# On Unenhanced Scope in English Sluicing*

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## 1. Introduction

This paper explores relative scope phenomena in English sluicing constructions, especially discuss a scopal contrast between sluiced and non-sluiced negative *wh*-interrogatives in terms of phases and the timing of Transfer. As a consequence of this work, we claim that the LF-copying approach is more appropriate than the PF-deletion approach to sluicing constructions in English.

The organization of this paper is as follows. Section 2 summarizes some peculiar properties of sluicing constructions and identifies the scope facts we will address in this paper. In section 3, we review Ueda's (2002, 2013, 2017) *phase*-based approach (henceforth, the PBA) to relative scope phenomena. Section 4 demonstrates that the PBA successfully explains the (un)enhanced scope phenomena and discusses other related issues, such as the absence of island effects (Ross 1967, 1969, Chung et al. 1995, Culicover 1992[2013], Merchant 2001, 2006, 2008, Griffiths and Lipták 2014, Landau 2020b, among others), the amelioration of *that*-trace effects (Ross 1969, Culicover 1992[2013], among others), and the missing T-in-C generalization (Lasnik 1999a, b, Culicover 1992[2013], Merchant 2001, 2006, Landau 2020a, among others). Finally, we argue for the validity of the LF-copying approach to sluicing constructions. Section 5 concludes this paper.

## 2. Peculiar Properties of Sluicing

A typical example of sluicing constructions is given in (1a), where everything but the preposed *wh*-phrase of the embedded question is elided. Ross (1969) first refers to this operation as *sluicing*. (1b) is the full-sentence counterpart to (1a).

(1) a. sluicing constructions
He is writing something, but you can't imagine what.
b. non-sluiced full *wh*-interrogatives
He is writing something, but you can't imagine what he is writing.
(Ross 1969: 15)

Ross (1969) observes that sluicing may violate almost all the standard conditions on movement: subjacency, the coordinate structure constraint, or the ECP.[1] Since Ross (1969), it has been argued in enormous literature that sluicing suspends the island effects as in (2)-(5) (Chung et al. 1995, Culicover 1992, Merchant 2001, 2006, 2008 and among others).

(2) the Complex NP Constraint (Ross 1967: Section 4.1)
 a. without sluicing
 *She kissed a man who bit one of my friends, but Tom doesn't realize which one of my friends she kissed a man who bit.
 b. with sluicing
 ?She kissed a man who bit one of my friends, but Tom doesn't realize which one of my friends.
 (Ross 1969: 38)

(3) the *wh*-island constraint
 a. without sluicing
 ?*Sandy was trying to work out which students would be able to solve a certain problem, but she wouldn't tell us which one [she was trying to work out which students would be able to solve].
 b. with sluicing
 Sandy was trying to work out which students would be able to solve a certain problem, but she wouldn't tell us which one.
 (Chung et al. 1995: 272)

(4) the coordinate structure constraint (Ross 1967: Section 4.2)
 a. without sluicing
 *Irv and someone were dancing together, but I don't know who Irv and *t* were dancing together.
 b. with sluicing
 ?Irv and someone were dancing together, but I don't know who.[2]
 (Ross 1969: 38)

(5) the adjunct-island constraint
 a. without sluicing

*Ben will be mad if Abby talks to one of the teachers, but she couldn't remember which (of the teachers) Ben will be mad if she talks to.

b. with sluicing

Ben will be mad if Abby talks to one of the teachers, but she couldn't remember which.

(Marchant 2001:87-88)

The islands effects in the (a)-sentences are alleviated in the (b)-sentences with sluicing in (2)-(5).

Chung et al. (1995) makes further observations that sluicing mitigates the ECP effects. (6) and (7) are examples of the subject ECP effects, that is, the *that*-trace effect.[3]

(6) the subject ECP effect (the *that*-trace effect)

a. without sluicing

?*It has been determined that somebody will be appointed; it's just not clear yet who it has been determined that [ ] will be appointed.

b. with sluicing

It has been determined that somebody will be appointed; it's just not clear yet who.

(Chung et al. 1995: 273-274)

(7) the subject ECP effect (the *that*-trace effect)[4]

John demanded *(that) SOMEONE read the book.

a. without sluicing

*I don't know $who_i$ John demanded that $t_i$ read the book.

b. with sluicing

I don't know WHO.

(Uozaki to appear: 21)

Furthermore, relative scope facts work also differently in sluicing. Landau (2020a) observes a scope unenhancement phenomenon in English sluicing constructions as in (8) and (9).

(8) A: Everybody didn't see one of the fights. (declarative)

✔every > Neg 'It is true that nobody saw one of the fights.'

✔Neg > every 'It is not true that everybody saw one of the fights.'

B: Which fight didn't everybody see? (*wh*-interrogative)

*every > Neg 'Which fight is it true that nobody saw?'

✔Neg > every 'Which fight is it not true that everybody saw?'

B': Which fight? (matrix sluicing)

✔every > Neg 'Which fight is it true that nobody saw?'

