ONLY: An NPI-licenser and NPI-unlicenser

Yimei Xiang, Harvard University

Accepted for publication in *Journal of Semantics*. (DOI: 10.1093/jos/ffx006)

Abstract It is commonly argued that weak negative polarity items (NPIs) (e.g., *any*) can occur in any (Strawson) downward-entailing environment. This generalization, however, is challenged by Wagner's (2006) observations with the NPI-licenser *only*: although an *only*-clause is (Strawson) downward-entailing in its unfocused part, NPIs are not necessarily licensed there. In particular, DP-*only* does not license an NPI that appears within the unfocused part of its left argument (as seen in **Only a chair of any HUMANITIES$_F$ department met with the president*), and VP-*only* does not license an NPI if this NPI and the focused item appear within the same island (as seen in **The president only met with a chair of any HUMANITIES$_F$ department*). These observations suggest that the licensing status of an NPI in an *only*-sentence is not just determined by the polarity pattern of the environment where this NPI gets interpreted.

To explain Wagner's (2006) observations, I argue that *only* is not just an NPI-licenser but also an "NPI-unlicenser." Following Chierchia (2006, 2013), I assume that an NPI carries a domain feature [D] which activates domain alternatives, and that an NPI is unlicensed if exhaustifying its domain alternatives yields a contradiction. I further propose that *only* can check off the [D] feature of an NPI that appears within its syntactic argument. If the argument of *only* is downward-entailing with respect to an NPI, using *only* to check off the [D] feature of this NPI would return an inference that contradicts the prejacent presupposition and make this NPI unlicensed. In the case of VP-*only* association, if an NPI is not focused and doesn't appear within a focus-contained island, the contradiction can be avoided by F-movement.

1. Introduction

Negative polarity items (henceforth NPIs), such as the emphatic expression *any*, are known to be licensed in downward-entailing (henceforth DE) environments (Fauconnier 1975, 1979; Ladusaw 1979). Prototypical DE environments are the following:

(1) Under the semantic scope of negation
   a. John didn't read any papers.
   b. * John read any papers.

(2) Within the scope of negative quantifiers
   a. Few/no/at most 3 students read any papers.
   b. * Many/most students read any papers.

(3) In the left argument of universal quantifiers
   a. Every student who has read any papers passed the exam.
   b. * Every student who has read some papers passed any exams.

c. * Some student who has read any papers passed the exam.

(4) In the antecedent of conditionals

a. If John knows any big names, he will be invited.

b. * If John is invited, he will know any big names.

An environment is DE if and only if it supports downward inferences from a superset to a subset. For instance, observe the contrast between (5a) and (5b) that a downward inference holds from a term *student* to a more specific term *smart student* in the left argument of *every*, but not in the left argument of *some*.

(5) a. Every *student* passed the exam. $\rightarrow$ Every *smart student* passed the exam.

b. Some *students* passed the exam. $\not\rightarrow$ Some *smart students* passed the exam.

Following von Fintel (1999) and Gajewski (2007), I define DE functions and DE environments as in (6), where the arrow '$\Rightarrow$' stands for generalized entailment.[1]

(6) a. **Downward entailing functions**
A function f of type $\langle\sigma,\tau\rangle$ is DE if and only if
for all x and y of type σ such that $x \Rightarrow y$, $f(y) \Rightarrow f(x)$.

b. **Downward entailing environments**
If α is of type δ and **A** is a constituent that contains α, then:
A is DE with respect to α if and only if the function $\lambda x.[\![\mathbf{A}[\alpha/\mathbf{v}_\delta]]\!]^{g[v_\delta \rightarrow x]}$ is DE.
$[\mathbf{A}[\alpha/\mathbf{v}]$ is the result of replacing α with a trace **v** in **A**.$]$

---

[1] Generalized entailment is cross-categorically defined for items of any *entailing type*. Entailing types are defined recursively as in (1), adopted from Chierchia (2013: 204). Accordingly, t, $\langle e,t\rangle$, $\langle e,et\rangle$, and any type of the form $\langle ... \ t\rangle$ are entailing types.

(1) **Entailing type**

a. t is a basic entailing type.

b. If τ is an entailing type, then for any type σ, $\langle\sigma,\tau\rangle$ is an entailing type.

Following von Fintel (1999), I define generalized entailment as in (2).

(2) **Generalized entailment '$\Rightarrow$'**

a. If ϕ, ψ are of type t, then: $\phi \Rightarrow \psi$ if and only if ϕ is false or ψ is true.

b. If β, γ are of an entailing type $\langle\sigma,\tau\rangle$, then:
$\beta \Rightarrow \gamma$ if and only if for all α such that α is of type σ: $\beta(\alpha) \Rightarrow \gamma(\alpha)$.

The basic case (2a) is defined based on truth values: a truth-value entails another if and only if it is not the case that the first is true and the second is false. In a generalized case, as schematized in (2b), a function entails another if and only if the result of applying the first function to any argument entails the result of applying the second function to the same argument. For example, $[\![$*smart student*$]\!]$ and $[\![$*student*$]\!]$ are functions of type $\langle e,t\rangle$. $[\![$*smart student*$]\!] \Rightarrow [\![$*student*$]\!]$, because for any x of type e, $[\![$*smart student*$]\!](x) \Rightarrow [\![$*student*$]\!](x)$. All the aforementioned cases can also be understood from a set-theoretic perspective: for any two sets A and B, $A \Rightarrow B$ if and only if A is a subset of B (written as '$A \subseteq B$').

For example, the function $\lambda x.[\![\text{every } A/A' \text{ is } B]\!]^{g[A'\to x]}$ is DE, and hence the sentence "every *A* is *B*" is DE with respect to *A*. The DE analysis of NPI-licensing can now be summarized as follows:

(7) **The DE analysis of NPI-licensing**
An NPI is grammatical if and only if it appears in a constituent that is DE with respect to this NPI.

Nevertheless, the NPI-licensing effect of the exclusive focus particle *only*, first observed by Klima (1964), casts doubt on the DE analysis of NPI-licensing: while the NPI *any* is licensed in (8a) and (9a), these contexts do not seem to support downward inferences (Atlas 1993, 1996), as shown in (10a) and (10b), respectively.[2] In comparison, the ungrammaticality of (8b) and (9b) shows that the NPI *any* can be licensed by the overt exclusive particle *only*, but not by a covert exhaustifier.[3]

(8) Right argument of DP-*only*
  a. Only JOHN$_F$ read any papers.
  b. * JOHN$_F$ read any papers.

(9) Unfocused part under VP-*only*
  a. Mary only gave any books to JOHN$_F$.
  b. * Mary gave any books to JOHN$_F$.

(10) a. Only JOHN$_F$ ate *vegetables* for breakfast. $\not\rightarrow$ Only JOHN$_F$ ate *kale* for breakfast.
  b. Mary only gave *fruit* to JOHN$_F$. $\not\rightarrow$ Mary only gave *apples* to JOHN$_F$.

In responding to the NPI-licensing effect of *only*, many different positions have been defended in the literature, each of which weakens the strict DE condition to some extent for weak NPIs. For example, the Strawson-DE analysis grants the presuppositions of the consequence when a downward-inference is assessed (von Fintel 1999, Wagner 2006, Hsieh 2012). The grammatical view of NPI-licensing ignores presuppositions and implicatures when the meaning of a weak NPI is evaluated (Gajewski 2012, Chierchia 2013; see fn. 13). The pseudo-anti-additivity analysis (Atlas 1996) and the non-veridicality analysis (Giannakidou 2006) each use a weaker condition for the licensing of weak NPIs.

It is further observed that the distributional pattern of NPIs in *only*-clauses is restricted by F-association: *only* cannot license an NPI that appears in its F-associate, as exemplified in (11). For simplicity, I call this fact "Licensing Asymmetry."

[2]Here and henceforth, CAPITAL letters mark stressed items, and the subscript '$_F$' marks semantic focus.

[3]The grammatical view of NPI-licensing (see section 3 and the references therein) assumes that focused items are always associated with overt or covert exhaustifiers. Accordingly, for example, the LF of (8b) contains a covert exhaustivity *O*-operator associated with the semantic focus *JOHN*$_F$. Under this view, the contrast between (8a) and (8b) thus suggests that the covert *O*-operator cannot license NPIs. This contrast is expected by the grammatical view: the *O*-operator is non-monotonic; unlike *only* which asserts only an exhaustivity inference, the *O*-operator also asserts a prejacent inference. See more details in footnote 13.

(11) a. Only [some/*any students]$_F$ saw John.
b. Mary only gave [some/*any books]$_F$ to John.

Nevertheless, Drubig (1994) and Wagner (2006) observe that Licensing Asymmetry is not solely determined by F-association. In both examples in (12), *only* does not license the NPI *any*, although the F-associate of *only* is just the NP-complement of *any*.

(12) a. Only [some/*any BOYS$_F$] arrived.
b. John only read [some/*any PAPERS$_F$], (he didn't read any books).

Similar facts are observed in (13) and (14). In these examples, *only* is associated with narrow focus, and the NPI *any* appears outside the focus: in (13), the NP-complement of *any* contains narrow focus; in (14), the *any*P serves as an *of*-argument of the focused NP *CHAIR*; in (15), the *any*P serves as the possessor of the focused NP *ADVISOR*.

(13) a. Only a chair of [a/*any HUMANITIES$_F$ department] met with the president.
b. The president only met with a chair of [a/*any HUMANITIES$_F$ department].

(14) a. Only [a CHAIR$_F$ of a/*any humanities department] met with the president.
b. The president only met with [a CHAIR$_F$ of a/*any humanities department].

(15) a. Only [someone's/*anyone's ADVISOR$_F$] met with the president.
b. The president only met with [someone's/*anyone's ADVISOR$_F$].

Examples (12) to (15) suggest two generalizations. First, DP-*only* does not license an NPI that appears within its left argument, regardless of whether this NPI is part of its associated focus. Second, VP-*only* does not license an NPI if this NPI and the focused item appear within the same island. In examples from (12) to (15), I used '[•]' to enclose the minimal island that contains the semantic focus.[4] I call these facts uniformly "Licensed-Nonfocal Mismatch", meaning that the part of an *only*-clause where an NPI can appear does not fully match up with the part that is not F-associated with *only*.[5]

In sum, to capture the NPI-licensing effect of *only*, we need to answer at least three questions:

[4]Determiner phrases like *any*P can be considered islands, to the extent that the NP complement of a determiner cannot be moved out alone. According to Abels (2003), the complement of a phasal head – such as the D head *any* – cannot be moved by itself and strand its embedding phasal head, but must pied-pipe that phasal head.

[5]There are some seeming counter-examples to this generalization. For example, the NPI *any* is licensed in (1a), although it appears within the left argument of DP-*only*. Interestingly, replacing the plural *candidates* with the singular existential indefinite *a candidate* makes *any* not licensed, as seen in (1b). Such a contrast is also observed with VP-*only*, as shown in (2). I thank Brian Buccola, Gary Thoms, and an anonymous reviewer for the observation.

(1) a. Only [candidates with some/any relation to NY$_F$] met with the pope.
b. Only [a candidate with some/*any relation to NY$_F$] met with the pope.

(2) a. The pope only met with [candidates with some/any relation to NY$_F$].
b. The pope only met with [a candidate with some/*any relation to NY$_F$].

(A) *Only* is not a prototypical DE-operator; why does it license NPIs?

(B) Why is it that the NPI-licensing effect of *only* is subject to Licensing Asymmetry?

(C) Why is it that Licensing Asymmetry is subject to Licensed-Nonfocal Mismatch?

The rest of this paper is organized as follows. Section 2 and section 3 will review two representative theories on the NPI-licensing effect of *only*. One is the focus (F)-movement theory by Wagner (2006), and the other is the grammatical (G-)view of NPI-licensing by Chierchia (2006, 2013). I will show that both analyses have clear advantages but neither of them properly predicts the distributional pattern of NPIs under *only*. In section 4, I will propose a hybrid analysis that incorporates features of both theories. The main ingredients of the new analysis are the following:

(A) Following the G-view of NPI-licensing, I assume that an NPI is licensed if and only if assessing its domain feature [D] does not yield a G-triviality.

(B) I argue that *only* is not only an NPI-licenser, but also an "NPI-unlicenser": if an NPI is interpreted within the syntactic complement of *only* and if the prejacent of *only* is not downward-entailing with respect to this NPI, using *only* to assess the [D] feature of this NPI returns an inference contradicting the prejacent presupposition of *only*.

(C) In the case of VP-*only* association, the requirement of avoiding G-trivialities motivates F-movement. The semantic contradiction in (B) can be avoided if and only if the NPI is interpreted in the remnant VP.

2. The theory of F-movement and its shortcomings

2.1. The Strawson DE-condition

To capture the NPI-licensing effect of *only*, von Fintel (1999) proposes a Strawson Downward Entailing (Strawson DE henceforth) analysis of NPI-licensing, as summarized in (16). Unlike the strict DE condition, the Strawson DE condition grants all presuppositions of the consequent sentence when the validity of a downward inference is assessed.

(16) **The Strawson DE analysis of NPI-licensing**

I argue that the licensing of *any* in (1a) and (2a) is irrelevant to *only*; instead, it correlates to the fact in (3) that an NPI can be licensed when it appears within a *with*-adjunct or a relative clause of a plural item.

(3) a. (The) candidates with some/any relation to NY_F met with the pope.

b. A candidate with some/*any relation to NY_F met with the pope.

c. (The) candidates who had some/any relation to NY_F met with the pope.

d. A candidate who had some/*any relation to NY_F met with the pope.

a. A function f of type $\langle \sigma, \tau \rangle$ is Strawson DE if and only if
for all x and y of type σ such that $x \Rightarrow y$ and $f(x)$ is defined: $f(y) \Rightarrow f(x)$.

b. An NPI is only grammatical if it is in the scope of a function f such that f is Strawson DE.

Further, von Fintel (1999) argues that "*only*+NP" is a Strawson DE function: *only* presupposes the truth of its propositional prejacent (Horn 1969); the scope of "*only*+NP" is DE when the prejacent presupposition of *only* is satisfied, as shown in (17).

