**On NPI-Licensing and the Semantics of *Because*-Sentences**

I-Ta Chris Hsieh (University of Connecticut, Storrs)
*i-ta.hsieh@uconn.edu*

⊙The Goal: to provide an adequate analysis for the licensing of weak NPIs and minimizers in *because*-sentences by investigating the semantic and syntactic properties of *because*-sentences.

## 1. Basic Facts

*When **negation** scopes over **because**,*

➢Weak NPIs such as *any* and *ever* are licensed in the reasoning adverbial clause but not in the main clause.

(1) a. *John did not marry ***any*** woman because he had money, but because he was afraid of being alone[1].
b. John did not marry Sue because she had ***any*** money, but because he loves her.

➢Minimizers with overt *even*, such as *even lift a finger*, are not licensed either in the reasoning adverbial clause or in the main clause.

(2) a. *John did not ***even lift a finger*** to help Sue because he married her, but because he was intimidated by her.
b. *John did not marry Sue because she ***even lifted a finger*** to help him, but because he loved her.

[1] Another weak-NPI *ever* exhibits the same paradigm as in (1).

(i) a. *John had not ***ever*** married because he had money, but because he was afraid of being alone.
b. John did not marry Sue because she had ***ever*** helped him, but because he loves her.

*In a **yes-no** question of **because**-sentences,*

➢Minimizers with overt *even* are not licensed in either the main clause or the reasoning adverbial clause.

(3) a. *Did John ***even lift a finger*** to help Sue because he married her?
b. *Did John marry Sue because she ***even lifted a finger*** to help him?

*Compare* (1)-(3) *to* (4)-(5)

➢Weak NPIs and minimizers are licensed in the scope of negation.

(4) a. John didn't marry ***any*** woman.
b. John didn't ***(even) lift a finger*** to help Mary.

➢Minimizers, like weak NPIs are licensed in *yes-no* questions and, unlike weak NPIs, bring up negative bias effect.

(5) a. S: Did John ***(even) lift a finger*** to help Mary?
A: #Yes, he did. A: No, he didn't.

b. S: Did John ***ever*** help Mary?
A: Yes, he did. A: No, he didn't

The contrast between (1)-(2) and (5a,5b) shows that minimizers differ from weak-NPIs, and we should deal with the cases of weak NPIs (eg. (1)) and minimizers (eg. (2)) separately.

## 2. Theoretical Background

### 2.1 Assumptions on NPI-Licensing:

➢The Fauconnier-Ladusaw-von-Fintel proposal on Weak NPI-Licensing (see (6a)) (Fauconnier (1975), Ladusaw (1979), von Fintel (1999)):

(6) a. An NPI is only grammatical if it is in the scope of α such that ⟦α⟧ is SDE[2].

b. Strwason Downward Entailingness (SDE):
A function f of type <σ, τ> is Strawson-downward entailing (DE) iff for all x, y of type σ such that x⇒y and f(x) is defined: f(y)⇒f(x)

(7) Only John ate *any* vegetables for breakfast.

(8) a. ⟦only⟧(x)(P) is defined only if P(x)=1
If defined, ⟦only⟧(x)(P)=1 iff ¬∃y≠x: P(y)=1
b. Only John ate vegetables for breakfast.
Presupposition: John ate vegetables for breakfast.
c. Only John ate kale for breakfast.
Presupposition: John ate kales for breakfast.

(8b)+ the presupposition of (8c) ⇒ (8c)

➢Crucially, the environment where NPIs are licensed cannot be (S)U(pward)E(ntailment) (Progovac (1993), Lahirhi (1998), Guerzoni and Sharvit (2007)).

(9) a. *The student who has *any* books on NPIs is selling them.
b. The students who have *any* books on NPIs are selling them.

**2.2 On *Because***

2.2.1 Lewis-style Semantics for *Because* and its Inadequacy

[2] Note that, as von Fintel (1999) states, this condition can only been seen as a necessary condition.

➢Lewis-style Semantics for *because*:

(10) $[\![because]\!]^{w,A,R}(p)(q)$ is defined only if:
i) $w \in q$, and ii) $w \in p$;
when defined, $[\![because]\!]^{w,A,R}(p)(q)=1$ iff
$\forall w' \in Max((\cap A(w)) \cap \neg p)(R(w))$: $w' \in \neg q$
(where $\cap A(w)$ is the set of accessible worlds from $w$ and $Max((\cap A(w)) \cap \neg p)(R(w))$ is the set of the best worlds among the worlds in $\cap A(w)$ in which $\neg p$ is true with respect to the ordering source $R(w)$)

(11) a. John read a book because he was bored.
b. **Presupposition:** John read a book in w;
John was bored in w.
**Assertion:** for all the possible worlds w′ such that w′ is in the set of the best worlds among the worlds in the modal base ∩A(w) in which it is not the case that John was bored, it is not the case that John read a book in w′

➢The Inadequacy of Lewis-style Semantics for *Because*

*Problem 1*: The contrast between *because*-sentences and *causative* sentences:

(12) a. Mary's being in a bad mood caused John's complaining.
b. John complained because Mary was in a bad mood.

