

## On the Non-Licensing of NPIs in the *Only*-Focus

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**Abstract.** This paper focuses on the ungrammaticality of NPIs in the focus associated with *only*. I first show that a naïve combination of the Strawson Downward Entailing (SDE) condition of NPI licensing (von Stechow 1999) and a Horn-style semantics of *only* (Horn 1969; a.o.) fails to predict that NPIs are ungrammatical in the focus associated *only*. To solve this problem, I suggest an analysis that appeals to a semantics of *only* implemented with the notion of innocent exclusion (Fox 2007) and a revision of the SDE condition that refers to assignment functions. The proposed analysis suggests that NPI licensing should be independent of the information provided by the discourse context.

**Keywords:** *only*, innocent exclusion, negative polarity item, NPI licensing

### 1 Introduction

Having a limited distribution, negative polarity items (NPIs) such as *any* and *ever*, as shown in (1), are grammatical in the scope of *only*. These items, as shown in (2) however, are ungrammatical in the focus<sup>1</sup>.

- (1) a. Only [John]<sub>f</sub> ate any vegetables.      b. Only [Mary]<sub>f</sub> has ever been to Paris.  
(2) a. \*Only [any student]<sub>f</sub> ate vegetables.  
     b. \*Only [that Mary has ever been to Paris]<sub>f</sub> is new to John.

While the grammaticality of NPIs in the scope of *only* has received great attention (Horn 1996; von Stechow 1999; Wagner 2006; a.o.), their ungrammaticality inside the focus is not much discussed (Beaver 2004; Wagner 2006; a.o.).

The focus of this paper is the ungrammaticality of NPIs in the *only*-focus. Building on a Downward-Entailing-based (DE-based) approach of NPI licensing (Fauconnier 1975, 1979; Ladusaw 1979; von Stechow 1999; a.o.), I first show that a naïve combination of the Strawson Downward Entailing (SDE) condition (von Stechow 1999; a.o.) and a Horn-style semantics of *only* (Horn 1969; a.o.) fails to predict the ungrammaticality of NPIs inside the *only*-focus. To solve this problem along with the SDE approach, this paper suggests a solution that appeals to two crucial ingredients: one is a semantics of *only* implemented with the notion of innocent exclusion (Fox 2007), and the

<sup>1</sup> Some seemingly counterexamples to this generalization are presented by Linebarger (1987) and Geurt and van der Sandt (2004). As pointed out by Horn (1996), Beaver (2004) and others, however, those examples should be analyzed as involving other licensors than *only*.

other is a revision of the SDE condition that refers to assignment functions and is context independent.

To be more specific, by using the term ‘context’ in the introduction above, I refer to the contextual variable  $C$ , which is claimed in the current theories (von Stechow 1994; Rooth 1992; a.o.) to be syntactically present in quantificational sentences and sentences with focus. For instance, in (3) the contextual variable  $C$  limits the quantificational domain to the salient individuals in the discourse context; in (4) the contextual variable  $C$  introduces the alternative set.

- (3) a. Every student had a good time.    b. LF:  $[[\text{every-}C\text{-student}][\text{had a good time}]]$   
 (4) a. Even  $[\text{John}]_f$  passed the exam.    b. LF:  $[\text{even-}C [[\text{John}]_f \text{ passed the exam}]]]$   
 $C := \{\text{John passed the exam, Mary passed the exam, Bill passed the exam, ...}\}$

The claim I would like to make in this paper is that NPI licensing should be independent of the specification of  $C$ ; an NPI is grammatical in a linguistic environment only if its SDE-ness is guaranteed solely by the lexically specified information, namely the presuppositions (definedness conditions) and the truth conditions. In an environment where an SDE inference is supported only with the implementation of information from the discourse context, NPIs cannot be licensed.

The rest of this paper is structured as the following. In section 2, I show that while a Horn-style semantics of *only* together with the SDE condition of NPI licensing captures the grammaticality of NPIs in the scope of *only*, such a combination fails to predict the ungrammaticality of these items in the focus. The proposed solution to this problem is given in section 3. Section 4 is the conclusion.