(17)

Kale is a vegetable.	$x \Rightarrow y$
John ate kale for breakfast.	$f(x)$ is defined
Only JOHN$_F$ ate vegetables for breakfast.	$f(y)$
$\therefore$ Only JOHN$_F$ ate kale for breakfast	$\therefore f(x)$

2.2. The theory of F-movement

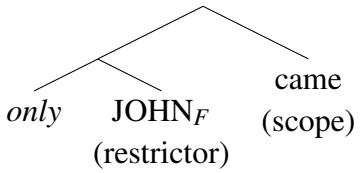
The Strawson DE condition, however, still cannot explain why VP-*only* association is subject to Licensing Asymmetry and why Licensing Asymmetry in general exhibits Licensed-Nonfocal Mismatch. In responding to these questions, Wagner (2006) proposes a theory of F-movement. This theory has components in both syntax and semantics, as outlined in the following.

2.2.1. The LF syntax of *only*

First, both DP-*only* and VP-*only* have two syntactic arguments, a restrictor and a scope. In the case of DP-*only*, the restrictor and the scope correspond to its left argument and right argument, respectively. In the case of VP-*only*, F-association always invokes covert phrasal movement of the focused expression to the syntactic restrictor of *only*; thus the restrictor and the scope correspond to the F-moved phrase and the remnant VP, respectively.

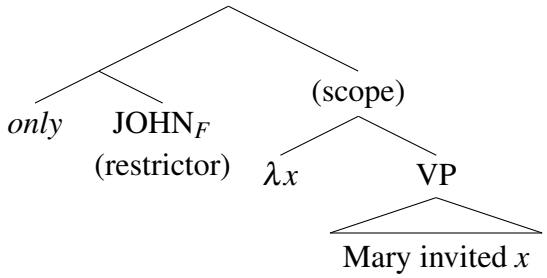
(18) a. DP-*only*

Only JOHN$_F$ came.



b. VP-*only*

Mary only invited JOHN$_F$.



Second, F-movement is island-sensitive (compare Anderson 1972, Jackendoff 1972, Rooth 1985); therefore, when *only* is associated into an island, the F-moved phrase ought to be the minimal island that contains the focus-associate of *only* (see also Drubig 1994). For instance, the F-moved item in (19a) ought to be the entire complex DP, and the one in (19b) ought to be the entire *when*-clause.

(19) a. Dr. Smith only rejected [the proposal that JOHN$_F$ submitted].
b. Dr. Smith only complains [when BILL$_F$ leaves the lights on].

2.2.2. The semantics of *only*

Wagner (2006) defines the lexical entry of *only* as in (20). *Only* is a two-place predicate; it asserts an exhaustivity inference and presupposes an existential premise. In (20), the arguments α and P correspond to the syntactic restrictor and the scope of *only*, respectively. The variable C stands for the exhaustification domain; its value is determined by both linguistic and contextual factors.

(20) a. $[\![\text{only}]\!](\alpha)(P) = \forall a \in C[P(a) \rightarrow {}^{\wedge} P(\alpha) \subseteq {}^{\wedge} P(a)]$
b. Presupposition: $\exists x.P(x)$

Note that the presupposition (20b) is unconventional. It clearly differs from the standard prejacent presupposition (i.e., $P(\alpha)$) assumed by Horn (1969). It is also weaker than the existential presupposition assumed by Horn (1996), which is generated by abstracting over the semantic focus, not the entire syntactic restrictor. See (21) for a simple comparison of these three presuppositions. Underlining marks the syntactic restrictor of *only*.

(21) Only a female inhabitant of [Twin Earth]$_F$ met Particle Man.
a. A female inhabitant of Twin Earth met Particle Man. Prejacent (Horn 1969)
b. A female inhabitant from somewhere met Particle Man. Existential (Horn 1996)
c. Someone met Particle Man. Existential (Wagner 2006)

The main purpose for Wagner to weaken the presupposition of *only* is to capture the phenomenon of Licensed-Nonfocal Mismatch. If we assume the prejacent presupposition (21a), we would predict an unfocused part of the syntactic restrictor of *only* to be Strawson DE. Compare the following two lines of reasoning for illustration. In both lines of reasoning, the premise grants the prejacent inference of the consequent *only*-sentence. In (22), the downward inference from the focused NP *student*$_F$ to its subset [*junior student*]$_F$ does not hold, while in (23), the downward inference from the unfocused item *inhabitant* to its subset *female inhabitant* does hold.

(22) A junior student is a student. $x \Rightarrow y$
A junior student met Particle Man. $f(x)$ is defined
Only a *student*$_F$ met Particle Man. $f(y)$
$\not\rightarrow$ Only a *[junior student]*$_F$ met Particle Man. $\not\rightarrow f(x)$

(23) A female inhabitant is an inhabitant. $x \Rightarrow y$
A female inhabitant of Twin Earth met Particle Man. $f(x)$ is defined
Only an *inhabitant* of [Twin Earth]$_F$ met Particle Man. $f(y)$
$\therefore$ Only a *female inhabitant* of [Twin Earth]$_F$ met Particle Man $\therefore f(x)$

The same problem arises if we adopt Horn's (1996) existential presupposition (21b). For instance, in (24), if the premise grants the truth of this presupposition, a downward inference holds from the unfocused item *inhabitant* to its subset *female inhabitant*.

(24) A female inhabitant is an inhabitant. $x \Rightarrow y$
A female inhabitant from somewhere met Particle Man. $f(x)$ is defined
Only an *inhabitant* of [Twin Earth]$_F$ met Particle Man. $f(y)$
$\therefore$ Only a *female inhabitant* of [Twin Earth]$_F$ met Particle Man $\therefore f(x)$

Hence, if assuming that *only* triggers Horn's (1969) prejacent presupposition or Horn's (1996) existential presupposition, the Strawson DE analysis of NPI-licensing would predict that the unfocused part of the restrictor can license NPIs, contra fact in (25).

(25) * Only any inhabitant of [Twin Earth]$_F$ met Particle Man.

To solve this problem, Wagner assumes that *only* presuppose just a weak existential presupposition, which abstracts over the entire syntactic restrictor, and argues that the syntactic restrictor of *only* is not Strawson DE. For instance, in (26), the downward inference from the unfocused item *inhabitant* to *female inhabitant* seems to be invalid.

(26) A female inhabitant is an inhabitant. $x \Rightarrow y$
Someone met Particle Man. $f(x)$ is defined
Only an *inhabitant* of [Twin Earth]$_F$ met Particle Man. $f(y)$
$\not\rightarrow$ Only a *female inhabitant* of [Twin Earth]$_F$ met Particle Man $\not\rightarrow f(x)$

2.2.3. Motivating F-movement

Wagner (2006) assumes that F-movement is triggered to strengthen the existential presupposition of *only*, in the spirit of the *Maximize Presupposition* (MP) Principle:

(27) **Maximize Presupposition Principle** (Heim 1991)
Out of two sentences which are presuppositional alternatives and which are contextually equivalent, the one with the stronger presuppositions must be used if its presuppositions are met in the context.

This idea brings up Wagner's assumptions on syntax and semantics: "F-movement minimizes the size the of the syntactic restrictor, which may have an effect on the strength of the statement that is grammatically encoded by the sentence." Consider the basic *only*-sentence in (28) for illustration. F-movement changes the size of the syntactic complement of *only*, as marked by underlining: the syntactic complement of *only* encloses the entire VP "played BASKETBALL$_F$" in (28a) but just the semantics focus "BASKETBALL$_F$" in (28b). Next, the existential presupposition triggered by *only* is obtained by abstracting over the entire VP in (28a), while over the focused noun phrase in (28b). Hence, the *only*-sentence obtains a stronger existential presupposition based on the F-moved form (28b). Finally, in the spirit of the MP Principle, the F-moved form is more preferable than the non-F-moved form.

(28) John only played BASKETBALL$_F$.

a. John only played BASKETBALL$_F$. [Without F-movement]
Presupposition: $\exists x$. John x-ed.

b. John only played BASKETBALL$_F$. [With F-movement]
Presupposition: $\exists x$. John played x.

2.2.4. Consequences

Wagner (2006) claims that the theory of F-movement is followed by two general restrictions on the NPI-licensing effect of VP-*only*, namely, the *Island Restriction* and the *Head Restriction*, as described in the following:

(29) **Head Restriction**
If *only* is associated with the head of a constituent, it does not license an NPI in the complement of the head.

(30) **Island Restriction**
Association with a constituent within an island cannot license an NPI that appears in the same island.

The Head Restriction comes from the standard view that F-movement is phrasal movement: a head cannot take phrasal movement; therefore, when *only* is associated with a head, the F-moved item has to be the entire projection of this head. For instance, in (31), the F-moved element has to be the entire VP, including the *any*P; therefore, the NPI *any* is interpreted within the syntactic restrictor of *only* and is not licensed.

(31) * John only [CUT$_F$ any vegetables]. (Wagner 2006: 310)

The Island Restriction follows Wagner's assumption that F-movement is sensitive to islands. For instance, in (32a), *only* is associated into the *because*-clause, which is an island; therefore, the F-moved item must be the entire *because*-clause, which contains an NPI *any*. In (32b), in contrast, the NPI *anyone* is outside the *because*-clause and therefore is not involved in F-movement.[6]

(32) a. * Mary only gave a book to John [because BILL$_F$ gave any book to him].
b. She only gave anything to anyone [because YOU$_F$ did].
(Wagner 2006: 313)

[6]The island effect of Licensing Asymmetry under VP-*only* might not be the real reason (or at least not the only reason) why the NPI *any* is not licensed in (32a). Chierchia (2013) indicates that *because* has an intervening effect on the licensing of NPIs. In (1b), even clause-mate negation cannot license the NPI *anybody* across *because*.

(1) a. Mary doesn't believe that John criticized anybody.
b. * Mary doesn't believe that John was arrested because he criticized anybody.

2.3. Problems with Wagner (2006)

Wagner (2006) has convincingly argued that F-movement is needed for predicting the NPI-licensing effect of *only*, especially for unifying the Licensed-Nonfocal Mismatch behaviors of DP-*only* and VP-*only*. DP-*only* does not license an NPI that appears in its left argument, even if it is not associated with this NPI. Analogously, VP-*only* does not license an NPI if this NPI and the focused item appear within the same island, regardless of whether this NPI itself is focused. By virtue of F-movement, whatever explanation that works for DP-*only* will also work for VP-*only*.

Nevertheless, Wagner's explanation of Licensed-Nonfocal Mismatch is infeasible: contrary to what he claims, with the weak existential presupposition (20b), an *only*-clause actually is Strawson DE with respect to any unfocused position (section 2.3.1). Moreover, in Wagner's account, the F-movement operation is not well-motivated or properly controlled (section 2.3.3 and 2.3.3).

2.3.1. Problems with Licensed-Nonfocal Mismatch

Recall that Wagner weakens the presupposition of *only*, so as to avoid overly predicting an unfocused position in the syntactic restrictor of *only* to be Strawson DE. This attempt of eliminating Strawson DE-ness, however, is infeasible. The seeming failure of licensing a Strawson-downward inference in (26), repeated below, involves confusions between natural language semantics and meta-language interpretations.

(33)

A female inhabitant is an inhabitant.	$x \Rightarrow y$
Someone met Particle Man.	$f(x)$ is defined
Only an *inhabitant* of [Twin Earth]$_F$ met Particle Man.	$f(y)$
? $\not\to$ Only a *female inhabitant* of [Twin Earth]$_F$ met Particle Man	? $\not\to f(x)$

To be more concrete, I suggest that the reason why the above reasoning is invalid is that the actual presupposition of the consequent *only*-sentence is stronger than what has been provided in the premise. The actual presupposition might be Horn's (1969) prejacent presupposition, Horn's (1996) existential presupposition, or Ippolito's (2008) conditional presupposition (see (42)), as described in the following:

(34) "Only a female inhabitant of [Twin Earth]$_F$ met Particle Man" presupposes at least one of the following:

a. A female inhabitant of Twin Earth met Particle Man. [Prejacent]

b. A female inhabitant of some planet met Particle Man. [Regular existential]

c. If a female inhabitant of some planet met Particle Man, then a female inhabitant of Twin Earth met Particle Man. [Conditional]

To see whether Wagner's definition of *only* in (20) predicts an unfocused position of the restrictor to be Strawson DE, we should compare the predicted interpretations of the two *only*-sentences in (33), as shown in the following:

(35) a. Only an *inhabitant* of [Twin Earth]$_F$ met Particle Man.

i. Assertion: 'If someone among C met PM, s/he is an inhabitant of TE.'
where $C = \{$an inhabitant of TE, an inhabitant of Earth, an inhabitant of Mars, ...$\}$

ii. Presupposition: 'Someone met PM.'

b. Only a *female inhabitant* of [Twin Earth]$_F$ met Particle Man.

i. Assertion: 'If someone among C' met PM, s/he is a female inhabitant of TE.'
where $C' = \{$a female inhabitant of TE, a female inhabitant of Earth, a female inhabitant of Mars, ...$\}$

ii. Presupposition: 'Someone met PM.'

From the interpretations above, we can see that Wagner's account actually predicts the sentence "only an α of [Twin Earth]$_F$ met Particle Man" to be Strawson DE as well as strictly DE with respect to α. It is Strawson DE because the downward inference holds in the asserted component (namely, (35a-i) entails (35b-i)). It is also strictly DE because (35a) and (35b) have exactly the same presupposition. Hence, Wagner cannot capture the phenomenon of Licensed-Nonfocal Mismatch in (25), no matter whether he follows the Strawson DE analysis or the DE analysis.

This problem also extends to the case of VP-*only* association. As the interpretations in (36) show, using the definition of *only* in (20), Wagner would predict that the sentence "John only CUT$_F$ x" is Strawson DE as well as DE with respect to the object position x. It is Strawson DE because a downward inference holds in the asserted component (i.e., (36a-i) entails (36b-i)). It is also strictly DE because the two *only*-sentences, (36a) and (36b), have the same presupposition.[7] Hence, Wagner cannot predict the Head Restriction in (31).