(13) a. It is not the case that *any storms* caused *any floods*.
b. *It is not the case that there were any floods because there were any storms.

*Problem 2:* the entailment property of *because*-sentences:

Under Lewis-style semantics, the main clause of a *because*-sentence is SDE

(14) a. {x: x is a long book}⊆ {x: x is a book}

b. John read a book because he was bored.
**Presuppositions:** John read a book.
John was bored.

c. John read a long book because he was bored.
**Presuppositions**: John read a long book.
John was bored.

(14b)+the presuppositions of (14c)→(14c)

*Prediction:* Weak NPIs should be licensed in the main clause.

However,
(15) a. *John read *any* book because he was bored.
b. *John had *ever* read a book because he was bored.

2.2.2 A New Semantics for *Because*
(16) $[\![\text{because}]\!]^{w,A,R}(p)(q)$ is defined only if:
i) $w \in q$ and $w \in \text{Max}(\cap A(w))(R(w))$, and
ii) $\text{Max}(\cap A(w))(R(w))) \subseteq q$;
If defined, $[\![\text{because}]\!]^{w,A,R}(p)(q)=1$ iff
for all $w' \in \text{Max}(\cap A(w))(R(w))$: $w' \in p$;
(where $\text{Max}(\cap A(w))(R(w))$ is the set of the best worlds in $\cap A(w)$ relative to the ordering source $R(w)$)

*According to* (16),
-the entailment property of *because*-sentences:

(17) a. *q because p*

| | Downward-Entailing | Upward-Entailing | Strawson-Downward-Entailing | Strawson-Upward-Entailing |
|---|---|---|---|---|
| *p* | | ✓ | | ✓ |
| *q* | | ✓ | ✓ | ✓ |

b. *not* [*q because p*]

| | Downward-Entailing | Upward-Entailing | Strawson-Downward-Entailing | Strawson-Upward-Entailing |
|---|---|---|---|---|
| *p* | ✓ | | ✓ | |
| *q* | | ✓ | ✓ | ✓ |

**3. Analysis**
**3.1 On the Licensing of Weak NPIs:**
➢The licensing problems of weak NPIs in *because*-sentences follows from (17):
-The main clause (under negation) is an UE, SDE and SUE context.
-The reasoning adverbial clause is an UE context and a DE context under negation.
(18) a. *John did not marry ***any*** woman because he had money, but because he was afraid of being alone.
b. John did not marry Sue because she had ***any*** money, but because he loves her.

**3.2 On the Licensing of Minimizers**
3.2.1 Minimizers and the Scope of *Even*
➢Minimizers= *even* (covert or overt) + the low endpoint (Heim (1984), Guerzoni (2003, 2004))

➢At LF, *even* moves across DE operators so that the scalar

presupposition can be satisfied (Wilkinson (1996), Lahiri (1998), and others).

(19) $[\![\text{even}]\!]^w(p)$ is defined only if
$\forall q[(q \in C \ \& \ q \neq p) \rightarrow \text{Likelihood}(p)(w) < \text{Likelihood}(q)(w)]$[3]
(**Scalar Presupposition**)
If defined, $[\![\text{even}]\!]^w(p)=1$ iff $p(w)=1$

(20) a. John didn't (even) lift a finer to help Mary.
b. LF: [***even*** [*not* [John helped Mary to the [minimal]$_F$ degree]]]
c. The Alternative Set C:
{John did not help Mary to the minimal degree,
John did not help Mary to a certain degree,
……..
John did not help Mary a large degree}

(21) a. *John (even) lifted a finer to help Mary.
b. LF: [***even*** [John helped Mary to the [minimal]$_F$ degree]]
c. The set of alternatives C:
{John helped Mary to the minimal degree,
John helped Mary to a certain degree,
……
John helped Mary a large degree,
John helped Mary to the maximal degree}

➢*even* can scope over *because* through LF-movement but not *not…because* , though *even* can scope over *not…because* at overt syntax.

★ At LF:
✓ *not…even*$_1$*…because…*[…….$t_1$…..]