## 2 NPIs and *Only*

### 2.1 NPIs in the Scope of *Only* and the SDE Condition

Fauconnier (1975, 1979) and Ladusaw (1979) suggest that a downward entailing inference (i.e. an inference from a set to its subset) is crucial for an environment to license NPIs. For instance, a downward entailing inference is supported in the restrictor of the universal quantifier *every* but not that of the existential quantifier *some* (see (5)); NPIs hence are grammatical in the restrictor of *every* but not in that of *some* (see (6)). Here I adopt the notion of cross-categorical entailment ( $\Rightarrow$ ) given in (7).

- (5) books on NPIs  $\subseteq$  books  
     Every student who read a book passed the exam.  $\Rightarrow$   
     Every student who read a book on NPIs passed the exam.  
     Some student who read a book passed the exam.  $\neq \Rightarrow$   
     Some student who read a book on NPIs passed the exam.  
 (6) Every/\*some student who read any books on NPIs passed the exam.  
 (7) Cross-categorical entailment ( $\Rightarrow$ )  
     a. for any  $p, q$  of type  $t$ ,  $p \Rightarrow q$  iff  $p=0$  or  $q=1$   
     b. for any  $f, h$  of type  $\langle \sigma, t \rangle$ ,  $f \Rightarrow g$  iff for all  $x$  of type  $\sigma$ ,  $f(x) \Rightarrow h(x)$

A DE inference, however, is not intuitively supported in the scope of *only* despite the fact that NPIs are grammatical in this environment (see (1)). Take (8) for instance; it could be the case that nobody other than John ate vegetables but what John ate was not kale; in this case, the inference in (8) is not truth-preserving.

(8)  $\text{kale} \sqsubseteq \text{vegetables}$

Only  $[\text{John}]_f$  ate vegetables.  $\neq \Rightarrow$  Only  $[\text{John}]_f$  ate kale.

To account for the licensing of NPIs in the scope of *only*, von Fintel (1999) suggests that NPI licensing is subject to a weaker notion of entailment, which he dubbed as Strawson entailment; the premise Strawson-entails the conclusion iff the premise together with the presuppositions (i.e. definedness conditions) of the conclusion entail the conclusion. A licensing condition of NPIs based on Strawson Entailment is formalized as in (9).

(9) a. The SDE condition of NPI licensing (von Fintel 1999):

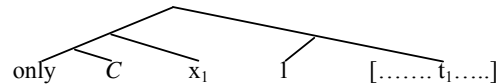
An NPI is only grammatical if it is in the scope of  $\alpha$  such that  $\llbracket \alpha \rrbracket$  is SDE.

b. Strawson Downward Entailingness:

A function  $f$  of type  $\langle \sigma, \tau \rangle$  is Strawson downward entailing (SDE) iff for all  $x, y$  of type  $\sigma$  such that  $x \Rightarrow y$  and  $f(x)$  is defined:  $f(y) \Rightarrow f(x)$

The SDE condition in (9) together with a Horn-style semantics of *only* like (10) (Horn 1969; a.o.) provide a straightforward account for the licensing of NPIs in the scope of *only*. Here I assume that *only* takes as its first argument a contextually provided alternative set  $C$  whose members are of the same type as that of the focalized constituent (Rooth 1985, 1992; a.o.); the focalized constituent then moves at LF to adjoin to *only*- $C$  and serves as the second argument of *only*<sup>2</sup>; a predicate that is created by  $\lambda$ -abstraction over the trace of the focalized constituent serves as the third argument (see (10a))<sup>3</sup>. Here I term the proposition that *only* quantifies in ‘the prejacent’; for instance, the prejacent of *Only  $[\text{John}]_f$  ate vegetables* is *John ate vegetables*. Based on (10b), an *only*-sentence is defined only if its prejacent is true; if defined, it is true iff there is no alternative proposition that is true and not entailed by the prejacent. (11) is an example that demonstrates the semantics in (10). I further assume that  $C$  is a free variable bearing an index and receives its value from a contextually provided assignment function  $g$ , which maps an integer to a set of alternatives to the focus.

(10) a.



<sup>2</sup> In this paper I adopt a focus-movement approach for the syntax of an *only*-sentence (Wagner 2006; a.o.). Adopting a propositional approach (Rooth 1992; a.o.) instead, however, would not lead to different predictions regarding the issue discussed.

<sup>3</sup> I assume Intensional Functional Application (IFA; see (i); see Heim and Kratzer (1998)).

