Free Choice under Ellipsis*

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Abstract

The ellipsis of a VP whose antecedent contains an occurrence of so-called free choice *any* is highly constrained: it is acceptable only if the elided VP is appropriately embedded. We show that while this is unexpected on the common approaches to free choice and ellipsis, it is predicted on a theory of *any* that takes its domain to stand in a dependency relation with a c-commanding alternative-sensitive operator (cf. Lahiri 1998) and that takes free choice inferences to be generated by covert exhaustification in grammar (e.g., Fox 2007, Chierchia 2013).

1 Ellipsis and the Puzzle of Free Choice

An ellipsis of a well-formed VP is licensed if the content of the VP can be appropriately recovered from the discourse. For example, the second sentence in (1-a) is interpretable because the elided VP, which we mark with △, can be recovered from the first sentence, namely, *read War and Peace*.

(1)   a.   John read *War and Peace*, and Mary did △ too.
       b.   △ = read *War and Peace*

1.1 Ellipsis Licensing Condition

In many cases the VP recovered at the ellipsis site does not correspond to a surface constituent in the preceding discourse. There have been many attempts to properly characterize the condition on ellipsis licensing in light of these cases (e.g., Sag 1976, Rooth 1992, Hardt 1993, among many others). While all these attempts share the assumption that an appropriate matching relation must obtain between a constituent containing the

elided VP and some antecedent constituent in the discourse, they differ with respect to the assumptions about the size of these constituents and the nature of the matching relation.

A particularly influential account of ellipsis licensing was put forward by Rooth (1992). We adopt it in the following, though any alternative that assumes syntactic structure at the ellipsis site would arguably suffice for the purposes of this paper (e.g., Fiengo & May 1994, Merchant 2001, 2013, van Craenenbroeck 2010, among others).

Rooth (1992) analyzes VP ellipsis as an extreme case of deaccentuation. He couches his proposal in alternative semantics and proposes that a VP can be elided if and only if it is contained in a constituent whose focus alternatives include the meaning of some constituent from the previous discourse.[1,2] (Rooth proposes in addition a condition requiring the antecedent and the elided VP to be identical *modulo* some minor variation. Since this is satisfied in all the examples looked at in this paper, we do not bring it up explicitly in our discussion.)

(2)   *Ellipsis Licensing Condition:*
        A VP may be elided if it is reflexively dominated by a constituent α whose focus value contains the meaning of some constituent β in the discourse, $[\![\beta]\!]^{g,c} \in F(\alpha)$, for every variable assignment g.

We will call the constituents on the basis of which the Ellipsis Licensing Condition is satisfied, 'Parallelism Domains' – specifically, the antecedent and the ellipsis Parallelism Domain. Following Rooth, we mark the ellipsis Parallelism Domain with a prefixed $\sim$-operator and indicate the antecedent Parallelism Domain with a suffixed index (we also underline them for readability).

In the sequence in (1), the Parallelism Domains may be the whole sentences, as indicated in (3). The meaning of the first sentence is a focus alternative to the second sentence, as given in (4). This accounts for the licensing of VP ellipsis in (1). (In the following 'A' stands for a constituent containing the antecedent Parallelism Domain and 'E' stands for a constituent containing the ellipsis Parallelism Domain. Furthermore, we rely on simplified formulas when representing meanings and hope that more accurate representations can be reconstructed by the reader.)

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[1]Focus alternatives of a constituent, that is, its focus value, are defined recursively as in (i) (see Rooth 1985). If a more structural approach to alternatives were adopted (Fox & Katzir 2011), this would not affect the proposal in the main text, only its presentation.

(i)   a.   If X is a terminal node that is not F-marked, then $F(X) = \{[\![X]\!]^{g,c}\}$
        b.   If X is a terminal node that is F-marked, then $F(X) = \{[\![Y]\!]^{g,c} \mid \text{type}(Y) = \text{type}(X)\}$
        c.   If X = [Y Z] is a branching node such that the meaning of Z is an argument of the meaning of Y, then $F(X) = \{Y'(Z') \mid Y' \in F(Y) \ \& \ Z' \in F(Z)\}$

[2]The condition in (2) prohibits semantically non-trivial mismatches between the antecedent and the elided VP. Such mismatches are possible between the antecedent VP and a deaccented, non-elided VP (e.g., Rooth 1992, Fox 2000, Ch. 3). The condition in (2) thus cannot be taken to hold of deaccentuation *simpliciter*. As we discuss in footnote 16, having a different condition for deaccentuation may lead to different predictions about the interaction of free choice and ellipsis, on the one hand, and free choice and deaccentuation, on the other hand. Thanks to a reviewer for bringing this up.

(3) a. A: [John read *War and Peace*]$_4$
     b. E: [∼4 [Mary$_F$ read *War and Peace*]]

(4) *Ellipsis Licensing Condition:*
     ⟦John read *War and Peace*⟧^{g,c} ∈ F([Mary$_F$ read *War and Peace*]) $\big(= \{λw.(x\ read_w$
     War and Peace) | x∈D$_e$}$\big)$

A slightly more involved example is provided in (5). The sequence in (5) is ambiguous: it either conveys that some boy and some girl are such that each of them read every book (= surface scope reading in both conjuncts), or that every book is such that it was read by some boy and some girl (= inverse scope reading in both conjuncts).

(5) Some boy read every book, and some girl did △ too.

The second disambiguation is derived from the parses of the sentences given in (6), where the universal quantifier takes scope above the existential quantifier in both sentences and where *girl* is focused in the second sentence. The meaning of the antecedent Parallelism Domain is contained in the focus value of the ellipsis Parallelism Domain, as shown in (7). Accordingly, VP ellipsis is licensed.

(6) a. A: [[every book] [λ1 [[some boy] read t$_1$]]]$_4$
     b. E: [∼4 [[every book] [λ5 [[some girl$_F$] read t$_5$]]]]

(7) *Ellipsis Licensing Condition:*
     ⟦[every book] [λ1 [[some boy] read t$_1$]]⟧^{g,c} ∈ F([every book] [λ5 [[some girl$_F$] read t$_5$]]) = {λw.(every book x: some NP read$_w$ x)| NP∈D$_{et}$}

If the scopes of the two quantifiers are not structurally isomorphic in the two Parallelism Domains (for instance, if we assign the inverse scope structure to the first sentence and the surface scope structure to the second sentence), the Ellipsis Licensing Condition cannot be satisfied. This accounts for the fact that the sequence in (5) is only two-way and not four-way ambiguous (see, e.g., Rooth 1992, Fox 2000 for further discussion).

1.2 Alternations

Many examples of VP ellipsis are such that the sentence containing it would be ungrammatical if the antecedent VP were pronounced at the ellipsis site (see, e.g., van Craenenbroeck & Merchant 2013 for an extensive discussion). Bresnan (1971) and Sag (1976) discuss examples like (8), in which the antecedent VP contains the polarity item *any book*. The polarity item is acceptable (or 'licensed') since it occurs in the scope of negation, that is, in a downward-entailing environment.

(8) John didn't read any book, but Mary did △.

Now, if the second VP in (8) contained an overt occurrence of *any book*, the sentence would not be well-formed since *any* would not be contained in a licensing environment:

(9) #John didn't read any book, but Mary (did) read any book.

On the assumption of the Ellipsis Licensing Condition in (2), however, one need not take the elided VP in the second sentence in (8) to have the form spelled out in (9): if we assume (i) that *any* is an indefinite comparable to *a/some*, and (ii) that whatever governs its distribution does not significantly affect the syntax and semantics of the VP containing *any*, then the elided VP may be taken to contain a plain indefinite, as given in (10). Both of these assumptions are in line with many standard treatments of polarity items and have been adopted in much previous work on polarity items in antecedents for VP ellipsis (see Merchant 2013 for an overview).[3]

(10)   a.   A: [not [John read any book]]$_4$
        b.   E: [∼4 [did$_F$ [Mary$_F$ read a book]]]

These structures satisfy the Ellipsis Licensing Condition, as shown in (11). We say that in sequences like (8), *any book* 'antecedes' *a book*.

(11)   *Ellipsis Licensing Condition:*
        [[not [John read any book]]]^{g,c} ∈ F([did$_F$ [Mary$_F$ read a book]]) $\left(= \{\lambda w.(x \; read_w \; a \; book), \lambda w.\neg(x \; read_w \; a \; book) \mid x \in D_e\} \right)$

The above observation about the distribution of polarity items in ellipsis contexts, that is, in antecedent VPs, can be summarized as follows:

(12)   *Observation about polarity items and ellipsis:*
        On the assumption that *any* is an indefinite and that its licensing mechanism does not significantly affect the syntax of the antecedent VP, it can freely antecede another indefinite in the elided VP.

In the following section, we discuss a class of occurrences of *any* that cannot antecede indefinites freely. We will come to grips with these data by dropping one of the assumptions in (12), namely, that the licensing mechanism responsible for the distribution of *any* does not significantly affect its syntax.

1.3   Free choice puzzle

We present two observations about the interaction of free choice and ellipsis. We show that they are puzzling on the common approaches to free choice and ellipsis licensing.

First observation. In addition to downward-entailing environments, *any* may also occur in the scope of existential modals and in some other modal environments. These

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[3]For illustration, following Giannakidou (2000) and others, Merchant (2013) proposes that polarity items have an unspecified polarity feature which gets valued by a c-commanding polarity head, which is external to the VP. This process determines the morphology of the polarity item, say, whether it is realized as *anything* or as *something*.

occurrences have been dubbed as occurrences of 'free choice *any*'.[4] Namely, they give rise to the so-called free choice inference that, roughly, every element in the restrictor of *any* verifies the statement (see, e.g., Dayal 1998, Chierchia 2013; and Menéndez-Benito 2010 for a qualification). An example of such an occurrence of *any* is provided in (13), which conveys that every book is such that John may read it:

(13)   John may/is allowed to read any book.

However, unlike the occurrence of *any* in the scope of negation, the occurrence of *any* in (13) is not able to freely antecede indefinites, or other DPs for that matter. In particular, while free choice *any* may antecede a nominal expression that is embedded under an existential modal, as shown in (14), it cannot antecede a DP if the elided VP is unembedded, or if it is embedded under a universal modal, as shown in (15).

(14)   John may/is allowed to read any book. Bill is also allowed to △.

(15)   a. #John may/is allowed to read any book. Bill (already) did △.
        b. #John may/is allowed to read any book. Bill has to △.

These distributional patterns differ from those of other DPs in antecedent VPs, for example, those of plain indefinites and universal quantifiers, as shown in (16).

(16)   a.   John is allowed to read a/every book. Bill (already) did △.
        b.   John is allowed to read a/every book. Bill has to △.

Another modal-like environment in which *any* is acceptable and gives rise to a free choice inference is the imperative clause. Perhaps unsurprisingly in light of the above observations, the distribution of *any* in imperatives mirrors that of *any* in the scope of existential modals when it comes to ellipsis contexts: sequences in which *any* occurs in an imperative antecedent VP are felicitous when the elided VP is embedded in the scope of an existential modal, but not when it is unembedded or embedded in the scope of a universal modal. This holds both for *any* in matrix imperatives, given in (17), and for *any* in embedded imperatives, given in (18) (see Crnič & Trinh 2009 for discussion of English embedded imperatives).

(17)   A: Ask anyone about it.
        B: I am allowed to △?
        B: #I already did △.
        B: #John has to △ as well.

(18)   a.   I said read any book. He was allowed to △.
        b. #I said read any book. He did △.
        c. #I said read any book. So, he was required to △.

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[4]While we largely follow this terminology in our paper, primarily for reasons of brevity, we do not assume that there are, in fact, different types of *any*. This should become clear in Section 2 at the latest, where we present the analysis of *any* on which our proposal is based.

Taken together, these data constitute the first part of the puzzle about the interaction of free choice and VP ellipsis: in contrast to *any* in the scope of negation, *any* in the scope of an existential modal cannot freely antecede other nominal phrases.

(19)   *First observation about the interaction of free choice and ellipsis:*
         An occurrence of free choice *any* in the antecedent VP requires the elided VP to be in a free choice licensing environment.