**even*$_1$*… not…because…*[…….$t_1$…..]
At overt syntax:
✓ *even*$_1$*… not…because…*[……. …..]

(22) a. I called Mary because she was sick (and not because I like her); I gave her a ride because she was sick (and not because I like her); I ***even*** did her shopping for her because she was sick (and not because I like her).

b. I didn't call Mary because she was sick (but because I like her); I didn't give her a ride because she was sick (but because I like her); #I didn't ***even*** do her shopping for her because she was sick (but because I like her).

c. I didn't call Mary because she was sick (but because I like her); I didn't give her a ride because she was sick (but because I like her); I ***even*** didn't do her shopping for her because she was sick (but because I like her).

3.2.2 Minimizers in Negated *Because*-Sentences
➢The case of the main clause

(23) *John did not ***even lift a finger*** to help Sue because he married her, but because he was intimidated by her.

*LF 1*: [*not* [[because John married Sue][***even*** [John helped Sue to the **[minimal]$_F$** degree]]]]

The alternative set C:
{John helped Sue to *the minimal* degree;
John helped Sue to *a certain* degree;
……
John helped Sue to *the 90%* degree;
John helped Sue to *the maximal* degree}

[3] For any two propositions $p$ and $q$ such that $p \neq q$, if $p$ entails $q$ ($\{w: w \in p\} \subseteq \{w: w \in q\}$), $p$ is less likely than $q$ in any world.

★Note that *help* is an UE predicate. Hence, the scalar presupposition cannot be met in LF1.

*LF 2*: [*not* [***even*** [[because John married Sue][John helped Sue to the **[minimal]$_F$** degree]]]]

The alternative set C:
{John helped Sue to the minimal degree because he married her;
John helped Sue to a certain degree because he married her;
……
John helped Sue to the 90% degree because he married her;
John helped sue to the maximal degree because he married her}

★The main clause is a UE, SDE and SUE environment. The scalar presupposition fails in $LF_2$ as well.
★Note that the possibility of *even* scoping over negation at LF has been excluded by the assumption motivated by (22).

➢The case of the reasoning adverbial clause

(24) *John did not marry Sue because she ***even lifted a finger*** to help him, but because he loved her.

*LF 1*:[*not* [[because [***even*** [Sue helped John to the **[minimal]$_F$** degree]]][John married Sue]]]

The alternative set C:
{Sue helped John to the minimal degree;
Sue helped John to a certain degree;
……
Sue helped John to the 90% degree;
Sue helped John to the maximal degree}

★Just like LF1 of (24), the scalar presupposition fails, for help is an UE predicate.

*LF* 2: [*not* [***even*** [[because Sue helped John to the **[minimal]$_F$** degree][John married Sue]]]

The alternative set C:
{John married Sue because she helped him to the minimal degree;
John married Sue because she helped him to a certain degree;
……
John married Sue because she helped him to the 90% degree;
John married Sue because she helped him to the maximal degree}

★Recall (17): the reasoning adverbial clause is an UE environment. Hence, the scalar presupposition fails in LF2 of (24).
★Note that the possibility of *even* scoping over negation at LF has been excluded by the assumption motivated by (22).

3.2.3 Minimizers in *Yes-No* Questions of *Because*-sentences
➢Guerzoni (2003, 2004): *even* can have scope interaction with the trace of *whether*. Possible answers that are not consistent with the scalar presupposition are excluded.

(25) Did John (even) lift a finger to help Mary?
a. LF: [Whether$_1$ [*even* [$t_1$ John helped Mary to the **[minimal]$_F$** degree]]
b. {p1=*even*[John helped Mary to the **[minimal]$_F$** degree], p2=*even*[**not**[John helped Mary to the **[minimal]$_F$** degree]]}

★The scalar presupposition fails in $p_1$.

➢The case of the main clause:

(26) *Did John ***even lift a finger*** to help Sue because he married her?

*LF 1*: [*Whether*$_i$ [$t_i$ [[because John married Sue][***even*** [John helped Sue to the **[minimal]$_F$** degree]]]]]
*Extension*:
{$p_1$=[[because John married Sue][***even*** [John helped Sue to the **[minimal]$_F$** degree]]];
$p_2$= [*not* [[because John married Sue][***even*** [John helped Sue to the **[minimal]$_F$** degree]]]]}

★Recall that *help* is a UE predicate. Due to the failure of the scalar presupposition, the possible answers $p_1$ and $p_2$ generated from LF1 of (26) are excluded.

*LF 2*: [*Whether*$_i$ [$t_i$ [***even*** [[because John married Sue][John helped Sue to the **[minimal]$_F$** degree]]]]
*Extension*:
{$p_1$=[***even*** [[because John married Sue][John helped Sue to the **[minimal]$_F$** degree]];
$p_2$=[¬[***even*** [[because John married Sue][John helped Sue to the **[minimal]$_F$** degree]]]}

★Recall that the main clause is not a strict DE context (see (17)). Due to the failure of the scalar presupposition, the possible answers $p_1$ and $p_2$ generated from LF2 of (26) are excluded.
★Reminder: **Whether*$_2$…*even*$_1$…$t_2$…*because*…$t_1$

➢The case of the reasoning adverbial clause

(27) *Did John marry Sue because she ***even lifted a finger*** to help him?

