

Extrapolation as Predicate Restriction: the case of Italian

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Abstract. In this paper I show that the extrapolation of restrictive relatives in Italian differs from English in that (i) extrapolation is only possible when the relative head is indefinite, (ii) extrapolation is impossible from the preverbal subject position. I propose an analysis of the Italian data based on the idea that the indefinite head and the extrapolated relative are interpreted by the rule of Predicate Restriction proposed by Chung & Ladusaw (2005). The indefinite head fails to saturate the argument position that it occupies: this allows the extrapolated relative to further restrict the same argument position, which is then bound by VP-level Existential Closure. Extrapolation is impossible from preverbal subjects because in Italian, these fail to be reconstructed into VP, within the scope of Existential Closure. The comparison of English and Italian suggests that relative clause extrapolation is not a unitary phenomenon at the cross-linguistic level.

Keywords: Relative clauses, extrapolation, Quantifier Raising, Predicate Restriction, Italian, English.

1. **Introduction.** The extrapolation of restrictive relative clauses raises a problem for the syntax-semantics interface, because the nominal head¹ and the clause that semantically modifies it appear in non-adjacent positions (for general discussion, see de Vries 2002, 233-303 and Baltin 2005):

(1) I saw [a man] yesterday [whom I knew in high school].

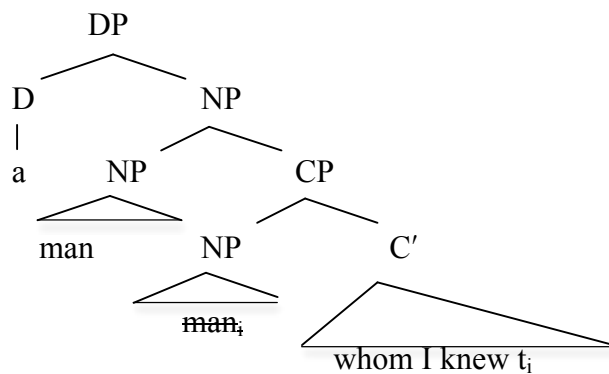
A recurrent analytical move, since Guéron & May (1984, (14)), is to assume that at some point of the derivation the head and the extrapolated relative are reunited. A recent version of this idea is found in Fox & Nissenbaum's (2000) analysis, also adopted and developed by Hulseley & Sauerland (2006, 116-120). On this proposal, extrapolation results from adjunction of the relative clause to the covert copy of the head that is right-adjoined to VP by Quantifier Raising (indicated in (2) between angled brackets):

(2) I saw [a man] yesterday [<a man> [CP whom I knew in high school]]

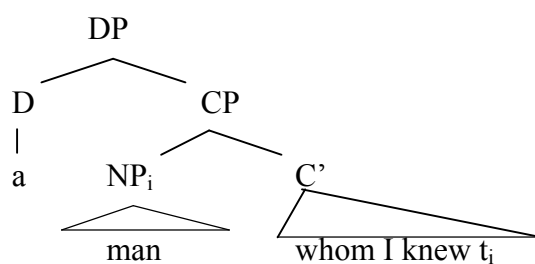
Hulseley & Sauerland point out that this “late” attachment is only possible with a matching structure like (3), where the relative CP is adjoined to the head and contains an internal copy of it, but not with a raising structure like (4), where the relative CP is directly selected by the Determiner:

¹ Following the standard terminological practice, the term “head” refers to the nominal constituent that is modified by the relative clause, with no reference to the X-bar theoretic notion of head.

