

Extraposition of NPIs from NP

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Abstract: Analyses of Extraposition from NP can be divided into those that suppose the extraposed material is base-generated inside the host DP and those that suppose it is base-generated outside the host DP. This paper presents novel evidence from the licensing of negative polarity items by the quantifier *every* in relative clauses extraposed from direct objects to argue that extraposed material can be interpreted internal to the host DP. These results suggest the necessity of an analysis of Extraposition from NP that permits extraposed material to be base-generated inside the host.

Keywords: rightward movement, extraposition from NP, NPI licensing, experimental syntax

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1 Introduction

Extraposition from NP (EXNP) presents an instance of discontinuous surface constituency whereby a PP or CP is interpreted as a modifier of a non-adjacent “host”, such as *linguist* in (1).¹

- (1) We met [_{DP} a linguist]₁ yesterday [(who is) from East Africa]₁.

This paper is concerned with understanding the derivational history of EXNP configurations. At stake is where the extraposed material is generated. Some analyses of EXNP suggest that the extraposed material is generated in the usual position inside the host and some additional mechanism, either in the syntax or at PF, results in the discontinuous constituency (e.g., Ross 1967, Chomsky & Lasnik 1977, Fox & Nissenbaum 1999, de Vries 2002). Other analyses argue that the extraposed material is generated outside of the host in a position adjoined to the verbal spine (e.g. Rochemont & Culicover 1990, Koster 2000, Webelhuth et al. 2013).

This paper attempts to contribute to the discussion by proposing and investigating a novel connectivity diagnostic that will probe the relationship between an extraposed adjunct and a host-internal position. With a focus on the extraposition of relative clauses from direct objects, we will find that extraposed material can be interpreted as if it were inside its host. The argument is based around the finding that a negative polarity item (NPI) licensed in the restrictor argument of a host headed by *every* remains licensed in an extraposed position (2).

- (2) a. We took [_{DP} every guest [_{CP} who ate *any* of the potato salad]] to the hospital.
b. We took [_{DP} every guest]₁ to the hospital [_{CP} who ate *any* of the potato salad]₁.

Given that NPIs are otherwise not licensed in the nuclear scope of *every*, a tight relationship between the extraposed material and the host is implicated in the licensing of the NPI in (2b). I will argue below that this finding is most naturally accounted for in theories of EXNP that generate the extraposed material in the restrictor argument of the host.

The remainder of the paper is organized as follows. Section 2 first briefly outlines the major representatives of the two competing classes of models for EXNP mentioned above as well as the predictions they make with respect to the ability to interpret the extraposed material inside the host. Section 3 establishes the licensing pattern for various NPIs in the restrictor argument of the quantifier *every* and introduces the phenomenon as a connectivity diagnostic for an extraposed relative clause. Of particular consequence will be the observation that *every* is incapable of licensing an NPI in material that is adjoined to the verbal spine regardless of the configuration. Section 4 presents an acceptability judgment study that tested the predictions and intuitions reported in this paper. This study reveals that participants reliably detect the contrast between NPIs in extraposed

¹Unless otherwise indicated, I will use the subscript notation [_{DP} ...]₁ ... [_{CP} ...]₁ as a theory-neutral indication of an EXNP configuration.

material that are licensed or unlicensed by the head of the host. Based on these results, I argue that extraposed material can be interpreted as if it were in the restrictor argument of its host.

Section 5 evaluates the available Host-Internal analyses of EXNP in light of this and additional data. I ultimately suggest that the theory of extraposition proposed by Fox & Nissenbaum (1999), whereby extraposition is parasitic on covert movement of the host, most adequately accounts for the range of facts examined in this paper. Section 6 presses the investigation slightly further to ask whether EXNP configurations might employ both Host-Internal and Host-External mechanisms. I suggest that this same Host-Internal analysis from Fox & Nissenbaum (1999) on its own may provide sufficient empirical coverage with respect to the data examined here. Finally, section 7 summarizes and concludes.

2 Two Competing Models of Extraposition from NP

At a very high level, it is possible to distinguish analyses of EXNP with regard to the proposed relationship between the extraposed material and the host.² Accounts may also differ with respect to whether the host is interpreted in-situ or ex-situ or perhaps with respect to precisely where the extraposed material is spoken.³ For the time being, these are issues that can be treated as orthogonal to the question at hand. We will initially be concerned with the distinction between what I refer to as *Host-External* and *Host-Internal* analyses of EXNP.

The unifying property of the Host-External class of analyses for EXNP is the assertion that the extraposed material is base-generated *external* to its host in a position adjoined directly to the verbal spine. The Host-Internal class asserts the obverse: the extraposed material is base-generated *internal* to its host.⁴ After reviewing representative members of each class, I will make explicit, and attempt in subsequent sections to capitalize on, the specific a priori predictions that each class makes with respect to where extraposed material can and cannot be interpreted.

²Recent overviews and critiques of EXNP analyses can be found in Baltin (2005) and Webelhuth et al. (2013).

³A set of analyses, which I will not directly address here are the non-syntactic analyses of EXNP. These analyses suggest that the extraposed word order is the result of a post-syntactic reordering process (e.g., Chomsky & Lasnik 1977, Rochemont 1978, Göbbel 2013, Hunter & Frank 2014). In addition to the arguments presented in section 5, I would point to a number of syntactic and semantic effects that have been identified with extraposition operations (e.g., Williams 1974, Guéron 1980, Taraldsen 1981, Guéron & May 1984, Rochemont & Culicover 1990, Fox & Nissenbaum 1999, Fox 2002, Bhatt & Pancheva 2004) to suggest that at least some instances of EXNP, including those considered in this paper, are syntactic.

⁴A major Host-Internal analysis of EXNP that I will not directly address in this paper is the stranding approach that was pursued initially by Kayne (1994). Variations on this type of account can be found in Rochemont & Culicover 1997. I refer the reader to research by Wilder (1995), Buring & Hartmann (1997), Rochemont & Culicover (1997), Koster (2000), de Vries (2002), Vicente (2003), Sheehan (2010), and Webelhuth et al. (2013) for arguments addressing the untenability of such accounts of EXNP.

2.1 Host-Internal Approaches to EXNP

The initial formulation of the EXNP operation by [Ross \(1967\)](#) is among the Host-Internal class of approaches to EXNP. On this analysis EXNP is an operation that extracts the extraposed material out of its host and right adjoins it to what Ross called the first cyclic node (3).

- (3) I met [_{DP} a linguist *e*₁] this morning [_{CP} who is from East Africa]₁.

For Ross, the only cyclic node was CP. However, Baltin (1978, 1981) and Guéron (1980) and later Rochemont & Culicover (1990) observed that the extraposed material does not always behave as if it were adjoined to CP. The contrasting grammaticality patterns in examples (4) and (5), which have been adapted from Baltin (1981:269), suggest that the height of the extraposed material correlates with the height of the host. The contrast in (4) can be taken to show that a relative clause extraposed from a DP in direct object position cannot be stranded by a VP-fronting operation and so must be part of the VP constituent. The contrast in (5), on the other hand, suggests that the opposite is true of a relative clause extraposed from a DP in subject position. The extraposed relative clause cannot be treated as part of the VP constituent with respect to a VP-fronting operation.

- (4) a. [VP Invite [DP someone]₁ tomorrow [CP who is from East Africa]₁]₂
 though we may *e*₂, ...
 b. * [VP Invite [DP someone]₁]₂ though we may *e*₂ [CP who is from East Africa]₁, ...
- (5) a. * [VP Invited [CP who is from East Africa]₁]₂
 though [DP someone]₁ may have been *e*₂, ...
 b. [VP Invited]₂
 though [DP someone]₁ may have been *e*₂ [CP who is from East Africa]₁, ...

From these facts Baltin (1981) suggests that a phrase extraposed from a direct object cannot target a position above VP while a phrase extraposed from the subject must target a position above VP and, for Baltin, even above the subject's surface position.

Fox & Nissenbaum (1999) and later Fox (2002) argue for a Host-Internal analysis of EXNP that capitalizes on the Copy-Theory of movement (Chomsky 1995) and a single-output model of grammar (Bobaljik 1995, Brody 1995, Groat & O’Neil 1996). For them, the host DP first undergoes an application of Quantifier Raising (QR) to the edge of the VP as shown in (6a) below. The extraposed material is subsequently late-merged into the higher copy of the host (as in Lebeaux 1988), which will be the copy of movement that is deleted at PF (6b).

- (6) a. [VP [VP I met [DP a linguist] this morning] [DP a linguist]]
 └───────────┬───────────↑

 b. [VP [VP I met [DP a linguist] this morning] [~~[DP a linguist]~~ CP who is from East Africa]]

A non-movement approach to EXNP of the Host-Internal variety is offered by [de Vries \(2002:ch.7\)](#). Following Koster's (2000) theory of *Parallel Construal*, which we will see in the following section, the extraposed material is part of a phrase projected from a null Boolean operator and is conjoined with the matrix clause (i.e., asyndetic coordination). For [de Vries \(2002\)](#), the second conjunct of the asyndetic coordination phrase (&P) contains not only the extraposed material but also a second occurrence of the matrix clause coordinate (7).

- (7) I [&P [VP met a linguist this morning] [&P &:
[VP ~~met~~ [DP ~~a linguist~~ [CP who is from East Africa]] ~~this morning~~]]]

As illustrated with strikethrough text, the EXNP word order is the result of targeting everything in the second conjunct with ellipsis except for the extraposed material.

2.2 Host-External Approaches to EXNP

Host-External analyses can be traced back to a suggestion about PP-extraposition from NPs by [Guéron \(1980:642\)](#) that was subsequently applied by [Guéron & May \(1984:sec. 2\)](#) to result-clause and relative clause extraposition.⁵ For Guéron & May, the extraposed material is extracted from its host and right adjoined to the verbal spine. The entire NP host subsequently undergoes an application of QR at LF to a position where it governs the extraposed material. It is by establishing this government relationship at LF that Guéron & May propose the extraposed material can be interpreted as if it were a complement to its host NP and interpretation would proceed as normal.