Second observation. While free choice *any* in the antecedent Parallelism Domain constrains subsequent VP ellipsis, the reverse appears not to hold: free choice may be generated in the ellipsis Parallelism Domain without free choice *any* being used in the antecedent Parallelism Domain. Consider the felicitious sequence in (20). We submit that the elided nominal gives rise to a free choice inference.

(20)   John didn't read any book. But he was allowed to $\triangle$ – except for *Lolita*.

The second sentence of the sequence in (20) contains an exceptive modifier phrase, *except for Lolita*. While an exceptive modifier can be used on a free choice construal of the sentence, as shown in (21), if such a construal is unavailable, the exceptive modifier cannot be used felicitously, as shown in (22).

(21)   a.   John was allowed to read any book – except for *Lolita*.
         b.   ?John was allowed to read a book – except for *Lolita*.

(22)   #John read a book – except for *Lolita*.

Accordingly, the felicity of the sequence in (20) suggests that the nominal phrase in the elided VP may induce a free choice inference. Moreover, note that while the exceptive modifier is used in (20) to force a free choice construal of the second sentence, its presence is not necessary for the second sentence to induce a free choice inference – a free choice inference may also obtain in its absence. In any case, a free choice inference can be induced in the second sentence even when there is no free choice *any* in the antecedent Parallelism Domain. This constitutes the second part of the puzzle about the interaction of free choice and VP ellipsis:

(23)   *Second observation about the interaction of free choice and ellipsis:*
         An elided VP occurring in a free choice licensing environment and giving rise to a free choice inference does not require the antecedent VP to be in a free choice licensing environment.

The puzzle. Coupled with the Ellipsis Licensing Condition in (2), none of the existing approaches to free choice *any* is able to predict both observations, at least not without making some further stipulations. We illustrate this in the following for simplified analyses of free choice *any* as (i) an existential quantifier (see Menéndez-Benito 2010, Dayal 2013, Chierchia 2013, among others), and (ii) as a universal quantifier, which is adopted

in approaches that analyze occurrences of *any* in downward-entailing environments as different from those in modal environments (see Dayal 1998, 2004, 2009, among others).

(i) Free choice any *as an existential quantifier.* On one type of approach to free choice, *any* is analyzed as an existential quantifier, and the same, or at least similar, mechanisms are responsible for its licensing in downward-entailing and in modal environments. Its universal import as well as its distribution is derived with the help of alternative-sensitive operators that c-command it at LF and quantify over the alternatives it induces (see, e.g., Menéndez-Benito 2010, Chierchia 2013, among others). In some cases, for example, if *any* occurs in the scope of an existential modal, the inferences generated by the operators are consistent – they correspond to the so-called free choice inference described above. In such cases we say that the occurrence of *any* is licensed. A schematic representation of an analysis along these lines is given in (24) (see footnote 5 for a more detailed exposition).

(24)　a.　John is allowed to read any book.
　　　b.　$[OP_i \ ... \ [OP_j \ [\Diamond \ [\text{John read any book}]]]$

　　　　　association with alternatives

This type of approach has no problem with the second observation about free choice and ellipsis. For example, the felicitous sequence with the exceptive modifier in (20), repeated below, may be assigned the representations akin to that sketched in (25), which satisfy the Ellipsis Licensing Condition.

(20)　John didn't read any book. But he was allowed to △ – except for *Lolita*.

(25)　a.　A: $[OP_i \ [\text{not } [\text{John read any book}]]_4]$
　　　b.　E: $[OP_i \ ... \ [OP_j \ [\sim 4 \ [\Diamond_F \ [\text{John read any book}]]]]]$

(26)　*Ellipsis Licensing Condition:*
　　　$[\![\text{not } [\text{John read any book}]]\!]^{g,c} \in F([\Diamond_F \ [\text{John read any book}]]) \ \big(= \{\lambda w.(\text{John read}_w \text{ a book}), \lambda w.\neg(\text{John read}_w \text{ a book}), \lambda w.\Box_w(\text{John read a book}), ...\}\big)$

However, the approach faces an issue with the first observation about free choice and ellipsis. Namely, on this approach, there are several constituents in the sentence containing the elided VP in (15), repeated below, that constitute licit Parallelism Domains on the basis of which ellipsis should be licensed. In (27), which presents possible parses of the sentences in the infelicitous sequence in (15-b), the minimal clauses containing the antecedent and the elided VP are chosen as the Parallelism Domains. Since the subject of the clause containing the elided VP is focused, its focus value contains the meaning of an antecedent constituent, specifically, of the embedded clause in the preceding sentence. Accordingly, VP ellipsis is incorrectly predicted to be licensed.[5]

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[5] The representations in (24), (25) and (27) are considerable simplifications. For example, the structure that Chierchia (2013) envisions for sentences with free choice *any* is exemplified in (i), where the two 'OP' operators are variants of the *exh* operator discussed in the next section (they associate with the domain of *any*). If the Parallelism Domains are selected as in (i)-(ii), the Ellipsis Licensing Condition is satisfied, (iii) (at least on the assumption that did_F has an existential modal auxiliary or verb as an

(15)   a. #John may/is allowed to read any book. Bill (already) did △.
         b. #John may/is allowed to read any book. Bill has to △.

(27)   a.   A: [OP$_i$ ... [OP$_j$ [◇ [John read any book]$_4$]]]
         b.   E: [□ [∼4 [Bill$_F$ read a book]]]

(28)   *Ellipsis Licensing Condition:*
         ⟦John read any book⟧^{g,c} ∈ F(Bill$_F$ read a book) $\big(= \{\lambda w.(x\ read_w\ a\ book) \mid x \in D_e\}\big)$

(ii) Free choice any *as a universal quantifier.* On the ambiguity approach to *any*, an occurrence of *any* can either be an occurrence of so-called negative polarity *any* or an occurrence of free choice *any*. The latter is analyzed as a universal quantifier similar to *every*. Its universal import follows from its universal semantics, while its distribution is derived with the help of an additional inference that accompanies it (e.g., Dayal 1998, 2004, 2009). This additional inference has been claimed to be satisfied only in a very restricted set of configurations, in particular, if *any* scopes above an existential modal. An LF that contains an existential modal and free choice *any*, and that purportedly yields a licit interpretation, is provided in (29), where *any NP* scopes above the modal.

(29)   a.   John is allowed to read any book.
         b.   [any book] [λ1 [◇ [John read t$_1$]]]

In order to account for the first observation, the approach would crucially have to assume that free choice *any* does not have a plain quantifier meaning, in contrast to negative polarity *any*. More to the point, it would have to assume that the inference constraining its distribution is encoded in the semantics of *any* itself. If that were not

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alternative).

(i)   a.   John may/is allowed to read any book.
         b.   A: [OP$_1$ [OP$_2$ [[any book] [λ3 [◇ [John read t$_3$]]]]$_4$]]

(ii)   a.   #Bill already did △.
         b.   E: [∼4 [did$_F$ [Bill$_F$ read a book]]]

(iii)   *Ellipsis Licensing Condition:*
         ⟦[any book] λ3 [◇ [John read t$_3$]]⟧^{g,c} ∈ F([did$_F$ [Bill$_F$ read a book]]) $\big(= \{\lambda w.(x\ read\ a\ book),$ $\lambda w.\neg(x\ read\ a\ book), \lambda w.◇(x\ read\ a\ book), ... \mid x \in D_e\}\big)$

A similar prediction obtains on Menéndez-Benito's (2010) account, according to which a sentence with free choice *any* has a representation along the lines of (iv-a). There are several parses of the problematic sequence that should satisfy the Ellipsis Licensing Condition, one of which is provided in (iv).

(iv)   a.   A: [∀ [◇ [exh [John read a book]$_4$]]]
         b.   E: [∃ [∼4 [Bill$_F$ read a book]]]

(v)   *Ellipsis Licensing Condition:*
         ⟦[John read a book]⟧^{g,c} ∈ F([Bill$_F$ read a book]) $\big(= \{\lambda w.(x\ read_w\ a\ book) \mid x \in D_e\}\big)$

Parallel considerations apply to examples where the elided VP is embedded under a universal modal, etc.

the case, and the inference were somehow triggered more globally, *any* should be able to antecede *every* in the sequence in (30). This is demonstrated in (31)-(32), where the relevant alternative to the second sentence is that every book is such that John has to read it.

(30)   #John may/is allowed to read any book. Bill has to △.

(31)   a.   A: [any book] [λ3 [◇ [John read t_3]]]_4
       b.   E: [∼4 [every book] [λ5 [□_F [Bill_F read t_5]]]]

(32)   *Ellipsis Licensing Condition:*
       $[\![$[any book] [λ3 [◇ [John read t_3]]]$]\!]^{g,c}$ ∈ F([every book] [λ5 [did_F [Bill_F read t_5]]])

Now, if the inference responsible for its restricted distribution were triggered by *any* itself, the elided VP with an antecedent that contains free choice *any* would have to occur in the scope of an existential modal, as shown in (33). This would account for the first observation and provide tentative support for the treatment of free choice *any* as being significantly different from other polarity items.

(33)   a.   A: [[any book] [λ1 [◇ [John read t_1]]]]_4
       b.   E: [∼4 [any book] [λ2 [◇ [Bill_F read t_2]]]]
       c. #E: [∼4 [any book] [λ2 [□_F [Bill_F read t_2]]]]
       d. #E: [∼4 [any book] [λ2 [did_F [Bill_F read t_2]]]]

The pertinent question is, of course, how this inference responsible for *any*'s restricted distribution can be adequately encoded in the meaning of *any*, not least given the fact that if *any* scopes above the modal, as it would be required to, it does not in fact occur in a modal environment anymore. Concretely, the occurrences of *any* in (33-a)-(33-b) are as much in an episodic environment as that of *any* in (33-d) is. This is a patent issue for the account, which we cannot elaborate on more extensively here (see Dayal 2013, Chierchia 2013 for further discussion).

Moreover, this approach sheds no light by itself on the second observation about free choice and ellipsis. Since the approach is designed so that, all else being equal, *any* yields a felicitous inference only in specific modal environments, the Ellipsis Licensing Condition cannot be satisfied in a sequence like (20), repeated below, if free choice *any* is used in the elided VP. In particular, if we assign the sequence in (20) the configuration in (34), we obtain the set of focus alternatives to the ellipsis Parallelism Domain given in (35) – in light of the properties of free choice *any*, no alternative to the existential modal can figure in the focus alternatives (otherwise the inference triggered by *any* would not be satisfied). And so the meaning of the antecedent Parallelism Domain cannot be contained in the focus value of the ellipsis Parallelism Domain. The VP ellipsis should thus not be licensed.

(20)   John didn't read any book. But he was allowed to △ – except for *Lolita*.

(34)   a.   A: [not [John read any book]]_4

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b.   E: [∼4 [[any book] [λ3 [◇_F [Bill_F read t_3]]]]]

(35)   F([any book] [λ3 [◇_F [Bill_F read t_3]]]]) = {λw.(any book y: ◇_w(x read y)) | x∈D_e}

Of course, a proponent of this approach may argue that the free choice inference conveyed by the second sentence in (20) is derived by other means, that is, means that do not require the presence of free choice *any*. This is the direction that we adopt in this paper. In addition to accounting for the second observation, we will show how these means can be utilized in maintaining a uniform treatment of *any* that can explain the first observation as well (following, esp., Lahiri 1998 and Chierchia 2013).

Summary.   We have seen that (i) the distribution of free choice *any* in antecedent VPs constrains the availability of VP ellipsis – this constituted our first observation – and that (ii) a free choice interpretation of an elided indefinite appears to be possible even if the antecedent VP does not contain an indefinite that gives rise to a free choice interpretation – this constituted our second observation. We have shown that these observations are puzzling on the existing approaches to free choice *any* and the standard assumptions about ellipsis licensing.