(3) (matching structure)



(4) (raising structure)



Given that idiom chunks can only be relativized in a raising structure, it is correctly predicted that extraposition is impossible when the head is idiomatic:

- (5) a. * Mary praised [the headway] last year [that John made].
 b. * I was shocked by [the advantage] yesterday [that she took of her mother].
 (Hulsey & Sauerland 2006, (9))

As for non-idiomatic heads, however, the late attachment of the extraposed relative is only contingent upon Quantifier Raising: we therefore expect that extraposition should be possible from any non-idiomatic DP that undergoes QR. But this condition is too liberal for Italian. Here, extraposition is only possible when the head is indefinite, as in (6),² but not when it is a definite description or a strong quantifier, as in (7):

- (6) a. Ho incontrato [dei ragazzi] ieri sera [che avevo conosciuto
 have.1SG met some boys yesterday night that had.1SG met
 alle superiori].
 in-the high-school
 'I met some boys yesterday night whom I knew from high school.'

² Following Diesing (1992), by "indefinite head" I mean weak noun phrases in the sense of Milsark (1977), introduced by *a*, *no*, *some*, and the numerals on their non-partitive interpretation: that is, all noun phrases that are licensed in the English existential *there* structure. McNally (1998) argues, contra Milsark, that partitive NPs introduced by numerals are allowed in the existential structure. I will leave aside partitives in this discussion.

- b. Consiglierò [un libro] ai ragazzi [che parla
 recommend.FUT.1SG a book to-the kids that is-about
 del loro periodo storico preferito].
 of-the their period historical favourite
 ‘I will recommend to the kids a book that is about their favourite historical
 period.’
- c. Ho comprato [due scatole] dal ferramenta [in cui metterò
 have.1SG bought two boxes at-the ironmonger’s in which put.FUT.1SG
 i chiodi e le viti].
 the nails and the screws.
 ‘I bought two boxes at the ironmonger’s in which I will put nails and
 screws.’
- d. Non ho trovato [nessuno] in quell’ufficio [che sapesse
 not have.1SG found anybody in that office that was-able
 aiutarmi con la pratica].
 to-help-me with the file
 ‘I didn’t find anyone in that office that was able to help me with the file.’
- (7) a. ?* Ho incontrato [i ragazzi] ieri sera [che avevo conosciuto
 have.1SG met the boys yesterday night that had.1SG met
 alle superiori].
 in-the high-school
- b. ?* Consiglierò [ogni libro] ai ragazzi [che parla
 recommend.FUT.1SG every book to-the kids that is-about
 del loro periodo storico preferito].
 of-the their period historical favourite
- c. ?*Ho comprato [entrambe le scatole] dal ferramenta
 have.1SG bought both the boxes at-the ironmonger’s
 [in cui metterò i chiodi e le viti].
 in which put.FUT.1SG the nails and the screws.

This empirical contrast does not follow from the QR-based analysis.

2. What is special about indefinite heads? The next question, then, is which relevant property singles out indefinite heads. While the QR-based approach requires the head of the extraposed relative to be quantificational, the most salient property of indefinites is the opposite one, namely the fact that they *need not* be quantificational.

The non-quantificational analysis of indefinites, started by Kamp (1981) and Heim (1982), has been developed by many authors, in particular Diesing (1992), and has been more recently rethought by McNally (1998), McNally & van Geenhoven (2005) and Chung & Ladusaw (2005). Departing from the Heimian tradition, these authors propose that a narrow scope indefinite, even when it occurs in an argument position, does not denote a (restricted) variable over

entities, but rather a property.³ According to McNally & van Geenhoven, the indefinite is “semantically incorporated” into the verb, which contributes the existential force. To illustrate, in the interpretation of a verb phrase like *catch rabbits*, the extensional verb *catch* contains in its denotation an existentially bound internal argument, and takes in input the property denoted by the indefinite direct object, which is then applied to the existentially bound argument. The idea is made formally explicit in (8).