✔Neg > every 'Which fight is it not true that everybody saw?'

(9) A: Everybody wasn't happy with a specific result. (declarative)

✔every > Neg 'It is true that nobody was happy with a specific result.'

✔Neg > every 'It is not true that everybody was happy with a specific result.'

B: Which result wasn't everybody happy with? (*wh*-interrogative)

*every > Neg 'Which result is it true that nobody was happy with?'

✔Neg > every 'Which result is it not true that everybody was happy with?'

B': Which result? (matrix sluicing)

✔every > Neg 'Which result is it true that nobody was happy with?'

✔Neg > every 'Which result is it not true that everybody was happy with?'

(Landau 2020a: 385, with slight modifications by the author)

The declarative sentences, (8A) and (9A), are both ambiguous in relative scope between the quantified subject *everybody* and the negation *-n't* (✔every > Neg, ✔Neg > every). However, the ambiguity disappears in the *wh*-interrogative counterparts, (8B) and (9B), where the negation *-n't* only takes scope over *everybody* (*every > Neg, ✔Neg > every). Landau (2020a) calls the limited reading *enhanced scope*. Surprisingly, in the sluicing counterparts, (8B') and (9B'), the missing reading, that is, the wide scope of the quantified subject *evrybody* over the negation *-n't* (every > Neg), revives. Sluicing shows the lack of scope enhancement, that is, unenhanced scope. The same is true of the embedded sluicing as in (10), which also takes unenhanced scope.

(10) a. I think that everybody didn't see one of the fights, but I forget which fight. (sluicing)

✔every > Neg ‘…, but I forget which fight it is true that nobody saw.’

✔Neg > every ‘…, but I forget which fight it is not true that everybody saw.’

b. It seemed like everybody wasn't happy with a specific result, so I tried to find out which result. (sluicing)

✔every > Neg ‘…, so I tried to find which fight it is true that nobody was happy with.’

✔Neg > every ‘…, so I tried to find which fight it is not true that everybody was happy with.’

(Landau 2020a: 387, with slight modifications by the author)

The embedded sluicing as in (10) has the same ambiguous scope as the matrix version as in (8B’) and (9B’) does.

Why do both matrix sluicing and embedded sluicing inherit a narrow scope of quantified subject readings (every > Neg) in the declarative version but the full *wh*-interrogatives do not?

In the subsequent sections, we attempt to explain the scopal contrast between sluiced *wh*-interrogatives and non-sluiced *wh*-interrogatives.

## 3. Unenhanced scope in sluicing constructions

Section 3 discusses the scopal contrast in sluiced *wh*-interrogatives and non-sluiced *wh*-interrogatives pointed out in the previous section in terms of *phases* by Chomsky (2008) and labeling algorithm by Chomsky (2013, 2015). In section 3.1, we, first, introduce the notion *phases* and the *phase*-impenetrability condition proposed by Chomsky (2001) to the relative scope calculation, which is originally proposed by Ueda (2002), and demonstrate how the *phase*-based system actually predicts the relative scope relation in declaratives and *wh*-interrogatives.

### 3.1 The *Phase*-Based Approach (the PBA): Ueda (2002, 2013, 2017)

English sentences such as (11a) have an ambiguous reading.

(11) English declaratives: ambiguous

Someone loves everyone. (✔some > every, ✔every > some)

'There is someone, who loves everyone.'

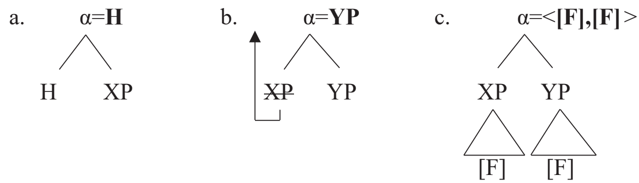
'Each person is loved by a different someone.'

A series of studies of Ueda (2002, 2013, 2017) has claimed that a crucial syntactic condition for creating inverse scope between two or more quantificational elements (henceforth, Q-elements) relies on whether the Q-elements in question stay in the same Transfer domain or not at a point of Transfer of each phrase-level and has proposed a *phase*-based scope calculation system, named a *phase*-based approach (henceforth, the PBA). Ueda (2002, 2013, 2017) proposes that if there are two or more [$F_{quant}$]s in the same Transfer domain in each phase-level, the [$F_{quant}$]s can enter a matching relation at syntax. Ueda (2002) calls this matching operation *[$F_{quant}$]-matching*. The result of the matching operation at syntax is rewritten as a binary absorbed quantifier and it creates the inverse scope at the C-I interface in the sense of Ben-Shalom (1993) and Watanabe (2000). One of the crucial assumptions of our proposal is that the operation between [$F_{quant}$]s, which are an interpretable feature related to quantification, is a sort of operation like *minimal search* at syntax. If it applies to the relevant [$F_{quant}$]-features, we get an inverse scope reading at C-I interface. In the subsequent sections, we will show how the PBA works to relative scope computation.