1.4   Preview of the proposal

We show that if we make the following three assumptions, the puzzling observations described above can be explained in approaches that take the distribution of *any* to be governed by an alternative-sensitive operator (e.g., Krifka 1995, Lahiri 1998, Chierchia 2013): (i) a dependency relation obtains between a subconstituent of the DP headed by *any* and its licensing operator (that is, a relation that corresponds to either movement or binding); (ii) free choice inferences are induced by a grammatical device (by covert exhaustification); and (iii) the distribution of this device is constrained (by an economy condition). While the first assumption is to some extent novel (though see Lahiri 1998 on Hindi polarity items), the latter two assumptions have received considerable attention and support in recent literature (e.g., Fox 2007, Fox & Spector 2009, Chierchia et al. 2011, Chierchia 2013, among others). We provide a schematic illustration of how these assumptions conspire to derive the two observations in the following.

First observation.   Existential modal sentences that contain free choice *any* have representations along the lines of (36), where the licensing operator governing the distribution of *any* (OP_Lic) stands in a dependency relation with a subconstituent of the DP headed by *any*. The operator has to c-command the device that induces the free choice inference (OP_FC), otherwise it will trigger a contradictory inference, and *any* will not be licensed.

(36)   [OP_Lic [λt [OP_FC [◇ [you read any t book]]]]]

Now, if a VP contains a bound variable, and the VP antecedes an elided VP, the Parallelism Domain relevant for ellipsis licensing must be such that it contains the binder

of that variable. In the case of (36), this could be the entire sentence, as indicated in (37).

(37)   [OP$_\text{Lic}$ [λt [OP$_\text{FC}$ [◇ [you read any t book]]]]]

Accordingly, the device that induces the free choice inference must be contained in the ellipsis Parallelism Domain, as represented in (38). However, it turns out that only in configuration with an existential modal, (38-a), is its occurrence admitted by an independent constraint on its distribution.

(38)   a.   ([OP$_\text{Lic}$) [OP$_\text{FC}$ [◇ [John$_\text{F}$ read a book]]]
        b. #([OP$_\text{Lic}$) [OP$_\text{FC}$ [did$_\text{F}$ [John$_\text{F}$ read a book]]]]
        c. #([OP$_\text{Lic}$) [OP$_\text{FC}$ [□$_\text{F}$ [John read a book]]]]

Second observation. In addition to *any*, plain indefinites may also give rise to free choice inferences in the scope of existential modals (see Chierchia 2013). An example of a parse that would yield a free choice inference is provided in (39). In the absence of *any*, the structure lacks the licensing operator that we find in (37).

(39)   [OP$_\text{FC}$ [◇$_\text{F}$ [John$_\text{F}$ read a book]]]

If the VP in (39) is elided, the VP itself can be chosen as the Parallelism Domain since it does not contain a variable bound outside the VP, given in (40). Accordingly, the antecedent Parallelism Domain need not contain the device that induces free choice.

(40)   [OP$_\text{FC}$ [◇$_\text{F}$ [John$_\text{F}$ [∼4 [read a book]]]]]

This type of explanation of the two observations about the interaction of free choice and ellipsis requires neither deviation from the standard assumptions about ellipsis licensing, as described in (2), nor from Sag's and others' assumption that *any* may in principle antecede indefinites. Thus, while the observation in (12), repeated below, remains patently true, we argue that the second assumption in it – that the syntax of a VP containing *any* is not significantly affected by whatever governs the distribution of *any* – should be dropped.

(12)   *Observation about polarity items and ellipsis:*
         On the assumption that *any* is an indefinite and that its licensing mechanism does not significantly affect the syntax of the antecedent VP, it can freely antecede another indefinite in the elided VP.

The paper is structured as follows. Section 2 presents an analysis of *any* that is based on Lahiri's (1998) treatment of Hindi polarity items (see also Lee & Horn 1994, Crnič 2014). The crucial ingredient of the analysis is the assumption that the alternative-sensitive operator governing the distribution of *any* stands in a dependency relation with (a subconstituent of) *any NP*. Furthermore, we introduce a theory of free choice that takes it to be generated in grammar by means of covert exhaustification (Fox 2007, Chierchia et al. 2011, Chierchia 2013). Section 3 derives the observations described above from the assumptions set out in Section 2. The derivation mirrors that of other so-called parallelism facts observed in the discussion of ellipsis, in particular the obligatory structural

isomorphism in binding and scope relations between the Parallelism Domains (e.g., Fiengo & May 1994, Fox 2000, Griffiths & Lipták 2014, among many others). Section 4 concludes the paper by pointing to some avenues for future research.

2   A theory of free choice *any*

Kadmon & Landman (1993) proposed that the distribution of *any* is governed by a strengthening requirement: "*Any* is licensed only if the widening that it induces creates a stronger statement" (p. 369). This requirement can be restated as in (41):

(41)   A DP headed by *any* is felicitous only if it is contained in a constituent whose meaning is stronger than it would be if the DP were replaced by an alternative.

On an appropriate characterization of strength and the alternatives to *any* phrases, and on the assumption that free choice inferences are generated in grammar, the distribution of *any* can be adequately captured across all environments by this requirement.

2.1   *Any*

In our implementation of (41), we adopt a variant of Lahiri's (1998) approach to Hindi negative polarity items. Specifically, we take *any* to denote an existential quantifier, as given in (42), and its domain to be base-generated as an argument of a covert *even* operator, as given in (43).

(42) $[\![\text{any}]\!]^{g,c}(D)(P)(Q) = \lambda w.\exists x \in D(P(w)(x){=}Q(w)(x){=}1)$

(43)   *Base-generated structure of* any NP:
         [[any [even D]] NP]

     The constituent [*even D*] must move at LF to a position in which it is interpretable and in which it triggers a satisfiable presupposition. More to the point, when *even* combines with a domain argument, its second argument must be a property of domains (see, e.g., Rooth 1985 on *even* taking arguments of different types). It thus cannot be interpreted *in situ* in a configuration like (43). Furthermore, its final landing site must be such that the presupposition triggered by *even*, provided in (44), is satisfied. This means that if the alternatives to the domain argument of *even*, D, are its subdomains (Krifka 1995, Chierchia 2013), the property of domains, P, combined with D must be ordered higher on a salient scale than it being combined with any subdomain D' of D. For ease of exposition, we represent this ordering with $P(D) \subset P(D')$ in the following, and assume throughout this paper that it corresponds to the entailment relation (see Crnič 2013, Crnič 2014 for discussion of cases requiring a likelihood-based ordering, and Greenberg 2015 for a recent,

more general discussion of *even*).[6,7]

(44) $[\![even]\!]^{g,c}(D)(P)$ is defined only if $\forall D'{\subset}D: P(D) \subset P(D')$.
        If defined, $[\![even]\!]^{g,c}(D)(P)(w) = \lambda w.P(D)(w)=1$

We thus formalized the condition in (41) by analyzing strength in terms of entailment, like Kadmon & Landman, and by taking the strengthening requirement to be checked by covert *even*. The alternatives induced by a DP headed by *any* differ from it only in their domains: their domains are subsets of the domain found in the DP, as assumed by Krifka and Chierchia. We now look at two predictions of the proposal most relevant for the purposes of this paper.

A sentence like (45-a), in which *any* occurs in the scope of negation, is felicitous because [*even D*] may scope above negation, as represented in (45-b).

(45)   a.   John didn't read any book.
        b.   [even D] [λ1 [not [John read any t_1 book]]]

        $\underset{\textit{movement of } even}{\underline{\hspace{4cm}}\uparrow}$

In (45), *even* triggers the presupposition that John not reading a book in D entails John not reading a book in D', for every subset D' of D, given in (47). This presupposition is a tautology.

(46)   *Assertive meaning of (45-b):*
        $[\![[even\ D]]\!]^{g,c}([\![\lambda1\ [not\ [John\ read\ any\ t_1\ book]\!]^{g,c}\ ) =$
        $[\![[even\ D]]\!]^{g,c}(\lambda D'.\ \lambda w.\ \neg(John\ read_w\ a\ book\ in\ D')) =$
        $(\lambda D'.\ \lambda w.\ \neg(John\ read_w\ a\ book\ in\ D'))(D) =$
        $\lambda w.\ \neg(John\ read_w\ a\ book\ in\ D)$

(47)   *Presupposition of* even *in (45-b):*
        $\forall D'{\subset}D: \lambda w.\neg(John\ read_w\ a\ book\ in\ D) \subset \lambda w.\neg(John\ read_w\ a\ book\ in\ D')$ $(\top)$

However, if [*even D*] is not base-generated in a downward-entailing environment or, equivalently, if its trace is not in a downward-entailing environment, the prediction is that the presupposition triggered by *even* will not be satisfiable. While this is a desirable prediction for occurrences of *any* in non-modal environments, as in (48), it is incorrect for occurrences of *any* in existential modal environments, as in (49).

(48)   #John read any book.

(49)   John is allowed to read any book.

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[6]It is actually not crucial for our purposes that a subconstituent of an *any* phrase moves at LF. It would also suffice if the base-generated domain of *any* were a variable bound by a c-commanding [*even D*]. This might allow us to avoid issues involving the displacement of [*even D*] (cf. Rooth 1985, Schwarz 2000, Nakanishi 2012, and the discussion in Section 3.3).

[7]The proposal that we put forward in this paper to deal with free choice *any* in ellipsis contexts could be transposed to alternative approaches to *any*, esp. to Chierchia's (2013) approach, and perhaps yield identical predictions. We leave a detailed exploration of this possibility to a future occasion.

Let us elaborate a bit more on this prediction. If we assume that the structure of sentence (49) is the one in (50), we predict that it will trigger the presupposition in (51-b), which is unsatisfiable: that John being allowed to read a book in D entails John being allowed to read a book in every one of D's subdomains is contradictory.

(50)   [even D] [$\lambda 1$ [$\diamond$ [John read [any t_1 book]]]]

(51)   a.   *Assertive meaning of (50):*
          $\lambda w.\ \diamond_w$(John read a book in D)
       b.   *Presupposition of* even *in (50):*
          $\forall D' \subset D:\ \lambda w.\diamond_w$(John read a book in D) $\subset$
          $\lambda w.\diamond_w$(John read a book in D')   ($\bot$)

Thus, all else being equal, the proposal sketched above undergenerates: it assigns sentence (49) an assertive meaning that is too weak – it lacks the free choice inference that every book is such that John is allowed to read it –, and incorrectly predicts *any* to be unacceptable in existential modal environments due to triggering an unsatisfiable presupposition. Clearly, if the assertive meaning included the free choice content, the presupposition of *even* would be satisfied: John being allowed to read any book of his choice in D entails John being allowed to read any book of his choice in every one of D's subdomains. The question we now address is how to derive the free choice content as part of the assertive meaning. In doing this, we rely on recursive exhaustification in grammar (e.g., Fox 2007, Chierchia et al. 2011, Chierchia 2013).

2.2   Recursive exhaustification

Consider sentences (52) and (53).

(52)   John is allowed to read *War and Peace* or *Anna Karenina.*

(53)   John has to read *War and Peace* or *Anna Karenina.*

Both sentences convey that John is allowed to read *War and Peace* and that he is allowed to read *Anna Karenina* (and perhaps that he is not allowed, or required, to read both, respectively). This free choice inference bears the signature property of scalar implicature – it tends to disappear when the sentence is embedded in a downward-entailing environment. Although the free choice inference of (53) can easily be derived as a scalar implicature – it follows from the meaning of the sentence and the negation of the stronger alternatives that John has to read *War and Peace* and that John has to read *Anna Karenina*, as we will see below –, the derivation of the free choice inference of (52) requires recursive exhaustification, an operation that is available on the assumption that scalar implicatures are computed in grammar, as argued by Fox (2007).

Exhaustification in grammar.   Scalar implicatures have been argued to be generated in grammar by a covert exhaustification device, *exh* (Fox 2007, Chierchia et al. 2011, Chierchia 2013, and others). The semantics of *exh* is provided in (54): it takes a set of

alternatives, C, and a proposition, p, as its arguments, and states that the proposition is true and that all the excludable alternatives, which form a subset of C, are false.[8]

(54) $[\![exh]\!]^{g,c}(C)(p) = \lambda w.\ p(w)\ \&\ \forall q \in Excl(C, p): p \nRightarrow q \rightarrow \neg q(w)$

We illustrate the application of *exh* on the example in (55). The answer in (55-b) conveys the scalar implicature that John read no book other than *War and Peace*.