(i) Intensional Functional Application (IFA): If  $\alpha$  is a branching node and  $\{\beta, \gamma\}$  the set of its daughters, then, for any world  $w$  and assignment  $g$ : if  $\llbracket \beta \rrbracket^{w,g}$  is a function whose domain contains  $[\lambda w'. \llbracket \gamma \rrbracket^{w',g}]$ , then  $\llbracket \alpha \rrbracket^{w,g} = \llbracket \beta \rrbracket^{w,g}(\lambda w'. \llbracket \gamma \rrbracket^{w',g})$

- b. for any  $C_{\langle \sigma, \tau \rangle}$ ,  $x_\sigma$ ,  $P_{\langle \sigma, \tau \rangle}$ ,  $\llbracket \text{only} \rrbracket^w(C)(x)(P)$  is defined only if  $P(w)(x)=1$ ;  
 if defined,  $\llbracket \text{only} \rrbracket^w(C)(x)(P)=1$  iff  $\forall y_\sigma [y \in C \ \& \ P(w)(y)]:$   
 $\{w': P(w')(x)=1\} \subseteq \{w': P(w')(y)=1\}$

(11) a. Only  $[\text{John}]_f$  ate vegetables.

b. LF:  $[[[\text{only-}C_8] \text{ John}_3][3 \ [t_3 \text{ ate vegetables}]]]$

- c.  $\llbracket (11a) \rrbracket^{w,g}$  is defined only if  $\llbracket \text{ate vegetables} \rrbracket^w(\text{John})=1$ ; if defined,  
 $\llbracket (11a) \rrbracket^{w,g}=1$  iff  $\forall y_e [y \in g(8) \ \& \ P(w)(y)]:$   
 $\{w': \llbracket \text{ate vegetables} \rrbracket^w(\text{John})\} \subseteq \{w': \llbracket \text{ate vegetables} \rrbracket^{w'}(y)\}$

The semantics in (10) renders the scope of *only* (i.e. the third argument of *only*) SDE (in other words,  $\llbracket \text{only} \rrbracket^w(C)(x)$  is an SDE function). Take (8) again for instance; while the premise *Only John ate vegetables* alone does not entail the conclusion *only John ate kale*, the premise together with the presupposition of the conclusion, namely *John ate kale*, entail the conclusion. The licensing of NPIs in the scope of *only* hence follows from the SDE condition (see (9)), which states that NPIs are only grammatical in SDE environments.

## 2.2 NPIs in the Focus Associated with *Only*

As shown in (2), unlike in its scope, NPIs are ungrammatical in the focus associated with *only*. While the combination of a Horn-style semantics of *only* like (10b) and the SDE condition in (9) correctly predicts the grammaticality of NPIs in the scope of *only*, they fail to capture the ungrammaticality of these items in the focus.

In order to show this, there are a couple of assumptions that need to be laid out. I assume that focus evokes a presupposition on the alternative set  $C$ :  $C$  must contain the focalized element  $x$  and at least one other member than  $x$  (Rooth 1992; a.o.). Furthermore, when checking the entailment relation between any two distinct propositions,  $C$  should be kept constant in the premise and the conclusion; otherwise, there would be no constant context within which to access the downward or upward inference. Therefore, when checking the entailment relation between (12a, b), the alternative set  $C$  should be kept constant in the premise and the conclusion and contain as its members both *some student* and *some linguistics student*.

Based on (10), the focus in an *only*-sentence is an SDE environment as well. As shown in (12), the premise (12a) contradicts the presupposition of the conclusion (12b); while (12a) asserts that no alternative proposition not entailed by its prejacent *some student cried* is true, (12b) presupposes that its prejacent *some linguistics student cried*, one of the alternative propositions stronger than the prejacent of (12a), is true. Given that the premise (12a) together with the presupposition of the conclusion (12b) is a contradiction and a contradiction entails any propositions (see (7)), an SDE inference from (12a) to (12b) is valid (in (12a, b),  $\llbracket \Sigma P \rrbracket^w = [\lambda f_{\langle e, \tau \rangle}. f(\llbracket \text{cried} \rrbracket^w)]$ ).

(12) a. Only  $[\text{some student}]_f$  cried.

LF:  $[[[\text{only-}C_8 [\text{some student}]_3] [\Sigma_P 3 \ [t_3 \text{ cried}]]]$

Presupposition: There is a student  $x$  such that  $x$  cried in  $w$ .