- (8) a. $\llbracket \text{catch} \rrbracket = \lambda P. \lambda w. \lambda x. \exists y \text{ catch}'_w(x, y) \ \& \ P_w(y)$
 (McNally & van Geenhoven 2005, (32))
 b. $\llbracket \text{rabbits} \rrbracket = \lambda w. \lambda z. \text{rabbit}'_w(z)$
 c. $\llbracket [\text{VP } \text{catch } \text{rabbits}] \rrbracket = [\lambda P. \lambda w. \lambda x. \exists y \text{ catch}'_w(x, y) \ \& \ P_w(y)]$
 $(\lambda w. \lambda z. \text{rabbit}'_w(z)) = \lambda w. \lambda x. \exists y \text{ catch}'_w(x, y) \ \& \ \text{rabbit}'_w(y)$

On Chung & Ladusaw’s proposal, instead, the argument position occupied by the indefinite is not bound as soon as the indefinite composes with the verb, but remains unsaturated until the “event level” VP. (The authors do not distinguish VP from vP; here I retain their formulation for the sake of simplicity.)

The property-denoting indefinite is interpreted by means of the following compositional rule:

- (9) Predicate Restriction (Restrict): the property P denoted by the indefinite restricts the domain of the function denoted by the predicate to the subdomain consisting of elements that have the property P .

To exemplify informally, in the verb phrase *meet a boy* the indefinite *a boy* denotes the property of being a boy; the VP expresses a relation between entities x and y , such that the internal argument y is restricted to entities that are boys.⁴ (10) is the formal rendition of the idea.

- (10) a. $[\text{VP } \text{meet } [\text{a boy}]]$
 b. $\llbracket V \rrbracket = \lambda y. \lambda x. \lambda e. \text{meet}'(x, y, e)$
 c. $\llbracket [\text{a boy}] \rrbracket = \text{boy}'$
 d. $\llbracket [\text{meet } [\text{a boy}]] \rrbracket = \text{Restrict}([\lambda y. \lambda x. \lambda e. \text{meet}'(x, y, e)], \text{boy}') =$
 $= [\lambda x. \lambda y. \lambda e. \text{meet}'(x, y, e) \ \& \ \text{boy}'(y)]^5$

After the external argument has been introduced, at the event level VP Existential Closure applies to both the event position and the restricted internal argument position, thus fully saturating the predicate.

³ See McNally (1998, 369 ff.) for arguments that all weak noun phrases can and must be interpreted as property-denoting.

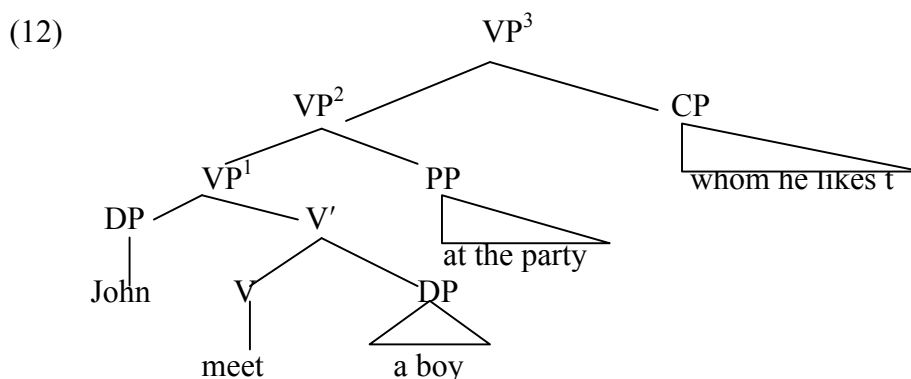
⁴ More precisely, the VP denotes a function whose domain is restricted to boys, which returns for each boy (the characteristic function of) the set of people who meet him.

⁵ The application of Restrict “demotes” the restricted argument in the sequence of lambda-prefixes. I return to this point below. Note that Chung & Ladusaw assume that the external argument is introduced by the lexical V, rather than by Voice/little v, as proposed instead by Kratzer (1996). I keep to their original formulation since this does not affect the proposed analysis.

The two proposals differ mainly in where they locate the source of the existential force of the indefinite. In the following section I show that the less “local” solution proposed by Chung & Ladusaw allows for an unusual approach to relatives clause extraposition from an indefinite head.