(36) a. John only CUT$_F$ vegetables.

i. Assertion: If John did any action to vegetables, that action is no more than cutting.

ii. Presupposition: John did something.

b. John only CUT$_F$ kale.

i. Assertion: If John did any action to kale, that action is no more than cutting.

ii. Presupposition: John did something.

In sum, the weak existential presupposition of *only* cannot help with explaining the phenomenon of Licensed-Nonfocal Mismatch. Wagner's account predicts that an *only*-clause is Strawson DE as well as DE with respect to any unfocused position.

2.3.2. Problems with the presupposition of *only* and "why move?"

Recall that Wagner uses the MP Principle to motivate F-movement: the presupposition of *only* is obtained by abstracting the syntactic restrictor; F-movement reduces the size of the syntactic restrictor and hence strengthens the existential presupposition. In this section, I will show that

[7] Wagner (2006: 310) himself writes the presupposition of (36b) as "John did something with kale", which however conflicts with his main assumption that the existential import abstracts over the entire complement of *only*.

only triggers either a prejacent presupposition or a conditional presupposition, the involvement of which makes the MP-based analysis of motivating F-movement untenable.

Wagner has noticed that the definition of *only* in (20) is too weak to account for sentences like (37), where *only* is associated with a conjunction. Intuitively, the sentence in (37) cannot be uttered if Sue invited only John, although the asserted exhaustivity inference in (37a) and the assumed existential presupposition in (37b) are both satisfied in this context. To predict this infelicity, Wagner adopts McCawley's (1993: 311) idea and proposes that the sentence (37) *conversationally implies* the prejacent inference in (37c). This implicature is derived roughly as follows. If the speaker believes that Sue didn't invite John or believes that Sue didn't invite Mary, she could have been more informative by leaving the person out of the list. Next, assuming the speaker is being cooperative in the Gricean sense and is well-informed, we conclude that the speaker believes that Sue invited both John and Mary.

(37) Sue only invited [John and Mary]$_F$.

a. Assertion: Sue didn't invite anyone who is neither John nor Mary.

b. Presupposition: Sue invited someone.

c. Conversational implicature: Sue invited both John and Mary.

As argued by Ippolito (2008: 59), however, the implicature analysis of the prejacent inference has at least two problems. First, it cannot explain why a negative *only*-sentence also introduces a prejacent inference, as in (38). If the speaker believes that Sue invited Mary but not John, saying "Sue invited someone who is not John" is less informative than the assumed exhaustive assertion "Sue invited someone who is neither John nor Mary." Hence, we are not able to derive the expected prejacent inference of (38) based on the conversational maxims.

(38) Sue not only invited [John and Mary]$_F$

Second, the implicature analysis cannot explain why the prejacent inference cannot be cancelled without an epistemic operator, as shown in (39).

(39) a. # Only Mary can speak French – in fact, not even she can.

b. Only Mary can speak French, and **maybe** not even she can.

Related to the second problem pointed out by Ippolito, the contrast between the following two conversations also suggests that the prejacent inference from *only* is more robust than an implicature from the weak scalar item *some*: unlike the scalar implicature from *some*, the prejacent inference affects the truth conditions of the *only*-clause and is much more difficult to cancel.

(40) Did John invite some of the speakers to the dinner?

a. Yes. Actually he invited all of them.

b. # No. He invited all of them.

(41) Did John only invite Mary?

a. # Yes. Actually he didn't invite anybody.

b. No. He didn't invite anybody.

Hence, the prejacent inference should not be treated as an independent implicature. Instead, we can analyze it as a presupposition (Horn 1969; Rooth 1985, 1992) or adopt Ippolito's (2008) analysis that the prejacent inference is a logical consequence of the scalar implicature (42a) together with a conditional presupposition (42b).

(42) Only *A* is *B*.

a. Implicature: *Someone is B*.
(Derived by negating the stronger alternative *No one is B*.)

b. Presupposition: *If someone is B, A is B*.

c. $\Rightarrow$ *A* is *B*.

In this section, I don't take a position as to which analysis correctly characterizes the presupposition(s) of *only*, but just show that the MP-based analysis of motivating F-movement is infeasible whichever analysis of presuppositions we follow. Under the presupposition analysis, the existential presupposition – regardless of its strength – is always entailed by and hence collapses under the prejacent presupposition, and thus the MP Principle cannot motivate F-movement. Alternatively, with Ippolito's (2008) conditional presupposition, the MP Principle would predict that the un-F-moved form is more preferable over the F-moved form: the existential inference is the antecedent of the conditional presupposition; therefore, strengthening the existential inference would *weaken* the presupposition. To be more concrete, consider the example (28) again, repeated below. If following Ippolito's (2008) analysis, we would have conditional presuppositions as follows. Observe that the presupposition in (43b) from the F-moved form is semantically weaker than the one in (43a) triggered in absence of F-movement.

(43) John only played BASKETBALL$_F$.

a. John only played BASKETBALL$_F$. [Without F-movement]
Presupposition: If $\exists x$ [John x-ed], then John played basketball.

b. John only played BASKETBALL$_F$. [With F-movement]
Presupposition: If $\exists x$ [John played x], then John played basketball.

2.3.3. Problems with "when move?"

Wagner (2006) claims that F-movement is mandatory for VP-*only* association. I argue that this strong claim leads to two undesired consequences.

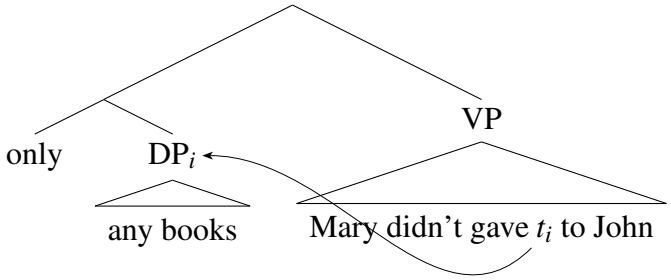
First, it incorrectly predicts that an NPI associated with *only* is always unlicensed, even if this NPI appears under some other licenser. Recall that Wagner's assumptions yield the prediction that *only* does not license an NPI appearing inside the F-moved constituent. This prediction, together with the claim that F-movement is mandatory for VP-*only* association, implies a stricter constraint as follows: "VP-*only* cannot be associated with any NPIs or with/into any NPI-contained islands

within which the NPIs are not licensed." This constraint, however, is too strong for cases like (44), where *only* is associated with an *any*P across another NPI-licenser (i.e., clause-mate negation).

(44) Mary only didn't give [any books]$_F$ to John. (She did her best to help him.)

The stricter constraint predicts that the sentence (44) has to take the LF in (45). In this LF, however, the NPI *any* cannot be licensed: the *any*P, as the minimal F-contained island, is moved to the syntactic restrictor of *only*, a context that is non-Strawson DE and cannot license NPIs.[89]

(45)



Second, as pointed out by Büring and Sharvit and reported by Wagner (2006: fn. 20), assuming F-movement to be mandatory overly rules out possible interpretations for sentences like (46), where *only* is associated with a scopal element *at most 3 students* across another scopal element *want*. If F-movement were mandatory, the focused item would have to take only a wide scope reading.

---

[8]Note that the NPI *any* is not licensed if *only* merely associates with *any*, as exemplified below. This is so because (1) doesn't have any excludable alternatives, failing to satisfy the additive presupposition of *only*.

(1) How much books is such that Mary didn't give to John?
*Mary only didn't give ANY$_F$ books to John.

Consider the dialogue in (2) for illustration of the additive presupposition. The *which*-question with a restricted domain ensures that the exhaustification domain of *only* contains exactly three members, namely, *I will invite John*, *I will invite Mary*, and *I will invite both John and Mary*. The answer (2b) is infelicitous because the prejacent is the strongest one among the alternatives, which therefore makes the additive presupposition of *only* unsatisfied. In contrast, the answer (2c) is fully acceptable, because a covert exhaustification does not have an additive presupposition.

(2) Which of John and Mary will you invite?
a. Only JOHN$_F$, (not Mary/ not both).
b. # Only BOTH$_F$.
c. BOTH$_F$.

Likewise in (1), the exhaustification domain contains only propositions of the following two forms: (i) *it is not the case that John read some paper in D′* ($D' \subseteq D$); (ii) *it is not the case that John read most/all/... the papers in D*. All of these alternatives are entailed by the prejacent and are not excludable. For more discussions on the additive presupposition, see Klinedinst (2005), Beaver and Clark (2009), among others.

[9]An anonymous reviewer of *Journal of Semantics* points out the possibility of moving the entire negative VP complement to the restrictor of *only*. This movement is in general possible, but is disallowed under Wagner's framework: to enable this movement, we need to stipulate that the licensing of an NPI occurs prior to the satisfaction of the MP Principle; but Wagner assumes that the failure of licensing an NPI is due to F-movement, an operation motivated by the MP Principle.

(46) She only wanted to kiss [at most 3 students]$_F$.

To account for the correct scope readings, Wagner (2006: fn. 20) proposes that the F-moved item undergoes obligatory semantic or syntactic reconstruction. Nevertheless, if reconstruction were always feasible, then the focused *any*P in (47) should also be reconstructed and licensed within the scope of VP-*only*, contra fact.

(47) * Mary only wanted to read [any books]$_F$.

A defender of the reconstruction analysis might argue that *only* must be reconstructed in company with the F-moved phrase. Under this assumption, (47) would be interpreted as '*Mary wanted to read only [any books]$_F$.' Nevertheless, this assumption is incorrect, because VP-*only* takes rigid scope reading (Taglicht & Randolph 1984, Rooth 1985, Bayer 1996), as exemplified in (48).

(48) John is only required to meet MARY$_F$. ($^{\text{OK}}$*only* > *required*; $^{\#}$*required* > *only*)

3. The G-view of exhaustifications

3.1. The G-view of scalar implicatures

The grammatical (G-)view (Fox 2007, Chierchia *et al*. 2012, among others) was first introduced to analyze scalar implicatures. This view argues that the generation of scalar implicatures is not purely due to pragmatics (compare Grice 1975), given the fact that scalar implicatures can be generated in embedding contexts.

The main ingredients of the G-view are summarized as follows. First, propositions with scalar items are associated with sets of alternatives, which are computed in the same way as answer sets of questions (Hamblin 1973) and alternative sets of focus (Rooth 1985, 1992, 1996). A recursive definition of alternative sets is schematized as follows:

(49) **Alternative sets**

a. For any lexical entry α, ALT(α) =

i. $\{[\![\alpha]\!]\}$ if α is lexical and does not belong to a scale;

ii. $\{[\![\alpha_1]\!], ..., [\![\alpha_n]\!]\}$ if α is lexical and part of a scale $\langle [\![\alpha_1]\!], ..., [\![\alpha_n]\!] \rangle$;

Where ALT is a function from expressions to a set of interpretations.

b. $\text{ALT}(\beta(\alpha)) = \{b(a) : b \in \text{ALT}(\beta), a \in \text{ALT}(\alpha)\}$

Next, alternatives keep growing until factored into meaning via a covert exhaustivity operator O (or written as "EXH"). This O-operator affirms the prejacent and negates all the alternatives that are not entailed by the prejacent, as schematized in (50).[10] The non-entailed alternatives are also called *excludable* alternatives.

[10] In this formula, the propositional letter p is sloppily used as a syntactic expression in ALT(p). A stricter definition of the O-operator is as follows, where S is the sentential complement of O.

(50) $[\![O]\!](p) = \lambda w[p(w) = 1 \wedge \forall q \in \text{ALT}(p)[p \not\subseteq q \rightarrow q(w) = 0]]$

Accordingly, a scalar implicature is derived as a logical consequence of applying an O-operator over a sentence containing a scalar item. For instance, in (51), applying an O-operator over the bare *some*-sentence ϕ_{SOME} affirms the prejacent ϕ_{SOME} and negates the stronger scalar alternative ϕ_{ALL}, yielding the scalar implicature $\neg\phi_{\text{ALL}}$.

(51) a. Some of the students came. $\rightarrow$ Not all of the students came.
b. $\text{ALT}(\phi_{\text{SOME}}) = \{\phi_{\text{SOME}}, \phi_{\text{ALL}}\}$
c. $O(\phi_{\text{SOME}}) = \phi_{\text{SOME}} \wedge \neg\phi_{\text{ALL}}$

3.2. The G-view of NPI-licensing

Chierchia (2006, 2013) extends the G-view to NPI-licensing with assumptions compatible with the strict DE condition. He proposes that the NPI *any* is an indefinite existential item like *some* but is lexically encoded with a grammatical feature [D]. This feature obligatorily activates a set of domain (D-)alternatives and must be checked off by a c-commanding O_D-operator.

Exercising an O_D-operator over a sentence containing an occurrence of *any* has consequences in both syntax and semantics. In syntax, it checks off the [D] feature in the lexicon of *any*, just like a regular feature-checking operation. In semantics, it affirms the assertion of the prejacent and negates all the excludable D-alternatives, namely, the D-alternatives that are not entailed by the assertion of the prejacent.

A schematic example for the total domain D and its corresponding D-alternative sets is given in (52). The D-alternative set includes the prejacent, while the proper D-alternative set does not.