### 3.2 Additional theoretical assumptions

Our technical assumptions in the PBA are briefly summarized in this subsection. First, we assume Chomsky's (2013, 2015) Labeling Algorithm (henceforth, LA) in this paper. In generative grammar, an output of Merge has been treated as a labeled set { K {α, β}} (Chomsky (1995a, b)). However, Chomsky (2013) suggests Merge does not encode a label. In Chomsky's new system, Merge creates only a simple set {α, β}, where projection, that is, labeling is no longer maintained as a defining property of Merge. The sets, however, have to be identified at C-I interface to satisfy Full Interpretation. Thus, Chomsky (2013, 2015) proposes a Labeling Algorithm (henceforth, LA) in (12).

(12) Labeling Algorithm (Chomsky 2013: 43)




In (12a), that is, a syntactic object {H, XP}, LA unambiguously selects H as the label by minimal search. On the other hand, the label of {XP, YP} in (12b, c) is not determined. It is called *the XP-YP problem*. Chomsky (2013) proposes two solutions to the problem: (i) Dislocate either XP or YP from {XP, YP} as in (12b), where the lower copy XP in this case is invisible to the minimal search (or labeling), thus the label will be the remaining head YP; (ii) The most prominent feature sharing between XP and YP is selected as the label ([F], [F]) as in (12c).

Second, we crucially assume Chomsky's (2000) Phase Impenetrability Condition (henceforth, the PIC) as in (13). The PIC is a syntactic condition, which restricts the size of 'working domain' of syntactic operations and the timing of Transfer.

(13) the Phase Impenetrability Condition (the PIC)

In phase $\alpha$ with head H, the domain of H is not accessible to operations outside $\alpha$, only H and its edge are accessible to such operations.

[$_{ZP}$ Z … [$_{HP=\alpha}$ [ H $\boxed{\text{YP}}$]]

(Chomsky 2000: 108)

What the PIC in (13) suggests is closely related to the timing of Transfer and its transfer domain. In Transfer 1, when phase HP is derivationally completed, the complement of H is transferred as in (14), the boxed solid-white letter portions are the Transfer domain of each phase-level, Transfer 1 and Transfer 2.

(14) a. Transfer 1: [$_{HP}$ H $\boxed{YP}$]]

↑ ↑

Phase head the domain of Transfer 1

b. Transfer 2: [$_{ZP}$ Z $\boxed{[\ldots [_{HP}\ H\ \ldots]]}$ ]

↑ ↑

Phase head the domain of Transfer 2

Third, Ueda (2002) introduces a notion *deactivated NPs* given in (15), and assumes (16) with respect to quantificational elements.

(15) Deactivated NPs

Deactivated NPs are NPs all of whose uninterpretable features are checked and marked for deletion.

(16) A quantificational element bears an [$F_{quant}$]-feature.

Ueda (2002) proposes that the [$F_{quant}$]-matching, mentioned in section 3.1, applies to [$F_{quant}$]s of the deactivated NPs.

Under the assumptions given in this section, we will demonstrate how the PBA works and properly predicts the ambiguous scope in English declaratives.

**3.2 Scope in English declaratives**

(17) is a typical example in English declaratives (= (11)), which has an ambiguous reading between the subject $QP_{[Fquant]}$ and the object $QP_{[Fquant]}$. The solid-white letter parts are the Transfer domain of each phase level, which becomes invisible to the operations in the higher phase-level.

(17) English: Someone loves everyone. (✔some > every, ✔every > some)

a. vP-phase level:

Transfer 1: {$_{v\text{*}P\ (=<R,\ v\text{*}>)}$ every$_{[Fquant]}$ {<R, $v$*>, {$_{\alpha(=\varphi,\ \varphi)}$ some$_{[Fquant]}$, { R, $t_{Obj}$ }}}}

(i) Set-Merge externally forms {R, Obj}.

(ii) Set-Merge internally merges Obj to Spec-R.

(iii) Set-Merge externally introduces $v$ and then Subj into the derivation, yielding the *v*P-phase.

(iv) R inherits uF from *v*.

(v)R agrees with Obj, valuing Case.

(vi) α is labeled as φ, φ under minimal search.

(vii) Pair-Merge internally forms <R, *v**> (R with v* affixed).

(viii) *v** becomes invisible (and thus no longer the phase-head).

(ix) The phase-head status is activated on the copy of R.

(x) The complement of R, $t_{\mathrm{Obj}}$ gets transferred.

b. CP-phase level

Transfer 2: $\{C, \{\beta (= \varphi, \varphi = TP)\ every_{[Fquant]}, \{T, \{vP (= \langle R, v^* \rangle)\ t_{Subj}, \{\alpha (= \varphi, \varphi)\ some_{[Fquant]}, \{R, \boxed{\text{Transfer 1}}\}\}\}\}\}\}$

(i)Set-Merge externally forms {T, *v*P}

(ii) Set-Merge internally merges Subj to Spec-T.