[Culicover & Rochemont \(1990\)](#) and [Rochemont & Culicover \(1990\)](#) adapt this idea to suggest that material extraposed from an NP is simply base-generated in an extraposed position that would achieve the same result. [Rochemont & Culicover \(1990:32–36\)](#) formulate the *Complement Principle* in (8), which encodes the requirement that the extraposed material is construable as a complement to the host NP (or DP, following [Abney \(1987\)](#)) for interpretive purposes and that this relationship is established under government.

⁵Outside of Transformational analyses of EXNP, which I focus on in this paper, [Kiss \(2005\)](#) provides a base-generation analysis of EXNP within the theory of Head-Driven Phrase Structure Grammar (HPSG). See [Webelhuth et al. \(2013\)](#) for a discussion of this system and [Crysmann \(2013\)](#) in the same collection for an extension of it. Put very simply, there is an index on the host, represented as the feature ANCHOR, which can percolate up the tree. Relative clauses are actively looking for an ANCHOR feature in order to identify a position to join with the structure. It is the local percolation of the ANCHOR feature that licenses the base-generation of a relative clause to the verbal spine and outside of the host.

At present it is difficult to fairly evaluate this analysis on par with the others as analyses of NPI-licensing in HPSG have emerged only relatively recently (e.g., [Tonhauser 2001](#), [Richter & Soehn 2006](#), [Sailer 2007](#)). It is not entirely clear to me exactly what the predictions of any given analysis would be concerning the licensing of NPIs in a relative clause be it in-situ or ex-situ. It is for this reason that I must set such analyses aside for the time being. However, an anonymous reviewer points out that the research in the unpublished dissertation by Heike Walker completed at Goethe-Universität am Main provides a Host-External analysis of EXNP that interprets the relative clause as if it were in the restrictor argument of its host.

(8) *Complement Principle*

β is a potential complement of α ($\alpha, \beta = X^{\max}$) only if α and β are in a government relation.

(adapted from [Rochemont & Culicover 1990:35](#))

The Complement Principle in conjunction with the *Principle of Full Interpretation* ([Chomsky 1986](#)) essentially forces material extraposed from an NP to be adjoined to a position on the verbal spine that is governed by the host in order to be properly interpreted. The ultimate result is that an extraposed relative clause adjoins to the first VP or IP that dominates the host roughly in accordance with the constituency facts seen in (4) and (5).⁶

Another base-generation analysis for EXNP of the Host-External variety is couched within the theory of *Parallel Construal* proposed by [Koster \(2000\)](#). [Koster \(2000\)](#) proposes employing the type of asyndetic coordination adopted by [de Vries \(2002\)](#). However, what [Koster \(2000:22\)](#) calls a Colon Phrase (:P) conjoins only the extraposed material with some phrase in the matrix clause that contains the acting host. For concreteness, I have chosen in (9) to conjoin the extraposed material with VP.

- (9) I [_P [_{VP} met [_{DP} a linguist] this morning] [_P : [_{CP} who is from East Africa]]]

The method for interpreting such a structure that is suggested by [Koster \(2000:22–23, 25\)](#) is that the extraposed material can be semantically interpreted as giving “further specification” to the acting host DP via “set intersection”.

2.3 Interpretive Predictions

As we have seen from the discussion above, these two sets of approaches to EXNP differ on where they assert the extraposed material is base-generated. Because of this, they also lead to different a priori predictions about where it is possible to interpret the extraposed material.

The Host-Internal analyses presented above predict that extraposed material should behave as if it were at some point in the restrictor argument of its host. A failure to observe any such behavior should be interpreted as a short-coming for this class of analyses. On the other hand, the Host-External analyses above lead us to expect the extraposed material to behave as if it were always adjoined to the verbal spine and never in the restrictor argument of its host. Observing that the extraposed material *does* behave as if it were in the restrictor argument of its host should be seen as a short-coming for this class of analyses. The following section will introduce exactly the type of phenomenon that could be used to test these predictions.⁷

⁶To be precise, [Culicover & Rochemont \(1990:30–35\)](#) argue that EXNP from a direct object targets the edge of VP, EXNP from a subject targets the edge of IP or optionally VP, and EXNP from a fronted *wh*-element targets the edge of CP. Along with a custom definition of government, it is these facts specifically that the Complement Principle is intended to account for.

⁷Other connectivity diagnostics have been explored in the literature as they relate to EXNP. [Taraldsen \(1981\)](#), for

3 A New Connectivity Diagnostic: NPIs Licensed in the Restrictor of *Every*

3.1 The Generalization

Among the class of NPIs originally discussed at length by Klima (1964) are elements like *any* and *ever*. Since at least Ladusaw 1979 it has been recognized that such NPIs are licensed in the restrictor argument of the universal quantifier *every* but not in its nuclear scope. This is illustrated in (10a) where the NPI *any* is licensed in a relative clause modifying *guest*, but goes unlicensed while in the matrix clause in (10b).⁸

- (10) a. Every [_{NP} guest who ate *any* of the potato salad] [_{VP} became ill].
 b. * Every [_{NP} guest who became ill] [_{VP} ate *any* of the potato salad].

The examples in (11)–(14) below are intended to help establish the generality of this pattern.

example, observed that the disjoint reference effect between the indirect object pronoun *her* and the R-expression *Kim* in the relative clause in (ia) is ameliorated in the context of EXNP (ib). Rochemont & Culicover (1990) go further to show that the disjoint reference effect persists when the pronominal form appears in subject position (ii).

- (i) a. * I showed her₂ [_{DP} a picture [_{CP} that Kim₂ thought I lost]] this morning.
 b. ? I showed her₂ [_{DP} a picture]₁ this morning [_{CP} that Kim₂ thought I lost]₁.
 (ii) a. * She₂ was shown [_{DP} a picture [_{CP} that Kim₂ thought I lost]] this morning.
 b. * She₂ was shown [_{DP} a picture]₁ this morning [_{CP} that Kim₂ thought I lost]₁.

These facts are interesting in that they can be interpreted as showing that material extraposed from a direct object is generated above the indirect object but below the subject. While they potentially tell us something about the height of the base-generated position of the extraposed material, they do not help us decide whether this position is internal or external to the host. The same can be said for the following data adapted from Guéron (1980:650). These examples suggest that the extraposed material with the minimizer *slightest* is in a position within the scope of sentential negation, but they do not tell us whether it was generated inside or outside of its host. (See Linebarger (1980) and especially Uribe-Etxebarria (1994:ch. 2) for relevant discussion of these and other data.)

- (iii) a. * Mary thinks that [_{DP} the extraposition transformation [_{CP} which has *the slightest* effect on LF]]
 hasn't been found yet.
 b. Mary thinks that [_{DP} the extraposition transformation]₁
 hasn't been found yet [_{CP} which has *the slightest* effect on LF]₁.

A more relevant diagnostic, which also employs the disjoint reference effects associated with Condition C, comes from Buring & Hartmann (1997:9–11). They observe from examples similar to the ones in (iii) that the disjoint reference effect observed between *his* in the host DP and the R-expression *John* in a clausal complement of the noun is not bled by EXNP.

- (iv) a. * Mary mentioned [_{DP} his₁ claim [_{CP} that John₁ is intelligent]] yesterday.
 b. * Mary mentioned [_{DP} his₁ claim]₂ yesterday [_{CP} that John₁ is intelligent]₂.

This suggests both that an extraposed complement clause is generated inside its host and that it must be interpreted in a position inside its host.

The NPI-licensing diagnostics we will see in this section, as a connectivity diagnostic that is observable as grammaticality, will provide the opportunity in sections 5 and 6 to further explore EXNP configurations in a way otherwise not afforded by Condition C effects.

⁸I will regularly use *any* in a partitive construction in an extra effort to block the free-choice reading of *any*, which is also licensed in the restrictor argument of *every* (e.g., Hoeksema 2012), but which would only introduce an additional complicating factor to the investigation in this paper. According to Dayal (2009), *any* in a partitive construction tends to resist a free-choice interpretation unless it appears in the semantic scope of a possibility modal.

In addition to the NPIs *any* and *ever*, so-called “minimizers” like *the slightest bit* and *so much as (a dime)* are also licensed in the restrictor argument of *every*. The contrasts in the (a.) and (b.) variants are between sentences with *every* and sentences with *some*, which Ladusaw (1979) noted does not license NPIs. These contrasts suggest that there is in fact something special about *every* that is responsible for licensing an NPI.⁹

- (11) a. We met [DP every biker [CP who has *ever* ridden on these trails]].
- b. * We met [DP some bikers [CP who have *ever* ridden on these trails]].
- (12) a. The company considered
[DP every applicant [CP who was from *any* of the local temp agencies]].
- b. * The company considered
[DP some applicants [CP who were from *any* of the local temp agencies]].
- (13) a. The bank contacted [DP every customer [CP who was in *the slightest bit* of debt]].
- b. * The bank contacted [DP some customers [CP who were in *the slightest bit* of debt]].
- (14) a. Sam stole [DP every bag [CP that had *so much as a dime* inside]].
- b. * Sam stole [DP some bags [CP that had *so much as a dime* inside]].

The examples below in (15)–(18) show that it is crucial for the NPI to be in the restrictor argument of the universal quantifier. The licensing pattern observed in these examples suggests that NPIs that are in a phrase that is simply adjoined to the matrix clause cannot be licensed by *every*.¹⁰

- (15) a. We met every biker [CP while riding on these trails].
- b. * We met every biker [CP while *ever* riding on these trails].
- (16) a. The company considered every applicant
[CP because they were from one of the local temp agencies].
- b. * The company considered every applicant
[CP because they were from *any* of the local temp agencies].