(52) a. Total-D: $\{a,b\}$ Assertion = $\exists x \in \{a,b\} f(x)$
b. Sub-D: $\{a,b\},\{a\},\{b\}$ D-ALT = $\{\exists x \in \{a,b\} f(x), \exists x \in \{a\} f(x), \exists x \in \{b\} f(x)\}$
c. Proper sub-D: $\{a\},\{b\}$ Proper D-ALT = $\{\exists x \in \{a\} f(x), \exists x \in \{b\} f(x)\}$

Consider the basic positive sentence (53) to see how the G-view captures the DE condition of NPI-licensing. In LF (53a), an O_D-operator is mandatorily present so as to check off the [D] feature of any_D. The meaning of this LF proceeds as follows. First, the prejacent clause of O_D (labeled 'S') asserts an existential inference (53b) and is associated with a set of D-alternatives (53c). These D-alternatives are activated by the [D] feature of any_D and are generated by substituting the total domain variable D with a subdomain D'. Next, applying O_D affirms the prejacent $[\![\text{S}]\!]$ and negates the excludable D-alternatives. Here, since the prejacent S is upward-entailing (henceforth UE) with respect to the domain variable D, the proper D-alternatives are all stronger than $[\![\text{S}]\!]$ and are all excludable. Hence, applying O_D yields the exhaustivity inference in (53d). Crucially, the

(1) $[\![O(\text{S})]\!] = \lambda w[[\![\text{S}]\!](w) = 1 \wedge \forall \phi \in \text{ALT}(\text{S})[[\![S]\!] \not\subseteq \phi \rightarrow \phi(w) = 0]]$

Note that this O-operator is distinct from the one used by Fox (2007), which negates only alternatives that can be negated consistently (viz., the so-called "innocently excludable alternatives").

exhaustivity inference in (53d) contradicts the prejacent inference $[\![\mathrm{S}]\!]$.[11] Such a contradiction makes the sentence (53) ungrammatical and the NPI *any* unlicensed.

(53) * John read any papers.

a. O_D [$_S$ John read any$_D$ papers]

b. $[\![\mathrm{S}]\!] = \exists x \in D[P(x) \wedge R(j,x)]$
(John read some papers in the total domain D.)

c. D-ALT(S) $= \{\exists x \in D'[P(x) \wedge R(j,x)] \mid D' \subseteq D\}$

d. $\forall D'[D' \subset D \rightarrow \neg\exists x \in D'[P(x) \wedge R(j,x)]]$
(for any proper subdomain D', John read no paper in D'.)

e. $[\![O_D(\mathrm{S})]\!] = [\![\mathrm{S}]\!] \wedge (53d) = \perp$
(# John read some papers in D, but for any proper subdomain D', he read no paper in D'.)

The contradiction in (53e) is in essence different from the one in (54). The former makes an utterance ungrammatical, while the latter makes an utterance infelicitous but not ungrammatical.

(54) # It is raining and it isn't raining.

To distinguish these two types of contradictions, Chierchia (2013: 49) adopts notions from Gajewski (2002) and describes the contradiction in (53e) as a "Grammatical (G-)triviality". G-triviality is a special form of Logical (L-)triviality: L-trivialities are tautologies or contradictions in the traditional sense; G-triviality refers to a characteristic that a sentence receives the same truth value (true or false) regardless of how the lexical terminals in the structure are replaced. Compare the sentences in (55) for illustration. Expressions like *John*, *smokes*, and *student* are lexical terminals, and the rest are functional terminals. The contradiction in (55a) can be avoided by substituting the two occurrences of *smoke* with distinct lexical items (as in *John smokes and doesn't dance*.). In contrast, the meaning of (55b) is always contradictory no matter which lexical items are used.[12] Therefore, we identify (55a) as L-trivial, while (55b) as both L-trivial and G-trivial.

[11] Consider the mini model in (1) for a simpler illustration of this idea. Assume that the total domain D contains exactly two items, paper $p1$ and paper $p2$. The D-alternative set is thus schematized as in (1b), consisting of three elements: the asserted proposition *John read a paper in* $\{p_1, p_2\}$ and two proper D-alternatives including *John read a paper in* $\{p1\}$ and *John read a paper in* $\{p2\}$. The proper D-alternatives are not entailed by the assertion. Therefore, applying an O_D-operator affirms the assertion and negates both proper D-alternatives, as schematized in (1c), yielding a contradictory inference that *John read* p_1 *or* p_2*, and he did not read* p_1*, and he did not read* p_2.

(1) a. $D = \{p_1, p_2\}$

b. D-ALT $= \{R(j,p_1) \vee R(j,p_2), R(j,p_1), R(j,p_2)\}$

c. $R(j,p_1) \vee R(j,p_2) \wedge \neg R(j,p_1) \wedge \neg R(j,p_2) = \perp$

[12] Following von Fintel (1993), Gajewski (2002) assumes the truth conditions in (1) for the logical skeleton of (55b), where the backslash '\' stands for subtraction. These truth conditions say that $\{x\}$ is the unique minimal set whose subtraction from the restrictor of the quantifier (i.e., P) makes the quantification true.

(55) a. # John smokes and doesn't smoke. [x P and not P]

b. * Some student but John smokes. [some P but x Q]

Next, Chierchia argues that the type of contradiction in (53e) can be avoided if the constituent that the O_D-operator attaches to is DE with respect to the D variable of any_D. Consider the basic negative sentence in (56) for instance. By virtue of negation, all the D-alternatives are entailed by the assertion and therefore not excludable. The O_D-operator, although mandatorily present for the sake of feature checking, has no effect on semantics.

(56) John didn't read any papers.

a. O_D [$_S$ not [John read any$_D$ papers]]

b. $[\![\mathrm{S}]\!] = \neg\exists x \in D[P(x) \wedge R(j,x)]$
(John read no paper in the total domain D.)

c. $\text{D-ALT}(\mathrm{S}) = \{\neg\exists x \in D'[P(x) \wedge R(j,x)] \mid D' \subseteq D\}$

d. $[\![O_D(\mathrm{S})]\!] = [\![\mathrm{S}]\!] = \neg\exists x \in D[P(x) \wedge R(j,x)]$
(John read no paper in the total domain D.)

3.3. Extending the G-view of NPI-licensing to *only*

Inspired by Krifka (1995) and Lahiri (1998), Chierchia (2006, 2013) extends the G-view of NPI-licensing to the licenser *only*. These approaches adopt the lexical entry of *only* from Horn (1969), namely, that *only* asserts an exhaustivity inference and presupposes the truth of its prejacent. The heart of this view is the following: the unfocused part of the asserted exhaustivity inference is DE and hence forms an NPI-licensing environment.

Using Chierchia's (2013) schematic notations, we assume the LF in (57a). This LF contains two exhaustification operators, O_D and *only*. In particular, O_D checks off the [D] feature of the NPI any_D, while *only* checks off the [F] feature of the focused item $JOHN_F$. The prejacent presupposition and the asserted exhaustivity inference of the *only*-clause are schematized as in (57b) and (57c), respectively. The D-alternatives are generated from the assertion by replacing the total domain D with a subdomain D', as schematized in (57d).

(57) Only JOHN$_F$ read any papers.

---

(1) $[\![\text{some } P_{\langle e,t\rangle} \text{ but } x_e\ Q_{\langle e,t\rangle}]\!] = 1$ if and only if

a. $\mathbf{some}(P\backslash\{x\})(Q) = 1$;

b. $\forall S_{\langle e,t\rangle}[\mathbf{some}(P\backslash S)(Q) = 1 \rightarrow x \in S]$

Because "some P Q" is UE with respect to the restrictor P, condition (1a) entails condition (2). Nevertheless, because $x \notin \varnothing$, (2) contradicts condition (1b). Hence, any sentence of the form "some P but x Q" is a contradiction.

(2) $\mathbf{some}(P\backslash\varnothing)(Q) = 1$, or equivalently, $\mathbf{some}(P)(Q) = 1$

For the purposes of this paper, it is enough to know that G-triviality is a type of L-triviality that affects grammaticality.

a. O_D [$_S$ only [JOHN$_F$ read any$_D$ papers]]

b. Presupposition of S: $\exists x \in D[P(x) \wedge R(j,x)]$
(John read some papers in the total domain D.)

c. Assertion of S: $\lambda w.\forall y \in D_e\ [\exists x \in D[P_w(x) \wedge R_w(y,x)] \rightarrow y \leq j]$
(For any individual y, if y read some papers in the total domain D, then y is John.)

d. D-ALT(S) $= \{[\![\text{only [JOHN}_F \text{ read any}_{D'} \text{ papers}]\ ]\!] : D' \subseteq D\ \}$
$= \{\lambda w.\forall y \in D_e[\exists x \in D'[P_w(x) \wedge R_w(y,x)] \rightarrow y \leq j] \mid D' \subseteq D\}$

The prejacent presupposition (57b), as argued by Gajewski (2011) and extended by Chierchia (2013), is irrelevant for assessing the [D] feature of the weak NPI *any*.[13] Moreover, the asserted

[13]Gajewski (2011) proposes that presuppositions and implicatures are relevant only for the assessment of the [D] feature in strong NPIs. This proposal captures the contrast between weak NPI-licensing and strong NPI-licensing under *only*. For instance, in (1), *only* does not license the strong NPI *in years*. The prejacent presupposition of *only* is UE with respect to the D variable of *in years*. When the presupposition is accommodated, the entire *only*-clause is non-monotonic with respect to the D variable in the strong NPI *in years*. Then applying O_D to assess the [D] features in the prejacent and the assertion yields a contradiction. See Chierchia (2013: section 4.4) for extensive discussion.

(1) *Only JOHN came in years.

a. John came in years. $\wedge$ $\forall x[x$ came in years $\rightarrow x \leq j]$
$\Uparrow$ $\Downarrow$

b. John came in D. $\wedge$ $\forall x[x$ came in $D \rightarrow x \leq j]$ where $D \subset$ YEARS

This idea also explains the lack of NPI-licensing effect of the covert O-operator, as seen in (8b) and (9b). In the following, I show that both syntactically well-formed LFs of (2) yield a G-triviality. Under the LF in (2a), according to the definition of O in (50), the prejacent inference $[\![S]\!]$ is *asserted* by the covert O_F-operator, as schematized in (2a-ii). Thus, when the O_D-operator is applied, the prejacent inference will also enter into the assessment of the [D] feature, contrary to the case of the *only*-sentence (57). Crucially, the prejacent inference (the underlined part) and the exhaustivity inference (the rest) are UE and DE with respect to the NPI *any*, respectively; thus overall the complement of O_D is non-monotonic with respect to the NPI *any*. Alternatively, under the LF in (2b), the [F] and [D] features will be checked off simultaneously, generating a set of alternatives via point-wise functional application (Hamblin 1973), as schematized in (2bii). Applying O affirms the prejacent and negates all the alternatives except the prejacent itself, yielding a contradiction.

(2) * JOHN$_F$ read any papers.

a. O_D [O_F [$_S$ JOHN$_{F,i}$ read any$_D$ papers]]

i. $[\![S]\!] = \lambda w.\exists y \in D[P_w(y) \wedge R_w(j,y)]$
(John read a paper in the total domain D.)

ii. $[\![O_F(S)]\!] = \lambda w.\underline{\exists y \in D[P_w(y) \wedge R_w(j,y)]} \wedge \forall x \in D_e[\exists y \in D[P_w(y) \wedge R_w(x,y)] \rightarrow x \leq j]$
(John and no one else read a paper in the total domain D.)

iii. $[\![O_D[O_F(S)]]\!] = \bot$

b. $O_{D,F}$ [$_S$ JOHN$_{F,i}$ read any$_D$ papers]

i. $[\![S]\!] = \lambda w.\exists y \in D[P_w(y) \wedge R_w(j,y)]$

ii. ALT(S) $= \{\lambda w.\exists y \in D'[P_w(y) \wedge R_w(x,y)] \mid D' \subseteq D, x \in D_e\}$

iii. $[\![O_{D,F}(S)]\!] = \bot$

component (57c) is DE with respect to the domain variable D. Therefore, *any* is licensed in (57), as it would be in any DE environments.

It is worthy noting that the G-view conventionally assumes that exhaustification operators operate on propositional alternatives. Therefore, for both DP-*only* and VP-*only*, this convention requires the exhaustification domain to be a set of propositions, represented as "ALT(p)" in (58).

(58) $[\![\text{only}]\!](p) = \lambda w[p(w) = 1.\forall q \in \text{ALT}(p)[q(w) = 1 \rightarrow p \subseteq q]]$

Following this convention strictly, the G-view of NPI-licensing would instead schematize the assertion of S as in (59). Here the F-alternatives are propositions of the form "y read some papers in the total domain D" where y is a contextually relevant individual.

(59) $\lambda w.\forall q \in \text{F-ALT}(p)[q(w) = 1 \rightarrow \lambda w.\exists x \in D[P_w(x) \wedge R_w(j,x)] \subseteq q]$
where $\text{F-ALT}(p) = \{\lambda w.\exists x \in D[P_w(x) \wedge R_w(y,x)] \mid y \in D_e\}$

This move does not change the polarity pattern of the assertion with respect to the D variable. It might not be easy to see the DE-ness of (59) with respect to D, but it is easy to prove it from the semantically equivalent formula (60), which is the conjunction of negated excludable F-alternatives: an F-alternative q is UE with respect to D, and thus its negation is DE with respect to D, and thus the conjunction of negated F-alternatives is DE with respect to D.[14]

(60) $\bigcap\{\lambda w.\neg q(w) : q \in \text{F-ALT}(p) \wedge \lambda w.\exists x \in D[P_w(x) \wedge R_w(j,x)] \not\subseteq q\}$,
where $\text{F-ALT}(p) = \{\lambda w.\exists x \in D[P_w(x) \wedge R_w(y,x)] \mid y \in D_e\}$

The G-view of NPI-licensing can be summarized as follows: the [D] feature of an NPI evokes the mandatory application of an O_D-operator; if the constituent that O_D attaches to is non-DE with respect to this NPI, employing O_D yields a G-triviality. As for the case of *only*, the G-view shows that the asserted component of an *only*-clause is DE with respect to its unfocused part, which therefore can license NPIs.

3.4. Advantages of the G-view

Superior to previous studies on NPI-licensing, the G-view explicitly explains why NPIs cannot appear in non-DE environments. Moreover, this view is compatible with the strict DE condition and therefore is free from the problems that the Strawson DE analysis of NPI-licensing faces.

As pointed out by Lahiri (1998) and Gajewski (2011), for example, the Strawson DE condition cannot account for the distributional pattern of NPIs under a definite description of the form "*the*+$\text{NP}_{\text{singular}}$" or "*both*+NP": the left argument is Strawson DE but cannot license NPIs. Given these problematic cases, Wagner (2006) admits that other conditions, such as not being Strawson-UE (Lahiri 1998, Cable 2002, Guerzoni & Sharvit 2007), are also required for licensing NPIs.