3. Extraposition as Predicate Restriction. The fact that a restricted argument position is not saturated until the topmost VP level gives us a key to interpreting an extraposed relative clause. Let us assume, for the sake of concreteness, that in (11) the relative CP is right-adjoined to VP immediately above the VP-modifier *at the party*, as represented in (12). (Other syntactic analyses can be envisaged, depending on one’s assumptions about X-bar structure; nothing hinges on this choice, provided that the relative clause is attached within the scope of Existential Closure.)

- (11) Gianni ha incontrato [un ragazzo] alla festa [che gli è molto simpatico].
John has met a boy at the party whom he likes a lot



The application of Restrict to the indefinite head within V’ demotes the targeted internal argument so that it will be saturated immediately before the event position, as shown in (10d), repeated here:

- (10)d. $[v' [v \text{ meet}] [a \text{ boy}]] = [\lambda x. \lambda y. \lambda e. \text{meet}'(x, y, e) \ \& \ \text{boy}'(y)]$

Saturation of the external argument by *John* yields (13b) as the denotation of VP¹:

- (13)a. $\llbracket [DP \text{ John}] \rrbracket = j$
 b. $\llbracket [VP^1 \text{ John meet a boy}] \rrbracket = [\lambda x. \lambda y. \lambda e. \text{meet}'(x, y, e) \ \& \ \text{boy}'(y)](j) =$
 $= [\lambda y. \lambda e. \text{meet}'(j, y, e) \ \& \ \text{boy}'(y)]$

At this point, the PP modifies VP¹ by an application of the compositional rule of Event Identification proposed in Kratzer (1996: 122) (*s* is defined as the type of events):

- (14) Event Identification (EI)
 $f_{\langle e, \langle s, t \rangle \rangle} \quad g_{\langle s, t \rangle} \quad \rightarrow \quad h_{\langle e, \langle s, t \rangle \rangle} \quad : \quad \lambda x_e \lambda e_s [f(x)(e) \ \wedge \ g(e)]$

The adverbial PP is a predicate of events and expresses the property of being located at the (contextually salient) party:

(15) $\llbracket [\text{PP at the party}] \rrbracket = [\lambda e. \text{loc}'(e, \iota u. \text{party}'(u))]$

The composition of VP¹ and PP by Event Identification yields (16):

(16) $\llbracket [\text{VP}^2] \rrbracket = \text{EI}([\lambda y. \lambda e. \text{meet}'(j, y, e) \ \& \ \text{boy}'(y)], [\lambda e. \text{loc}'(e, \iota u. \text{party}'(u))]) =$
 $= [\lambda y. \lambda e. \text{meet}'(j, y, e) \ \& \ \text{boy}'(y) \ \& \ \text{loc}'(e, \iota u. \text{party}'(u))]$

Crucially, at the level VP² the internal argument is still unsaturated: thus, it is possible to semantically combine the relative CP with VP² by one more application of Predicate Restriction, targeting once again the internal argument position. As a result, the descriptive content conveyed by the relative clause is conjoined with the restriction already introduced by the indefinite head:⁶ i.e., the internal argument is restricted to being a boy and being a person whom John likes. The formal rendition is in (17).

(17) a. $[\text{VP}_3 [\text{VP}_2 \text{ John meet a boy at the party}] [\text{CP whom he}_2 \text{ likes } t]]$
 b. $\llbracket [\text{CP whom he}_2 \text{ likes } t] \rrbracket = [\lambda z. \text{like}'(j, z)]$ (j the value of he_2)
 c. $\llbracket [\text{VP}^3] \rrbracket = \text{Restrict}(\llbracket [\text{VP}^2] \rrbracket, \llbracket [\text{CP}] \rrbracket) =$
 $= \text{Restrict}([\lambda y. \lambda e. \text{meet}'(j, y, e) \ \& \ \text{boy}'(y) \ \& \ \text{loc}'(e, \iota u. \text{party}'(u))],$
 $[\lambda z. \text{like}'(j, z)]) =$
 $= [\lambda y. \lambda e. \text{meet}'(j, y, e) \ \& \ \text{boy}'(y) \ \& \ \text{like}'(j, y) \ \& \ \text{loc}'(e, \iota u. \text{party}'(u))]$