(iii) Set-Merge externally introduces C, yielding CP-phase.

(iv) T inherits uF from C.

(v) T agrees with $Subj_{[Fquant]}$, valuing Case.

**(vi) [$F_{quant}$]-matching can apply to Q-elements with [$F_{quant}$].**

(vii) β is labeled as φ, φ (= TP) under minimal search.

(viii) The complement of C, β (= TP) gets transferred.

At the CP-phase level in (17b), Case-features of the subject $QP_{[Fquant]}$ and the object $QP_{[Fquant]}$ are both valued at the point of (17b-vi). This means both $QP_{[Fquant]}$s become a deactivated QP. The object $QP_{[Fquant]}$ is an element of the lower *v*P-phase, but it is a remnant of Transfer 1 of the *v*P-phase level. This means that [$F_{quant}$] in the object QP is visible from the higher CP-phase level. Thus, the both the [$F_{quant}$]s of the deactivated $QP_{[Fquant]}$s can enter a matching relation by a sort of minimal search at syntax. The result of this operation at syntax can be rewritten as a binary absorbed [$F_{quant}$] and create the inverse scope reading (every > some) at the C-I interface. Unless the matching operation happens at syntax, the two QPs are interpreted as their hierarchical C-I input structure (some > every) at the C-I interface. (18) is the LF structures of each scope interpretation. In semantic side, we assume May's (1985) quantifier raising (henceforth, QR), which raises quantifiers to a position external to TP at

LF, leaving a variable in the base-generated position. The variables are bound by a TP-adjoined λ-operator in the sense of Heim and Kratzer (1998).

(18) LF-representations: Someone loves everyone.

a. without [$F_{quant}$]-matching at syntax
some > every
LF: [x:someone, y:everyone [ λxλy [$_{TP}$ x loves y]]]

b. with [$F_{quant}$]-matching happens at syntax
every > some (inverse scope)
LF: [x:someone, y:everyone [ λyλx [$_{TP}$ x loves y]]]

In the subsequent section, we will demonstrate that the proposed PBA correctly predicts the unenhanced scope in English sluicing. Finally, we conclude that the LF-copying approach is more plausible than the PF-deletion approach to the derivation of sluicing constructions in English.

**4. A Proposal: Unenhanced Scope in Sluicing Constructions**

Section 4 shows how the proposed PBA actually works and properly predicts the following scopal contrast between declaratives, *wh*-interrogatives, and sluicing, mentioned in section 2. Furthermore, we claim that the PF-deletion approach cannot properly predict the scopal contrast between non-sluiced full *wh*-interrogatives as in (19B) and sluiced *wh*-interrogatives as in (19B'). For the sake of convenience, detail derivations of each Transfer 1 of the *v*P-phase level are omitted.

(19) (= (8))

A: Everybody didn't see one of the fights. (declaratives)
✔every > Neg ‘It is true that nobody saw one of the fights.'
✔Neg > every ‘It is not true that everybody saw one of the fights.'

B: Which fight didn't everybody see? (*wh*-interrogatives)
*every > Neg ‘Which fight is it true that nobody saw?'
✔Neg > every ‘Which fight is it not true that everybody saw?'

B': Which fight? (matrix sluicing)

✔every > Neg 'Which fight is it true that nobody saw?'

✔Neg > every 'Which fight is it not true that everybody saw?'

### 4.1 Against the PF-deletion approach to English sluicing

Let us begin with the derivation of declarative sentence (19A). (20) is the corresponding derivation of (19A). Here we focus our attention on the subject QP *everybody*$_{\text{[Fquant]}}$ and the Q-element Neg *-n't*$_{\text{[Fquant]}}$.

(20)(= (19A))

A: **Everybody** did**n't** see one of the fights. (declaratives)

✔every > Neg 'It is true that nobody saw one of the fights.'

✔Neg > every 'It is not true that everybody saw one of the fights.'

CP-phase level

Transfer 2: {C, {$_{\beta(=\varphi, \varphi=\text{TP})}$ every$_{\text{[Fquant]}}$, {T, {Neg$_{\text{[Fquant]}}$ {$_{\text{vP}(=\langle\mathbb{R}, v^*\rangle)}$ Subj, {$_{\alpha(=\varphi,\varphi)}$ Obj, {$\mathbb{R}$, $\boxed{\text{Transfer 1}}$ }}}}}}}

The two quantified elements in (19A), the subject *everybody*$_{\text{[Fquant]}}$ and the *Neg -n't*$_{\text{[Fquant]}}$, can enter [$F_{\text{quant}}$]-matching under minimal search when the subject *everybody*$_{\text{[Fquant]}}$ is Case-valued and becomes a deactivated QP at the CP-phase level. If it applies, they create a binary absorbed quantifier and then get the inverse-scope reading at the C-I interface (Neg > every) as in (21b). Unless the matching operation happens at syntax, the two QPs are interpreted as their hierarchical C-I input structure (every > Neg) in (21a) at the C-I interface. The LF-representations are given in (21).