[14] I thank an anonymous reviewer of *Journal of Semantics* for pointing out a mistake in an older version of this article (in *proceedings of Sinn und Bedeutung 19*), where I claimed that (59) is non-DE with respect to the variable D.

(61) * The student who had any linguistics did well.
   a. Presupposition: $|\text{student}'_w| = 1$
   b. Assertion: $\text{student}'_w \subseteq \text{did-well}'_w$

(62) * Both students who had any linguistics did well.
   a. Presupposition: $|\text{students}'_w| = 2$
   b. Assertion: $\text{student}'_w \subseteq \text{did-well}'_w$

Following the G-view, Gajewski (2011) provides a simpler explanation of the distributional pattern of NPIs under definite descriptions. He proposes that the cardinality inferences in (61a) and (62a) are not only presupposed but also asserted, as exemplified below. Hence the overall assertions of the sentences (61-62) are non-monotonic with respect to *any*, which therefore explains why the NPI *any* is not licensed.

(63) Assertion of (61) due to Gajewski (2011):
$|\text{student}'_w| = 1 \wedge [\text{student}'_w \subseteq \text{did-well}'_w]$

3.5. Problems with the G-view

Previous works on the G-view have not yet discussed the phenomenon of Licensing Asymmetry. In this section, I will first show that the current G-view is indeed sufficient for analyzing the basic cases in (64), where *only* is associated with *any* or *any*P. But this explanation is highly restricted; it cannot extend to cases like (65), where *only* is associated with *any* across an existentially quantificational expression, nor to cases like (66) that are subject to Licensed-Nonfocal Mismatch.

(64) a. * John only read ANY_F papers.
   b. * John only read [any PAPERS]$_F$, (he didn't read every book).

(65) a. * Mary only invited some students who read ANY_F papers.
   b. * Only some students who read ANY_F papers passed the test.

(66) a. * John only read any PAPERS_F.
   b. * Only any BOYS_F arrived.

3.5.1. A potential solution for Licensing Asymmetry

If we follow the G-view of NPI-licensing strictly, we would structure the LF of (64a) as (67a): a covert O_D-operator embeds the entire *only*-clause; the grammatical features [F] and [D] agree with *only* and O_D, respectively. Following Chierchia's (2006, 2013) assumption that the polarity item *any* is a variant of the existential indefinite *some*, we conjecture that its default F-alternatives are simply the scalar alternatives, as schematized in (67b). The semantics of (67a) thus proceeds as follows: first, applying *only* negates the stronger scalar/focus alternative, yielding the assertion (67c), which is UE with respect to the D variable; next, exercising O_D to check off the [D] feature

leads to the semantic consequence of negating the proper D-alternatives, yielding the inference (67e). Crucially, (67e) contradicts the asserted scalar inference (67c), yielding a G-triviality.

(67) * John only read ANY_F papers.

a. O_D [$_{S2}$ only [$_{S1}$ John read $\text{ANY}_{D,F}$ papers]]

b. $\text{F-ALT}(\text{S1}) = \left\{ \begin{array}{ll} \exists x \in D[P(x) \wedge R(j,x)] & \text{(John read } \textit{some} \text{ papers in } D.) \\ \forall x \in D[P(x) \rightarrow R(j,x)] & \text{(John read } \textit{all} \text{ the papers in } D.) \end{array} \right\}$

c. Assertion of S2: $\neg \forall x \in D[P(x) \rightarrow R(j,x)]$
(John didn't read all the papers in the total domain D.)

d. $\text{D-ALT}(\text{S2}) = \{\neg \forall x \in D'[P(x) \rightarrow R(j,x)] : D' \subseteq D\}$

e. $\forall D'[D' \subset D \rightarrow \forall x \in D'[P(x) \rightarrow R(j,x)]]$
(For each proper subdomain D', John read all the papers in D'.)

f. (67e) contradicts (67c). For example, let $D = \{a,b\}$, then
$\text{D-ALT}(\text{S2}) = \{\neg[R(j,a) \wedge R(j,b)], \neg R(j,a), \neg R(j,b)\}$
$(67c) = \neg[R(j,a) \wedge R(j,b)]$ (not [John read both a and b])
$(67e) = R(j,a) \wedge R(j,b)$ (John read both a and b)

3.5.2. Problem 1: Licensing Asymmetry with existentials

Nevertheless, the solution used above is highly restricted. If *only* is associated with *any* across an existential quantifier, the inference derived by negating the proper D-alternatives might do not contradict the asserted scalar inference.

Consider (65a) for illustration. Due to the Complex NP Constraint, the NPI *any* must be interpreted within the relative clause of the existentially quantificational phrase *some students*. The following derivation shows that the meaning of the LF in (68a) is not contradictory.

(68) * Mary only invited some students who read ANY_F papers.

a. O_D [$_{S2}$ only [$_{S1}$ Mary invited some students who read ANY_F papers]]

b. $\text{F-ALT}(\text{S1}) = \left\{ \begin{array}{l} \exists x[S(x) \wedge \exists y \in D[P(x) \wedge R(x,y)] \wedge I(m,x)] \\ \text{(Mary invited some students who read } \textit{some} \text{ papers in } D.) \\ \exists x[S(x) \wedge \forall y \in D[P(x) \rightarrow R(x,y)] \wedge I(m,x)] \\ \text{(Mary invited some students who read } \textit{all} \text{ the papers in } D.) \end{array} \right\}$

c. Assertion of S2: $\neg \exists x[S(x) \wedge \forall y \in D[P(x) \rightarrow R(x,y)] \wedge I(m,x)]$
(Mary didn't invite any students who read all the papers in D.)

d. $\text{D-ALT}(\text{S2}) = \{\neg \exists x[S(x) \wedge \forall y \in D'[P(x) \rightarrow R(x,y)] \wedge I(m,x)] : D' \subseteq D\}$

e. $\forall D' \subset D \exists x[S(x) \wedge \forall y \in D'[P(x) \rightarrow R(x,y)] \wedge I(m,x)]$
(For every proper subdomain D', Mary invited some students who read all the papers in D'.)

f. (68c) does not contradict (68e). For example, let $D = \{a, b\}$, then:
$(68c) = \neg\exists x[S(x) \wedge R(x, a \oplus b) \wedge I(m,x)]$
(Mary didn't invite any students who read both a and b.)
$(68e) = \exists x[S(x) \wedge R(x,a) \wedge I(m,x)] \wedge \exists x[S(x) \wedge R(x,b) \wedge I(m,x)]$
(Mary invited some students who read a and some students who read b.)

To understand this problem from a more general perspective, recall how the G-view explains the NPI-licensing effect of negation:

Claim 1: Assessing the [D] feature of any_D over negation is semantically vacuous.

Claim 2: In absence of negation, assessing the [D] feature of any_D yields a G-triviality.

Claim 1 can easily extend to other DE environments, such as *only*, as we have seen in section 3.3. This is so because the D-alternatives will be non-excludable as long as the [D] feature is assessed in a DE context. Nevertheless, Claim 2 does not necessarily hold in other non-DE environments, such as the one seen in (68): even though the proper D-alternatives are excludable, negating them does not necessarily yield a G-triviality.

3.5.3. Problem 2: Licensed-Nonfocal Mismatch

We have seen from section 3.3 that the asserted component of an *only*-sentence is DE with respect to any unfocused position of this sentence. Since the G-view takes the DEness of the asserted component as the only requirement for licensing weak NPIs, it cannot capture the phenomenon of Licensed-Nonfocal Mismatch.

For instance, following the G-view, we would assume that the sentence in (66a) takes the LF in (69a). Applying *only* negates all the excludable F-alternatives and returns an assertion that is DE with respect to the D variable. Next, since the D-alternatives are all entailed by the assertion, using O_D to check off the [D] feature of the NPI *any* does not yield a G-triviality. Therefore, if the LF in (69a) were possible, the NPI *any* should have been licensed in (66a), contra fact.

(69) * John only read any PAPERS$_F$.

a. O_D [$_{S2}$ only [$_{S1}$ John read any$_D$ PAPERS$_F$]]

b. F-ALT(S1) $= \left\{ \begin{array}{ll} \exists x \in D[P(x) \wedge R(j,x)] & \text{(John read some } \textit{papers} \text{ in } D.) \\ \exists x \in D[B(x) \wedge R(j,x)] & \text{(John read some } \textit{books} \text{ in } D.) \end{array} \right\}$

c. Assertion of S2: $\neg\exists x \in D[B(x) \wedge R(j,x)]$ (John didn't read any books in D.)

d. D-ALT(S2) $= \{\neg\exists x \in D'[B(x) \wedge R(j,x)] : D' \subseteq D\}$

e. $[\![O_D(\text{S2})]\!] = (69c) = \neg\exists x \in D[B(x) \wedge R(j,x)]$ (John didn't read any books in D.)

4. A new analysis

We have seen that the F-movement operation is needed to unify the distributional patterns of NPIs under DP-*only* and VP-*only*, especially for the facts related to Licensed-Nonfocal Mismatch.

But, this operation has not yet been well-motivated. A natural move would be to incorporate F-movement into the G-view of NPI-licensing and motivate F-movement based on the requirement of avoiding G-trivialities.

Why is it that a logical inference can motivate a syntactic operation? Chierchia (2013: 444) indicates that the structure-building apparatus (e.g., Merge, Move, Agree) and the inferential one are not radically different: "grammar only sees functional/logical material; logic sees functional/logical material and whether the lexical material is the same or different." G-triviality, in particular, is the type of L-triviality that takes effect in grammar.

Nevertheless, we have also seen that neither Wagner (2006) nor Chierchia (2006, 2013) can properly capture the distributional pattern of NPIs under *only*. Both theories predict that NPIs can appear in any Strawson DE or DE environment. And both theories predict that the asserted component of an *only*-sentence is DE with respect to any unfocused position. The phenomenon of Licensed-Nonfocal Mismatch, however, suggests that the licensing status of an NPI in an *only*-sentence is not just determined by the polarity pattern of the environment where this NPI gets interpreted. For instance, compare the minimal pair in (70): despite the fact that the asserted component of the entire *only*-sentence is DE with respect to *any* in (70a) and UE with respect to *any* in (70b), both occurrences of *any* are not licensed. We can conclude that a pure monotonicity-based account cannot account for the distributional patter of NPIs under *only*.

(70) a. * Only any BOYS_F arrived.
b. * Only ANY_F boys arrived.

I argue that *only* is not just an NPI-licenser but also an "NPI-unlicenser." It is an NPI-licenser because it creates a DE environment in its unfocused part. It is also an NPI-unlicenser because interpreting an NPI within its syntactic complement makes this NPI not licensed. In the G-view of NPI-licensing, an NPI is unlicensed if and only if the assessment of its [D] feature yields a G-triviality. To this extent, we can say that the O_D-operator can trigger an NPI-unlicensing effect, which occurs when O_D is applied to a constituent that is non-DE with respect to an NPI.

To capture NPI-unlicensing effect of *only*, I propose that *only*, just like the covert O_D-operator, can check off the grammatical feature [D]. A more general assumption is stated as follows:

(71) *Only* mandatorily checks off all the *unchecked* [D] features in its syntactic complement.
a. *Only* can check off any alternative-generating features (e.g., [F], [D]).
b. An alternative-generating feature that always takes "+" value (e.g., the [D] feature of *any*) must agree with the closest probe.

The locality constraint (71b) is exclusive to alternative-generating features that always take "+" value.[15] When an alternative-generating feature takes "+" value, it activates the corresponding

[15]For instance, it is clearly not the case that a focused element has to be associated with the closest focus-sensitive operator. In (1), the second focused item *BOBBY* is not associated with the closest focus-sensitive particle *only*.

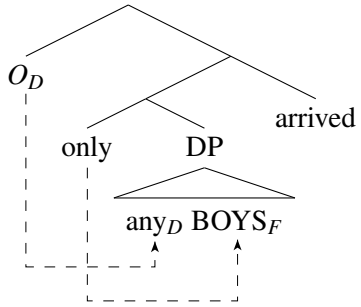
(1) We only_1 recovered the diary entries that MARILYN_{F1} made about John.

alternatives; otherwise it does not. In Chierchia's (2013) system, the domain feature [D] and the scalar feature [σ] of polarity items (including NPIs, free choice items (FCIs), and minimizers), if syntactically visible, always take "+" value, obligatorily activating D-alternatives and scalar alternatives. In contrast, the [σ] feature of a regular scalar item (e.g., *some*) can take either "+" or "–" value, and hence the activation of the corresponding scalar alternatives is optional.

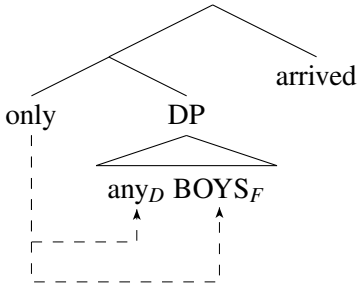
According to the assumptions in (71), contra the traditional G-view, the occurrence of DP-*only* in (70a) checks off not only the [F] feature of the focused item $BOYS_F$ but also the [D] feature of the NPI any_D, as illustrated in (72b). There is thus no need to posit a covert O_D-operator in the LF. In particular, the feature-checking operation on [D], as we will see in section 4.1.3, gives rise to a G-triviality and "unlicenses" the NPI *any*: *only* negates the proper D-alternatives, returning an assertion that contradicts the prejacent presupposition of *only*.