(55)   a.   A: What did John read?
         b.   B: John read *War and Peace*.

The structure of (55-b) is provided in (56). The domain of *exh*, C_1, consists of alternatives built on the alternatives to *War and Peace*. If the only relevant alternative to *War and Peace* is *Anna Karenina*, we obtain the set of alternatives in (57) (see footnote 1 for the definition of alternatives).

(56)   [exh C_1] [John read War and Peace]

(57) $C_1 = \{\lambda w.(\text{John read}_w\ War\ and\ Peace),\ \lambda w.(\text{John read}_w\ Anna\ Karenina)\}$

Given these alternatives, the sentence gives rise to the scalar implicature in (58): there is *ex hypothesi* only one relevant alternative not entailed by the prejacent, and it is negated by *exh*, yielding the proposition that John read *War and Peace* and that he did not read *Anna Karenina*.

(58) $[\![[exh\ C_1]\ [\text{John read War and Peace}]]\!]^{g,c} = \lambda w.(\text{John read}_w\ War\ and\ Peace)\ \&$
         $\forall q \in C_1:(\lambda w.(\text{John read}_w\ War\ and\ Peace) \nsubseteq q) \rightarrow \neg q(w) = \lambda w.(\text{John read}_w\ War$
         $and\ Peace)\ \&\ \neg(\text{John read}_w\ Anna\ Karenina)$

Free choice with existential modals.   Let us now apply the exhaustification operator recursively to an existential modal sentence containing embedded disjunction, such as the one in (52). The pertinent structure of the sentence in (52) is provided in (59).

(59)   [exh C_2] [exh C_1] [$\Diamond$ [John read *War and Peace* or *Anna Karenina*]]

If we assume that the domain of the lower *exh* is the one given in (60), whose elements are built on the disjunct alternatives to *War and Peace* or *Anna Karenina*, then the application of the lower *exh* will not affect the meaning of its prejacent since neither of the

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[8]The reason why not all alternatives in the first argument of *exh* are negated is to avoid potential contradictions and other issues. For example, when dealing with plain disjunction, one does not want to negate both disjuncts. Fox (2007) proposes the following characterization of excludable alternatives (see also Spector 2006 for discussion): the set of excludable alternatives with respect to a proposition p and a set of alternatives C is the instersection of all the maximal sets C' in C that have the property that the negations of all their members can be jointly conjoined with p:

(i) $Excl(C, p) = \cap\{C' \subseteq C \mid C'$ is a maximal set in C s.t. $\{\neg q \mid q \in C\} \cup \{p\}$ is consistent$\}$

disjunct alternatives is excludable (negating both of them would lead to a contradiction and negating just one of them is arbitrary, see footnote 8).

(60) $C_1 = \{\lambda w.\Diamond_w(\text{John read WP}), \lambda w.\Diamond_w(\text{John read AK})\}$

(61) $[\![\text{exh } C_1] [\Diamond [\text{John read WP or AK}]]\!]^{g,c} = \lambda w.\Diamond_w(\text{John read WP or AK})$

However, this selection of C_1 does affect the interpretation of the matrix sentence. Namely, the domain of the higher *exh* may be constituted as in (62), where the alternatives are the exhaustified disjunct alternatives, that is, the alternatives to the sister of $[\textit{exh } C_2]$.

(62) $C_2 = \{\lambda w.\text{exh}(C_1)(\Diamond_w(\text{John read WP})), \lambda w.\text{exh}(C_1)(\Diamond_w(\text{John read AK}))\} = \{\lambda w.\big(\Diamond_w(\text{John read WP}) \,\&\, \neg\Diamond_w(\text{John read AK})\big), \lambda w.\big(\Diamond_w(\text{John read AK}) \,\&\, \neg\Diamond_w(\text{John read WP})\big)\}$

Exhaustifying over these alternatives, we obtain the inferences that the prejacent of the higher *exh* is true – that John is allowed to read *War and Peace* or *Anna Karenina* – and that both the alternative that John is allowed to read *War and Peace* but not *Anna Karenina* and the alternative that John is allowed to read *Anna Karenina* but not *War and Peace* are false. Together, these inferences correspond to John being allowed to read *War and Peace* and him being allowed to read *Anna Karenina*, as derived in (63). This corresponds to the free choice interpretation of disjunction.

(63) $[\![\text{exh } C_2] [\text{exh } C_1] [\Diamond [\text{John read WP or AK}]]\!]^{g,c} =$

$\lambda w.\Diamond_w(\text{John read WP or AK}) \,\&\, \neg\big(\Diamond_w(\text{John read WP}) \,\&\, \neg\Diamond_w(\text{John read AK})\big) \,\&\, \neg\big(\Diamond_w(\text{John read AK}) \,\&\, \neg\Diamond_w(\text{John read WP})\big) =$

$\lambda w.\Diamond_w(\text{John read WP or AK}) \,\&\, \big(\Diamond_w(\text{John read WP}) \Rightarrow \Diamond_w(\text{John read AK})\big) \,\&\, \big(\Diamond_w(\text{John read AK}) \Rightarrow \Diamond_w(\text{John read WP})\big) =$

$\lambda w.\Diamond_w(\text{John read WP}) \,\&\, \Diamond_w(\text{John read AK})$

Although we did not include the conjunctive alternative in the domains of the two *exh* operators, that is, the conjunctive alternative was 'pruned', this was a matter of choice rather than necessity. Not pruning the conjunctive alternative from either domain would result in the sentence conveying the meaning described in (64), which in addition to the meaning in (63) conveys that the conjunctive alternative is false.

(64) $\lambda w.\Diamond_w(\text{John read WP}) \,\&\, \Diamond_w(\text{John read AK}) \,\&\, \neg\Diamond_w(\text{John read WP and AK})$

Following Fox (2007), we thus derived the free choice interpretation of disjunction by a recursive application of the exhaustification operator, an embeddable device in grammar.

Free choice with universal modals.   We saw in (53), repeated below, that we obtain a free choice interpretation of disjunction also with universal modals: the sentence conveys that John may read *War and Peace* and that he may read *Anna Karenina*. It turns out that this reading can be derived with a single application of *exh*, as represented in (65).

(53)   John has to read *War and Peace* or *Anna Karenina.*

(65)   [exh C_1] [□ [John read WP or AK]]

In parallel to our discussion of the existential modal example above, assume that the domain C_1 in (65) contains the disjunct alternatives, as given in (66).

(66) $C_1 = \{\lambda w.\Box_w(\text{John read WP}), \lambda w.\Box_w(\text{John read AK})\}$

Since both alternatives in (66) are excludable, as witnessed by their negation being jointly consistent with the prejacent, they are both negated by *exh*. We obtain the free choice interpretation of disjunction, given in (67): John has to read *War and Peace* or *Anna Karenina*, but it is false that he has to read *War and Peace*, and it is false that he has to read *Anna Karenina*. This entails that he is allowed to read *War and Peace* and that he is allowed to read *Anna Karenina*, as given in (68).

(67) $\lambda w.\Box_w(\text{John read WP or AK})\ \&\ \neg\Box_w(\text{John read WP})\ \&\ \neg\Box_w(\text{John read AK})$

(68) $\lambda w.\Box_w(\text{John read WP or AK})\ \&\ \Diamond_w(\text{John read WP})\ \&\ \Diamond_w(\text{John read AK})$

If we apply exhaustification another time, as represented in (69), this does not affect the meaning of the sentence. Namely, in this case, all the alternatives in the domain of the higher *exh*, given in (70), are incompatible with the prejacent, and so their negation is entailed by the prejacent (for example, (67) entails that it is false that John has to read *War and Peace* but does not have to read *Anna Karenina*).

(69)   [exh C_2] [exh C_1] [□ [John read WP or AK]]

(70) $C_2 = \{\lambda w.\text{exh}(C_1)(\Box_w(\text{John read WP})), \lambda w.\text{exh}(C_1)(\Box_w(\text{John read AK}))\} = \{\lambda w.\Box_w(\text{John read WP})\ \&\ \neg\Box_w(\text{John read AK}), \lambda w.\Box_w(\text{John read AK})\ \&\ \neg\Box_w(\text{John read WP})\}$

(71)   *Vacuity of the higher* exh *in (69):*
        $[\![[\text{exh } C_2]\ [\text{exh } C_1]\ [\Box\ [\text{John read WP or AK}]]]\!]^{g,c} =$
        $[\![[\text{exh } C_1]\ [\Box\ [\text{John read WP or AK}]]]\!]^{g,c}$

Economy Constraint.   Locally exhaustified meanings of embedded expressions are not always accessible, for instance, they tend to be inaccessible for expressions embedded in the scope of negation. In the approach to exhaustification adopted here this means that the distribution of *exh* must be constrained. In light of this, it has been proposed that an application of *exh* is licit only if it affects in some specific way the interpretation of the sentence in which it occurs. While different formulations of the way in which the interpretation must be affected have been put forward (see, esp., Fox & Spector 2009), the weakest conceivable formulation suffices for the purposes of this paper:

(72)   *Economy Constraint on* exh:
        An occurrence of *exh* is licensed only if it occurs in a constituent whose interpretation would be different if the occurrence of *exh* were deleted.

We have already seen a hypothesized occurrence of *exh* that would violate the Economy Constraint on *exh*, namely, the higher *exh* in the structure in (69): it did not affect the meaning of any constituent in which it occurred, as stated in (71). In contrast, both occurrences of *exh* in (59) on the resolution of the domains of *exh* in (60) and (62) affected the meaning of a constituent in which they occurred, namely, the matrix sentence:

(73)   *Economy Constraint is respected in (59):*
        $[\![[\text{exh } C_2] [\text{exh } C_1] [\Diamond [\text{John read WP or AK}]]]\!]^{g,c} \neq$
        $[\![[\text{exh } C_{1/2}] [\Diamond [\text{John read WP or AK}]]]\!]^{g,c}$

The Economy Constraint will play an important role in our derivation of the distribution of free choice *any* in ellipsis contexts in Section 3.

2.3   Putting the pieces together

In introducing the syntax and semantics of *any* in Section 2.1, we ran into the problem of incorrectly predicting that *any* should be infelicitous in the scope of an existential modal, that is, we did not allow for so-called free choice occurrences of *any*. We show in the following that this prediction is avoided once the free choice inferences induced by *any* are taken into account. (See Chierchia 2013, Ch. 6, for a closely related discussion, though his assumptions about the analysis of *any* in existential modal environments are significantly different from ours.)

Let us look at a sentence containing *any* in the scope of an existential modal in (74-a). If we assume that *even* moves above two *exh* operators, in addition to the existential modal, and if the *exh* operators associate with the domain of *any*, we obtain a licit interpretation. We show this stepwise.

(74)   a.   John is allowed to read any book.
        b.   [even D] [λ3 [exh C_2] [exh C_1] [$\Diamond$ [John read [any t_3 book]]]]

$$\underbrace{[\text{even D}] [\lambda 3 \underbrace{[\text{exh } C_2] [\text{exh } C_1]}_{domain\ exhaustification} [\Diamond [\text{John read [any } t_3 \text{ book]]]}]}_{movement\ of\ \text{even}}$$

Free choice meaning.   If the two *exh* operators in (74) associate with the domain of *any*, and if the alternatives over which they quantify are built on the subdomains of the domain of *any*, we obtain parallel results to when *exh* operators associate with disjunction and the alternatives in the domain of *exh* are built on the different disjuncts, as discussed in the preceding section. This is unsurprising given the fundamental connection between existential quantification and disjunction.

More concretely, the first layer of exhaustification in (74) does not affect the prejacent if the domain of *exh* corresponds to (75): in this case none of the alternatives are excludable relative to the prejacent of *exh*, and so none of them are negated.

(75) $C_1 = \{\lambda w.\Diamond_w(\text{John read a book in D}) \mid D \subseteq g(3)\}$

(76) $[\![[\text{exh } C_1] [\Diamond [\text{John read [any } t_3 \text{ book]]}]\!]^{g,c} = \lambda w.\Diamond_w(\text{John read a book in } g(3))$

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The second layer of exhaustification yields the free choice interpretation of *any*, in parallel to what we observed for disjunction. The alternatives in the domain of the higher *exh* are provided in (77). They are built on the subdomain alternatives to the sister of the higher *exh*.