(21) LF-structures: Everybody didn't see one of the fights.

a. without [$F_{\text{quant}}$]-matching at syntax: every > Neg

LF: x: everybody, y: one of the fights [ λxλy [$_{\text{TP}}$ x didn't see y]]]

b. with [$F_{\text{quant}}$]-matching at syntax: Neg > some

LF: [x: everybody, y: one of the fights ¬[λxλy [$_{\text{TP}}$ x see y]]]]

Next consider (19B), a full *wh*-interrogative. The syntactic derivation and the LF-representations are given in (22) and (23), respectively.

(22)(= (19B))

B: Which fight didn't everybody see? (*wh*-interrogatives)

* every > Neg 'Which fight is it true that nobody saw?'

✔Neg > every 'Which fight is it not true that everybody saw?'

CP-phase level

Transfer 2: {which fight { C-T-**Neg**$_{[Fquant]}$, {$_{\beta(=\varphi,\varphi=TP)}$ every$_{[Fquant]}$, { $\mathbb{T}$-$t_{Neg\ [Fquant]}$,

{ $t_{Neg\ [Fquant]}$, {$_{vP(=\langle\mathbb{R},v^*\rangle)}$ $t_{Subj}$, {$_{\alpha(=\varphi,\varphi)}$ $t_{wh}$, { $\mathbb{R}$, $\boxed{\text{Transfer 1}}$ }}}}}}}}

In (22), the two quantified elements in (19B), the subject *everybody*$_{[Fquant]}$ and the Neg -*n't*$_{[Fquant]}$, can enter [$F_{quant}$]-matching, immediately after the Case-valuation of the subject QP *everybody*$_{[Fquant]}$. At this point of the derivation, the head of T must stay in the original position with the Neg -*n't*$_{[Fquant]}$, because of the Case-valuation of the subject. If under [$F_{quant}$]-matching is executed under this circumstance, then we expect the inverse scope *Neg* > *every*. Unless the matching operation happens at syntax, the two QPs are interpreted as their hierarchical C-I input structure (Neg > every). The relative scope between an subject QP and the head of Neg in non-sluiced *wh*-interrogatives as in (22)(=(19B)) are unambiguous whether [$F_{quant}$]-matching happens or not. (23) is the LF-representations.

(23) LF-structures: Which fight didn't everybody see? (*wh*-interrogatives)

a. without [$F_{quant}$]-matching at syntax: Neg > every

LF: y: which fight, x: everybody, ¬ [λyλx [$_{TP}$ x see y]]

b. with [$F_{quant}$]-matching at syntax: Neg > every

LF: y: which fight, x: everybody, ¬ [λxλy [$_{TP}$ x see y]]

Finally, consider the sluiced *wh*-interrogative (19B'), that is, sluicing in question, which is reproduced as (24). If sluicing (24) were derived by PF-deletion, the derivation would wrongly predict that (24) would be unambiguous, on a par with the full *wh*-interrogative (22)(= (19B)), because exactly the same derivation must happen in (24) and (22), resulting in the unambiguous reading given in (22) under the PF-deletion approach. However, in fact, (24B') is ambiguous.

(24)(= (19B')): ambiguous

B': Which fight? (matrix sluicing)

✔every > Neg 'Which fight is it true that nobody saw?'

✔Neg > every 'Which fight is it not true that everybody saw?'

(25) Under the PF-deletion approach

B': Which fight? (matrix sluicing)

a. at Syntax:

CP-phase level

Transfer 2: {which fight { C-T-**Neg**$_{[Fquant]}$, {β(=φ, φ=TP) every$_{[Fquant]}$, { $\mathbb{T}$-$t_{Neg\ [Fquant]}$, { $t_{Neg\ [Fquant]}$, {vP $(=\langle R, v^{*}\rangle)$ $t_{Subj}$, {α(=φ, φ) $t_{wh}$, { $\mathbb{R}$, $\boxed{\text{Transfer 1}}$ }}}}}}}}

b. at PF:

{which fight { C-T-**Neg**$_{[Fquant]}$, ~~{β(=φ, φ=TP) every$_{[Fquant]}$, { $\mathbb{T}$-$t_{Neg\ [Fquant]}$, { $t_{Neg[Fquant]}$, {vP $(=\langle R, v^{*}\rangle)$ $t_{Subj}$, {α(=φ, φ) $t_{wh}$, { $\mathbb{R}$, $\boxed{\text{Transfer 1}}$ }}}}}}}}~~

Note that as far as we assume the PF-deletion approach, sluicing sentences have the same underlying structure as the corresponding full *wh*-interrogatives (22) as in (26a). The LF-structures are given in (26).

(26)LF-representations: Which fight didn't everybody see? (*wh*-interrogatives)

a. without [$F_{quant}$]-matching at syntax: Neg > every

LF: y: which fight, x: everybody, $\neg$ [$\lambda y \lambda x$ [$_{TP}$ x see y]]

b. with [$F_{quant}$]-matching at syntax: Neg > every

LF: y: which fight, x: everybody, $\neg$ [$\lambda x \lambda y$ [$_{TP}$ x see y]]

To sum up, the PF-deletion approach cannot explain the scopal contrast between the full *wh*-interrogatives in (19B) and sluicing in (19B') in English.