(72) *Only any BOYS_F arrived.

a. Traditional G-view



b. New analysis



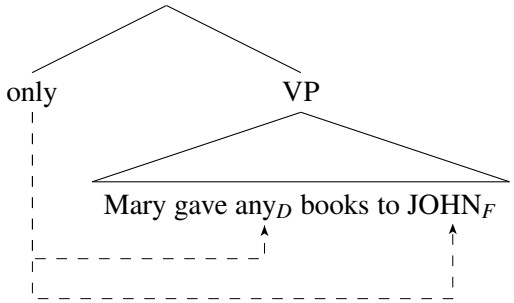
In the case of VP-*only* association, F-movement is motivated so as to avoid this G-triviality. The following lists out all the syntactically well-formed LFs for the sentence in (73). If the focused item $JOHN_F$ is interpreted in situ, as in (73a), the [D] feature of any_D will be checked off by the closest probe, which can be the particle *only*, as in (73a-i), or a local O_D-operator, as in (73a-ii). Both of these LFs yield a G-triviality and thus cannot make *any* licensed. Conversely, if the focused item undergoes F-movement as in (73b), *only* c-commands the focused item but not the NPI *any*; therefore, the [D] feature of *any* is left to be checked off by a global covert O_D-operator. Moreover, the scope of *only* creates a DE environment; therefore, using O_D to assess the [D] feature does not yield a G-triviality, making the NPI *any* licensed.

We also$_2$ only$_1$ recovered [the diary entries that MARILYN_{F1} made about BOBBY_{F2}].

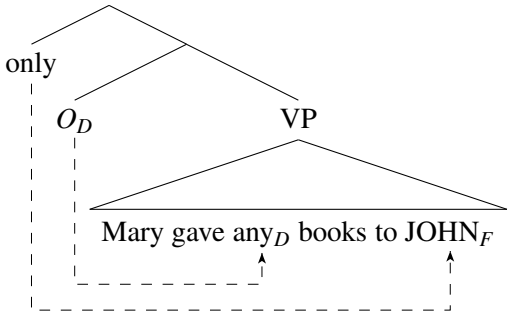
(73) Mary only gave any books to JOHN$_F$.

a. #Without F-movement

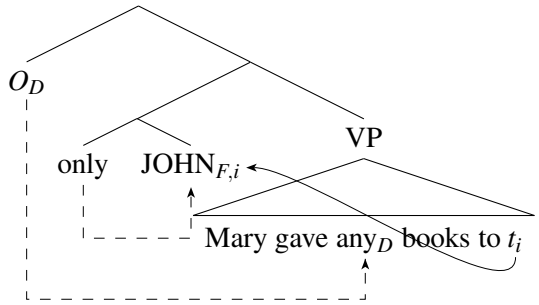
(i) Without O_D



(ii) With O_D



b. ^{OK}With F-movement



4.1. DP-*only* association

4.1.1. Semantics of DP-*only*

I define the semantics of DP-*only* cross-categorically as in (74), where α and P stand for the syntactic restrictor (i.e., the left argument) and the scope (i.e., the right argument), respectively. The letter τ stands for an arbitrary semantic type. This definition follows the convention initiated by Horn (1969): *only* presupposes the truth of the prejacent and asserts an exhaustivity inference.[16]

(74) **Semantics of DP-*only***

a. $[\![\text{only}(\alpha_\tau)(P_{\langle\tau,st\rangle})]\!] = \lambda w.\forall a \in [\![\alpha]\!]^{f,d}[[\![P]\!](a)(w) = 1 \rightarrow [\![P]\!]([\![\alpha]\!]^0) \subseteq [\![P]\!](a)]$

b. Presupposition: $[\![P]\!]([\![\alpha]\!]^0)$

Following the Roothean convention of Alternative Semantics (Rooth 1985, 1992, 1996), I use $[\![\alpha]\!]^0$ and $[\![\alpha]\!]^{f,d}$ to represent the *ordinary value* and the *focus-and-domain value* of α, respectively. The

[16]For the proposed analysis, all we need is that *only* obligatorily triggers a prejacent inference; it isn't crucial how this prejacent inference is generated. It could be an independent presupposition, as assumes in (74b). It could also be derived as in (42), where a scalar implicature together with Ippolito's (2008) conditional presupposition entails a prejacent inference. Here I go for the former option for simplicity.

ordinary value is simply the truth value. The focus-and-domain value of α forms the exhaustification domain; it denotes the union of the set of F-alternatives (written as "$[\![\alpha]\!]^f$" or "F-ALT(α)") and the set of D-alternatives (written as "$[\![\alpha]\!]^d$" or "D-ALT(α)"), composed point-wise as follows:

(75) a. $[\![\alpha_F]\!]^f = D_{\text{type}([\![\alpha]\!]^0)}$
b. $[\![\alpha_D]\!]^d = \{[\![\alpha_{[D/D']}]\!] : D' \subseteq D\}$
c. $[\![\alpha]\!]^f = \{[\![\alpha]\!]^0\}$
d. $[\![\alpha]\!]^d = \{[\![\alpha]\!]^0\}$
e. $[\![\alpha]\!]^{f,d} = [\![\alpha]\!]^f \cup [\![\alpha]\!]^d$
f. $[\![\alpha(\beta)]\!]^{f,d} = \{a(b) \mid a \in [\![\alpha]\!]^{f,d}, b \in [\![\beta]\!]^{f,d}\}$

The proposed definition of DP-*only* differs from the definition by Wagner (2006) in (20) in the following two respects. First, *only* triggers a prejacent presupposition,[17] which is much stronger than Wagner's existential presupposition. Second, the exhaustification domain of *only* contains also the D-alternatives of the syntactic restrictor. To see how the proposed definition works in practice in cases without NPIs, consider the following example:

(76) Only JOHN$_F$'s advisors left.
Let $A_w(x) = \iota y[\text{advisor}'_w(y,x) \wedge \forall z[\text{advisor}'_w(z,x) \rightarrow z \leq y]]$
(the unique maximal individual y such that y is x's advisor(s) in w.)
a. $[\![\text{JOHN}_F\text{'s advisors}_w]\!]^0 = A_w(j)$
b. $[\![\text{JOHN}_F]\!]^f = D_e$
c. $[\![\text{JOHN}_F\text{'s advisors}_w]\!]^f = \{A_w(x) : x \in D_e\}$
d. Presupposition: $\lambda w.L_w(A_w(j))$
(John's advisors left.)
e. Assertion: $\lambda w.\forall x \in [\![\text{JOHN}_F\text{'s advisors}_w]\!]^f[([\![\text{left}_w]\!])(x)$
$\rightarrow \lambda w.[\![\text{JOHN}_F\text{'s advisors}_w]\!]^0([\![\text{left}_w]\!]) \subseteq \lambda w.[\![\text{left}_w]\!](x)]$
$= \lambda w.\forall y \in \{A_w(x) : x \in D_e\}[L_w(y) \rightarrow \lambda w.L_w(A_w(j)) \subseteq \lambda w.L_w(y)]$
($\lambda w.$ for any y such that y is someone's advisor(s) in w and y left in w, the proposition 'John's advisors left' entails the proposition 'y left'.)
$= \lambda w.\forall x \in D_e[L_w(A_w(x)) \rightarrow x \leq j]$
(if anyone$_i$'s advisors left, then he$_i$ is John.)

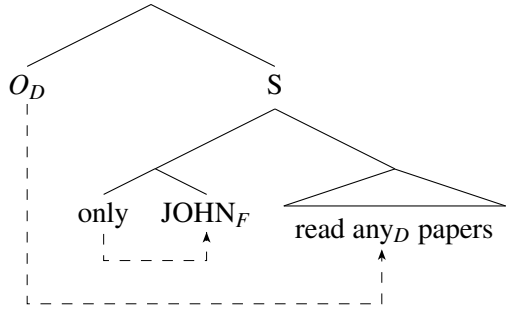
4.1.2. The NPI-licenser use of DP-*only*

When an NPI *any* appears within the scope of DP-*only*, its [D] feature will be assessed by a covert O_D-operator that embeds the entire *only*-clause (labeled "S"). The asserted component of the *only*-clause is DE with respect to the scope. Therefore, assessing the [D] feature of *any* via an O_D is

[17] There are also other presuppositions triggered by *only* (such as the additive presupposition, see fn. 8). I ignore these presuppositions because they are not crucial for the purpose of this paper.

semantically vacuous and would not yield a G-triviality. An example with schematized derivation is given in (77). The application of O_D is semantically vacuous, because all the D-alternatives (i.e., members in $[\![\text{S}]\!]^d$) are entailed by the asserted component of the *only*-sentence (i.e., $[\![\text{S}]\!]^0$). The only difference between this analysis from the traditional G-view is that here *only* c-commands the focused item JOHN_F but not the the NPI *any*.

(77) Only JOHN_F read any papers.



a. $[\![\text{JOHN}_F]\!]^0 = j$

b. $[\![\text{JOHN}_F]\!]^f = D_e$

c. $[\![\text{read any papers}]\!] = \lambda y \lambda w.\exists x \in D[P_w(x) \wedge R_w(y,x)]$

d. $[\![\text{S}]\!]^0 = \lambda w.\forall y \in [\![\text{JOHN}_F]\!]^f [[\![\text{read any papers}]\!](y)(w) \rightarrow$
$[\![\text{read any papers}]\!]([\![\text{JOHN}_F]\!]^0) \subseteq [\![\text{read any papers}]\!](y)]$
$= \lambda w.\forall y \in D_e[\exists x \in D[P_w(x) \wedge R_w(y,x)] \rightarrow$
$\lambda w.\exists x \in D[P_w(x) \wedge R_w(j,x)] \subseteq \lambda w.\exists x \in D[P_w(x) \wedge R_w(y,x)]]$
$= \lambda w.\forall y \in D_e[\exists x \in D[P_w(x) \wedge R_w(y,x)] \rightarrow y \leq j]$
(Only John read any papers in the total domain D.)

e. $[\![\text{S}]\!]^d = \{\lambda w.\forall y \in D_e[\exists x \in D'[P_w(x) \wedge R_w(y,x)] \rightarrow y \leq j] : D' \subseteq D\}$

f. $[\![O_D(\text{S})]\!] = \lambda w[[\![\text{S}]\!]^0(w) = 1 \wedge \forall p \in [\![\text{S}]\!]^d[p(w) = 1 \rightarrow [\![\text{S}]\!]^0 \subseteq p]]$
$= [\![\text{S}]\!]^0$
(Only John read any papers in the total domain D.)

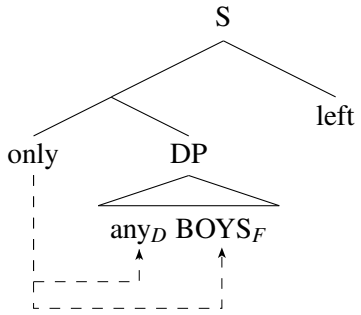
g. $[\![\text{S}]\!]^0$ entails every member in $[\![\text{S}]\!]^d$.
For example, let $D = \{a,b\}$ and $[\![\text{JOHN}_F]\!]^f = \{j,m\}$, then:
$[\![\text{read any papers}]\!] = \lambda x[R(x,a) \vee R(x,b)]$
$[\![\text{S}]\!]^0 = \neg[R(m,a) \vee R(m,b)]$
$[\![\text{S}]\!]^d = \{\neg[R(m,a) \vee R(m,b)], \neg R(m,a), \neg R(m,b)\}$
Hence, $[\![O_D(\text{S})]\!] = [\![\text{S}]\!]^0 = \neg[R(m,a) \vee R(m,b)]$ (Mary read neither a nor b.)

4.1.3. The NPI-unlicenser use of DP-*only*

When an NPI *any* appears within the left argument of DP-*only*, *only* checks off both [F] and [D] features, and therefore its exhaustification domain consists of not only the focus value of its left

argument but also the domain-value of its left argument. In the asserted component, applying *only* negates all the excludable alternatives, including the proper D-alternatives, yielding the inference in (78d). Crucially, (78d) contradicts the prejacent presupposition of *only*, as in (78e). Hence, the meaning of (78) is always undefined, which therefore explains why the NPI *any* is not licensed in this *sentence*.

(78) *Only any$_D$ BOYS$_F$ left.



a. $[\![\text{any}_D\ \text{BOYS}_F]\!]^0 = \lambda f_{\langle e,st\rangle}.\exists x \in D[B(x) \wedge f(x)]$

b. $[\![\text{any}_D\ \text{BOYS}_F]\!]^f = \{\lambda f_{\langle e,st\rangle}.\exists x \in D[g(x) \wedge f(x)] : g \in D_{\langle e,st\rangle}\}$

c. $[\![\text{any}_D\ \text{BOYS}_F]\!]^d = \{\lambda f_{\langle e,st\rangle}.\exists x \in D'[B(x) \wedge f(x)] : D' \subseteq D\}$

d. $[\![\text{S}]\!] = \lambda w.\forall \mathscr{P} \in [\![\text{any}_D\ \text{BOYS}_F]\!]^{f,d}[\mathscr{P}([\![\text{left}]\!])(w) \rightarrow [\![\text{any}_D\ \text{BOYS}_F]\!]^0([\![\text{left}]\!]) \subseteq \mathscr{P}([\![\text{left}]\!])]$

$\Downarrow$

e. $\lambda w.\forall \mathscr{P} \in [\![\text{any}_D\ \text{BOYS}_F]\!]^d[\mathscr{P}([\![\text{left}]\!])(w) \rightarrow [\![\text{any}_D\ \text{BOYS}_F]\!]^0([\![\text{left}]\!]) \subseteq \mathscr{P}([\![\text{left}]\!])]$
$= \forall D'[D' \subset D \rightarrow \neg\exists x \in D'[B(x) \wedge L(x)]]$
(For any proper subdomain D', no boy in D' left.)

f. Presupposition of S: $\exists x \in D[B(x) \wedge L(x)]$
(Some boys in the total domain D left.)

g. (78e) contradicts (78f). For example, let $D = \{a, b\}$, then:
$(78e) = \neg L(a) \wedge \neg L(b)$ (Neither a nor b left.)
$(78f) = L(a) \vee L(b)$ (a or b left.)

4.2. VP-*only* association

4.2.1. Semantics of VP-*only*

In the case of VP-*only* association, if focus is interpreted in situ, the alternatives are all propositional. Following Rooth (1985, 1992), I schematize the semantics of VP-*only* as in (79). The letter S stands for the VP complement of *only*.