(77) $C_2 = \{\lambda w.\text{exh}(C_1)(\Diamond_w(\text{John read a book in D})) \mid D \subseteq g(3)\} = \{\lambda w.\Diamond_w(\text{John read a book in D}) \ \& \ \neg\Diamond_w(\text{John read a book in } g(3)\backslash D) \mid D \subseteq g(3)\}$

These alternatives are excludable, as witnessed by their negation being jointly consistent with the prejacent of the higher *exh*. We obtain the proposition that the prejacent is true – that John is allowed to read a book in D – and that for every subdomain of books D' of D, it is false that John is allowed to read a book in D' but not a book in D\D'. Together, these inferences correspond to the proposition that every book is such that John is allowed to read it, as represented in (78).[9] (In (78) and the following, we make the simplifying assumption that the restrictor of *any* is evaluated with respect to the actual world.)

(78) $[\![\text{[exh } C_2] \text{ [exh } C_1] \ [\Diamond \text{ [John read [any } t_3 \text{ book]]]]}]\!]^{g,c} =$
        $\lambda w.\forall D \subset g(3) \cap [\![\text{book}]\!]:\Diamond_w(\text{John read a book in D}) =$
        $\lambda w.\forall x \in g(3) \cap [\![\text{book}]\!]:\Diamond_w(\text{John read x})$

Presupposition of *even*.   If *even* now scopes above the two *exh* operators that associate with its trace, as given in (79), we obtain the meaning in (80).

(79) $[\text{even D}] \ [\lambda 3 \ [\text{exh } C_2] \ [\text{exh } C_1] \ [\Diamond \text{ [John read [any } t_3 \text{ book]]]]]}$

(80)   a.   *Assertive meaning of (79):*
               $\lambda w.\forall x \in D \cap [\![\text{book}]\!]:\Diamond_w(\text{John read x})$
        b.   *Presupposition of* even *in (79):*
               $\forall D' \subset D: \big(\lambda w.\forall x \in D \cap [\![\text{book}]\!]:\Diamond_w(\text{John read x})\big) \subset$
               $\big(\lambda w.\forall x \in D' \cap [\![\text{book}]\!]:\Diamond_w(\text{John read x})\big)$ $(\top)$

The presupposition in (80-b) is a tautology: if it is true that every book in D is such that John is allowed to read it, then it is also true that every book in a subdomain D' of D is such that John is allowed to read it. Accordingly, on this construal of sentence *John is allowed to read any book*, the occurrence of *any* is licensed and no special conditions on the context of its use are imposed, that is, the presupposition of *even* accompanying *any* is satisfied in every context. This accounts for the felicity of *any* in existential modal sentences and for the obligatory free choice inference it induces.

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[9]Note that given what we said so far it is not necessary to have an *any* indefinite in the structure to induce free choice – rather, free choice could in principle be induced by every indefinite if its domain is recursively exhaustified (as argued by Chierchia 2013, Ch. 6). The reason why free choice is obligatory with *any*, but at most optional with other indefinites, is that only in the former case is there a covert *even* accompanying the indefinite and associating with its domain, requiring recursive exhaustification to rescue an otherwise illicit structure.

Prediction about universal modals. *Any* is marked in universal modal environments (e.g., Dayal 1998). This is predicted on the account developed above. Specifically, assume that the sentence in (81-a) is assigned the structure in (81-b), and that the alternatives in the domain of *exh* are those provided in (82).

(81)   a. #John has to to read any book.
         b.   [even D] [$\lambda 3$ [exh C_1] [$\Box$ [John read [any t_3 book]]]]

(82) $C_1 = \{\lambda w.\Box_w(\text{John read a book in D}) \mid D \subseteq g(3)\}$

The assertive meaning of (81) on this choice of alternatives is the one given in (83). This meaning is equivalent to John having to read a book in D and him being allowed to read any book in D.

(83)   *Assertive meaning of (81) :*
         $\lambda w.\Box_w(\text{John read a book in D}) \ \& \ \forall D'{\subset}D: \neg\Box_w(\text{John read a book in D'})$

Accordingly, the domain of *even* in (81) consists of mutually logically independent alternatives. If the ordering on which *even* operates is resolved to entailment, as we are assuming in this paper, it triggers an unsatisfiable presupposition. All else being equal, we thus correctly predict that *any* is infelicitous in the scope of universal modals.[10]

(84)   *Presupposition of* even *in (81):*
         $\forall D'{\subset}D: \lambda w.\big(\Box_w(\text{John read a book in D}) \ \& \ \forall D''{\subset}D:\neg\Box_w(\text{John read a book in D''})\big) \subset \lambda w.\big(\Box_w(\text{John read a book in D'}) \ \& \ \forall D''{\subset}D':\neg\Box_w(\text{John read a book in D''})\big)$ ($\bot$)

Overgeneration and the scalar alternative. Admitting recursive exhaustification into grammar introduces several issues for the theory of *any*. For instance, given our assumptions so far, the recursive exhaustification of the domain of *any* that occurs in a plain episodic sentence, given in (85), should yield a universal interpretation of *any*, given in (86): the application of the two *exh* operators leads to the inference that John read a book in D, and that for all D'⊂D it is false that John read a book in D' but not D\D'; this is equivalent to John reading every book in D (see Chierchia 2013, Singh et al. 2013, Bar-Lev & Margulis 2014, Bowler 2014, Meyer 2016 for related discussion).[11]

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    [10]The assumption in this paper that *even* that accompanies *any* operates on an entailment-based scale is a simplification that is not warranted in the general case. This means that the presupposition in (84) may in principle be satisfied in appropriate contexts if *even*'s scale is resolved appropriately, say, to the 'be less likely than' relation. Since we cannot investigate here how to distinguish the contexts in which (84) could be satisfied on this resolution, we provisionally assume that the resulting presupposition is implausible in natural contexts, and that this is the source of apparent markedness of *any* in universal modal environments (though see Crnič 2013). Although this is only an initial step towards a proper understanding of the distribution of *any* in universal modal environments (see Chierchia 2013, Ch. 6, for the intricacies involved), the proposal does provide a distinction between the existential and the univeral modal environments that can be exploited in explaining the contrast between (74) and (81).

    [11]Singh et al. (2013), Bar-Lev & Margulis (2014), Bowler (2014) and Meyer (2016) discuss special cases of disjunction and existential quantification that, respectively, lack the conjunctive and the universal

(85) a. #John read any book.
  b. [even D] [λ3 [exh C_2] [exh C_1] [John read any t_3 book]]

(86) *Assertive meaning of (85):*
  $[\![$[exh C_2] [exh C_1] [John read any t_3 book]$]\!]^{g,c} =$
  $\lambda w.\forall D{\subseteq}g(3)$: John read a $book_w$ in D =
  $\lambda w.\forall x{\in}g(3){\cap}[\![book]\!]$: John $read_w$ x

The presupposition of *even* in (85), given in (87), is a tautology: since the domain of *any* is in a downward-entailing environment (in effect, the restrictor of a universal quantifier), replacing it with a subdomain yields a weaker meaning. But, of course, rather than having a universal quantifier meaning, the occurrence of *any* in (85) is infelicitous. Accordingly, the representation in (85) must be ruled out.

(87) *Presupposition of* even *in (85):*
  $\forall D'{\subset}D$: $\lambda w.\big(\forall x{\in}D{\cap}[\![book]\!]$: John $read_w$ x$\big) \subset$
  $\lambda w.\big(\forall x{\in}D'{\cap}[\![book]\!]$: John $read_w$ x$\big)$ ($\top$)

Following Chierchia (2013), this problem can be resolved by assuming that *exh* that associates with the domain of *any* must also associate with *any* itself, which induces a scalar alternative (*every*). And while alternatives may be pruned under certain conditions, that is, subtracted from the domain of *exh*, this is not possible in (85). Specifically, if we assume the independently argued-for constraint on pruning that requires pruning to lead to a weaker meaning (as proposed by Crnič et al. 2015; see Fox & Katzir 2011, Katzir 2013 for alternatives), the sentence in (85) is correctly ruled out.[12] Namely, the universal meaning described in (87) is crucially derived by pruning the universal quantifier alternative – that John read every book – from the domains of both *exh* operators. But this, trivially, leads to a stronger meaning than when pruning does not apply, in violation of the constraint on pruning: if the universal quantifier alternative is contained in the domain of the higher *exh*, none of the alternatives is excludable and, thus, none of them gets negated (you can appreciate this by noting that the universal meaning is incompatible with the negation of the universal quantifier alternative). This means that the pruning of the universal quantifier alternative that is required to derive the universal meaning of *any* is not legitimate (= it does not weaken the meaning of the respective constituent). (See

(i) *Constraint on pruning:*
  exh(C)(S) is licensed for C $\subseteq$ F(S) only if for any C', C$\subset$C'$\subseteq$ALT(S), exh(C')(S) asymmetrically entails exh(C)(S).

Crnič et al. 2015, Sect. 3.3, for a detailed discussion of an analogous example and the motivation behind the constraint, and footnote 8 for the characterization of excludable alternatives.)

Furthermore, a single exhaustification does not yield a consistent interpretation of a plain episodic sentence containing *any*. For instance, the exhaustification represented in (88)-(89), on which the universal quantifier alternative is negated, does not rescue the presupposition of the sentence: John reading some but not every book in a subset D' of D entails John reading some but not every book in D – in contradiction to what is required by the presupposition of *even*, given in (89-b).

(88)   [even D] [λ3 [exh C$_1$] [John read any t$_3$ book]]

(89)   a.   *Assertive meaning of (88):*
              λw.(John read$_w$ a book in D) & ¬(John read$_w$ every book in D)

        b.   *Presupposition of* even *in (88):*
              ∀D'⊂D∩⟦book⟧: λw.(John read$_w$ some but not every book in D) ⊂
              λw.(John read$_w$ some but not every book in D')   (⊥)

Finally, the assumption of a universal quantifier alternative for *any* does not affect significantly our treatment of *any* in existential modal environments. In particular, pruning the universal quantifier alternative from the domain of both *exh* operators leads to a weaker meaning of (74), repeated below, compared to when no pruning takes place: for example, if one does not prune the universal quantifier alternatives from the domains of the two *exh* operator, one obtains the free choice meaning computed in (78) above conjoined with the negation of all the universal quantifier alternatives, that is, all the universal quantifier alternatives built on the non-singleton subdomains of the domain of *any NP*, as given in (90).[13]

(74)   a.   John is allowed to read any book.
        b.   [even D] [λ3 [exh C$_2$] [exh C$_1$] [◇ [John read [any t$_3$ book]]]]

(90)   *Assertive meaning of (74) (without pruning):*
        λw.(∀D'⊂D∩⟦book⟧: ◇$_w$(John read a book in D')) & (¬∃D'⊆D: card(D')≥2 &
        ◇$_w$(John read every book in D'))

The presupposition of *even*, given in (91), is also in this case a tautology. To recognize this, it suffices to observe that for both conjuncts in (90), replacing D with a subdomain D' of D results in a weaker meaning of the conjunct.

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[13]With the lower *exh* in (78), if one prunes the universal quantifier alternative, one obtains the proposition that John is allowed to read a book in D (no alternatives are negated by *exh*) instead of the stronger proposition that John is allowed to read a book in D but for no subdomain D' of D that consists of at least two elements is John allowed to read every book in D'. With the higher *exh*, if one prunes the universal quantifier alternative, one obtains the proposition that every domain D' of D is such that John is allowed to read a book in D' instead of the stronger proposition that every domain D' of D is such that John is allowed to read a book in D', but for no subdomain D" of D that consists of at least two elements is John allowed to read every book in D". This means that pruning the universal quantifier alternative from the domains of either *exh* respects the condition on pruning described above.