Finally, the internal argument position, as well as the event position, is bound by Existential Closure (EC) at the topmost level VP³:

(18) $\text{EC}(\text{EC}(\llbracket [\text{VP}^3] \rrbracket)) = \exists y. \exists e. \text{meet}'(j, y, e) \ \& \ \text{boy}'(y) \ \& \ \text{like}'(j, y) \ \& \ \text{loc}'(e,$
 $[\iota u. \text{party}'(u)])]$

Under this analysis, the head and the extraposed relative are interpreted independently of each other, by two distinct applications of Predicate Restriction. Note that from this perspective, the extraposed relative could even be generated independently of the head, provided that the latter is interpreted as a restricting indefinite. The “right roof” effect (i.e., the non-cyclicity of extraposition) will anyway follow from the fact that the relative CP must be attached within the scope of the Existential Closure that binds the restricted argument position.⁷ Even if the relative CP were moved from within the DP head, the point would remain that it need not be “put back” in its original position in order to be properly interpreted.

4. **Further consequences.** A corollary of the present proposal is that the extraposition structure is interpretable only when the indefinite head is existentially closed within VP. This is certainly possible for internal arguments, as

⁶ More precisely, the internal argument is further restricted to satisfy the property which defines the characteristic function (of type $\langle e, t \rangle$) denoted by the relative CP.

⁷ The consistency in phi-features between the head and the relative operator would follow from the fact that the features of the operator are interpreted as presuppositions restricting the possible value of the function denoted in (17b), thus ultimately restricting the internal argument position in (17c).

exemplified in (6) and (11) above. On the other hand, external arguments typically undergo movement to Spec,TP: the prediction, then, is that they will allow for extraposition only if they are totally reconstructed and interpreted within VP.

Interestingly, in Italian, differently from English, preverbal subjects tend not to reconstruct:⁸

- (19) a. Every player didn't score. (✓ not > ✓)
 b. Ogni giocatore non ha segnato. (?*not > ✓)
 (20) a. A unicorn seems [*t* to be in the garden]. (✓ seem > ✓)
 b. Un unicorno sembra [*t* essere nel giardino]. (?*seem > ✓)
 (21) a. Most guests might be late. (✓ might > most)
 b. La maggior parte degli ospiti potrebbe essere in ritardo. (?*might > most)

The reason for this is beyond the scope of this discussion (I refer the reader to (reference omitted)); what is relevant here is that the lack of reconstruction of preverbal subjects correctly predicts that these disallow relative clause extraposition, even when they are indefinite (cf. Cardinaletti 1987: fn. 4):

- (22) a. ?* [Una lettera] è arrivata ieri [che era indirizzata a Maria].
 a letter has arrived yesterday that was addressed to Mary
 b. ?* [Due studenti] hanno telefonato oggi [che cercavano il Preside]
 two students have phoned today that were-looking-for
 the Dean

Since a preverbal subject fails to be reconstructed into VP, it cannot be interpreted by Predicate Restriction; consequently, an extraposed relative clause cannot restrict the corresponding argument position.