(79) **Semantics of VP-*only* (without F-movement)**

a. $[\![\text{only(S)}]\!] = \lambda w.\forall q \in [\![\text{S}]\!]^{f,d}[q(w) = 1 \rightarrow [\![\text{S}]\!]^0 \subseteq q]$

b. Presupposition: $[\![\text{S}]\!]^0$

When F-movement takes place, VP-*only* is defined cross-categorically the same as DP-*only*. Now the two arguments α and P correspond to the F-moved phrase and the remnant VP, respectively.

(80) **Semantics of VP-*only* (with F-movement)**

a. $[\![\text{only}(\alpha_\tau)(P_{\langle\tau,st\rangle})]\!] = \lambda w.\forall a \in [\![\alpha]\!]^{f,d}[[\![P]\!](a)(w) = 1 \rightarrow [\![P]\!]([\![\alpha]\!]^0) \subseteq [\![P]\!](a)]$

b. Presupposition: $[\![P]\!]([\![\alpha]\!]^0)$

In the absence of NPIs, F-movement is not motivated and therefore the exhaustification domain of *only* would be a set of propositions. A schematized example is given in the following.

(81) Sue only invited JOHN$_F$'s advisors.
Let $A_w(x) = \iota y[\text{advisor}'_w(y,x) \wedge \forall z[\text{advisor}'_w(z,x) \rightarrow z \leq y]]$
(the unique maximal individual y such that y is x's advisor(s) in w.)

a. $[\![\text{Sue invited JOHN}_F\text{'s advisors}]\!]^0 = \lambda w.I_w(s,A_w(j))$

b. $[\![\text{JOHN}_F]\!]^f = D_e$

c. $[\![\text{Sue invited JOHN}_F\text{'s advisors}]\!]^f = \{\lambda w.I_w(s,A_w(x)) \mid x \in D_e\}$

d. Assertion: $\lambda w.\forall q \in \{\lambda w.I_w[s,A_w(x)] \mid x \in D_e\}[q(w) = 1 \rightarrow \lambda w.I_w(s,A_w(j)) \subseteq q]$
(Any true proposition of the form "Sue invited x's advisors" is entailed by the prejacent that "Sue invited John's advisors.")

e. Prejacent presupposition: $\lambda w.I_w(s,A_w(x))$

4.2.2. Case 1: F-movement is not motivated

Assuming that F-movement is used to avoid G-trivialities, we conjecture that interpreting focus in situ is allowed as long as it does not yield a G-triviality. For instance, in (82), the NPI *any* can be licensed by negation: assessing the [D] feature of *any*$_D$ by the overt particle *only* or a covert O_D-operator that immediately c-commands negation does not yield a G-triviality; therefore, F-movement is not motivated in (82).

(82) Mary only didn't give any$_D$ books to JOHN$_F$

Only [(O_D) **not** [Mary gave any$_D$ books to JOHN$_F$]]

Assuming F-movement to be conditional better controls the use of this operation. For instance, contrary to Wagner's (2006) predictions (seen in section 2.3.3), the new analysis predicts that F-movement is not motivated in (83) and (84), because interpreting focus in situ does not yield a G-triviality: (83) has no NPI, while the NPI *any* in (84) is licensed by negation.

(83) She only wanted to kiss [at most 3 students]$_F$.

(84) Mary only didn't give [any books]$_F$ to John. She did her best to help him.

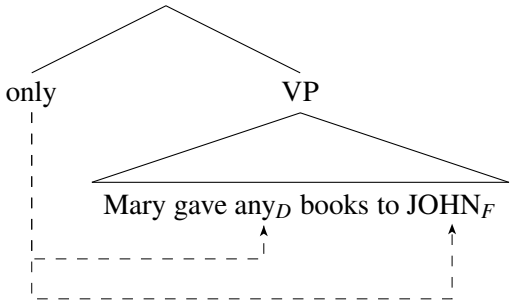
4.2.3. Case 2: F-movement is motivated

In the case of DP-*only* association, we have seen that interpreting an NPI within the immediate syntactic complement of *only* yields a G-triviality, making the NPI unlicensed. In the case of VP-*only* association, interpreting focus in situ would also cause a G-triviality, but this G-triviality can be avoided by F-movement under certain configurations.

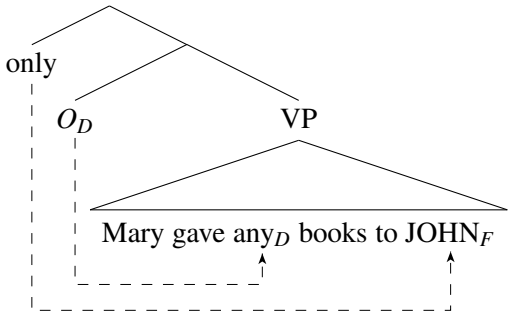
Let us first see why the two un-F-moved forms in (73a), repeated below, yield a G-triviality.

(85) Mary only gave any books to JOHN$_F$. (Without F-movement)

a. Without O_D



b. With O_D



In the LF (85a), *only* immediately c-commands the entire prejacent VP (labeled "S") and therefore checks off the [F] feature of $JOHN_F$ as well as the [D] feature of any_D. Hence, the exhaustification domain of *only* consists of not only F-alternatives but also D-alternatives, as schematized in (86a).[18] Applying *only* negates all the excludable alternatives of S and yields the exhaustivity assertion (86b), which further entails the inference (86c). Crucially, (86c) contradicts the prejacent presupposition (86d), as illustrated in (86e). Hence, the value of the LF in (85a) is always untrue.

(86) **Interpreting the LF (85a)**

[only [$_S$ Mary gave any$_D$ books to JOHN$_F$]]

a. Exhaustification domain of *only*: $\text{ALT(S)} = \text{F-ALT(S)} \cup \text{D-ALT(S)}$

   i. $\text{F-ALT(S)} = \{\exists x \in D[B(x) \wedge G(m,y,x)] \mid y \in D_e\}$

   ii. $\text{D-ALT(S)} = \{\exists x \in D'[B(x) \wedge G(m,j,x)] \mid D' \subseteq D\}$

b. Assertion: $\lambda w.\forall q \in \text{ALT(S)}[q(w) = 1 \rightarrow \exists x \in D[B(x) \wedge G(m,j,x)] \subseteq q]$

$\Downarrow$

c. $\forall D'[D' \subset D \rightarrow \neg\exists x \in D'[B(x) \wedge G(m,j,x)]]$

(Mary didn't give John any books in any proper subdomain D'.)

[18] Alternatively, we can also assume a larger exhaustification domain for *only*, namely, the set of propositions of the form "Mary gave some books in D' to y", as schematized in (1). This alternative set is point-wise composed from the D-alternatives of any_D and the focus alternatives of $JOHN_F$. Since this set includes all the D-alternatives in (86a-ii), exhaustifying over this set also yields an assertion that entails the inference in (86c).

(1) $\text{ALT(S)} = \{\exists x \in D'[B(x) \wedge G(m,y,x)] \mid y \in D_e, D' \subseteq D\}$

d. Presupposition: $\exists x \in D[B(x) \wedge G(m,j,x)]$
(Mary gave John some books in the total domain D.)

e. (86c) contradicts (86d). For example, let $D = \{a,b\}$, then:
$(86c) = \neg G(m,j,a) \wedge \neg G(m,j,b)$ (Mary didn't gave John a or b.)
$(86d) = G(m,j,a) \vee G(m,j,b)$ (Mary gave John a or b.)

In the LF (85b), the [D] feature of any_D is checked off by a local O_D-operator. From (87), it is easy to see that the prejacent of *only*, namely 'O_D(S)', is a contradiction: S is UE with respect to the D variable; affirming $[\![\text{S}]\!]$ and negating all the proper D-alternatives of S yields a contradiction. With a contradictory prejacent presupposition, the meaning of the LF in (85b) is always undefined.

(87) **Interpreting the LF (85b)**
[only [O_D [$_S$ Mary gave any$_D$ books to JOHN$_F$]]]

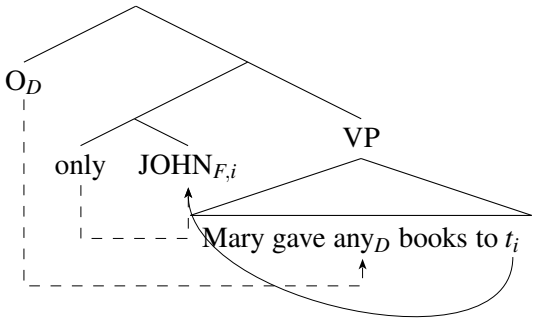
a. $[\![\text{S}]\!] = \exists x \in D[B(x) \wedge G(m,y,x)]$

b. D-ALT(S) $= \{\exists x \in D'[B(x) \wedge G(m,j,x)] \mid D' \subseteq D\}$

c. Presupposition: $[\![O_D(\text{S})]\!] = \lambda w[[\![\text{S}]\!](w) = 1 \wedge \forall p \in \text{D-ALT(S)}[[\![\text{S}]\!] \not\subseteq p \rightarrow p(w) = 0]]$
$= \bot$
For example, let $D = \{a,b\}$, then:
$[\![\text{S}]\!] = G(m,j,a) \vee G(m,j,b)$
D-ALT(S) $= \{G(m,j,a), G(m,j,b), G(m,j,a) \vee G(m,j,b)\}$
$[\![O_D(\text{S})]\!] = [G(m,j,a) \vee G(m,j,b)] \wedge \neg G(m,j,a) \wedge \neg G(m,j,b) = \bot$

Alternatively, under the F-moved LF in (73b), repeated below, *only* does not c-command *any*, and hence the [D] feature of any_D is assessed by a covert O_D-operator. As seen in section 3.3, this LF does not suffer G-triviality: *only* creates a DE environment with respect to the D variable in its scope; therefore, in this LF, assessing [D] by the O_D-operator is semantically vacuous.

(88) Mary only gave any books to JOHN$_F$. (With F-movement)



In conclusion, in the case of VP-*only* association, F-movement is motivated if *only* c-commands an NPI and this NPI is not licensed within the prejacent of *only*. Note that the discussion above is irrelevant to overt F-movement. Since G-triviality is assessed at LF, the requirement of avoiding G-trivialities can only motivate covert movement. Hence, this requirement is not the cause of overt F-movement in languages like Hungarian and Basque. (See Kiss 1995 for more instances of languages with overt F-movement.)

4.2.4. Case 3: F-movement is unhelpful

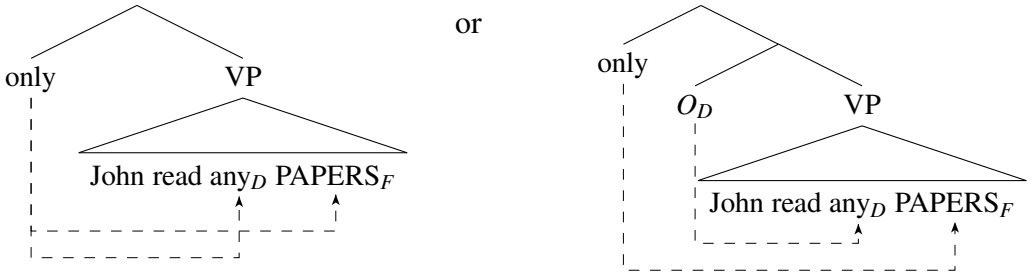
Let us move on to Licensing Asymmetry: *only* cannot license an NPI if this NPI appears within its F-associate or an island that contains its F-associate. Relevant examples mentioned in the previous sections are collected in (89). I will show that NPIs are not licensed in these sentences because their G-trivialities cannot be salvaged by F-movement.

(89) a. * John read only ANY$_F$ papers.
b. * John read only [any PAPERS]$_F$, (he didn't read every book).
c. * John read only any PAPERS$_F$, (he didn't read any books).
d. * The president only met with a chair of any HUMANITIES$_F$ department.
e. * The president only met with a CHAIR$_F$ of any humanities department.
f. * Mary only gave a book to John [because BILL$_F$ gave any book to him].
g. * The president only met with [*anyone's ADVISOR$_F$].
h. * Mary only invited some students who read ANY$_F$ papers.

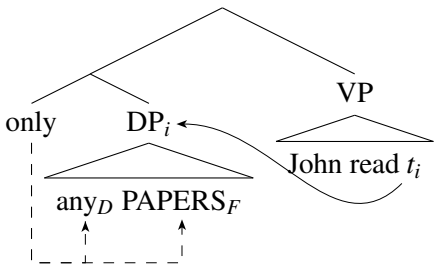
Take (89c) for example, where *only* is directly associated with the NP complement of *any*. From (90), it is easy to see that all the possible LFs of (89c), with and without F-movement, yield a G-trivial meaning. The two un-F-moved forms in (90a) are interpreted in the same way as the two forms in (85). The F-moved form in (90b) is interpreted in the same way as the one in (78), where an NPI appears within the restrictor of DP-*only*). Crucially, F-movement is subject to island constraints, and hence the F-moved item has to be the entire *any*P.

(90) *John read only any PAPERS$_F$, (he didn't read any books).

a. # Without F-movement



b. # With F-movement



Moreover, under the new analysis, as long as the prejacent of *only* is non-DE with respect to an NPI, a contradiction arises between the prejacent presupposition and the inference of negating the proper D-alternatives. This generalization also applies to the case where *only* is associated with an NPI across an existential quantifier. For illustration, compare the following semantic derivation with the one in (68), which follows the traditional G-view.