(91)   *Presupposition of* even *in (74) (without pruning):*
$\forall$D'$\subset$D: λw.$\big(\forall$D"$\subset$D: $\diamond_w$(John read a book in D") & $\neg\exists$D"$\subseteq$D: card(D")$\geq$2 & $\diamond_w$(John read every book in D")$\big) \subset \lambda$w.$\big(\forall$D"$\subset$D': $\diamond_w$(John read a book in D")
& $\neg\exists$D"$\subseteq$D': card(D")$\geq$2 & $\diamond_w$(John read every book in D")$\big)$ ($\top$)

While the meaning in (90)-(91) corresponds to a possible interpretation of sentence (74), and may indeed be its preferred interpretation (perhaps even its only interpretation, see Menéndez-Benito 2010 for discussion), we continue to employ the simpler representations in which the universal quantifier alternatives are pruned in the remainder of the paper. This choice does not affect our conclusions since the presuppositions of the representations with and without pruning of the universal quantifier alternative are identical in the examples discussed, namely, trivial.
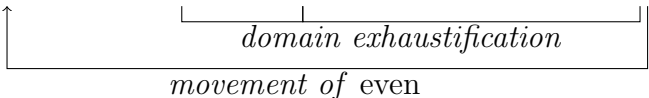
To conclude, building on the insights of Chierchia (2013), we proposed that *any NP*s induce, in addition to subdomain alternatives, also a potentially prunable universal quantifier alternative (*every*). We showed that this assumption constrains the overgeneration of the proposal developed above and correctly rules out the problematic universal construals of unembedded *any*. Although many further cases of potential overgeneration due to covert exhaustification should be investigated, we cannot pursue this task here.

2.4   Summary

Any takes as its first argument a domain combined with a covert *even* operator, that is, [*even D*]. Since [*even D*] cannot be interpreted *in situ*, it must move at LF. If *any* is appropriately embedded, *even* may trigger a licit presupposition at its landing site. This is the case if *any* occurs in a downward-entailing environment or in the scope of an existential modal. In the former case, it suffices for *even* to move just outside the downward-entailing environment in which it is base-generated to trigger a satisfiable presupposition:

(92)   [even D] [λ1 [not [John read any t$_1$ book]]]
       movement of even

In the latter case, *even* must move above an existential modal and two *exh* operators that associate with its trace, as given in (93). This way we obtain the desired interpretation of the sentence, specifically, the free choice interpretation of *any*, and *even* triggering a tautologous presupposition.

(93)   [even D] [λ3 [exh C$_2$] [exh C$_1$] [$\diamond$ [John read [any t$_3$ book]]]]]
       domain exhaustification
       movement of even

Furthermore, if *any* is embedded below a universal modal, or if it is unembedded, *even* will trigger an unsatisfiable presupposition, and the occurrence of *any* will correctly be predicted to be infelicitous. Finally, we discussed some potential cases of overgeneration due to the availability of covert exhaustification. We ruled them out by assuming that

any also activates *every* as an alternative.

3 Free choice puzzle derived

If the treatment of *any* presented in the preceding section is combined with the standard assumptions about ellipsis licensing, the two puzzling observations about the interaction of free choice and ellipsis fall out naturally. First: we show that the scope position of *even* that accompanies *any* in an antecedent VP determines the lower bound on the size of the Parallelism Domains – everything that is in the scope of *even* must have a potentially focused counterpart in the ellipsis Parallelism Domain. If this is not the case, the sequence will be infelicitous. This is the reasoning that underlies the account of the first observation. Second: if the nominal expression giving rise to a free choice inference is unpronounced, one need not assume that it is *any* rather than some other indefinite. Accordingly, since the presence of *even* is optional, no lower bound on the size of the Parallelism Domains is mandated by *even*. This accounts for the second observation.

3.1 Basic example

Before turning to the two observations about free choice in ellipsis contexts, let us first look at the basic example from the introduction, repeated below. In this example the antecedent VP contains *any* in the immediate scope of sentential negation, while the elided VP occurs in a plain episodic sentence.

(8)   John didn't read any book, but Mary did $\triangle$.

The proposal developed above assigns the first sentence the representation in (94-a). We may choose the matrix sentence as the antecedent Parallelism Domain, that is, the antecedent Parallelism Domain may contain [*even D*]. (As will become clear in the following subsection, the matrix sentence must, in fact, be chosen as the antecedent Parallelism Domain.)

(94)   a.   A: [even D] [λ1 [not [John read any t$_1$ book]]]$_4$
         b.   E: [∼4 [did$_F$ [Mary$_F$ read a D book]]]

The meaning of the structure in (94-a), that is, the antecedent Parallelism Domain, is provided in (95): it conveys that John did not read a book, and it triggers a presupposition that is tautologous, as discussed in the preceding section.

(95)   a.   *Assertive meaning of (94-a):*
                λw.¬(John read$_w$ a book in D)
         b.   *Presupposition of even in (94-a):*
                ∀D'⊂D: λw.¬(John read$_w$ a book in D) ⊂
                λw.¬(John read$_w$ a book in D')   (⊤)

Since the ellipsis Parallelism Domain in (94-b) has the focus alternatives in (96), the Ellipsis Licensing Condition is satisfied, as stated in (97). This accounts for the felicity of the basicexample. Note that although none of the alternatives in (96) contains *even*, and thus none of them triggers any presupposition, this is not an issue for ellipsis licensing since the presupposition of the antecedent Parallelism Domain is tautologous.

(96) $F([\text{did}_F [\text{Mary}_F \text{ read a D book}]]) =$
        $\{\lambda w.(\text{x read a book in D}), \lambda w.\neg(\text{x read a book in D}) \mid \text{x} \in D_e\}$

(97)   *Ellipsis Licensing Condition:*
        $[[\text{even D}] \lambda 1 [\text{not } [\text{John read any } t_1 \text{ book}]]]^{g,c} \in F([\text{did}_F [\text{Mary}_F \text{ read a D book}]])$

3.2   First observation

Recall the first observation about the interaction of free choice and ellipsis:

(19)   *First observation about the interaction of free choice and ellipsis:*
        An occurrence of free choice *any* in the antecedent VP requires the elided VP to be in a free choice licensing environment.

Unlike *any* in the scope of negation, free choice *any* appears to only be able to antecede an occurrence of free choice *any* or, more precisely, an indefinite that gives rise to a free choice inference. This means that the elided VP must occur, roughly, in the scope of an existential modal. We discuss sequentially the different environments in which one could try to embed an elided VP with an antecedent containing free choice *any*.

Ellipsis in existential modal environments.   The felicity of the sequence in (14), repeated below, follows straightforwardly from the proposal in Section 2.

(14)   John may/is allowed to read any book. Bill is also allowed to △.

Namely, the two sentences in (14) may be assigned the structures in (98), where the domains of the existential quantifiers are recursively exhaustified, generating a free choice inference in both sentences. The matrix sentences are chosen as the Parallelism Domains.

(98)   a.   A: $[[\text{even D}] [\lambda 3 [\text{exh } C_2] [\text{exh } C_1] [\Diamond [\text{John read } [\text{any } t_3 \text{ book}]]]]]_4$
        b.   E: $[\sim 4 [[\text{exh } C_2] [\text{exh } C_1] [\Diamond [\text{Bill}_F \text{ read } [\text{a D book}]]]]]$

The focus value of the second sentence is represented in (99).

(99) $F([\text{exh } C_2] [\text{exh } C_1] [\Diamond [\text{Bill}_F \text{ read } [\text{a D book}]]]) =$
        $\{\lambda w.\forall x \in D \cap [\![\text{book}]\!] : \Diamond_w(\text{y read x}) \mid \text{y} \in D_e\}$

The meaning of the antecedent Parallelism Domain, given in (100), is clearly contained in this set: since the presupposition of *even* in the structure in (98-a) is tautologous, as discussed in the preceding section, only its assertive meaning matters. Accordingly, the Ellipsis Licensing Condition is satisfied by the structures in (98), as stated in (101).

(100) $[\![[\text{even D}]\ [\lambda 3\ [\text{exh C}_2]\ [\text{exh C}_1]\ [\diamondsuit\ [\text{John read [any t}_3\ \text{book]}]]]]]\!]^{g,c} =$
$[\![[\text{exh C}_2]\ [\text{exh C}_1]\ [\diamondsuit\ [\text{John read [any D book]}]]]]\!]^{g,c} =$
$\lambda w.\forall x\in D\cap[\![\text{book}]\!]:\diamondsuit_w(\text{John read x})$

(101) *Ellipsis Licensing Condition:*
$[\![[\text{even D}]\ [\lambda 3\ [\text{exh C}_2]\ [\text{exh C}_1]\ [\diamondsuit\ [\text{John read [any t}_3\ \text{book]}]]]]]\!]^{g,c} \in$
$F([\text{exh C}_2]\ [\text{exh C}_1]\ [\diamondsuit\ [\text{Bill}_F\ \text{read [any D book]}]])$

A question that arises in light of this discussion is whether there are other constituents in the two sentences on the basis of which the Ellipsis Licensing Condition could be satisfied. The answer turns out to be 'no'. In order to appreciate this we first need to discuss another constraint operative in ellipsis resolution: No Meaningless Coindexation.

Excursus: No Meaningless Coindexation. Recall the sequence in (5), repeated below. We observed that the sequence is two-way ambiguous – in particular, the interpretation of the first sentence determines the interpretation of the second sentence (for instance, if the first sentence has the so-called surface scope reading, the second sentence has it as well).

(5) Some boy read every book, and some girl did △ too.

Obviously, the second sentence cannot be interpreted as conveying that some girl read, say, (only) *War and Peace*. This does not follow immediately from the Ellipsis Licensing Condition proposed above. For example, the sentences in (5) could be assigned the representations in (102), where *it* refers to *War and Peace* and bears the same index as the trace of *every book* in the first sentence. These representations satisfy the Ellipsis Licensing Condition, as shown in (103).

(102) a. A: [[every book] [$\lambda 5$ [some boy] [read t$_5$]$_4$]]
       b. E: [some girl$_F$] [~ 4 [read it$_5$]]

(103) *Ellipsis Licensing Condition:*
$[\![\text{read t}_5]\!]^{g,c} \in F(\text{read it}_5)\ \left(= \{\lambda x.\lambda w.(x\ \text{read}_w\ g(5))\}\right)$

A way to avoid this prediction is to prohibit opportunistic choices of indices. This was proposed by Heim (1997) and is captured by the following constraint (see also Sag 1976: 180):

(104) *No Meaningless Coindexation:*
       If an LF contains an occurrence of a variable X that is bound by a node Z, then all occurrences of X in this LF must be bound by the same node Z.

Accordingly, the problematic representations in (102) are ruled out. Since the same selection of Parallelism Domains, but with a different choice of indices, does not satisfy the Ellipsis Licensing Condition, we correctly predict that the sequence in (5) will not have the undesirable interpretation described above.

(105) a. A: [every book] [$\lambda 1$ [some boy] $\underline{[\text{read } t_1]}_4$]
   b. E: [some girl$_F$] [~ 4 $\underline{[\text{read it}_5]}$]]
      ($\checkmark$ No Meaningless Coindexation, # Ellipsis Licensing Condition)

Let us now turn back to the VP ellipsis in the sequence in (14). Given No Meaningless Coindexation, selecting any subconstituent of (98-a) that does not include the moved constituent [*even D*] will either respect No Meaningless Coindexation but violate the Ellipsis Licensing Condition, or violate No Meaningless Coindexation, as illustrated in (106)-(107) for the sentential complement of the existential modal.

(106) a. A: [even D] [$\lambda 5$ [exh C$_2$] [exh C$_1$] [$\diamondsuit$ $\underline{[\text{John read [any } t_5 \text{ book]]}}_4$]]
   b. E: [exh C$_2$] [exh C$_1$] [$\diamondsuit$ [~ 4 $\underline{[\text{Bill}_F \text{ read [a D}_6 \text{ book]]}}$]]]
      ($\checkmark$ No Meaningless Coindexation, # Ellipsis Licensing Condition)

(107) a. A: [even D] [$\lambda 3$ [exh C$_2$] [exh C$_1$] [$\diamondsuit$ $\underline{[\text{John read [any } t_3 \text{ book]]}}_4$]]
   b. E: [exh C$_2$] [exh C$_1$] [$\diamondsuit$ [~ 4 $\underline{[\text{Bill}_F \text{ read [a D}_3 \text{ book]]}}$]]]
      (# No Meaningless Coindexation, $\checkmark$ Ellipsis Licensing Condition)

No Meaningless Coindexation, coupled with our assumption that a subconstituent of an *any* phrase stands in a dependency relation with a c-commanding operator, thus regulates the minimal size of the Parallelism Domain containing an *any* phrase: it has to contain the [*even D*] constituent accompanying *any*, as stated in (108). This generalization has noticeable repercussions for *any*'s ability to antecede indefinites in elided VPs.[14]

(108) *Generalization about* any *in ellipsis contexts:*
   If an antecedent VP contains *any*, any antecedent Parallelism Domain dominating the VP will have to also dominate [*even D*] accompanying *any*.