- Assertion:  $\forall f_{\langle e, \langle e, \langle \rangle \rangle} [f \in g(8) \text{ and } \llbracket \Sigma P \rrbracket^w(f)=1]$ :  
 $\{w': \text{there is a student } x \text{ such that } x \text{ cried in } w'\} \subseteq \{w': \llbracket \Sigma P \rrbracket^{w'}(f)=1\}$
- b. Only [some linguistics student]<sub>f</sub> cried.  
 LF:  $\llbracket [\text{only-}C_8 [\text{some linguistics student}]_3] [\Sigma P \ 3 \ [ \ t_3 \text{ cried}]] \rrbracket$   
 Presupposition: There is a linguistics student  $x$  such that  $x$  cried in  $w$ .  
 Assertion:  $\forall f_{\langle e, \langle e, \langle \rangle \rangle} [f \in g(8) \text{ and } \llbracket \Sigma P \rrbracket^w(f)=1]$ :  $\{w': \text{there is a linguistics student } x \text{ such that } x \text{ cried in } w'\} \subseteq \{w': \llbracket \Sigma P \rrbracket^{w'}(f)=1\}$
- c.  $g(8) = \{\text{some student, some linguistics student, ....}\}$   
(12a) + the presupposition of (12b)  $\Rightarrow$  (12b)  
 Contradiction

That the focus associated with *only*, based on a Horn-style semantics like (10), is SDE further leads to the prediction that NPIs are grammatical in this environment. As already shown in (2) however, this prediction is incorrect.

Given that the SDE-ness in the focus associated with *only* results from a contradiction between the premise and the presupposition of the conclusion and hence is trivial, one might try to save a Horn-style semantics like (10) from this wrong prediction by claiming that while NPI licensing is subject to SDE-ness, an environment that is trivially SDE cannot license NPIs. Such an analysis, however, cannot be an adequate solution. In the literature (e.g., Horn 1996; Ippolito 2008; a.o.), the claim that an *only*-sentence presupposes its prejacent has been challenged; many researchers have suggested that the presupposition triggered by *only* should be something weaker than the prejacent (see (13) for some of such proposals). Once the presupposition in (10b) is replaced by a weaker one like (13a, b), the focus associated with *only* would be non-trivially SDE, which again leads to the wrong prediction that NPIs are grammatical in this environment.

- (13) a. Horn 1996: *Existential Presupposition*  
 $\llbracket \text{only} \rrbracket^w(C)(x)(P)$  is defined only if  $\exists y[y \in C \text{ and } P(w)(y)=1]$
- b. Ippolito 2008: *Conditional Presupposition*  
 $\llbracket \text{only} \rrbracket^w(C)(x)(P)$  is defined only if  $\exists y[y \in C \text{ and } P(w)(y)=1] \rightarrow P(w)(x)$

Due to the controversy on the presupposition triggered by *only*, I suggest that the key to a fundamental solution should lie in its exclusive component. In the following, I suggest that a semantics of *only* implemented with the notion of innocent exclusion (Fox 2007) together with a revision of the SDE condition that refers to assignment functions provide a solution to the problem pointed above.

### 3 The Proposal

#### 3.1 Only and Innocent Exclusion

Fox (2007) suggests that in an *only*-sentence, the alternatives that are excluded must be innocently excludable. In a nutshell, the set of innocently excludable alternatives (henceforth, I.E.) is the intersection of the maximal sets the conjunction of nega-

tion of whose members is consistent with the prejacent. Take (14) for instance; assuming that the alternative set  $C$  introduced in (14a) is (14b), the only innocently excludable alternative is *John and Mary*. The other two alternatives, namely *John* and *Mary*, cannot be in the same maximal set of excludable alternatives, for excluding both these two alternatives together would lead to contradiction to the prejacent (i.e. the conjunction of *John did not cry* and *Mary did not cry* contradicts to the prejacent *John or Mary cried*).

(14) a. Only [John or<sub>f</sub> Mary] cried.

b. The alternative set  $C$ : {*John, Mary, John or Mary, John and Mary*}

Max. sets of excludable alternatives: {*John, J. and M.*}, {*Mary, J. and M.*}

I.E. := {*John, John and Mary*}  $\cap$  {*Mary, John and Mary*} = {*John and Mary*}

Building on Fox's (2007) proposal, I suggest the semantics of *only* in (15), which is implemented with a cross-categorical notion of innocent exclusion<sup>4</sup>. Based on (15), the *only*-sentence (12a) translates as (16a').