(91) * Mary only invited some students who read ANY_F papers.

a. only [$_S$ Mary invited some students who read $\text{ANY}_{F,D}$ papers]

b. Exhaustification domain of *only*: $\text{ALT(S)} = \text{F-ALT(S)} \cup \text{D-ALT(S)}$

i. $\text{F-ALT(S)} = \left\{ \begin{array}{l} \exists x[S(x) \wedge \exists y \in D[P(x) \wedge R(x,y)] \wedge I(m,x)] \\ \text{(Mary invited some students who read } \textit{some} \text{ papers in } D.) \\ \exists x[S(x) \wedge \forall y \in D[P(x) \rightarrow R(x,y)] \wedge I(m,x)] \\ \text{(Mary invited some students who read } \textit{all} \text{ papers in } D.) \end{array} \right\}$

ii. $\text{D-ALT(S)} = \{\exists x[S(x) \wedge \exists y \in D'[P(x) \wedge R(x,y)] \wedge I(m,x)] : D' \subseteq D\}$

c. Assertion: $\lambda w.\forall q \in \text{ALT(S)}[q(w) \rightarrow \exists x[S(x) \wedge \exists y \in D[P(x) \wedge R(x,y)] \wedge I(m,x)] \subseteq q]$

$\Downarrow$

d. $\forall D'[D' \subset D \rightarrow \neg\exists x[S(x) \wedge \exists y \in D'[P(x) \wedge R(x,y)] \wedge I(m,x)]]$
(For any proper subdomain D', Mary didn't any students who read some papers in D'.)

e. Prejacent presupposition: $\exists x[S(x) \wedge \exists y \in D[P(x) \wedge R(x,y)] \wedge I(m,x)]$
(Mary invited some students who read some papers in the total domain D.)

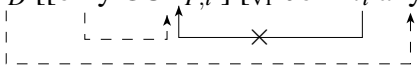
f. (68d) contradicts (68e). For example, let $D = \{a,b\}$, then:
$(68d) = \neg\exists x[S(x) \wedge R(x,a) \wedge I(m,x)] \wedge \neg\exists x[S(x) \wedge R(x,b) \wedge I(m,x)]$
(Mary didn't invite any students who read a or any students who read b.)
$(68e) = \exists x[S(x) \wedge R(x,a \cup b) \wedge I(m,x)]$
(Mary invited some students who read a or b.)

In sum, if the prejacent of *only* is non-DE with respect to the D variable of *any*, then regardless of whether F-movement takes place, using *only* to assess the [D] feature of *any* yields a contradiction between the prejacent presupposition and the negation of the proper D-alternatives, making the NPI *any* unlicensed.

4.3. Head Restriction

Recall that a focused head cannot undertake F-movement alone, because F-movement is phrasal movement. Hence, in (92), it is impossible to move the focused verb CUT_F alone to the restrictor of *only* while leaving the NPI *any* in the scope of *only*.

(92) *John only CUT_F any vegetables.
[O_D [[only $\text{CUT}_{F,i}$] [$_{\text{VP}}$ John t_i any_D vegs]]]



Unlike the cases that are subject to island constraints, cases that are subject to the Head Restriction do have the option of using a global covert O_D-operator to assess the [D] feature of any_D. For instance, in (93), as Gajewski points out, the *any*P can vacate the VP, stranding the remnant VP associated with *only* (reported by Wagner 2006 in fn. 14).

(93) *John only CUT$_F$ any vegetables.
[O_D [$_{DP}$ any$_D$ vegs]$_i$ [only [$_{VP}$ John CUT$_F$ t_i]]]

Nevertheless, the NPI *any* still cannot be licensed. The reason is obvious: vacating the VP, the *any*P can be raised to the position sandwiched between O_D and *only*, and this is the only position where it can be raised to. In this structure, the [D] feature of *any* is assessed under the immediate complement of O_D, yielding a G-triviality.

On the other hand, if the *any*P could be raised to a DE context, the NPI *any* would be licensed. For instance, the conditional sentence (94), which takes (93) as its antecedent, is more acceptable. This is so for the following reason: the whole conditional is DE with respect to *any*; applying O_D over the entire conditional does not yield a G-triviality.

(94) (?) If John only CUT any vegs (and didn't STEAM any vegs), Mary would be unhappy.
[O_D [if [$_{IP}$ [$_{DP}$ any$_D$ vegs]$_i$ [only [$_{VP}$ John CUT$_F$ t_i]]] [$_{IP}$ Mary would be happy]]]

Moreover, if the quantifier raising of the *any*P is blocked, the NPI *any* would not be licensed. For instance, the NPI *any* is not licensed in (95), a conditional where *only* is associated with the NP complement of *any*. First, the determiner *any* cannot take F-movement alone, ruling out the possibility in (95a). Second, since an *only*-associated focus cannot be moved from beneath *only* (Tancredi 1990, Beaver and Clark 2003), the F-contained *any*P cannot raise over *only*, ruling out the possibility in (95b).

(95) *If John only invited [anyone's ADVISORS$_F$], the students would be unhappy.

a. If John only invited [anyone's] ADVISORS$_F$, ...

b. If John only invited [anyone's ADVISORS$_F$], ...

5. Conclusions

The goal of this paper has been to explain the distributional pattern of weak NPIs in *only*-sentences. The phenomenon of Licensed-Nonfocal Mismatch suggests that the licensing status of an NPI in

an *only*-sentence is constrained not only by the monotonicity pattern of the environment where this NPI gets interpreted, but also by syntactic factors in the LF of *only*-sentences.

I reviewed two representative analyses, namely, the F-movement theory by Wagner (2006) and the G-view of NPI-licensing by Chierchia (2006, 2013). I showed that both analyses have clear advantages but also make incorrect predictions. First, neither analysis can properly explain the phenomenon of Licensed-Nonfocal Mismatch. Both analyses assume that weak NPIs can be licensed in any Strawson DE or DE environment, and both analyses predict that the asserted component of an *only*-sentence is DE with respect to any unfocused position. Second, in Wagner's treatment, the F-movement operation in VP-*only* association is not well-motivated or properly controlled. Third, Chierchia's analysis cannot capture cases where *only* is associated with an NPI across an existential quantifier.

As an alternative to these approaches, I incorporated F-movement into the G-view by assuming that the requirement of avoiding G-trivialities can motivate covert F-movement. Moreover, I argued that *only* is not just an NPI-licenser but also an "NPI-unlicenser." To capture the latter role, I proposed that *only*, just like the covert O_D-operator, can check off the grammatical feature [D] and operate on D-alternatives.

Compared with previous analyses, my proposal yields two new predictions. First, when an NPI is interpreted within the immediate complement of *only*, a contradiction arises between the exhaustivity assertion and the prejacent presupposition, making this NPI unlicensed. Second, in the case of VP-*only* association, this contradiction can be avoided via F-movement if the NPI does not appear within the F-moved phrase. These predictions explain why the distributional pattern of NPIs in *only*-clauses exhibits Licensed-Nonfocal Mismatch, as well as why VP-*only* association sometimes triggers F-movement.

Acknowledgements

For helpful discussions on the current and earlier versions of this paper, I thank Gennaro Chierchia, Noah Constant, Michael Erlewine, Danny Fox, Martin Hackl, I-Ta Chris Hsieh, C.-T. James Huang, Andreea Nicolae, Gary Thoms, Hedde Zeijlstra, as well as additional audiences at MIT LF Reading Group, the 37th GLOW colloquium, and the 19th Sinn und Bedeutung. I am grateful to the editor (Yael Sharvit), the proofreader (Nathan Klinedinst), and the anonymous reviewers of *Journal of Semantics*. Their comments have substantially shaped the way the ideas in this paper are presented. Special thanks to Zuzanna Fuchs for proofreading this paper. This paper expands significantly on Xiang (2015) in the *Proceedings of Sinn und Bedeutung 19*. All errors are mine.

YIMEI XIANG
Department of Linguistics
Harvard University
Boylston Hall Floor 3
Cambridge, MA 02138, USA
Email: xiang.yimei@gmail.com

References

Abels, Klaus (2003). *Successive cyclicity, anti-locality, and adposition stranding*. Ph. D. thesis, University of Connecticut, Storrs, CT.

Anderson, Stephen R. (1972). How to get even. *Language*, 893–906.

Atlas, David J. (1993). The importance of being 'only': Testing the neo-Gricean versus neo-entailment paradigms. *Journal of Semantics 10*(4), 301–318.

Atlas, David J. (1996). 'Only' noun phrases, pseudo-negative generalized quantifiers, negative polarity items, and monotonicity. *Journal of Semantics 13*(4), 265–328.

Bayer, Josef (1996). *Directionality and logical form: On the scope of focusing particles and wh-in-situ*, Volume 34. Springer.

Beaver, David and Brady Clark (2003). *Always* and *only*: Why not all focus-sensitive operators are alike. *Natural Language Semantics 11*(4), 323–362.

Beaver, David and Brady Clark (2009). *Sense and sensitivity: How focus determines meaning*. John Wiley & Sons.

Cable, Seth (2002). Some remarks on two theories of negative polarity. Unpublished MS.

Chierchia, Gennaro (2004). Scalar implicatures, polarity phenomena, and the syntax/pragmatics interface. In A. Belletti (Ed.), *Structures and Beyond*, Volume 3, pp. 39–103. Oxford University Press. Oxford.

Chierchia, Gennaro (2006). Broaden your views: Implicatures of domain widening and the "logicality" of language. *Linguistic Inquiry 37*(4), 535–590.

Chierchia, Gennaro (2013). *Logic in grammar: Polarity, free choice, and intervention*. Oxford University Press. Oxford.

Chierchia, Gennaro, Danny Fox and Benjamin Spector (2013). The grammatical view of scalar implicatures and the relationship between semantics and pragmatics. In C. Maienborn, K. von Heusinger, and P. Portner (Eds.), *Semantics: An International Handbook of Natural Language Meaning*, Volume 3. Mouton de Gruyter.

Drubig, Bernhard H. (1994). *Island constraints and the syntactic nature of focus and association with focus*. Universitäten Stuttgart und Tübingen in Kooperation mit der IBM Deutschland GmbH.

Fauconnier, Gilles (1975). Polarity and the scale principle. In *Proceedings of Chicago Linguistics Society (CLS) 11*, pp. 188–199.

Fauconnier, Gilles (1979). Implication reversal in a natural language. In F. Guenthner and S. J. Schmidt (Eds.), *Formal semantics and pragmatics for natural languages*, pp. 289–301. Reidel. Dordrecht.

von Fintel, Kai (1993). Exceptive constructions. *Natural Language Semantics 1*(2), 123–148.

von Fintel, Kai (1999). NPI licensing, Strawson entailment, and context dependency. *Journal of Semantics 16*(2), 97–148.

Fox, Danny (2007). Free choice and the theory of scalar implicatures. In Sauerland, Uli and

Penka Stateva (Ed.), *Presupposition and Implicature in Compositional Semantics*, pp. 71–120. Palgrave. Basingstoke.

Fox, Danny (2013). Mention some readings of questions. MIT class notes.

Gajewski, Robert J. (2002). L-analyticity and natural language. Unpublished MS.

Gajewski, Robert J. (2007). Neg-raising and polarity. *Linguistics and Philosophy 30*(3), 289–328.

Gajewski, Robert J. (2011). Licensing strong NPIs. *Natural Language Semantics 19*(2), 109–148.

Geurts, Bart and Rob van der Sandt (2004). Interpreting focus. *Theoretical Linguistics 30*, 1–44.

Giannakidou, Anastasia (2006). Only, emotive factive verbs, and the dual nature of polarity dependency. *Language*, 575–603.

Grice, Paul H. (1975). Logic and conversation. In P. Cole and J. Morgan (Eds.), *Syntax and Semantics III: Speech Acts*. Academic Press. New York.

Grice, Paul H. (1991). *Studies in the Way of Words*. Harvard University Press. Cambridge.

Guerzoni, Elena and Yael Sharvit (2007). A question of strength: on NPIs in interrogative clauses. *Linguistics and Philosophy 30*(3), 361–391.

Hamblin, Charles L. (1973). Questions in montague English. *Foundations of language 10*(1), 41–53.

Heim, Irene (1991). Artikel und definitheit. *Semantik: ein internationales Handbuch der Zeitgenössischen forschung*, 487–535.

Horn, Laurence R. (1969). A presuppositional analysis of *only* and *even*. In *Proceedings of Chicago Linguistics Society (CLS) 5*, pp. 98–107.

Horn, Laurence R. (1996). Exclusive company: *Only* and the dynamics of vertical inference. *Journal of semantics 13*(1), 1–40.

Hsieh, Chris I.-T. (2012). *Polarity in Conditionals and Conditional-Like Constructions.* Ph. D. thesis, University of Connecticut, Storrs, CT.

Ippolito, Michela (2008). On the meaning of only. *Journal of Semantics 25*(1), 45–91.

Jackendoff, Ray (1972). *Semantic interpretation in generative grammar*. MIT Press. Cambridge.

Kiss, Katalin É. (1998). Identificational focus versus information focus. *Language*, 245–273.

Klima, Edward S. (1964). Negation in English. In J. Fodor and J. Katz (Eds.), *The Structure of Language*. Prentice Hall. Englewood Cliffs.

Klinedinst, Nathan (2005). *Scales and only*. Master thesis, UCLA.

Krifka, Manfred (1995). The semantics and pragmatics of polarity items. *Linguistic Analysis 25*(3-4), 209–257.

Ladusaw, William A. (1979). *Polarity Sensitivity as Inherent Scope Relations*. Ph. D. thesis, University of Texas, Austin.

Lahiri, Utpal (1998). Focus and negative polarity in Hindi. *Natural Language Semantics 6*(1), 57–123.

McCawley, James D. (1993). *Everything that linguists have always wanted to know about logic... but were ashamed to ask (2nd edition)*. University of Chicago Press.

Rooth, Mats (1985). *Association with focus*. Ph. D. thesis, University of Massachusetts, Amherst.

Rooth, Mats (1992). A theory of focus interpretation. *Natural language semantics 1*(1), 75–116.

Rooth, Mats (1996). Focus. In S. Lappin (Ed.), *The Handbook of Contemporary Semantic Theory*, pp. 271–297. Blackwell Publishers. Oxford.

Spector, Benjamin (2007). Modalized questions and exhaustivity. In *Semantics and Linguistic Theory*, pp. 282–299.

Taglicht, Josef and Randolph Quirk (1984). *Message and emphasis: On focus and scope in English*. Longman. London.

Tancredi, Christopher (1990). Not only EVEN, but even ONLY. Unpublished MS.

Wagner, Michael (2006). Association by movement: Evidence from NPI-licensing. *Natural Language Semantics 14*(4), 297–324.