⁹NPIs are also licensed in the restrictor of the universal *all (of)*, but not *each* or *both*, and they are licensed in the restrictor argument of proportional *most (of)* and *few (of)*. In this paper, I will focus on the use of *every*. See Heim (1984) for a discussion of some interesting felicity conditions for the licensing of NPIs in the restrictor of *every* and Hoeksema (1998) for a discussion of the types of NPIs that do and do not appear in the restrictor of universals.

For the purposes of this paper, I will set aside the issue of how to properly model the formal properties of *every* that are responsible for licensing NPIs in its restrictor argument. However, I would direct the reader to Giannakidou (1998) and Hoeksema (2012) for challenges faced by both the standard monotonicity analysis of weak NPIs (Ladusaw 1979, von Stechow 1999) and the Anti-Additivity analysis of strong NPIs (Zwarts 1998) with respect to licensing NPIs in the restrictor argument of *every*. It will be enough for the argument being made in this paper to work purely with the empirical facts observed in this section.

¹⁰ Note that it is a property of certain connectives including *if*, *without*, *instead of*, and *before* that they independently license NPIs in their complements.

- (17) a. The bank contacted every customer [_{CP} after they were in some amount of debt].
 b. * The bank contacted every customer [_{CP} after they were in *the slightest bit* of debt].
- (18) a. Sam stole every bag [_{CP} because they had some money inside].
 b. * Sam stole every bag [_{CP} because they had *so much as a dime* inside].

Moreover, as we have already seen from the contrast in (10), it is not enough for the NPI to fall within the scope of the phrase headed by *every*. The examples below go further to show that *every* still fails to license an NPI in its nuclear scope even when a configuration is forced in which that NPI is in the syntactic and semantic scope of the phrase headed by *every*. In both (19) and (20), a quantificational DP in subject position binds a variable in the phrase containing the NPI and, therefore, presumably occupies a position in which the NPI is in that DP's syntactic and semantic scope. The contrast between the (a.) and (b.) variants suggest that, even under these conditions, the NPI fails to be licensed *every*.

- (19) a. [_{DP} Every girl]₁ leaves early because she₁ becomes bored.
 b. * [_{DP} Every girl]₁ leaves early because she₁ *ever* becomes bored.
 c. [_{DP} No girl]₁ leaves early because she₁ *ever* becomes bored.
- (20) a. [_{DP} Every boy]₁ worked while someone was watching him₁.
 b. * [_{DP} Every boy]₁ worked while *anyone* was watching him₁.
 c. [_{DP} No boy]₁ worked while *anyone* was watching him₁.

The (c.) variants of (19) and (20) substitute the quantifier *no*, which licenses NPIs in its restrictor argument as well as its nuclear scope. These examples are intended to provide assurance that the culprit for the relevant unacceptability observed in (15)–(20) is not necessarily a violation of the locality constraints on NPI-licensing.¹¹ The observation that *no* is able to license the NPIs in these clausal adjuncts suggests that it is indeed a failure to satisfy a configurational requirement that is responsible for the inability of *every* to license NPIs in material adjoined to the verbal spine.

This characterization of the conditions on the licensing of NPIs by *every* is consistent with the consensus in a portion of the literature that the conditions on NPI-licensing are at least in part syntactic. In particular, it has been argued by Linebarger (1980, 1987), Uribe-Etxebarria (1994), de Swart (1998), and Guerzoni (2006) that NPIs are licensed by virtue of being interpreted in the scope of their licenser at LF. For the time being, I will assume the same, but we will see relevant evidence in section 5 that this is correct. Given this particular conception of the conditions on NPI-licensing, it is possible to capture the distribution of NPIs in the data above with the generalization in (21).

¹¹It has been recognized at least since Fauconnier (1975) and Linebarger (1980) that the licensing of certain NPIs may show sensitivity to the types of island constraints discussed in Ross (1967), including certain adjunct islands. See Guerzoni (2006) for a recent discussion and other relevant references.

- (21) An NPI is licensed by *every* only if that NPI is generated in the restrictor argument of *every*.

This condition on NPI-licensing ensures that there will be some means available for interpreting an NPI in the restrictor of *every* at LF. It also provides a straightforward way to evaluate the two sets of analyses outlined previously in section 2. Finding that an NPI remains licensed by *every* following the extraposition operation would suggest that the extraposed material is base-generated in the restrictor argument of the host. This is naturally captured by the Host-Internal analyses. If we find that an NPI is no longer licensed following the extraposition operation, we would have evidence for claiming that the extraposed material is not base-generated in the restrictor argument of the host. The Host-External theories would more naturally account for this state of affairs.

3.2 The Test Cases

The examples in (22) represent one of the relevant data points to be evaluated. A relative clause containing the NPI *any* is intended to be interpreted as a modifier for a non-adjacent host, *guest* in this case. The contrast in acceptability that arises from the alternation between *every* in (22a) and *some* in (22b) suggests that *every* is capable of licensing the NPI in the extraposed material.

- (22) a. They took [_{DP} every guest]₁ to the hospital [_{CP} who ate *any* of the potato salad]₁.
 b. * They took [_{DP} some guests]₁ to the hospital [_{CP} who ate *any* of the potato salad]₁.

The additional examples in (23)–(26) are variations of the examples above and are intended to help establish the robustness of this pattern. The (a.) variants present the NPI *ever* and minimizers in relative clauses that have been extraposed from a host headed by *every*. The (b.) variants provide the relevant contrast with the quantifier *some*.

- (23) a. We met [DP every biker]₁ yesterday [CP who had *ever* ridden on these trails]₁.
b. * We met [DP some bikers]₁ yesterday [CP who had *ever* ridden on these trails]₁.
- (24) a. The company considered [DP every applicant]₁ last month
[CP who was from *any* of the local temp agencies]₁.
b. * The company considered [DP some applicants]₁ last month
[CP who were from *any* of the local temp agencies]₁.
- (25) a. The bank contacted [DP every customer]₁ today
[CP who is in *the slightest bit* of debt]₁.
b. * The bank contacted [DP some customers]₁ today
[CP who are in *the slightest bit* of debt]₁.
- (26) a. Sam stole [DP every bag]₁ last night [PP that had *so much as a dime* inside]₁.
b. * Sam stole [DP some bags]₁ last night [PP that had *so much as a dime* inside]₁.

Intuitively, the EXNP structures here follow the same licensing pattern observed with the in-situ structures in the previous section. The acceptability of an NPI in the extraposed relative clauses seems to be dependent on the presence of *every* as opposed to *some*. This contrast suggests that *every* is capable of licensing an NPI even when the NPI appears in an extraposed relative clause.¹²

At this point we might be tempted to conclude that the predictions of the Host-Internal analyses are borne out. However, the crucial comparison to be made is between sets of sentences like in (2), which has been repeated below. Recall that it is whether or not the NPI remains licensed in the extraposed position that provides a window into the derivation of EXNP structures.

- (2) a. We took [DP every guest [CP who ate *any* of the potato salad]] to the hospital.
 b. We took [DP every guest]₁ to the hospital [DP who ate *any* of the potato salad]₁.

In addition to the licensing of the NPI, though, there are likely to be additional factors influencing our judgment of these sentences. These might include, for example, the effect of EXNP on acceptability and possibly the increased difficulty in licensing an NPI that this additional complexity might introduce. The following section reports on an experiment designed to test the intuitions reported here and the predictions in section 2.3 while taking these additional factors into account.

4 Experimental Evidence

A judgement study was conducted to evaluate the acceptability of NPIs in both in-situ and extraposed relative clauses. Based on the claims in the previous sections, we should expect to find that sentences with an NPI in a relative clause that modifies the restrictor argument of *every* are perceived as more acceptable or more natural than when the same relative clause modifies the restrictor argument of *some*. Finding that this contrast disappears when there is no NPI in the relative clause would be a confirmation of Ladusaw’s (1979) claim that *every*, but not *some*, licenses NPIs in its restrictor argument.

¹²The data in (i) are cited by Akmajian & Lehrer (1976:fn. 8) who credit Bresnan (1973) for identifying the contrast. Similar data are also cited by Guéron (1980:fn. 17). I have not myself seen Bresnan 1973, but such data are presented in Guéron (1980) as evidence that EXNP is a syntactic operation that feeds LF rules for interpretation.

- (i) a. [DP The best friend [CP that I *ever* had]] is gone.
 b. * [DP The best friend]₁ is gone [CP that I *ever* had]₁.

These data are relevant for the fact that the NPI *ever* in (ia.) is licensed by the superlative *best* when the relative clause is in-situ but is not licensed in the EXNP configuration in (ib.). However, it does not appear that superlative adjectives are entirely incapable of licensing NPIs in

- (ii) a. Sam wrote [DP the longest title [CP that I had *ever* seen on a paper]] last year.
 b. Sam wrote [DP the longest title]₁ last year [CP that I had *ever* seen on a paper]₁.

Understanding what separates examples (i) and (ii) goes beyond the scope of this article and so the issue must be set aside for now.

Moreover, this experiment was designed so as to identify any difference in the ability of *every* to license an NPI in an in-situ or extraposed relative clause. If it is the case that an NPI is licensed in both in-situ and extraposed relative clauses, then we should expect to see the asymmetry between *every* and *some* that arises in the presence of an NPI regardless of the position of the relative clause. Conversely, if it is the case that an NPI fails to be licensed in extraposed material, we expect to observe the above quantifier asymmetry with an in-situ relative clauses but the asymmetry should be significantly reduced or effectively neutralized with an extraposed relative clause.