Furthermore, the PF-deletion approach as in (26) cannot explain a long-term mystery of Marchant's (2006) missing T-in-C generalization in (27), which has been tackled by many researchers since Lasnik (1999a, b).

(27) The missing T-in-C generalization

No element of T may be stranded in C in sluicing environments that otherwise (i.e. without sluicing) do require T-in-C.

As shown in the PF-representation (25), the *C-T-Neg* in (25b) should have been phonetically realized as *didn't* because it is outside of the elided domain. However, auxiliary elements (+ negation) do not allow to appear in sluicing as shown in (28) (Lasnik 1999a, b, Merchant 1999, 2001, Landau 2020a, b).

(28) A: Everybody didn't see the fight.
B : *Which fight *didn't*?
B': ✔Which fight?

In the next subsection, the LF-copying approach successfully explain both the scopal contract between the full *wh*-interrogative (19B) and sluicing (19B'), and the missing T-to-C generalization (27).

### 4.2 The PBA under the LF-copying approach to English sluicing

Under the LF-copying approach, the PBA we have proposed properly predicts the scopal contrast in question, repeated here as (29).

(29) (= (8), (19))
A: Everybody didn't see one of the fights. (declaratives)
✔every > Neg 'It is true that nobody saw one of the fights.'
✔Neg > every 'It is not true that everybody saw one of the fights.'
B: Which fight didn't everybody see? (*wh*-interrogatives)
*every > Neg 'Which fight is it true that nobody saw?'
✔Neg > every 'Which fight is it not true that everybody saw?'
B': Which fight? (matrix sluicing)
✔every > Neg 'Which fight is it true that nobody saw?'
✔Neg > every 'Which fight is it not true that everybody saw?'

The derivation of non-sluiced *wh*-interrogative (30B) and the LF-representations are given in (30) and (31) as mentioned in (22) and (23) above.

(30)(= (19B))

B: Which fight didn't everybody see? (*wh*-interrogatives)

* every > Neg ‘Which fight is it true that nobody saw?’

✔Neg > every ‘Which fight is it not true that everybody saw?’

CP-phase level

Transfer 2: {which fight { C-**Neg** $_{[Fquant]}$, {$_{\beta(=TP)}$ Subj$_{[Fquant]}$, { $\mathbb{T}$, { $t_{Neg\ [Fquant]}$ {$_{vP(=<R, v^*>)}$ $t_{Subj}$, {$_{\alpha(=\varphi,\varphi)}$ $t_{wh}$, { $\mathbb{R}$, $\boxed{\text{Transfer 1}}$ }}}}}}}}}

(31) LF-structures: Which fight didn't everybody see? (*wh*-interrogatives)

a. without [$F_{quant}$]-matching at syntax: Neg > every

LF: y: which fight, x: everybody, ¬ [λyλx [$_{TP}$ x see y]]

b. with [$F_{quant}$]-matching at syntax: Neg > every

LF: y: which fight, x: everybody, ¬ [λxλy [$_{TP}$ x see y]]

As we mentioned in (22), at the point of the derivation when the two quantified elements in (30B), the subject *everybody*$_{[Fquant]}$ and the Neg *-n't*$_{[Fquant]}$, become deactivated QPs, the head of Neg stays in T. Immediately after the Case-valuation of the subject completes, [$F_{quant}$]-matching applies to the two [$F_{quant}$]s between the subject *everybody* and the head of Neg *-n't* under minimal search, resulting in the inverse scope (Neg > every). If nothing happens in syntax, the result is the same (Neg > every). It has the LF-representation like (31b) above.

On the other hand, under the LF-copying approach, the sluicing (30B'), reproduced as (32), has the following derivation.

(32) A: Everybody didn't see one of the fights. (antecedent clause)

✔every > Neg ‘It is true that nobody saw one of the fights.’

✔Neg > every ‘It is not true that everybody saw one of the fights.’

B': Which fight? (matrix sluicing)

✔every > Neg ‘Which fight is it true that nobody saw?’

✔Neg > every ‘Which fight is it not true that everybody saw?’

The sluicing (32B) takes (32A) as its antecedent clause. The sentence (32A) has the derivation (33) and the LF-representation (34), which has already mentioned in the previous section 4.1.

(33) A: **Everybody** did**n't** see one of the fights. (antecedent clause)

✔every > Neg 'It is true that nobody saw one of the fights.'

✔Neg > every 'It is not true that everybody saw one of the fights.'