Ellipsis in episodic environments. The sequence in (109) is infelicitous. To account for this fact, we need to show that there are no parses of the sentences in the sequence that could simultaneously satisfy all the pertinent grammatical constraints, that is, the constraints on ellipsis licensing, on exhaustification, and on the distribution of *any*.

(109) #John may/is allowed to read any book. Bill (already) did $\triangle$.

Due to No Meaningless Coindexation, the antecedent Parallelism Domain in (109) must be the matrix sentence, otherwise the Ellipsis Licensing Condition cannot be satisfied.

(110) A: [even D] [$\lambda 3$ [exh C$_2$] [exh C$_1$] [$\diamondsuit$ [John read [any t_3 book]]]]]]$_4$
      $\underbrace{\hspace{8cm}}$
      minimal Parallelism Domain

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[14]Strictly speaking, it suffices to take the λ-prefixed sister of [*even D*] as the antecedent Parallelism Domain. Consequently, the Ellipsis Licensing Condition could be satisfied by base-generating *any* in the elided VP, moving [*even D*] as in the antecedent sentence, and taking the sister to its landing site as the ellipsis Parallelism Domain. See Section 3.3 for further discussion.

We may assign the second sentence in (109) one of the parses in (111). However, both of these parses violate at least one of the constraints introduced above. We attend to them in turn. (Of course, there is a variety of other parses that the sentence could be assigned, but they all suffer from one of the problems facing the parses in (111).)

(111) a. E: [∼4 [did$_F$ [Bill$_F$ read [a D book]]]]
       b. E: [∼4 [exh C$_2$] [exh C$_1$] [did$_F$ [Bill$_F$ read [a D book]]]]

First: The structure in (111-a) does not induce a focus alternative that would correspond to the meaning of the antecedent Parallelism Domain – to have a chance of satisfying the Ellipsis Licensing Condition, the elided VP has to be embedded under a (potentially focused) sentential operator and two *exh* operators. Accordingly, the sequence consisting of (110)-(111-a) is predicted to be infelicitous.

(112) *Ellipsis Licensing Condition:*
       $[\![$[even D] [λ3 [exh C$_2$] [exh C$_1$] [◇ [John read [any t$_3$ book]]]]$]\!]^{g,c} \notin$
       F([did$_F$ [Bill$_F$ read [a D book]]]) (= {λw.(x read$_w$ a book in D), λw.¬(x read$_w$ a book in D), λw.◇$_w$(x read a book in D), ... | x∈D$_e$})

Second: The representation in (111-b) faces a different problem. In contrast to (111-a), the meaning of the antecedent Parallelism Domain may be contained in the focus value of the ellipsis Parallelism Domain in (111-b), as shown in (113).

(113) *Ellipsis Licensing Condition:*
       $[\![$[even D] [λ3 [exh C$_2$] [exh C$_1$] [◇ [John read [any t$_3$ book]]]]$]\!]^{g,c} \in$
       F([exh C$_2$] [exh C$_1$] [did$_F$ [Bill$_F$ read [a D book]]]) (= {λw.(x read$_w$ a book in D), λw.¬(x read$_w$ a book in D), λw.∀y∈D∩$[\![$book$]\!]$:◇$_w$(x read y), ... | x∈D$_e$}

However, the structure in (111-b) suffers from another problem: it violates the Economy Constraint on *exh*. Namely, at least one of the occurrences of *exh* in (111-b) is vacuous:

(114) *Economy Constraint on* exh *is violated in (111-b):*
       $[\![$[exh C$_2$] [exh C$_1$] [did$_F$ [Bill$_F$ read [a D book]]]$]\!]^{g,c} =$
       $[\![$[exh C$_{1/2}$] [did$_F$ [Bill$_F$ read [a D book]]]$]\!]^{g,c}$

On the one hand, if the universal quantifier alternative is pruned from the domain of the lower *exh* in (111-b), it cannot be pruned from the domain of the higher *exh*, and so both occurrences of *exh* turn out to be vacuous (recall from Section 2.3 that in such a configuration no alternative in the domain of the higher *exh* is excludable, and that pruning of the universal quantifier alternative violates the constraint on pruning). On the other hand, if the universal quantifier alternative is not pruned from the domain of the lower *exh*, the higher *exh* is vacuous (no remaining alternative is excludable, and so none of them can be negated). Finally, since it is not possible to prune the universal quantifier alternative from the domains of both *exh* operators, as discussed in Section 2.3, we are forced to conclude that the structure in (111-b) runs afoul of the Economy Constraint on

exh on any legitimate selection of the relevant alternatives.[15]

Ellipsis in universal modal environments.   Sequences in which the antecedent VP contains an occurrence of free choice *any* and in which the elided VP is embedded in the scope of a universal modal face the same problem: while the antecedent Parallelism Domain has the representation given in (110), the second sentence may be parsed along the lines of one of the representations in (116), all of which either violate the Ellipsis Licensing Condition or the Economy Constraint on *exh*.

(115)   #John may/is allowed to read any book. Bill has to △.

(116)   a.   E: [∼4 $\underline{[\square_F \text{ [Bill}_F \text{ read [a D book]]]]}}$

          b.   E: [∼4 $\underline{[\text{exh } C_1] \text{ [}\square_F \text{ [Bill}_F \text{ read [a D book]]]]}}$

          c.   E: [∼4 $\underline{[\text{exh } C_2] \text{ [exh } C_1] \text{ [}\square_F \text{ [Bill}_F \text{ read [a D book]]]]}}$

First: Sequences (110)-(116-a) and (110)-(116-b) cannot satisfy the Ellipsis Licensing Condition because in order to have a chance of satisfying the Ellipsis Licensing Condition the elided VP has to be embedded in the scope of two *exh* operators. Second: While the elided VP is embedded under two *exh* operators in (116-c), the representation violates the Economy Constraint on *exh*. Namely, on any legitimate selection of the relevant alternatives, one of the two *exh* operators will be vacuous, as discussed with respect to the disjunctive counterpart of (116-c) in (71) above.

(117)   *Economy Constraint on* exh *is violated in (116-c):*
          $[\![\text{[exh } C_2] \text{ [exh } C_1] \text{ [}\square_F \text{ [Bill}_F \text{ read [a D book]]]]}]\!]^{g,c} =$
          $[\![\text{[exh } C_{1/2}] \text{ [}\square_F \text{ [Bill}_F \text{ read [a D book]]]]}]\!]^{g,c}$

Summary.   An occurrence of free choice *any* in an antecedent for VP ellipsis requires the antecedent Parallelism Domain to contain the existential modal and the mechanism responsible for free choice, that is, two *exh* operators.

(118)   [even D] [λ3 [exh C_2] [exh C_1] [◇ [John read [any t_3 book]]]]

                                  domain exhaustification
                          movement of even
                      minimal Parallelism Domain

Consequently, recursive exhaustification must also apply in the ellipsis Parallelism Domain in order for the Ellipsis Licensing Condition to be satisfied. This leads to a licit result only if the application of recursive exhaustification is licensed by grammar. This

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[15]The satisfaction of the Ellipsis Licensing Condition does not sanction a vacuous application of *exh* by itself. This is in line with preceding work on economy and ellipsis licensing: for example, the satisfaction of the Ellipsis Licensing Condition does not license covert movement that would otherwise not affect the meaning of the sentence (see Fox 2000 for detailed discussion).

is not the case if the application of one of the exhaustification operators is vacuous, as is the case if the elided VP occurs in an episodic or a universal modal environment.[16]

3.3   Excursus: Movement of *even* and its properties

Following Lahiri's (1998) assumptions for Hindi polarity items, we assumed that *even* that accompanies *any* is base-generated in *any NP* and moves covertly at LF. This movement has been argued to be problematic since at least (Rooth 1985), not least because it may cross island boundaries (see Nakanishi 2012 for a recent discussion). Accordingly, we pointed out in footnote 6 that our approach could potentially be restated in terms of long-distance binding that does not involve movement, which would allow us to steer clear of questions pertaining to movement, though it might raise other questions (see Lahiri 2006 for issues involved). In this subsection we explore in greater detail some more intricate consequences of assuming that *even* moves for our account of the interaction of free choice and ellipsis. In particular, we explore what predictions one would obtain if the movement of *even* were successive cyclic.

   It turns out that the assumption that the movement of *even* is (at least optionally) successive cyclic does not significantly affect the predictions discussed in the preceding

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[16]A reviewer observes that a different pattern obtains with deaccented, non-ellipsis counterparts of the sentences that we look at in the main text. In particular, free choice *any* may antecede an unembedded indefinite in a deaccented VP, as exemplified in (i).

(i)   John can read any book, and Bill$_F$ did$_F$ read a book.

   In footnote 2, we hinted at the fact that the Ellipsis Licensing Condition is too strong a condition to also hold for deaccentuation. This is illustrated in (ii), where no constituent containing the deaccented VP has a focus alternative that would be identical to the meaning of some constituent in the preceding sentence, though the deaccentuation is nonetheless felicitous (Rooth 1992).

(ii)   First Bill called Mary a Republican, and then [John]$_F$ [insulted her.]$_{deacc}$

   In light of data like this, Fox (2000) proposes that when there is appropriate pronounced material in the deaccented VP, one may accommodate an alternative entailed by an antecedent sentence (say, Bill insulting Mary may be accommodated in (ii)). And if this alternative is in the focus value of some constituent containing the deaccented VP, the deaccentuation is licensed.

   Turning back to (i), the alternative that Mary is allowed to read a book (without a free choice inference), represented in (iii-a), is entailed by the first sentence. Moreover, the alternative is contained in the focus value of the second sentence, (iii-b) (on the assumption that negation has the existential modal as an alternative). This means that if the alternative that Mary is allowed to read a book is accommodated, the deaccentuation in (i) should be felicitous, as desired.

(iii)   a.   Accommodated alternative: $\lambda w.\diamond$(John read a D book)
         b. $\lambda w.\diamond$(John read a D book) $\in$ F([neg$_F$ [Bill$_F$ read book]])

   The remaining question is whether the accommodation of the alternative in (iii-a) is legitimate in (ii). Note that the pronounced indefinite [*a D book*] is not semantically equivalent to the DP headed by *any* in the antecedent VP, not least because of their domains necessarily being different (recall that [*even D*] moves out of *any NP*, and that indices are subject to No Meaningless Coindexation). Although this should suffice for accommodation to be licensed, further study of such patterns is required. Thanks to a reviewer for bringing these issues up.

subsection. For example, consider the case of the elided VP being unembedded:

(119) #John may/is allowed to read any book. Bill (already) did △.

The first sentence in (119) may on the assumption that there are intermediate steps in the movement of *even* be assigned the structure in (120), where [*even D*] first moves to a position below the modal, creating an embedded λ-prefixed constituent along the way.

(120)   A: [even D] [λ5 [exh C_2] [exh C_1] [◇ [t_5 [λ3 [John read [any t_3 book]]]$_4$]]]]

In (120) the most embedded λ-prefixed constituent is chosen as the antecedent Parallelism Domain (if a bigger constituent were chosen, we would obtain the same prediction as discussed above; if a smaller constituent were chosen, we would not be able to satisfy the Ellipsis Licensing Condition due to No Meaningless Coindexation). Turning now to the ellipsis Parallelism Domain, different structures can again be assigned to the sentence containing the elided VP. We discuss them in turn. First: if no movement of the domain of the indefinite takes place in the ellipsis Parallelism Domain, as given in (121), the Ellipsis Licensing Condition cannot be satisfied, as shown in (122).