(15) a. for any  $C_{\langle\sigma, \triangleright\rangle}$ ,  $x_\sigma$ ,  $P_{\langle\sigma, \langle\sigma, \triangleright\rangle\rangle}$ ,  $\llbracket \text{only} \rrbracket^w(C)(x)(P)$  is defined only if  $P(w)(x)=1$ ;  
if defined,  $\llbracket \text{only} \rrbracket^w(C)(x)(P)=1$  iff  $\neg \exists y_\sigma \in \text{I.E.}(x, C, P): P(w)(y)=1$

b. for any  $x$  of type  $\sigma$  and its alternative set  $C_{\langle\sigma, \triangleright\rangle}$  and any  $P_{\langle\sigma, \langle\sigma, \triangleright\rangle\rangle}$ , the set of innocent excludable alternatives to  $x$  w.r.t  $C$  and  $P$  (henceforth,  $\text{I.E.}(x, C, P)$ ) is defined as the following:

$\text{I.E.}(x, C, P) := \cap \{C' \subseteq C: C' \text{ is a maximal set in } C \text{ such that}$   
 $\cap (\{[\lambda w. \neg P(w)(y)]: y \in C'\} \cup \{[\lambda w. P(w)(x)]\}) \neq \emptyset\}$

(16) a. Only [some student]<sub>f</sub> cried.

LF:  $\llbracket [\text{only}-C_8 [\text{some student}]_3] [\Sigma_P 3 [t_3 \text{ cried}]] \rrbracket$

a'.  $\llbracket (16a) \rrbracket^{w,g}$  is defined only if there is a student  $x$  such that  $x$  cried in  $w$ ; if defined,  $\llbracket (16a) \rrbracket^{w,g}=1$  iff  $\neg \exists f_{\langle e, \langle e, \triangleright \rangle \rangle} \in \text{I.E.}(\text{some-stu}, g(8), [\lambda w'. \llbracket \Sigma_P \rrbracket^w])$ :  
 $\llbracket \Sigma_P \rrbracket^w(f)=1$

The I.E. in (16a') is determined by the content of  $g(8)$  and may vary from one discourse context to another. This is illustrated in the examples (17) and (18). Consider the discourse context in (17) first. In (17), the discourse context provides an alternative set  $g(8)$  as in (17a'); by asserting (16a) in this context, one excludes all the alternatives in  $g(8)$  other than the focus *some student*. In this case, the set of innocently excludable alternatives include all the members in  $g(8)$  other than *some student*.

(17) Discourse context: The college was holding a campus-wide reception for the new president. Faculty, staff, and students were all invited. You know the faculty, the staff, and you also know the students from linguistics. Nonethe-

<sup>4</sup> The lexical entry for *only* and the original definition of innocent exclusion suggested in Fox (2007) are propositional (see (i)).

(i)  $\llbracket \text{only} \rrbracket^{A_{\langle\sigma, \triangleright\rangle}}(p_{\langle\sigma, \triangleright\rangle}) = [\lambda w: p(w)=1. \forall q \in \text{I.E.}(p, A) \rightarrow q(w)=0]$   
 $\text{I.E.}(p, A) = \cap \{A' \subseteq A: A' \text{ is a max. set in } A \text{ s.t. } A' \cup \{p\} \text{ is consistent}\}; A'^{\neg} = \{\neg p: p \in A\}$

less, you didn't know the rest of the students by name. You saw that the faculty, staff and the linguistics students had no interest in the vegetables that were served, but one of the other students in the reception was eating them voraciously. The next day someone asks you who at the reception ate vegetables....

You: Only [some student]<sub>f</sub> ate vegetables.

- a.  $g(8) := \{\text{some student, some linguistics students, some faculty, some staff}\}$   
 max. set of excludable alt.:  $\{\text{some ling. student, some faculty, some staff}\}$   
 I.E.:  $\{\text{some linguistics student, some faculty, some staff}\}$

Now consider (18); this time the discourse context provides an alternative set  $g(8)$  as in (18a'). In this context, the set of students is exhaustified by the set of linguistics students and the set of philosophy students. By asserting (16a) in this context, one merely excludes the alternatives *some faculty* and *some staff* but not the other two (namely *some linguistics student* and *some philosophy student*). In (18a'), given that the conjunction of negation of *some linguistics student ate vegetables* and that of *some philosophy student ate vegetables* contradicts to the prejacent *some student ate vegetables*, these two alternatives cannot be in the same maximal set of excludable alternatives. The set of innocently excludable alternatives hence merely contains the alternatives *some faculty* and *some staff*.