4.1 Participants

Sixty-four native speakers of English were recruited for the study using Amazon’s Mechanical Turk, a web-based service for crowd-sourcing tasks.¹³ Only participants with a minimum 95% success-rate on task completion (minimum of 100 tasks) were accepted for participation. To prevent evaluating data from non-native speakers, participation was restricted to IP addresses in the United States and participants were asked to report their language abilities. Only a single participant reported a first language other than English. This participant’s data was removed and another participant was recruited to replace the lost data. Participants ranged in age from 18 to 73 with an average age of 36.33 years and a median age of 33 years. Of the 64 participants, 53% were female and 47% were male.

4.2 Materials

The materials consisted of 16 items distributed across 8 lists in a fully crossed $2 \times 2 \times 2$ design that included the factors *Extraposition*, *Host*, and *Polarity*. A full example item is provided in (27). Items differing on the nature of the Host, had either the NPI-licensing *every* (27a) or the non-NPI-licensing *some* (27b). The dimension *Polarity* had items vary between having an NPI in the relative clause (27a) or some other non-polarity-sensitive element (27c). Varying items on the dimension of *Extraposition* provided an in-situ control for each of the ex-situ configurations.

- (27) a. *Ex-situ / Every / NPI*
 Park rangers removed every camper yesterday who was at any of the sites with significant flooding.
- b. *Ex-situ / Some / NPI*
 Park rangers removed some campers yesterday who were at any of the sites with significant flooding.
- c. *Ex-situ / Every / Other*
 Park rangers removed every camper yesterday who was at one of the sites with significant flooding.

¹³Amazon’s Mechanical Turk can be accessed <https://www.mturk.com>.

- d. *Ex-situ / Some / Other*
Park rangers removed some campers yesterday who were at one of the sites with significant flooding.
- e. *In-situ / Every / NPI*
Yesterday park rangers removed every camper who was at any of the sites with significant flooding.
- f. *In-situ / Some / NPI*
Yesterday park rangers removed some campers who were at any of the sites with significant flooding.
- g. *In-situ / Every / Other*
Yesterday park rangers removed every camper who was at one of the sites with significant flooding.
- h. *In-situ / Some / Other*
Yesterday park rangers removed some campers who were at one of the sites with significant flooding.

In all cases the NPI in the extraposed relative clause was *any*. In the same way as noted in footnote 8, the NPI sometimes appeared in a partitive construction in an attempt to discourage a possible free-choice reading. The non-NPI counterparts did not always contain a partitive construction as they do in (27). For the purpose of grammaticality or coherence, a simple indefinite or other non-polarity-sensitive element was used instead.¹⁴ A full list of the experimental items can be found in Appendix A.

4.3 Procedure

Once agreeing to participate, participants clicked a link that took them to the on-line experiment presentation tool Ibex Farm where the experimental items were presented.¹⁵ Participants were told that they would be reading sentences and evaluating their naturalness as sentences of English. After providing informed consent they then received a short guided practice for using a 7-point Likert-scale where 1 corresponded to “Completely Unnatural” and 7 corresponded to “Completely Natural”.

The items were presented in a Latin-square design and were presented randomly among 38 filler items. The filler items had a large number of non-canonical word orders including passive and cleft constructions. A total of 4 items were designed to be ungrammatical by including an island violation, a case assignment problem, or a violation of a selectional restriction. The Likert-scale

¹⁴One might note that these issues could be avoided entirely by using an NPI like *ever* or a minimizer instead of *any*. Minimizers were avoided because the experimental design did not make it possible to be sure that participants were not interpreting the minimizer under a literal interpretation. The reason *any* was preferred to *ever* is that this experiment is part of a larger study that is also investigating the extraposition of PPs from NP and *ever* is not possible in PPs.

¹⁵ Ibex Farm was developed by Alex Drummond and can be accessed at: <http://spellout.net/ibexfarm/>.

with the corresponding scale values were presented along with each item. The experiment took an average of approximately 15 minutes to complete and participants received \$0.50 in compensation upon completing the task.

4.4 Results

The mean naturalness rating for each condition is presented numerically in Table 1 and graphically in Figure 1.

	Ex-Situ		In-situ	
	Every	Some	Every	Some
NPI	4.60 (0.13)	3.87 (0.14)	4.96 (0.13)	3.98 (0.14)
Other	5.14 (0.11)	5.13 (0.12)	5.23 (0.13)	5.44 (0.12)

Table 1: Mean naturalness ratings by condition with standard errors in parentheses.

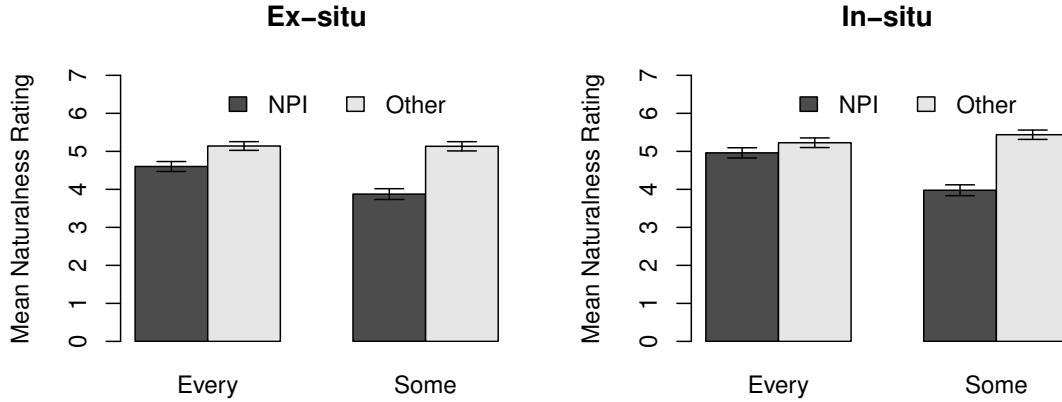


Figure 1: Mean naturalness ratings by condition with standard errors bars.

The data were analyzed using a linear mixed-effects (LME) regression model (Baayen et al. 2008) with the lme4 package (Bates et al. 2014) in the statistical computing environment R, version 3.2 (R Core Team 2015).¹⁶ The fixed effects of Extraposition, Host, and Polarity, as well as their interactions, were included as predictors and centered around 0 (Ex-situ, Every, NPI = 1). Both subjects and items as well as the predictors and their interactions were assigned random slopes. The model that was evaluated is provided in (28).

$$(28) \quad \text{Rating} \sim \text{Extraposition} \times \text{Host} \times \text{Polarity} + (\text{Extraposition} \times \text{Host} \times \text{Polarity} + 1 | \text{subject}) + (\text{Extraposition} \times \text{Host} \times \text{Polarity} + 1 | \text{item})$$

Pointwise comparisons and 95% Confidence Intervals (95% CI) were calculated with two-tailed *t*-tests of the subject means.

¹⁶The statistical computing package R can be accessed at: <http://www.r-project.org/>.

The LME model yielded the results summarized in Table 2. Significance at the conventional level $\alpha = 0.05$ was determined by an absolute t -value greater than 2.00. A significant main effect

	$\hat{\beta}$	Std. Error	t
(Intercept)	4.793	0.128	37.26
Extrapolation	-0.105	0.043	-2.45
Host	0.190	0.048	3.99
Polarity	-0.438	0.084	-5.23
Extrapolation \times Host	-0.006	0.039	-0.15
Extrapolation \times Polarity	-0.010	0.045	-0.23
Host \times Polarity	0.237	0.062	3.85
Extrapolation \times Host \times Polarity	-0.055	0.048	-1.16

Table 2: LME model results with estimate, standard error, and t -value.

was revealed for each of the fixed effects Extrapolation, Host, and Polarity. Additionally, a significant interaction was observed for the type of Host and the Polarity sensitivity of the extraposed material, reflecting a significantly larger effect of Polarity for conditions with the host *some* than for the conditions for the host *every*. In particular, collapsing over the factor Extrapolation, we find that there was overall a significantly greater penalty in naturalness for replacing a non-NPI with an NPI in the relative clause when the host was *some* ($\Delta_{\hat{\mu}} = 1.36$, 95% CI [1.09, 1.63]) than there was when the host was *every* ($\Delta_{\hat{\mu}} = 0.40$, 95% CI [0.18, 0.62]).

The LME model did not detect a significant effect of the three-way interaction term. Looking closely at the *every* conditions in Table 1 and Figure 1, though, it does seem that numerically there was some additional penalty in naturalness observed for having an NPI in an extraposed relative clause compared to having an NPI in an in-situ relative clause. For this reason, a set of post-hoc analyses were designed to further investigate the effect.

First, examining only those conditions with an NPI in the relative clause, a comparison of the confidence intervals for the difference between the estimate of the mean for each Host condition in an Ex-situ construction (27a)/(27b) ($\Delta_{\hat{\mu}} = 0.73$, 95% CI [0.35, 1.11]) and the difference between the estimate of the mean for the same two conditions In-situ (27e)/(27f) ($\Delta_{\hat{\mu}} = 0.98$, 95% CI [0.69, 1.27]) failed to indicate a significant effect of Extrapolation on naturalness ratings. A pair of by-participants (F_1) and by-items (F_2) repeated-measures ANOVAs were also performed on the NPI conditions. These analyses, like the LME model, showed a significant effect of both Extrapolation ($F_1(1, 63) = 6.09, p < 0.05; F_2(1, 15) = 4.91, p < 0.05$) and the type of Host ($F_1(1, 63) = 48.8, p < 0.01; F_2(1, 15) = 31.7, p < 0.01$). However, this analysis, too, failed to observe a significant interaction between Extrapolation and Host ($F_1(1, 63) = 1.22, p < 0.30; F_2(1, 15) = 0.99, p < 0.35$).