(121) #E: [∼4 [$Bill_F$ read a D book]]

(122)   *Ellipsis Licensing Condition:*
          $[[λ3 \ [\text{John read [any } t_3 \text{ book}]]]]^{g,c} \notin F([Bill_F \text{ read a D book}])$

Second: if the domain moves by itself to adjoin to the matrix clause, as given in (123), we obtain a violation of Scope Economy (Fox 2000), stated in (124), since the movement would not affect the meaning of the sentence.

(123)   E: [D [∼4 [λ1 [$Bill_F$ read a t_1 book]]]]

(124)   *Scope Economy:*
          A scope-shifting operation can move α from a position in which it is interpretable only if the movement leads to an interpretation of the resulting structure that is distinct from that of the structure in which this movement did not apply.

Third: if the ellipsis Parallelism Domain contained the constituent [*even D*], and this constituent moved, as given in (125), the sentence would trigger an unsatisfiable presuppostion, given in (126): that John reading a book in D entails John reading a book in D', for every subset D' of D, is contradictory

(125)   E: [even D] [λ1 [$Bill_F$ read a t_1 book]]]

(126)   *Presupposition of* even *in (125):*
          $\forall D' \subset D: λw.(\text{Bill read}_w \text{ a book in D}) \subset λw.(\text{Bill read}_w \text{ a book in D'})$ (⊥)

These are all the pertinent parses of the second sentence of the infelicitous sequence in (119). We thus showed that the addition of an intermediate landing site in the movement of *even* would not rescue the felicity of the sequence. Parallel considerations apply to

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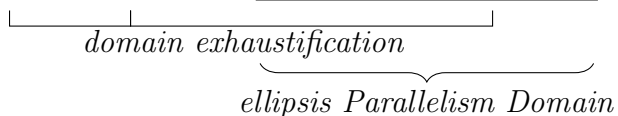examples with universal modals.

3.4   Second observation

Recall the second observation about the interaction of free choice and ellipsis:

(23)   *Second observation about the interaction of free choice and ellipsis:*
An elided VP occurring in a free choice licensing environment and giving rise to a free choice inference does not require the antecedent VP to be in a free choice licensing environment.

This means that there is an asymmetry between the antecedent and the ellipsis Parallelism Domains with respect to whether a free choice construal of an embedded indefinite in one domain affects the construal of its counterpart in the other domain: while it is not possible to induce free choice in the antecedent Parallelism Domain without inducing free choice in the ellipsis Parallelism Domain, the reverse appears to be possible. We argue that this state of affairs follows from, and provides further support for, the approach to *any* and free choice adopted in this paper.

Derivation.   The sequence in (127) may have the representation in (128), in which we do not represent the exceptive modifier for reasons of simplicity (recall also that the free choice inference can be induced in the absence of the exceptive modifier).[17]

(127)   John didn't read any book. But he was allowed to $\triangle$ – except for *Lolita*.

(128)   a.   A: $[\text{even D}]\ [\lambda 1\ [\text{not}\ [\text{John read any } t_1 \text{ book}]]]]_4$
b.   E: $[\text{exh } C_2]\ [\text{exh } C_1]\ [\sim 4\ [\diamondsuit_F \text{ John read a D book}]]$

domain exhaustification

ellipsis Parallelism Domain

The representations in (128) satisfy the Ellipsis Licensing Condition. Importantly, the ellipsis Parallelism Domain in (128-b) does not contain the two *exh* operators that associate with the domain of the indefinite and are responsible for the free choice inference. This is possible because, trivially, no dependency relation obtains between any of the elements in the elided VP and an element taking scope above the two *exh* operators. Accordingly, the focus alternatives to the ellipsis Parallelism Domain are those provided in (129).

(129) $F([\diamondsuit_F\ [\text{John read a D book}]]) = \{\lambda w.(\text{John read}_w \text{ a book in D}), \lambda w.\neg(\text{John read}_w \text{ a book in D}), \lambda w.\square_w(\text{John read a book in D}), ...\}$

---

[17]We take it that the choice of ignoring the exceptive modifier is innocuous: if we follow Gajewski (2009, 2013) in assuming that exceptives are interpreted *in situ* and trigger exhaustification that may apply higher in the structure, we could assume that the exceptive modifier in (127) occurs in the same minimal clause as the elided VP, but that its 'exceptive' import is computed at the matrix level.

Given that the presupposition of *even* in (128-a) is tautologous (*any* occurs in a downward-entailing environment), the meaning of the antecedent Parallelism Domain corresponds to one of the alternatives in (129), namely, that John did not read a book in D, as stated in (130). This accounts for the felicity of the sequence in (127).

(130)   *Ellipsis Licensing Condition:*
        $[\![\text{[even D]} \ [\lambda 1 \ [\text{not [John read any } t_1 \ \text{book]}]]]]]\!]^{g,c} =$
        $[\![\text{[not [John read a D book]}]]]\!]^{g,c} \in F([\Diamond_F \ \text{[John read a D book]]})$

Summary. We saw that recursive exhaustification of the domain of an indefinite contained in the elided VP, which generates a free choice inference, does not require two *exh* operators to be contained in the ellipsis Parallelism Domain, not least because there is no requirement for the indefinite at the ellipsis site to be accompanied by a covert *even*. The crucial difference between the examples captured by the first observation and those captured by the second observation is in the overt morphology of the indefinites that give rise to a free choice inference. While free choice *any* in an antecedent VP is overt, is accompanied by *even*, and its domain is recursively exhaustified, this is not the case for the indefinite in the elided VP – although it need not be accompanied by *even* (since it need not be an *any* phrase), its domain may nonetheless be recursively exhaustified.

4   Conclusion and outlook

The starting point of the paper were two observations pertaining to the distribution of free choice *any* in ellipsis contexts:

(19)   *First observation about the interaction of free choice and ellipsis:*
        An occurrence of free choice *any* in the antecedent VP requires the elided VP to be in a free choice licensing environment.

(23)   *Second observation about the interaction of free choice and ellipsis:*
        An elided VP occurring in a free choice licensing environment and giving rise to a free choice inference does not require the antecedent VP to be in a free choice licensing environment.

We showed that these observations can be derived on an approach (i) that takes *any NP* to be accompanied by a covert *even* that stands in a dependency relation with a subconstituent of the DP headed by *any*, and (ii) that assumes that free choice is generated in grammar by a recursive application of covert exhaustification.

First observation. The assumption about *any* and *even*, coupled with the standard assumptions about ellipsis licensing, determines the minimal size of the Parallelism Domains containing *any*. Specifically, we have seen that if the antecedent VP contains *any*, then *even* must be contained in the antcedent Parallelism Domain. This means that everything that *even* c-commands must have a (potentially focused) parallel counterpart in the ellipsis Parallelism Domain.

(131)   A: $\underbrace{[\text{even D}] \ [\lambda 3 \ [\text{exh C}_2] \ [\text{exh C}_1] \ [\diamond \ [\text{John read [any t}_3 \text{ book}]]]]]}_{\textit{minimal Parallelism Domain}}$

Thus, if the antecedent Parallelism Domain contains two *exh* operators, the ellipsis Parallelism Domain must also contain them in order to satisfy the Ellipsis Licensing Condition. Since these operators have to be licensed by the Economy Constraint on *exh*, we obtain a licit sequence only if the elided VP occurs under an existential modal.

(132)   a. E: $[\text{exh C}_2] \ [\text{exh C}_1] \ [\diamond \ [\text{Bill}_F \text{ read [a D book}]]]]$
         b. #E: $[\text{exh C}_2] \ [\text{exh C}_1] \ [\text{did}_F \ [\text{Bill}_F \text{ read [a D book}]]]]$
         c. #E: $[\text{exh C}_2] \ [\text{exh C}_1] \ [\square_F \ [\text{Bill}_F \text{ read [a D book}]]]]$
             (b. and c. violate the Economy Constraint on *exh*)

Second observation.   The state of affairs is different if a free choice inference is generated in the ellipsis Parallelism Domain. In this case the antecedent Parallelism Domain need not contain a free choice licensing environment. The key difference is that in the examples discussed under the second observation recursive exhaustification may apply in the absence of matrix *even* and need not be part of the ellipsis Parallelism Domain.

(133)   a. A: $[\text{even D}] \ [\lambda 1 \ \underline{[\text{not [John read [any t}_1 \text{ book}]]]}_4]$
         b. E: $[\text{exh C}_2] \ [\text{exh C}_1] \ [\sim4 \ \underbrace{[\diamond_F \ [\text{John read [a D book}]]]]}_{\textit{minimal Parallelism Domain}}$

Future work.   We conclude the paper by discussing three topics for future research. The first one involves studying the extent to which our proposal is wedded to the analysis of *any* developed above. The second one pertains to studying the behavior of polarity items other than *any* in ellipsis constexts. The third one pertains to occurrences of *any* in antecedent VPs that are contained in non-monotone environments.

(i) *Alternative approaches to* any. The three main ingredients of our proposal are the assumptions (a) that an *any* phrase, or one of its subcomponents, stands in a dependency relation with a c-commanding expression governing its behavior, (b) that this expression may occur above a mechanism generating free choice, and (c) that this mechanism is subject to an economy constraint. There may be other approaches to the licensing of *any* that could in principle incorporate these assumptions and perhaps generate the same predictions. For example, in Chierchia's (2013) approach, similar results might be derived if one were to assume that the domain of *any* stands in a dependency relation with an appropriate *exh* operator. We hope to investigate this possibility in the future.

(ii) *Strong NPIs and other polarity items.* Collins & Postal (2014) discuss the distribution of so-called strong NPIs like punctual *until 6PM* in ellipsis contexts. They observe that, at least for some speakers, they appear to only be able to antecede expressions that

are embedded in environments in which strong NPIs are licensed (see, esp., Collins & Postal 2014, Ch. 4). An illustration of this is provided in (134), where the elided VP is in an upward-entailing environment.

(134)   A: Nobody got there until 6PM. B: #I did △.

One potential explanation of these data available to us would take strong NPIs to have meanings or syntactic properties that are simply not shared by any other expressions; in this respect, they would be different from *any*, whose meaning corresponds to that of a plain indefinite. One implementation of this could be to assume that strong NPIs always trigger some non-vacuous inference, an inference that can be satisfied only if the NPI occurs in a specific downward-entailing environment (cf., e.g., Eckardt 2005, Chierchia 2013 on minimizers). Accordingly, since such inferences would have to be triggered in both the ellipsis and the antecedent Parallelism Domain to satisfy the Ellipsis Licensing Condition, both Parallelism Domains would have to contain an environment in which strong NPIs are licensed. While we cannot develop such an analysis here, nor properly investigate the empirical landscape involving strong NPIs and other polarity items, it is on our to-do list.

(iii) Any *in non-monotone environments.* Any may occur in non-monotone environments, as exemplified in (135). The felicity of such occurrences of *any* is highly context-dependent. This can be captured on the proposal outlined above if we assume that the scale on which *even* operates is a likelihood-based one (see Crnič 2014 for details).

(135)   Exactly two students in my class read any book at all.

Unlike in the cases where *any* occurs in a downward-entailing or a free choice environment, *even* triggers a contingent presupposition in (135). Now, if *even* triggers a contingent presupposition in the antecedent Parallelism Domain, a parallel occurrence of *even* must be contained in the ellipsis Parallelism Domain in order for the Ellipsis Licensing Condition to be satisfied. Accordingly, we expect that *any* that occurs in a non-monotone environment may antecede *any* in a non-monotone or a downward-entailing environment (where a parallel occurrence of *even* would trigger a satisfiable presupposition), but not in an upward-entailing environment. This prediction appears to be borne out, as suggested by the contrast between (136)-(137). However, it goes without saying that further investigation of these data, as well as a careful study of the distribution of *any* in ellipsis contexts other than those discussed in this paper, is necessary.

(136)   a.   Exactly two boys read any book. Exactly two girls did △ too.
           b.   Exactly two boys read any book. No one else did △.

(137)   a. #Exactly two boys read any book. Mary did △ too.
           b. #Exactly two boys read any book. At least five girls did △ too.

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