- (18) Discourse context: The college was holding a reception to honor the students in linguistics and philosophy only. In addition to those students, the faculty and staff of the entire college were invited. While at this reception you saw that the faculty and staff showed no interest in the vegetables, someone you identified as being a student ate vegetables voraciously. The next day someone asks you who at the reception ate vegetables...

You: Only [some student]<sub>f</sub> ate vegetables.

- a'.  $g(8) := \{\text{some stu, some phil. stu, some ling. stu, some faculty, some staff}\}$   
 (the set of students contains only linguistics and philosophy students)  
 max. excludable alt. set:  $\{\text{some phil. stu, some faculty, some staff}\},$   
 $\{\text{some ling. stu, some faculty, some staff}\}$   
 I.E.:  $\{\text{some faculty, some staff}\}$

Now with the semantics in (15), the focus associated with *only* (i.e. the second argument of *only*) is not always SDE. In the discourse context given in (17), (16a) contradicts the presupposition of (19a). Given that a contradiction entails any propositions, an SDE inference is valid in the *only*-focus under the context in (17) (see (20a); see also (19) for the meaning of (12b) based on (15)). On the other hand, in the discourse context in (18), an SUE rather than SDE inference is valid in the focus associated with *only* (see (20b)).

- (19) a. Only [some linguistics student]<sub>f</sub> cried.  
 LF:  $[[\text{only-C}_8 [\text{some linguistics student}]_3] [\Sigma P \ 3 \ [ \ t_3 \text{ cried}]]]$

- a'.  $\llbracket (19b) \rrbracket^{w,g}$  is defined only if there is some linguistics student  $x$  such that  $x$  cried in  $w$ ; if defined,  $\llbracket (19b) \rrbracket^{w,g} = 1$  iff
- $$\neg \exists f_{\langle e, \langle e, t \rangle \rangle} \in I.E.(some\text{-}ling\text{-}stu, g(8), [\lambda w'. \llbracket \Sigma P \rrbracket^{w'}]): \llbracket \Sigma P \rrbracket^v(f) = 1$$
- b. with the alternative set  $g(8)$  in (17a):
- $$I.E.(some\text{-}ling\text{-}stu, g(8), [\lambda w'. \llbracket \Sigma P \rrbracket^{w'}]) := \{some\text{ faculty}, some\text{ staff}\}$$
- c. with the alternative set  $g(8)$  in (18a):
- $$I.E.(some\text{-}ling\text{-}stu, g(8), [\lambda w'. \llbracket \Sigma P \rrbracket^{w'}]) := \{some\text{ phil. stu.}, some\text{ faculty}, some\text{ staff}\}$$
- (20) a. with the alternative set  $g(8)$  in (17a):
- (16a) + the presupposition of (19a)  $\Rightarrow$  (19a)
- Contradiction
- (19a) + the presupposition of (16a)  $\neq \Rightarrow$  (16a)
- b. with the alternative set  $g(8)$  in (18a):
- (16a) + the presupposition of (19a)  $\neq \Rightarrow$  (19a)
- (19a) + the presupposition of (16a)  $\Rightarrow$  (16a)

### 3.2 NPI Licensing, the SDE Condition, and Context (In)Dependency

The second tool that is needed to account for the ungrammaticality of NPIs inside the *only*-focus is a licensing condition that is context-independent. As shown in (20), an SDE inference may be valid in the focus associated with *only* with certain specification for  $C$  (i.e. the first argument of *only*). Based on the SDE condition in (10), we are led to the prediction that NPIs are grammatical in the focus associated with *only* in the discourse context that renders *only*- $C$  an SDE function (e.g., (17)). This prediction is not borne out; NPIs are ungrammatical in the focus of an *only*-sentence regardless the discourse context. A revision of the SDE condition in (10) hence is required.

Here I suggest a revision of the SDE condition as in (21). Based on (21), a syntactic object is qualified as an NPI licenser iff it denotes an SDE function with respect to any assignment function  $g$ . Given that an assignment function  $g$  is given by the discourse context, (21) suggests that an NPI licenser should denote an SDE function across discourse contexts.