Another corollary of this proposal is that an indefinite modified by an extraposed relative clause will necessarily have narrow scope w.r.t. negation, since it gets bound by Existential Closure at the VP level (cf. Chung & Ladusaw 2005: 13-14). This prediction too seems to be correct. In (23a), we see relative clause extraposition in a simple declarative clause. In the negative sentence (23b), the indefinite DP with a non-extraposed relative has a wide scope reading w.r.t. negation, whereby there are two boys that I didn't see yesterday whom I had met two days before. The extraposition variant in (23c), instead, does not allow for this reading, and is in fact awkward. The awkwardness can be related to the fact that restrictive relatives in the indicative mood are not felicitous in the scope of negation: compare (23c) to the extraposed subjunctive clause in (23d).⁹

- (23) a. Ho visto [due ragazzi] ieri [che avevo conosciuto
 have.1SG seen two boys yesterday that had.1SG met
 la sera prima].
 the night before
 'I saw two boys yesterday whom I had met the night before.'
 b. Ieri non ho visto [due ragazzi] [che avevo conosciuto
 yesterday not have.1SG seen two boys that had.1SG met

⁸ The English examples are taken from McCloskey (1997: 207).

⁹ Compare also the extraposed subjunctive relative clause in example (6d) above.

- la sera prima]].
the night before (2 > not)
‘Yesterday I didn’t see two boys whom I had met the night before.’
- c.?? Non ho visto [due ragazzi] ieri [che avevo conosciuto
not have.1SG seen two boys yesterday that had.1SG met
la sera prima].
the night before (* 2 > not)
- d. Non ho visto [due ragazzi] ieri [che riuscissero
not have.1SG seen two boys yesterday that were-able.SUBJ.3PL
a superare il test].
to pass the test (* 2 > not, √ not > 2)
‘I didn’t see two boys yesterday who were able to pass the test.’

5. **Comparison and further prospects.** To sum up, the analysis based on Predicate Restriction accounts for the following properties of (restrictive) relative clause extraposition in Italian:

- (i) it is limited to restrictive relatives with an indefinite head;
- (ii) it is blocked from the preverbal subject position;
- (iii) it forces the indefinite head to take narrow scope w.r.t. negation.

As far as I can see, these properties would not follow from the QR-based analysis.¹⁰

On the other hand, relative clause extraposition in English is not amenable to Predicate Restriction, in light of the fact that, contrary to Italian, it is also allowed with definite and universally quantified heads:¹¹

- (24) a. Mary praised [the pot roast] yesterday [that John made].
b. I was shocked by [the garish dress] yesterday [that she took from her mother]. (Hulsey & Sauerland 2006, (10a-b))
c. [Everybody] is so strange [whom I like] that I can’t go out in public with them. (Guéron & May 1984, (10a))

This suggests that the QR-based analysis remains necessary for English.¹²

¹⁰ The same holds for the specifying coordination analysis proposed by de Vries (2002: 268 ff.): extraposition results from specifying coordination (&:) of two pieces of clausal structure (AgrOP in (i)), where the first conjunct contains the head, and the second conjunct contains an elliptical copy of the head plus the non-elided relative clause (De Vries assumes a raising analysis for the latter):

(i) Ik heb [&:P [AgrOP [DP de man] gezien] [&: [DP ~~de~~ [CP [~~man~~ die] een rode
I have the man seem the man who a red
jas droeg]] gezien]. (de Vries 2002: 277, (93))
coat wore seen
‘I have seen the man who wore a red coat.’

¹¹ Cf. also the Dutch example in the preceding note.

¹² According to Fox & Nissenbaum, extraposition in English forces the head to take scope at least as high as VP. This is shown by the unacceptability of (ii), where the NPI head *anything*, being modified by an extraposed relative, cannot be licensed in the scope of the intensional verb *look for* (Fox & Nissenbaum 1999, (5a-b)):

However, this conclusion leaves one problem open: it is unclear how QR-based extraposition could be parametrized so as to account for the contrast between (24) in English and (7) in Italian. Plausibly, QR is universally available, and it is unclear which language-specific property may condition the possibility of adjoining the relative CP to the covert copy of QR.