The same analyses were also performed over only those conditions with *every* as the host. Comparing the confidence intervals for the difference between the estimate of the mean for the two

Polarity conditions ex-situ (27a)/(27c) ($\Delta_{\hat{\mu}} = 0.54$, 95% CI [0.22, 0.85]) and the same conditions in-situ (27e)/(27g) ($\Delta_{\hat{\mu}} = 0.27$, 95% CI [-0.04, 0.57]) again did not indicate a significant effect of Extraposition on naturalness ratings. In the repeated-measures ANOVAs, Polarity was significant by-participants and by-items ($F_1(1, 63) = 14.2, p < 0.01$; $F_2(1, 15) = 5.64, p < 0.05$) while Extraposition was significant by-participants and marginally significant by-items ($F_1(1, 63) = 4.55, p < 0.05$; $F_2(1, 15) = 3.43, p < 0.10$). The interaction of Extraposition and Polarity failed to reach significance ($F_1(1, 63) = 1.45, p < 0.25$; $F_2(1, 15) = 1.46, p < 0.25$).

4.5 Discussion

The main effect of Extraposition found in the LME model is not particularly surprising. We can understand the lower acceptability ratings for Ex-situ structures to be a reflection of the fact that EXNP is a marked structure in out-of-the-blue contexts. The main effect observed for each of Host and Polarity in the LME model do not follow directly from any a priori predictions made here. However, we might imagine that the main effect of the presence or absence of an NPI in the relative clause reflects the additional cost in processing related to licensing an NPI. The main effect of the type of Host, and perhaps even some of the main effect of Polarity, seems to be carried by the significant interaction between these two factors. From the direction of this interaction, which is apparent in the graph in Figure 1, we see that NPI conditions with the host *every* consistently received higher ratings than the NPI conditions with the host *some*. This is a clear reflection of the intuition that NPIs are licensed by *every* but are not licensed by *some*.¹⁷

Concerning the three-way interaction, we were looking for this effect as a sign that the sensitivity of an NPI in a relative clause to the type of host is affected by whether or not that relative clause has been extraposed. Finding that EXNP neutralizes the effect of the type of host would suggest that NPIs are not licensed in extraposed material. Interestingly, this three-way interaction between factors was not detected in the LME model. In the absence of this interaction there is no evidence that the magnitude of the additional decrease in perceived naturalness that results from having an NPI in a relative clause with a universal host is different based on whether or not the relative clause is in-situ or extraposed. This means that we are unable to reject the null-hypothesis that NPIs are equally licensed by the presence of *every* in-situ and ex-situ.

The post-hoc analyses also failed to reject this null-hypothesis. The lack of evidence that Extraposition interacts with the Host conditions given an NPI in the relative clauses means that we are unable to say that the observed licensing asymmetry between *every* and *some* differs given the

¹⁷The anonymous reviewers point out that the relatively high condition means and the relatively small difference between the levels of Host in the NPI conditions fail to meet the expectations developed based on the discussion in section 3. Specifically, one might expect to observe lower response means for the NPI conditions with *some* as part of the claim by Ladusaw (1979) that *some* does not license NPIs. It is important to keep in mind that there are no a priori predictions made regarding the estimates of the means for the experimental conditions. The values of the estimates for the true means of these conditions will necessarily be an artifact of the design of this particular experiment. For this reason, we are only interested in interpreting the predictors and their interactions that are included in the model in (28).

position of the relative clause. The inability to identify an interaction between Extraposition and the Polarity conditions when the host was headed by *every* means we cannot conclude that the observed ability of *every* to license an NPI differed as a function of the position of the relative clause. Something extra must be said, then, concerning the additional penalty that seems to be present numerically when an NPI is in extraposed material. A potential explanation that one might pursue is that this effect is an off-line reflection of some additional increase in on-line processing effort that is associated with licensing an NPI either across a greater distance or in the face of greater structural complexity. The current study was not designed to speak to either of these possibilities, thus the issue must be left for future research.

To summarize briefly, we saw a significant interaction of the factors Host and Polarity such that NPIs were reliably perceived as less natural when the host quantifier was *some* compared to when the host quantifier was *every*. We also failed in both the planned and post-hoc comparisons, to identify any evidence that this licensing pattern is interrupted by EXNP. These results are consistent with the intuitions that were reported above: NPIs licensed in a relative clause by *every* remain licensed following EXNP. Returning to the predictions made by the two sets of analyses for EXNP discussed in section 2, these results show the predictions of Host-Internal analyses borne out. Although a relative clause has been extraposed, with respect to NPI-licensing it behaves as if it were generated in the restrictor argument of the DP that hosts it.

5 Towards Modelling Extraposition from NP

Having seen evidence that a Host-Internal analysis of EXNP will be necessary, at least to account for the NPI-licensing data at hand, a question that naturally follows is which of the available analyses should be preferred. The data that we have concerned ourselves with so far do not provide a way to directly compare the three Host-Internal analyses discussed in section 2.1. Each of those analyses is consistent with the generalization from (22), which is repeated below and captures Ladusaw's (1979) original observation.

- (22) An NPI is licensed by *every* only if that NPI is generated in the restrictor argument of *every*.

In this section I will gradually introduce additional data that will allow us to evaluate each of the Host-Internal analyses. On the basis of the data to be presented, I will suggest adopting the QR-based analysis of EXNP from Fox & Nissenbaum (1999).

Let us start by considering the subextraction analysis of Ross (1967) again. Recall that on this analysis of EXNP, the extraposed relative clause has been extracted out of its host and right-adjoined to the verbal spine. On this analysis, it will be necessary to reconstruct the extraposed material back into the restrictor argument of *every*. Only in this way will it be possible to satisfy the configurational condition that an NPI be interpreted in the scope of its licensor at LF.¹⁸

¹⁸Independent of the discussion here, any need to reconstruct the extraposed material is arguably a weakness

To see that reconstruction of the material containing the NPI will be necessary, we can consider the following examples, which have been adapted from Linebarger (1980:225-228). Equivalent examples are discussed in this same context by Uribe-Etxebarria (1994:ch. 2). It is interesting to note first that the existentially quantified subject in (29) is scopally ambiguous with respect to sentential negation. The truth of the surface scope reading in (29a) requires a context in which there is a particular doctor that was not available. The inverse-scope reading in (29b) requires a situation in which there are no doctors that are available.

(29) A doctor wasn't available.

a. $\exists > \neg$

Context : Tim and Pam are doctors. Only Tim wasn't available.

'There is a (certain) doctor x such that x was not available.'

b. $\neg > \exists$

Context : Tim and Pam are doctors. Both Tim and Pam weren't available.

'It is not the case that there is a doctor x such that x was available.'

What is interesting for our purpose is the observation that the scope of the subject and sentential negation is disambiguated given a relative clause containing an NPI. The string in (30) strongly resists the surface scope reading in (30a) but is compatible with the inverse scope reading in (30b).

(30) A doctor who knows *anything* about acupuncture wasn't available .

a. $*\exists > \neg$

Context : Tim and Pam are doctors who know about acupuncture. Only Tim wasn't available.

'There is a (certain) doctor x such that x knows about acupuncture and it is not the case that x was available.'

b. $\neg > \exists$

Context : Tim and Pam are doctors who know about acupuncture. Both Tim and Pam weren't available.

'It is not the case that there is a doctor x such that x knew about acupuncture and x was available.'

A way to make sense of these facts is to assert that the relative clause that contains the NPI must be interpreted at LF in a position that is within the scope of sentential negation. Taking it to be the case that logical scope relations are determined at LF (e.g. May 1985), then the obligatory low scope of the subject would follow from something along the lines of the Principle of Full Interpretation. While the subject and its relative clause may be spoken outside the scope of negation, if they are

of this analysis. I would refer the reader to Williams (1974), Taraldsen (1981), Rochemont & Culicover (1990), Fox & Nissenbaum (1999), Fox (2002), and Bhatt & Pancheva (2004) for interpretive evidence that extraposed material must be interpreted in its extraposed position.

not in a position in together where the relative clause can be construed as a modifier of the subject, the resulting structure could not be interpreted in full and would consequently not be a legitimate linguistic representation.

In short, the data above in (30) suggest that NPI-licensing affects logical scope relations, which in turn suggests that NPI-licensing is itself determined at LF. It is from this conclusion that we formulate the expectation that it will be necessary to reconstruct the extraposed material back into the restrictor argument of *every* in order to satisfy the configurational constraints on NPI-licensing. Given this, we can formulate a very specific prediction regarding when NPI-licensing by *every* will be possible. On the Ross-style analysis, NPI-licensing by *every* should no longer be possible if there is some independent requirement to interpret the extraposed material in its extraposed position at LF. The resulting conflict over where to interpret the extraposed material is predicted to result in ungrammaticality.

A requirement of the relevant type for testing this prediction comes in the form of Antecedent-Contained Deletion (ACD). An example is provided in (31).

- (31) I [_{VP} bought every book]_I yesterday [_{CP} that I was told to Δ_1].

Based on the observations in Sag (1976) and Williams (1977) and following May (1985), the relative clause containing the ellipsis site must evacuate the antecedent VP. It is in this way that the LF-identity relationship that is required for deletion can be established between the ellipsis site and the antecedent VP without falling into the problem of infinite regress. Baltin (1987) proposes an EXNP-by-extraction analysis of ACD intended to do exactly this. For him, the relative clause in (31) is extracted from its host *every book* and adjoined to the VP. By allowing movement to only optionally leave a trace (e.g. Pesetsky 1982, Lasnik & Saito 1984), the ellipsis site can be resolved under LF-identity with the antecedent VP.¹⁹ Basically, then, it is because the extraposed material is interpreted in its extraposed position at LF that ACD is licensed.

Because on this analysis of EXNP the choice to satisfy either the conditions on ACD-licensing or the conditions on NPI-licensing would necessarily violate the conditions of the other, we should observe ungrammaticality in a sentence with both an instance of ACD and an NPI licensed by *every*. As the contrast in (32) demonstrates, this expectation is not borne out. The extraposed relative clause can simultaneously contain an ACD site and an NPI licensed by *every*.