- (21) *The Revised SDE Condition*: An NPI is only grammatical in the scope of  $\alpha$  such that, for any assignment function  $g$ ,  $\llbracket \alpha \rrbracket^g$  is SDE.

Based on the semantics of *only* in (15), *only*- $C$  denotes an SDE function only with certain specification for  $C$ . Given that the focus associated with *only* is not always SDE with respect to a contextually provided assignment function  $g$ , NPIs are ungrammatical in this environment.

The analysis suggested above not only predicts the ungrammaticality of NPIs inside the focus associated with *only* but also that of these items in a DP-constituent containing the focus. As observed by Wagner (2006) and others, NPIs are ungrammatical in a DP-constituent containing the *only*-focus (see (22a)). Wagner (2006) and others suggest that at LF the whole DP-constituent that contains the focus is pie-pied and serves



as the second argument of *only* (see (22b)); with this assumption, the ungrammaticality of NPIs in a DP-constituent containing the focus associated with *only* follows from the semantics in (15) and the SDE condition in (21): given that based on the semantics in (15), the second argument of *only* is not always an SDE environment with respect to an assignment function  $g$ , NPIs are ungrammatical in a DP-constituent containing the focus associated with *only*.

- (22) a. \*Only any inhabitant of [Twin Earth]<sub>f</sub> met Particle Man.  
 b. LF: [[*only-C* [any inhabitant of Twin Earth]<sub>3</sub>] [<sub>3</sub> [<sub>t<sub>3</sub></sub> met Particle Man]]]

#### 4 Concluding Remarks

In this paper, I discuss the ungrammaticality of NPIs in the focus associated with *only*. I have shown that a naïve combination of a Horn-style semantics of *only* and the SDE condition of NPI licensing fails to predict the ungrammaticality of these items in the *only*-focus. I further suggest that this problem can be solved with a semantics of *only* with the implementation of the notion of innocent exclusion (Fox 2007) and a revision of the SDE condition that refers to assignment functions.

The proposal of this paper reaches the conclusion that NPI licensing is independent of the discourse context; for a linguistic expression to license an NPI, it must denote an SDE function without the implementation of the information provided by the discourse context. This, however, is not an uncontroversial claim; one challenge that this claims faces is the contrast between definite and indefinite superlatives with respect to NPI licensing. Herdan and Sharvit (2006) observe that although the distribution is limited, indefinite superlatives do exist (see (23b)); nevertheless, NPIs are only licensed in definite but not in indefinite superlatives (see (24)).

- (23) a. This class has the best student.                      b. This class has a best student.

- (24) This class has the/\*a best student with any knowledge of French

To provide a unified semantics for *-est* in both definite and indefinite superlatives (see (23)), Herdan and Sharvit suggest the semantics in (25).

- (25)  $\llbracket -est \rrbracket = \lambda S_{\langle et, t \rangle} \cdot \lambda R_{\langle d, et \rangle} \cdot \lambda P_{et} \cdot \lambda x_e$ : (i) there is an  $X \in S$  s.t.  $x \in X$ ; and (ii)  $x \in P$ .  
 For some  $X \in S$  such that  $x \in X$ , there is a degree  $d$  such that  $\{z: R(d)(z)=1 \text{ and } P(z)=1\} = \{x\}$

Based on this semantics, the superlative morpheme  $\llbracket -est \rrbracket(S)(R)$  is not an SDE function. As Herdan and Sharvit (2006) point out however, an SDE inference, based on (25), is supported in the restrictor  $P$  of *-est* when  $S$  is a singleton set. Given that this is only guaranteed in a definite superlative due to the uniqueness requirement of *the*, NPIs are grammatical only in definite superlatives.

The contrast in (23) poses a challenge to the conclusion drawn from the discussion above, for based on Herdan and Sharvit's analysis, NPIs in definite superlatives are licensed because of a unique specification for the contextual variable  $S$ . In Hsieh (2011), I suggest that although further investigation on the (anti-)uniqueness require-

ment in (in)definite superlatives is required, the claim that NPI licensing is context-independent may be maintained if an environment-based approach of NPI licensing (Heim 1984; Zwarts 1996; Gajewski 2007; a.o.), rather than an operator-based one, is adopted. I thereby refer the reader to Hsieh (2011) for more details and leave this issue for future research.

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