Let me also point out one technical problem with the QR-based analysis. The level of attachment of the extraposed relative is not explicitly indicated in the schematic structure (2), repeated here for convenience:

(2) I saw [a man] yesterday [~~a man~~> [_{CP} whom I knew in high school]]

Note that in the matching structure (3) assumed by Hulse & Sauerland, the restrictive relative is in the c-command domain of the Determiner. This structural relation is motivated by considerations of compositionality: as argued by Partee (1975: 231), the denotation of the restrictive relative is first intersected with the denotation of the NP head, and the result is then fed to the function denoted by the Determiner.¹³ Now, in order to maintain this compositional interpretation, the extraposed relative in (2) should be merged with the covert copy of the NP in the c-command domain of the quantificational Determiner, as explicitly represented in (25). But this is a counter-cyclic adjunction violating the Extension Condition.¹⁴

(25) I saw [_{DP} a man] yesterday [_{DP} ~~a~~ [_{NP} [_{NP} ~~man~~] [_{CP} whom I knew in high school]]]

6. Summary. In this paper I have shown that in Italian, restrictive relative clause extraposition is allowed only with indefinite heads. I have argued that the extraposed relative clause can be properly interpreted if the indefinite head undergoes Predicate Restriction, in the sense of Chung & Ladusaw (2005), and

(i) I looked very intensely for [anything [that would help me with my thesis]].

(ii) * I looked for [anything] very intensely [that would help me with my thesis].

I will not try to develop this point w.r.t. Italian, because it is unclear how NPI licensing interacts with Chung & Ladusaw's Predicate Restriction.

¹³ Heim & Kratzer (1998, 82-83) apply the same argument to other restrictive modifiers.

¹⁴ Bach & Cooper (1981) assume instead that the restrictive relative attaches outside the c-command domain of the Determiner. The head is taken to denote a function which takes in input the $\langle e, t \rangle$ denotation of the relative clause:

(i) $[[\text{the book}]]([\text{CP that John read } t_1]) =$
 $= [\lambda R_{e,t}. \iota x. \text{book}'(x) \ \& \ R(x)]([\lambda y. \text{read}'(j, y)]) =$
 $= \iota x. \text{book}'(x) \ \& \ \text{read}'(j, x).$

This is compatible with attachment of the extraposed relative outside the c-command domain of the Determiner. Note however that on this analysis, the head has a denotation of type $\langle \langle e, t \rangle, \langle e, t \rangle \rangle$; therefore, it is far from obvious that it may undergo Quantifier Raising by itself, before the restrictive relative has attached to it. In any event, Bach & Cooper's solution is not the one presupposed in Hulse & Sauerland's argument.

the relative CP also undergoes Predicate Restriction within the scope of Existential Closure. Since Predicate Restriction can only apply to indefinites, the observed constraint follows immediately.

I have also shown that this analysis accounts for two further properties: (i) the impossibility of extraposing from preverbal subjects, (ii) the obligatory narrow scope of the indefinite head from which the relative clause has been extraposed.

Unfortunately, this analysis is too restrictive w.r.t. relative clause extraposition in English, which is also possible with definite and universally quantified heads. The QR-based analysis instead captures the English data, but it is unclear how it might be parametrized so as to account for the English/Italian asymmetry. This leaves us without a unitary cross-linguistic analysis. More work is needed, but we can definitely make one methodological point: the phenomenon of relative clause extraposition must be investigated from a cross-linguistic perspective.¹⁵

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¹⁵ After this draft was completed, I was directed to Cardoso's (2010) dissertation, which undertakes a cross-linguistic analysis of relative clause extraposition and proposes for Contemporary European Portuguese two generalizations parallel to those that I pointed out for Italian: (a) in CEP, contrary to English and other Germanic languages, extraposition of a restrictive relative clause is only possible from weak noun phrases; (b) in CEP, contrary to English and other Germanic languages, extraposition is impossible from preverbal subjects. I refer to Cardoso's (2010, chapter 3) extensive discussion for the empirical data and an alternative analysis.

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