*LF 1:* [*Whether*$_i$ [$t_i$ [[because [***even*** [Sue helped John to the **[minimal]$_F$** degree][John married Sue]]]]

*Extension* from *LF 1*:
{$p_1$=[[because [***even*** [Sue helped John to the **[minimal]$_F$** degree][John married Sue]];
$p_2$=[¬[[because [***even*** [Sue helped John to the **[minimal]$_F$** degree][John married Sue]]]}

Just as in LF1 of (26), no felicitous answers can be generated.

LF 2: [*Whether*$_i$ [$t_i$ [***even*** [[because Sue helped John to the [minimal]$_F$ degree][John married Sue]]]]]

*Extension from LF 2*:
{$p_1$=[***even*** [[because Sue helped John to the **[minimal]$_F$** degree][John married Sue]]];
$p_2$=[¬[***even*** [[because Sue helped John to the **[minimal]$_F$** degree][John married Sue]]]]}

★Recall that the reasoning adverbial clause is a UE context (see (18)). Due to the failure of the scalar presupposition, the possible answers $p_1$ and $p_2$ generated from LF2 of (27) are excluded.
★Reminder: **Whether*$_2$…*even*$_1$…$t_2$…*because*…$t_1$

➢Some Further Predictions:

(28) John ***even*** did not marry Sue because she ***lifted a finger*** to help John, (but because...).
*LF*: [***even*** [*not* [[because Sue helped John to the

**[minimal]$_F$** degree][John married Sue]]]]

(29) S:Did John ***even*** marry Sue because she lifted a finger to help him?
A: #Yes. A: No.
*LF*: [*Whether*$_i$ [***even*** [$t_i$ [[because Sue helped John to the **[minimal]$_F$** degree][John married Sue]]]]]

*Extension*:
{$p_1$= [***even*** [[because Sue helped John to the [minimal]$_F$ degree][John married Sue]]]];
$p_2$=[***even*** [*not* [[because Sue helped John to the [minimal]$_F$ degree][John married Sue]]]]}

★Note that, in these cases, *even* scopes over negation and the trace of *whether* at overt syntax.
✓ *even*$_1$… *not*…*because*…[……. …..]

(30) a. ?John didn't marry Sue because she ***lifted a finger*** to help him, (but because….)
b. ?Did John marry Sue because she ***lifted a finger*** to help him?

The degradability in (30) can be attributed to the difficulty of speakers' parsing the position of the covert *even*.

**4. Open Question**

➢The counterfactual-conditional inference of *because*-sentences

(31) a. *If ¬p, then ¬q*
If the United States had used nuclear arms in Vietnam, it would have won the war.
b. *q because p*
The United Sates did not win the war because it did not use nuclear arms.

**Appendix I: On the truth of *p* in *q because p***

According to (16), there is no factivity presupposition on the reasoning adverbial clause.

➢Support 1: The Rise of the Negative Implicature (Linebarger (1987), Kadman and Landman (1993)):
(32) John does not know so much about French wine because he has been to Bordeaux, but because he used to be a wine steward.
*Negative Implicature:* John has never been to Bordeaux.

➢Support 2: Compatibility with veridical attitude verbs:
(33) Peter did not come because Mary was sick, but because Sue was sick and everyone **regretted that** Mary was sick.

(Meier 2001)

➢The truth of the reasoning adverbial clause follows when a *because*-sentence is asserted.
-Presupposition of $[\![\text{because}]\!]^{w,A,R}(p)(q)$:
i. $w \in q$ **and** $w \in \mathbf{Max}(\cap \mathbf{A}(w))(\mathbf{R}(w))$, and
ii. $\text{Max}(\cap \text{A}(w))(\text{R}(w))) \subseteq q$;
-Truth Condition of $[\![\text{because}]\!]^{w,A,R}(p)(q)$ if deifned:
for all $w' \in \text{Max}(\cap \text{A}(w))(\text{R}(w))$: $w' \in p$

**Appendix II: Grammatical cases in which weak-NPIs are in the main clause:**

(35) John did not marry [**any** woman]$_i$ because she$_i$ had money. He married for love.
LF: [¬[[**any** *woman*]$_i$ [[because she$_i$ had money][John married

$t_i$]]]]

- OR of *any NP* and Ruys'(1993) generalization:
  - *any NP* in (35) moves out of the main clause to the immediate scope of negation.
  - The availability of QR-ing *any NP* in (35) can be covered by Ruys' (1993) generalization.

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