CP-phase level

Transfer 2: {C, {$_{\beta(=\varphi,\varphi=TP)}$ every $_{[F_{quant}]}$, {T, {Neg $_{[F_{quant}]}$ {$_{vP(=R,v^*)}$ Subj, {$_{\alpha(=\varphi,\varphi)}$ Obj, {ℝ, $\boxed{\text{Transfer 1}}$ }}}}}}}}

(34) LF-structures: Everybody didn't see one of the fights.

a. without [$F_{quant}$]-matching: every > Neg

LF: x: everybody, y: one of the fights [λxλy [$_{TP}$ x didn't see y]]

b. with [$F_{quant}$]-matching: Neg > some

LF: [x: everybody, y: one of the fights ¬[λxλy [$_{TP}$ x see y]]

Keeping the two LF-representations of antecedent clause (33) in mind, next, consider the sluiced *wh*-interrogative (33B'), namely, sluicing. Under the LF-copying approach, (33B') had the following derivation.

(35) B': Which fight [$_{TP}$ e ]? (matrix sluicing)

✔every > Neg 'Which fight is it true that nobody saw?'

✔Neg > every 'Which fight is it not true that everybody saw?'

The CP-phase level

{$_{\alpha(= Q, Q = CP)}$ Which fight {C, [$_{TP}$ e ]}}?

(i) Set-Merge externally forms {C, [$_{TP}$ e ]}.

(ii) Set-Merge ***externally*** forms {$_{\alpha}$ which fight, { C, [$_{TP}$ e ]}}.

(iii) α is labeled as Q, Q under minimal search.

(iv) Finally, whole the structure, α (= CP) gets transferred.

In (36), the clausal empty category [$_{TP}$ e ] Merges with the head of C. Next, the set {C, [$_{TP}$ e ]} Merges with *which fight* not *internally*, but *externally*. At the CP-phase level, the NP *which fight* Agrees with the head of C and they share the prominent feature [+Q]. Thus, α is labeled as Q, Q (=CP) under minimal search. Note that the antecedent clause (34A) has the LF-representations as in (34), repeated here as (36).

(36)LF-structures: Everybody didn't see one of the fights.

a. without [$F_{quant}$]-matching: every > Neg
LF: x: everybody, y: one of the fights [λxλy [$_{TP}$ x didn't see y]]

b. with [$F_{quant}$]-matching: Neg > some
LF: [x: everybody, y: one of the fights ¬[λxλy [$_{TP}$ x see y]]

Under the LF-copying approach, If the relevant LF-structure *[λxλy [$_{TP}$ x didn't see y]]* in the antecedent clause (36a) is copied to the empty slot [$_{TP}$ e ] in (35B'), (35B') has a wide scope interpretation of *everybody* over the Neg *-n't* (every > Neg). On the other hand, if the relevant LF-structure *¬[λxλy [$_{TP}$ x see y]]* in the antecedent clause (36b) is copied to the empty slot [$_{TP}$ e ], then (36B) has the inverse scope, that is, a wide scope interpretation of negation (Neg > every). The results of the LF-copying operation is given in (37).

(37) The results of LF-copying

a. Which fight [$_{TP}$*λxλy [$_{TP}$ x didn't see y]* ]? (every > Neg)

b. Which fight [$_{TP}$*¬[λxλy [$_{TP}$ x see y]]* ]? (Neg > every)

The LF-copying approach can appropriately predict the ambiguous reading of sluicing in (35). Under the LF-copying approach, the head of C Merges with an empty category [$_{TP}$ e ], but this [$_{TP}$ e ] does not have any internal structure at syntax. Thus, nothing can be extracted from the empty [$_{TP}$ e ] in the sense of Sakamoto (2016, 2020). Therefore, the missing T-in-C generalization in (28), here reproduced as (38), is just a consequence of the structural emptiness at syntax.

(38) The missing T-in-C generalization

No element of T may be stranded in C in sluicing environments that otherwise (i.e. without sluicing) do require T-in-C.

Note that the *wh*-phrase *which fight* is *externally* introduced into the derivation, not by movement. The lack of displacement of *wh*-phrases causes island repair shown in (2)-(5) in section 2. Furthermore, there is no movement, there is no trace. Therefore, the absence of *that*-trace effect also easily predictable.

**5. Conclusion**

This paper has discussed a relative scope phenomenon in English sluicing constructions. We focused our attention on the scopal contrast between sluiced and non-sluiced negative *wh*-interrogatives in terms of phases and the timing of Transfer. We demonstrated that the (revised) PBA proposed by Ueda (2002, 2013, 2017) successfully explains the (un)enhanced scope phenomena. As a consequence of this work, we claim that the LF-copying approach is more appropriate than the PF-deletion approach to sluicing constructions of this type in English.[6] The crucial point of this analysis is that *wh*-phrases in sluicing constructions are *externally* introduced into a derivation under the LF-copying approach. The derivation without *wh*-movement also explains the absence of island effects and *that*-trace effects. Finally, under the LF-copying approach, the head of C in sluicing constructions Merges with an empty clausal category $[_{\text{TP}}$ e ] at syntax. We suggested that the emptiness of the internal structure of $[_{\text{TP}}$ e ] at syntax also explains a traditional generalization in sluicing constructions, that is, the missing T-in-C generalization, because by means of the copying operation, the empty $[_{\text{TP}}$ e ] is satisfied with the relevant LF-representation, which contains variables. In the original antecedent clause, a variable is bound by an indefinite quantified element such as *someone* or *one of the fights*, whereas in the corresponding sluiced clause, the variable is bound by a relevant *wh*-element through λ-operator in the C-I interface without any other tools such as head-movement.