- (32) a. Kim [_{VP} bought every book]_I yesterday [_{CP} that she had *ever* been told to Δ_1].
b. * Kim [_{VP} bought some books]_I yesterday [_{CP} that she had *ever* been told to Δ_1].

Given the particular beliefs about ACD that have been adopted here, I interpret the grammaticality of (32a) as indicating that reconstruction is not necessary for the licensing of NPIs in extraposed material. It can, therefore, be taken as evidence against subextraction analyses of EXNP like those proposed by Ross (1967), Baltin (1978, 1981), and Guéron & May (1984).

¹⁹See Larson & May (1990) and Fox (2002) for further discussion of the analysis presented in Baltin 1987.

We can also note that (32a) resists a non-syntactic analysis of the EXNP operation. Assume that NPI-licensing in an extraposed relative clause with a host headed by *every* is possible because the EXNP operation involves constituent reordering at PF (e.g. Hunter & Frank 2014). Such an analysis falls into the Host-Internal variety of analyses seeing as the extraposed material is generated in the restrictor argument of its host. It would also straightforwardly account for the ability of the host to license an NPI in extraposed material because the extraposed material in fact never leaves the host and could be interpreted in its restrictor argument at LF. The issue that this analysis faces is that EXNP can be observed to feed ACD.

Building on data from Larson & May (1990), Tiedeman (1995) observes contrasts like the one between (33a) and (33b). The example in (33a) shows that a relative clause contained in the subject of an embedded finite clause cannot be interpreted in a position where the ACD site can be resolved to the matrix VP. What (33b) reveals is that an application of EXNP will produce the structural configuration required to properly resolve the ACD site. As the bracketing of this examples illustrates, this can be achieved if the extraposed relative clause targets a position outside the matrix VP.²⁰ The example in (33c) that replaces *every* with *some* provides the relevant contrast with (33b) to show that *every* is licensing the NPI in the extraposed relative clause.

- (33) a. * I [_{VP} claimed that [_{DP} every movie [_{CP} that you *ever* did Δ_1]] was awful]₁.
 b. I [_{VP} claimed that [_{DP} every movie] was awful]₁ [_{CP} that you *ever* did Δ_1].
 c. * I [_{VP} claimed that [_{DP} some movies] were awful]₁ [_{CP} that you *ever* did Δ_1].

The contrast between (33a) and (33b) is unexpected on the view that the mechanism responsible for EXNP operates at PF. Finding that EXNP shows its influence both on the linear string and on the semantic interpretation suggests that we are observing a syntactic operation. The contrast between (33b) and (33c), then, is showing us that an NPI licensed by *every* remains licensed following the syntactic operation that is responsible for EXNP. I take this to be evidence against a purely non-syntactic analysis of the EXNP mechanism and the NPI-licensing phenomenon.

This leaves us with two remaining Host-Internal analyses: the QR analysis in Fox & Nissenbaum 1999 then Fox 2002 and the asyndetic coordination analysis in de Vries 2002. Both of these analyses are suited to handle the facts in (32) and (33). For each analysis, the extraposed material is in the restrictor argument of its host and the host is in a position external to the antecedent VP. This is precisely the type of configuration required to simultaneously license an NPI with *every* and properly resolve an ellipsis site in the extraposed material.

In choosing between these two remaining analyses, we can note that the asyndetic coordination analysis suffers from a general interpretive problem. Webelhuth et al. (2013:38) point out that, given a quantificational head, the phrases being coordinated could potentially have different truth conditions. The issue is more serious for the universally quantified structures that we have been

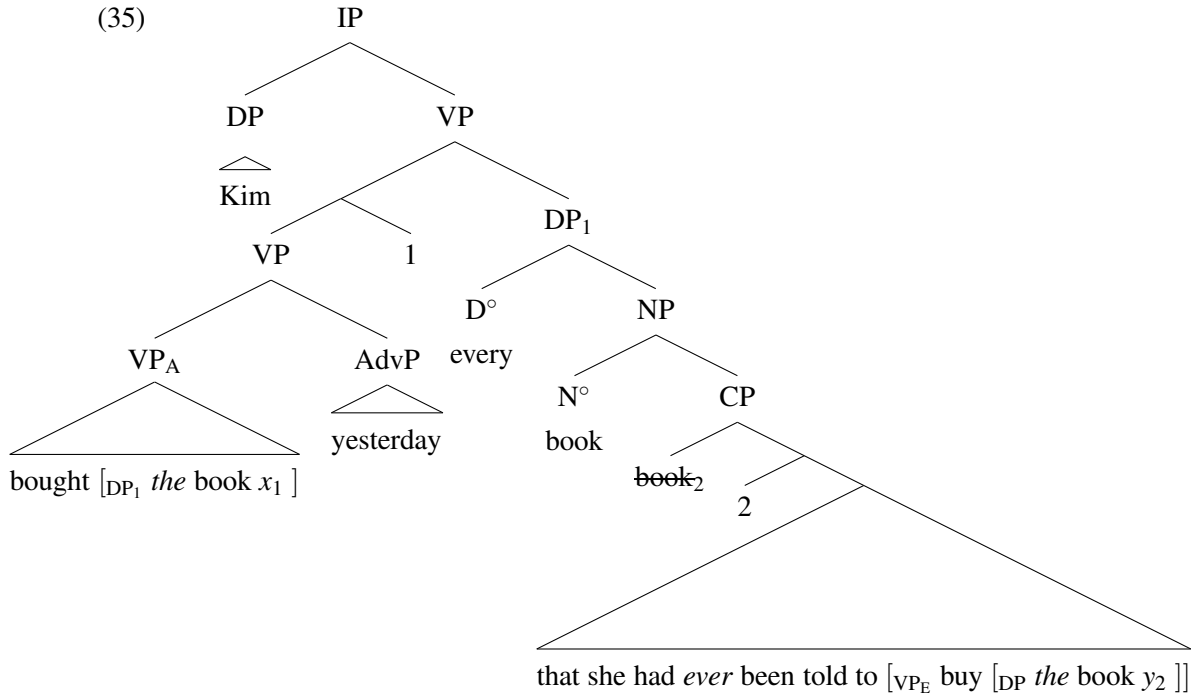
²⁰See Fox (2002) for further relevant discussion of such examples.

considering in this paper. We in fact get the wrong truth conditions. For example, the postulated conjuncts for the structure in (34) would respectively mean *x took every guest to the hospital* and *x took every guest who ate any potato salad to the hospital*.

- (34) They [_{&:P} [_{VP} took every guest to the hospital] [_{&:P} &:
 [_{VP} ~~took~~ [_{DP} ~~every guest~~ [_{CP} who ate any of the potato salad]] ~~to the hospital~~]]]

Because the truth conditions of the first conjunct entail the truth conditions of the second, the conjunction of the two is expected to be equivalent to *x took every guest to the hospital*. However, this example, in which the extraposed relative clause is intended to serve as a restrictive modifier, has only the interpretation in which a subset of all the guests, namely those who ate the potato salad, were taken to the hospital.

This interpretive problem is not an issue for the QR analysis, which is designed to interpret the relevant quantifier only once. Fox (2002) suggests that, for extraposition structures to be interpretable, the lower copy of the host must be turned into the kind of object at LF that can be bound by the higher copy. Following Engdahl (1980) and Sauerland (1998), Fox (2002:67) formulates an operation called *Trace Conversion* which effectively turns the lower copy into a definite description with a variable. The variable that is introduced by this operation can then be bound by the binder index introduced as part of the movement of the host in the way suggested by Heim & Kratzer (1998). This is illustrated in (35), which is a rough partial representation of the LF for the example in (32a).



The direct object *every book* here has undergone an instance of QR to the edge of the matrix VP. The lower copy of the direct object in the matrix antecedent VPA has undergone Trace Conversion,

which replaced the lower instance of *every* with a null variant of *the* and inserted the variable *x* to yield *the book x*. The relative clause containing both the NPI *ever* and the elided VP_E, which was merged counter-cyclically, is present only in the higher copy of QR'ed direct object. The NPI is licensed in this configuration by virtue of being interpreted in the restrictor argument of *every*. The identity relationship between VP_E and VP_A required for deletion of VP_E can also be satisfied in this configuration as VP_E is not contained in VP_A. Along with the additional assumption that relative clauses can employ a head-internal matching analysis,²¹ the lower copy of the movement dependency in the relative clause will undergo Trace Conversion to yield *the book y*. Modulo the names of the variables, the LF representations of these VPs are identical and ellipsis is licensed.

The QR-based analysis of EXNP directly accounts for the licensing of NPIs in extraposed material while simultaneously accounting for the additional data presented here. On the basis of these results, I would suggest that it is this analysis that we get from Fox & Nissenbaum (1999) and Fox (2002) that is best suited for modeling instances of EXNP that call for a Host-Internal approach.

6 On Maximizing Empirical Coverage

While the data that have been presented in the preceding discussion support the conclusion that a Host-Internal mechanism for deriving EXNP is generally available, they do not force us to conclude that EXNP configurations can only be derived via Host-Internal means. It remains to be shown that, in the absence of the need to employ a Host-Internal strategy, there is no Host-External means for deriving EXNP configurations.

The same point can be raised with respect to the types of data that are typically put forward in support of Host-External analyses. Perhaps the strongest evidence for the necessity of a Host-External approach to EXNP includes the observation that EXNP is not subject to the full range of island constraints that we find with leftward movements (e.g., Rochemont & Culicover 1990) and the possibility for split antecedents (Perlmutter & Ross 1970). We will look at each of these in turn below, but it is worth noting at this point that, while such data may suggest the need for some Host-External analysis of EXNP, they do not force us to the conclusion that EXNP configurations can only be derived via some Host-External mechanism.

