perspective. On the one hand, root modal adverbs are possible, as expected:

(45)   No sé   quins llibres llegir   **obligatòriament** /**necessàriament.**
       not know.1SG which books read.INF obligatorily   /necessarily
       'I don't know which books to obligatorily/necessarily read.' Ca.

On the other hand, epistemic modal adverbs are not allowed in post-verbal position, but they must appear in preverbal position:

(46) a. *No sé quins libres llegir **possiblement**. Ca.
   not know.1SG which books read.INF possibly

   b. ?No sé quins libres **possiblement** llegir. Ca.
   not know.1SG which books possibly read.INF

   'I don't know which books to possibly/maybe read.'

This suggests that interrogative infinitives might have a defective left periphery similar to that of their *wh*-relatives counterparts, namely one including a ModEpisP and ForceP. Such a parallelism seems strong if we consider the evidence from Germanic languages, where infinite *wh*-relatives and *wh*-interrogatives go hand in hand. For example, whereas English allows both, German and Scandinavian languages reject both (examples from Sabel 2014):

(47) a. This is a topic about which to argue.

   b. Lisa has decided who to visit.

(48) a. *Lisa sucht das Messer mit dem Käse zu schneiden. Ge.
   Lisa seek.3SG the.ACC knife with the.DAT cheese to cut.INF
   'Lisa seeks the knife with which to cut the cheese.'

   b. *Lisa hat entschieden was Tom zu sagen. Ge.
   Lisa have.3SG decided what Tom to say.INF
   'Lisa has decided what to say to Tom.'

All in all, this regular behaviour suggests that our common proposal for *wh*-relatives and *wh*-interrogatives might be on the right track, even though a more detailed description is required of the exact left periphery of infinitive interrogatives, considering the finer-grained proposals by Rizzi and Bocci (2017) or Shlonsky and Soare (2011).

5 Conclusions

In this article, we have offered an analysis of infinitive relatives, which crucially involves truncation of part of the functional left periphery of the clause. The resultant defective structure helps us explain the lack of material typically hosted at FocusP and TopicP (fronted focus, CLLD, negative inversion). Furthermore, our proposal offers us a principled explanation of the availability of certain modal readings: while root modal adverbs are always possible, epistemic modals can only appear with *wh*-relatives and in preverbal position. This led us to suggest different clausal sizes: a truncated one for prepositional relatives (just FinP), and a bigger structure for *wh*-relatives (and, tentatively, for *wh*-interrogatives). Besides the success of our descrip-

tion of infinitive relatives, we have also shown that these reduced clauses can be a fruitful playground for testing cartographic analyses of phenomena involving a rich left periphery.

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