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## Notes

1. On the basis of Marchant's (2008) observation in (i), Griffiths and Lipták (2014) proposes a universal generalization on island repair that contrast fragments of all types including sluicing are sensitive to islands, whereas noncontrastive fragments of all types are not.

(i) a. non-contrastive sluicing
Abby wants to hire someone who speaks a Balkan language, but I don't remember which.
b. contrastive sluicing
*Abby wants to hire someone who speaks GREEK, but I don't remember what OTHER LANGUAGE.

In this paper, we will focus our investigation only on non-contrastive sluicing as in (ia). We leave the issues on island-(in)sensitivity in both types of sluicing, contrastive and non-contrastive, for future studies.

2. Ross (1969) mentions that (2b) is not perfect, but it is immeasurably better than the corresponding full sentence (2a).

3. The *that*-trace effect is the phenomenon that the complementizer *that* cannot be followed by a trace as in (i).

(i) a.*I asked what$_i$ Leslie said that $t_i$ had made Robin give a book to Lee.
b. I asked what$_i$ Leslie said [e]$_{that}$ $t_i$ had made Robin give a book to Lee.
(Culicover 2012: 222)

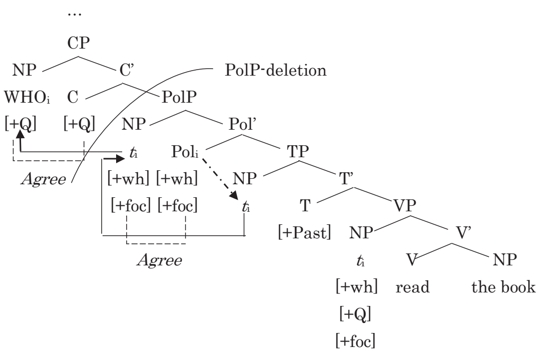
4. Chung et al. (1995) investigates not only the subject ECP, but also the adjunct ECP. However, with respect to the subject ECP-effect in (5), that is, the *that*-trace effect, Uozaki (to appear) points out that the example (5) in Chung et al. (1995) is insufficient to prove that slicing works to suspend the *that*-trace effect because (5a) may have originally derived from a sentence without *that*. Therefore, Uozaki (to appear) examines the suspension effect of the *that*-trace effect by means of the sentences in which *that* cannot be deleted, such as subjunctives in (i) below.

(i) Subjunctives
John demanded *(that) SOMEONE read the book.
a. without sluicing
*I don't know who$_i$ John demanded that $t_i$ read the book.
b. with sluicing
I don't know WHO.

(Uozaki to appear: 21)

The full sentence (ia) is ungrammatical in violation of the *that*-trace effect, whereas the sluiced sentence (ib) is grammatical. The result in (i) genuinely indicates that sluicing can suspend the *that*-trace effect. She attempts to explain the amelioration in sluicing and proposes a unified account for both embedded and matrix sluicing by assuming a functional projection headed by *Pol(arity)* in the sense of Culicover (1992) between TP and CP, and by assuming Radford's (2016) clause-typing conditions, originally proposed by Cheng (1991). Under the assumptions above, Uozaki (to appear) proposes the PolP-deletion analysis for sluicing under the PF-deletion approach. (ii) is the partial structure of (ib) by Uozaki (to appear).

(ii) John demanded *(that) SOMEONE read the book.
I don't know WHO. (= (ib))




(Uozaki to appear: 22)

See Uozaki (to appear) for detail discussion on the derivation and the related issues to sluicing constructions under the PF-deletion approach.

5. Ueda (2017) is a revised version of Ueda (2002, 2013) in terms of Chomsky's (2013, 2015) Labeling Algorithm.

6. It has been widely assumed that sluicing constructions are divided into the following three types with respect to remnant *wh*-phrases (Ross 1969, Chung, Ladusaw, and McCloskey 1995, among others):

(i) a. Adjuncts
He is writing, but you can't imagine where/why/how/how fast/with whom.
b. Arguments, but no corresponding antecedent in the antecedent clause
She is reading. I can't imagine what.
c. the corresponding antecedent appears as indefinite nouns such as *something* in the antecedent clause
She's reading something, but I can't imagine what.

In this paper, we investigated the third type (ic) only. Antecedent clauses without corresponding antecedent of remnant *wh*-phrases as in (ia) and (ib) are problematic to the LF-copying approach because externally-Merged *wh*-phrases require a relevant variable in the original position in the antecedent clause to be copied for satisfying the full interpretation. We leave this issue open for future studies.

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