This state of affairs places us in a position to employ the investigative logic that has recently been applied to Right Node Raising configurations by Barros & Vicente (2011) and Larson (2012). In what follows we will examine sentences that simultaneously contain a suspected requirement to employ a Host-External strategy and our new suspected requirement to employ a Host-Internal strategy. If we find, in the form of ungrammaticality, that these contradictory requirements on the derivation cannot be simultaneously accommodated, we can conclude that both types of mechanisms are available to the grammar and necessary to derive EXNP configurations. However, if we find that

²¹Fox (2002) cites Kayne (1976), Cinque (1981–82), Sauerland (1998), Cresti (2000) and Kennedy (2000).

such sentences do not result in ungrammaticality, we would have evidence that one or both of these two approaches is no longer needed. Assuming that these two approaches | either *inside* or *outside* the host | exhaust the logical possibility space, we are licensed to make the stronger conclusion that one approach in particular could be dispensed with.

On the basis of the particular English data that we examine below, I will suggest that only a single strategy is necessary and that the QR-based analysis of EXNP is able to provide sufficient empirical coverage. We will see in the same way as above that the virtue of this analysis is ultimately its combination of the benefits of Host-Internal and Host-External analyses. The extraposed material is simultaneously generated inside of its host and in its extraposed position.

6.1 Island-Violating EXNP

The example in (36), which is adapted from [Rochemont & Culicover \(1990:33\)](#), provides an example of a relative clause extraposed from a DP in subject position.

- (36) $[_{DP} \text{ A man }]_1$ came into the room $[_{CP} \text{ that no one knew }]_1$.

Examples such as this are often noted to represent an exception to the *Subject Condition*, which is presented in (37).

- (37) *Subject Condition*

A DP in Spec,IP is opaque for subextraction.

The examples in (38) illustrate. Leftward subextraction from a DP serving as the grammatical subject (38a) is significantly degraded relative to subextraction from the same DP that is in the associate position of expletive-*there* (38b) or in the direct object position (38c).²²

- (38) a. * This is $[_{\text{the animal}}]_2$ that $[_{\text{a documentary about } e_2}]_1$ was reviewed e_1 last week.
 b. ? This is $[_{\text{the animal}}]_2$ that there was $[_{\text{a documentary about } e_2}]_1$ reviewed e_1 last week
 c. This is $[_{\text{the animal}}]_2$ that they reviewed $[_{\text{a documentary about } e_2}]$ last week.

[Rochemont & Culicover \(1990\)](#) interpret this state of affairs as strong evidence against a movement analysis of EXNP and in favor of a Host-External base-generation analysis, which at the time was the major competing approach.

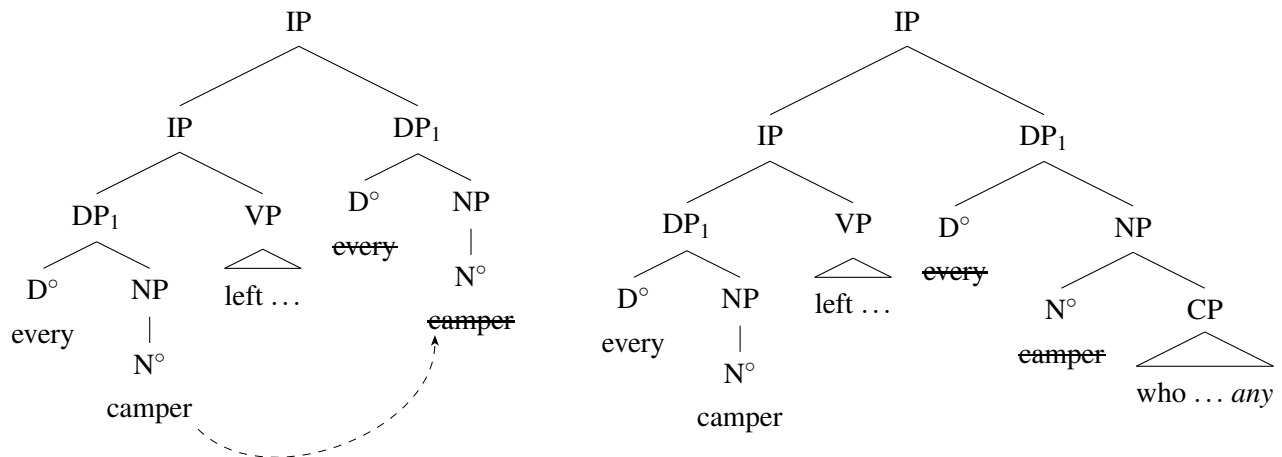
In as far as EXNP from a DP in subject position does indicate the use of a Host-External strategy and NPI-licensing by the host indicates a Host-Internal strategy, we should find that the two phenomena are mutually incompatible. As explained above, the contradictory requirements placed on the derivation of a such a sentence should result in ungrammaticality. This is not what we find, however, in the examples that we have already seen in (33) and the pair of examples below in (39). The contrast between these examples suggests that the NPI in the extraposed relative clause is licensed by *every* even when EXNP targets a DP in subject position.

²²See [Haegeman et al. \(2014\)](#) for a discussion of ameliorating effects for the Subject Condition.

- b. *_[DP Some campers]₁ left this morning
 _[CP who were at *any* of the sites with significant flooding]₁.

It is the acceptability of (39a) specifically which suggests that either a Host-Internal or Host-External approach is sufficient to account for these data on its own. Still taking it to be the case that NPI-licensing by *every* strongly supports the need for a Host-Internal approach, the strategy I will take is to sketch a way in which (39a) could be derived via Fox & Nissenbaum's (1999) QR-based analysis of EXNP. Recall that on this analysis the host will first undergo an instance of covert movement and the extraposed material will be introduced counter-cyclically into the higher copy. As illustrated in (39), this strategy provides a means for rightward displacement without incurring a violation of the Subject Condition.

- ii. *Late-Merger*



Note that the extraposed material is not subextracted on this derivation. Instead, the island domain is itself picked up and moved. By late-merging the relative clause into the higher copy, the Subject Condition is effectively circumvented.²³

Of course this makes the straightforward prediction that EXNP should be subject to whatever constraints are placed on the type of covert movement that we assume targets the host, this being QR for [Fox & Nissenbaum \(1999\)](#). This expectation is not realized in full as discussed in [Webelhuth et al. \(2013:23-24\)](#).²⁴ Therefore, further work here will be necessary.

²³[Strunk & Snider \(2013\)](#) also present a series of corpus and experimental studies that they interpret as showing that EXNP of a relative clause is not subject to a categorical constraint against extraction out of a complex NP (see [Chomsky 1973](#)). They conclude further from this observation that EXNP is not subject to a categorical syntactic locality constraint such as Subadjacency. If this is the correct interpretation of those data, then we might hope to extend the analysis sketched here to those examples.

²⁴Webelhuth et al. (2013) point out that EXNP is possible from subject position, the object position of prepositions, and

6.2 Split Antecedents

EXNP is famously compatible with so-called *split antecedents*. The original observation comes from (Perlmutter & Ross 1970) and is exemplified by sentences like in (41), which is adapted from their example (3).

- (41) [DP A man]₁ entered the room and [DP a woman]₁ went out
[CP who were quite similar]₁.

The problem that these examples present can be seen by trying to reconstruct the source sentence. One finds that neither DP is capable of hosting a relative clause of this particular shape.

- (42) a. * [DP A man who were quite similar] entered the room and [DP a woman] went out.
b. * [DP A man] entered the room and [DP a woman who were quite similar] went out.

This observation has been interpreted by a number of researchers as strong evidence against a movement analysis of EXNP and in favor of some Host-External base-generation analysis (Perlmutter & Ross 1970, Gazdar 1981, Rochemont & Culicover 1990, Webelhuth et al. 2013).

With this, we can probe for the necessity of both Host-External and Host-Internal analyses of EXNP in the same way as we did above. In as far as NPI-licensing requires a Host-Internal mechanism and split antecedence requires a Host-External mechanism, we should expect ungrammaticality in a sentence that must simultaneously satisfy both requirements. The pair of examples in (43) below suggests, contrary to these expectations, that an NPI can be licensed in the extraposed material even given split antecedence.

- (43) a. [DP Every intern]₁ left and [DP every employee]₁ quit
[CP who were in *any* of the basement offices]₁.
b. * [DP Some interns]₁ left and [DP some employees]₁ quit
[CP who were in *any* of the basement offices]₁.

The acceptability of (43a) suggests that either a Host-Internal or Host-External approach alone is sufficient to account for the data at hand. Again, I would suggest that the QR-based analysis of Fox & Nissenbaum (1999) provides a way to think about these data that will accommodate the ability to have split antecedents and have those antecedents license an NPI in the extraposed relative. However, having seen that the extraposed material can be traced back to just one of the host DPs, we will require something extra to make this work.

As a hint for what this extra something might be, we can take note that (41) displays what Yatabe (2003) and Grosz (2015) refer to as *summative agreement* and which Postal (1998) observed

the first object position of the double object construction. However, overt rightward DP movement is typically disallowed from subject position and the object position of prepositions and overt leftward DP movement is typically disallowed from the first object position of the double object construction.

in known instances of Right Node Raising (RNR). The example below has been adapted from Postal (1998:173).

- (44) The pilot claimed that the first nurse e_1 and the sailor proved that the second nurse e_1 – [were spies]₁

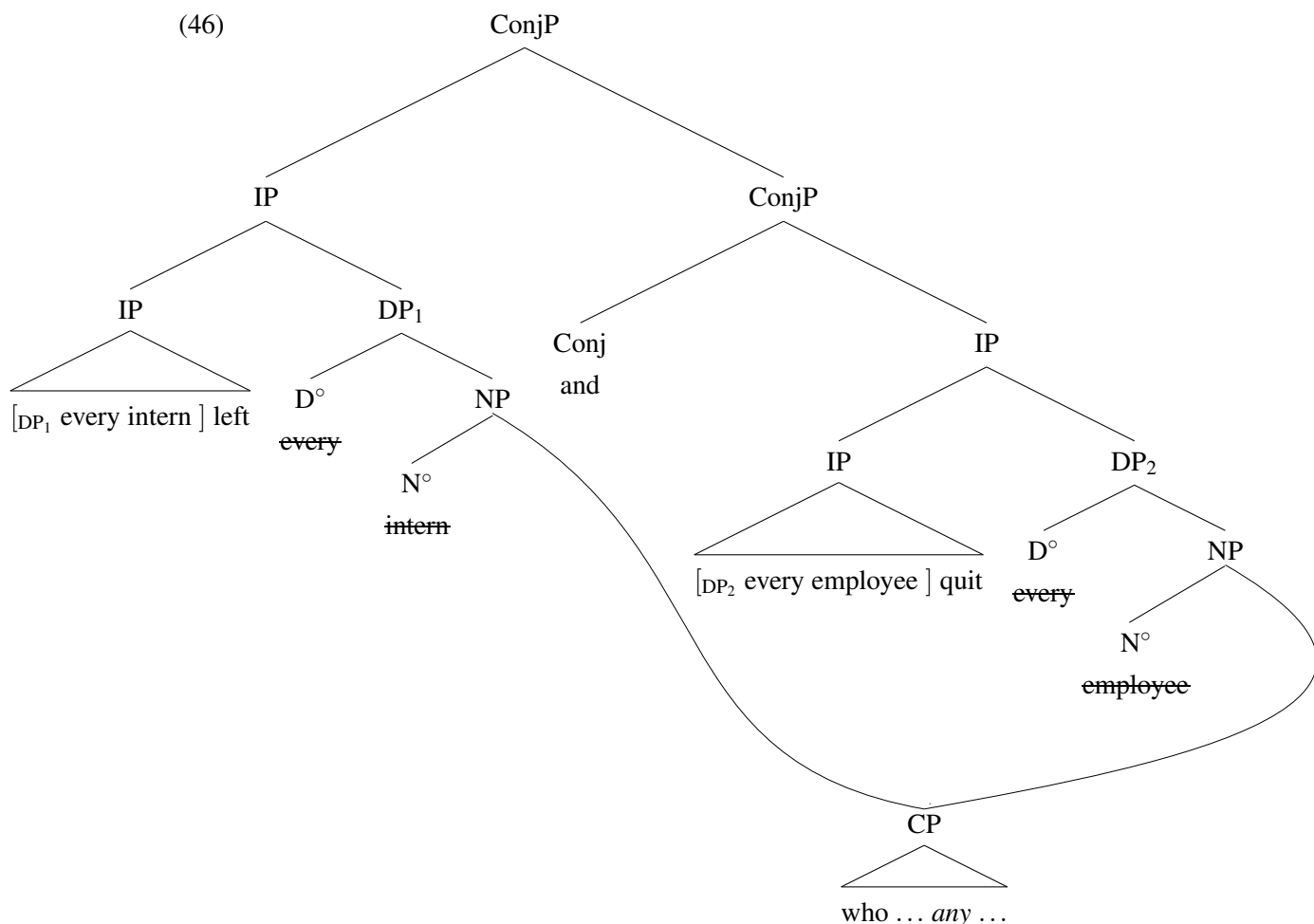
In the same way as (40) above, the example in (44) does not find an obvious source in either conjunct, as demonstrated by (45). The morphological shape of the displaced predicate *were spies* is not determined singularly by the subject of either conjunct but instead cumulatively by the subject of both conjuncts.

- (45) * The pilot claimed that the first nurse [were spies] and the sailor proved that the second nurse [were spies].

On the basis of this observation, I would like to expand on a suggestion made by Grosz (2015) that EXNP configurations that show split antecedence like (41) and (43a) involve multidominance-based RNR (e.g. McCawley 1982). As we will see immediately below, this means that the extraposed material is shared by the host in each conjunct. Still building on Grosz (2015) and following Kluck & de Vries (2013) specifically, I would suggest that the relevant mechanism for EXNP feeds the application of RNR.²⁵ On this view of split antecedence, sentences like (41) in fact do not reveal anything about the mechanics of the EXNP operation itself. However, by adopting the QR-based analysis of EXNP, it is possible to model the observation that in (43a) an NPI is licensed in extraposed material that has split antecedents headed by *every*.

We can imagine a derivation of (43a) that proceeds as follows to produce the representation in (46) below. Separate applications of movement (or further multidomination) will covertly displace *every intern* and *every employee* to the edge of their respective conjuncts. The resulting configuration will permit the late-merger of the relative clause into both conjuncts simultaneously. Looking at (46) we see a representation for a relative clause with split antecedents very much like the one proposed by McKinney-Bock (2013). The relative clause is simultaneously in the restrictor argument of each host. By permitting the type of multiple agreement and feature sharing between the hosts and the relative clause operator that we find in Grosz 2015, an explanation of summative agreement begins to emerge. Specifically, it is the features on the relative clause operator that are triggering summative agreement inside the relative clause. By being interpreted in the restrictor argument of a DP headed by *every*, we expect an NPI to be licensed in the extraposed material in the same way as above.

²⁵I am imagining, in particular, that the output of EXNP satisfies the *Right Edge Restriction*, which represents a constraint on the application of RNR that requires the shared material to be rightmost in both conjuncts (e.g. Postal 1974, Wilder 1997, Hartmann 2000, Sabbagh 2007).



This, however, is merely a sketch of an approach to the problem. It remains to be shown that this type of structure can be both properly linearized and properly interpreted. Moreover, this approach differs in non-trivial ways from other recent analyses for split antecedence. [Baltin \(2005\)](#) and [Fox & Johnson \(2015\)](#) propose different methods of achieving an Across-the-Board style QR operation that results in coordinating the two hosts in a position outside of what I have represented above as ConjP.²⁶ On both accounts, the extraposed material is functionally late-merged with the coordinated hosts. [Zhang \(2007\)](#) presents an account that is essentially the inverse. The hosts begin as the conjuncts of a nominal coordinate phrase that is conjoined above my ConjP and each move sideward (e.g. [Nunes 2001](#)) into their respective conjuncts. Filling the gaps present in the analysis sketched around (46) and choosing among the available alternative analyses must be left as challenges to future research.²⁷

²⁶See [Fox & Johnson \(2015\)](#) for an explicit way of interpreting the representation that results from their treatment.

²⁷We might also hope to see that this analysis could be extended or adapted to account for relative clause constructions with coordinated heads ([Vergnaud 1974](#), [Jackendoff 1977](#), [Link 1984](#)), which are also compatible with EXNP configurations.

7 Conclusion

We have seen in this paper that NPIs are licensed in relative clauses that have been extraposed from a direct object host that is headed by the quantifier *every*. I have argued that this observation is best modeled by a Host-Internal analysis of EXNP, which treats the extraposed material as being generated internal to the restrictor argument of its host. Host-External analyses claiming that the extraposed material is adjoined to the nuclear scope of the host do not a priori predict the possibility of NPI-licensing in such configurations. Based on additional evidence presented in sections 5 and 6, I suggested further that the QR-based analysis of EXNP in Fox & Nissenbaum 1999 achieves the widest empirical coverage.

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- (i) a. $[_{DP} \text{ Every intern and every employee }]_1 \text{ quit } [_{CP} \text{ who were in any of the basement offices }]_1$.
b. * $[_{DP} \text{ Some interns and some employees }]_1 \text{ quit } [_{CP} \text{ who were in any of the basement offices }]_1$.

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A Experimental Items

- (1) (Yesterday) park rangers removed [every/some] camper(s) (yesterday) who was/were at [any/one] of the sites with significant flooding.
- (2) (Last night) the boys stole [every/some] bag(s) (last night) that had [any/a few] credit cards inside.
- (3) (Last night) we invited [every/some] neighbor(s) (last night) who had [any/some] interest in building a park.
- (4) (Yesterday) citizens ousted [every/some] politician(s) (yesterday) who had [any/many] connection(s) to pirates.
- (5) (Last month) the bank contacted [every/some] customer(s) (last month) who had [any/some] outstanding credit card debt.

- (6) (Last year) the company considered [every/some] job applicant(s) (last year) who was/were from [any/one] of the local temp agencies.
- (7) (Last week) the press criticized [every/some] representative(s) (last week) who is/are from [any/one] of the Republican districts.
- (8) (Last week) the police monitored [every/some] witness(es) (last week) who was/were in [any/some] danger from the local mafia.
- (9) (This afternoon) Greg removed [every/some] rosebush(es) (this afternoon) that was/were in [any/some] of the temporary pots.
- (10) (This month) Kara promoted [every/some] employee(s) (this month) who was/were in [any/one] of the top accounting divisions.
- (11) (This morning) the doctors examined [every/some] patient(s) (this morning) who is/are on [any/some] of the new experimental pain medications.
- (12) (Last week) the government quarantined [everyone/someone] (last week) who was on [any/one] of the cruises in the Caribbean.
- (13) (Last night) someone stole [every/some] bike(s) (last night) that was/were on [any of/Ø] the bike rack(s) behind the building.
- (14) (Today) Sarah sold [every/some] book(s) (today) that was/were in [any/one] of the national book review journals.
- (15) (Next season) teams will recruit [every/some] athlete(s) (next season) who is/are at [any of the/a] universities/university with a recent championship.
- (16) (Last semester) Allen tutored [every/some] student(s) (last semester) who was/were on [any/one] of the intramural basketball teams.