Binding reconstruction and the types of traces[1]

Kenyon Branan & Michael Yoshitaka Erlewine, National University of Singapore
{kgbranan,mitcho}@nus.edu.sg

LSA January 2021
Handout: http://tinyurl.com/traces-lsa

1 Introduction and motivation

Much work since Chomsky 1993 has developed the idea that **movement produces copies:**

(1) [Which cake] did Amy say [which cake] that Bob baked [which cake]

Resulting *copy-chains* however must be modified to be interpretable at both PF (see e.g. Nunes, 2004) and LF (e.g. via *Trace Conversion*; Fox, 2002):

(2) a. PF: [which cake] did Amy say ~~[which cake]~~ that Bob baked ~~[which cake]~~

b. LF: [which cake] λx did Amy say [the cake x] λy that Bob baked [the cake y]

Q: Are different traces in a copy-chain structurally equivalent?

Trace Conversion as in (2b) (modulo late merger) predicts them to be the equivalent.

A: But evidence from reconstruction suggests that they can be distinct:

- Barss (1986: 25) observes that anaphors can be bound as if their Ā-moved containers are interpreted in their base or intermediate positions — i.e. *binding reconstruction*:

(3) a. [Which picture of *himself*$_B$] does Amy think t Bob likes $\underline{t}$?

b. [Which picture of *herself*$_A$] does Amy think $\underline{t}$ Bob likes t?

(4) Baseline: Amy thinks [(that) Bob likes [some picture of **herself*$_A$/$^{\checkmark}$*himself*$_B$]].

The facts in (3a,b) suggest that the anaphor is evaluated for Condition A in just one trace position ($\underline{t}$) at a time.

[1] We thank Hadas Kotek, Stefan Keine, and members of the NUS syntax/semantics lab for discussion that has informed this work.

- Bhatt (2002) independently motivates the idea that one trace position is privileged for interpretation, from the interpretation of adjectival modifiers in relative clauses:

  (5) the *only* book that John said t that Tolstoy wrote t (Bhatt, 2002: 58)

  a. ≈ the book x s.t. John said that Tolstoy *only* wrote x (low)

  b. ≈ the book x s.t. John *only* said that Tolstoy wrote x (high)

  Here too, reflexives can be used to privilege one position over another:

  (6) a. the *only* picture of *himself*$_B$ that Amy said t that Bob liked $\underline{t}$ ✓high, ✓low

  b. the *only* picture of *herself*$_A$ that Amy said $\underline{t}$ that Bob liked t ✓high, *low

  (The high reading in (6a) is due to a different parse; see Bhatt 2002.)

► **One copy of a DP copy-chain is privileged for the interpretation of the NP at LF.** This necessitates different types of Ā-traces at LF.

  – Today we present a concrete implementation of this idea.

  – Our theory for Ā-movement above and below the interpreted NP position makes correct predictions for new data on *interactions between reflexive binding, parasitic gaps, and weak crossover*, as well as previously observed differences between *two subclasses of Ā-movement* (Cinque, 1990; Postal, 1994).

(Much of the earlier motivation for Ā-movement involving copying comes from Condition C reconstruction (see e.g. Lebeaux, 1991; Romero, 1998; Fox, 1999), in some cases explicitly setting aside Condition A data (see discussion in Heycock 1995). But recent work (e.g. Adger et al. 2017; Bruening and Al Khalaf 2019 on English) has questioned the Condition C evidence (but see also Wierzba et al. to appear on German and Stockwell et al. to appear on English). We do not discuss Condition C reconstruction facts today and instead endeavor to take the Condition A facts as primary.)

Roadmap §2 Proposal §3 Above vs below the NP §4 Types of Ā-movement

2 Proposal

Suppose we copy a quantificational DP and wish to interpret the higher quantifier at LF:

(7) $[_{\langle et,t\rangle}$ D NP] ... $[_{\langle et,t\rangle}$ D NP]

By LF, the lower copy must (a) *replace its determiner* and (b) *be bound* by the higher copy.

(8) **Two existing proposals for interpreting lower copies of DP movement:**

a. Binding over individual (type e) variables: (*Trace Conversion*; Fox, 2002 a.o.)
Lower D is replaced by the definite determiner *the*; the higher DP binds an individual variable in the restrictor via Predicate Abstraction:
$[_{\langle et,t\rangle}$ D NP] ... $[_{\langle et,t\rangle}$ D NP] → $[_{\langle et,t\rangle}$ D NP] $\boldsymbol{\lambda x_e}$ ... $[_{\mathbf{e}}$ **the** [NP $\boldsymbol{x}$]]

b. Binding over choice functions: (Sauerland, 1998: ch. 5, 2004; Ruys, 2000)
Lower D is replaced by a choice function; higher quantifier D is converted into a quantifier over choice functions, $\mathcal{D}$[2]; higher NP is deleted (see also Heim, 2012):
$[_{\langle et,t\rangle}$ D NP] ... $[_{\langle et,t\rangle}$ D NP] → $[\boldsymbol{\mathcal{D}}$ ~~NP~~] $\boldsymbol{\lambda f_{\mathbf{cf}}}$ ... $[_{\mathbf{e}}$ $\boldsymbol{f_{\mathbf{cf}}}$ NP]

Now consider a DP movement chain with multiple copies.

A proposal for copy conversion:
- The NP restrictor is interpreted in only one copy at LF; delete all other NPs.
- Below the NP, use binding over individual variables (8a).
- Above the NP, use binding over choice functions (8b).
(See Sauerland 1998: ch. 5 for a similar intuition.)

Concretely, we predict chains of the following types:

(9) **One chain, three copies, two "links":**
[① D NP] ... [② D NP] ... [③ D NP] →

a. [① D **NP**] λx_e ... [② the x] λy_e ... [③ the y] (all below the NP)

b. [① $\mathcal{D}$] λf_{cf} ... [② f **NP**] λy_e ... [③ the y] (some above, some below)

c. [① $\mathcal{D}$] λf_{cf} ... [② f] λg_{cf} ... [③ g **NP**] (all above the NP)

► Because we propose that the chain above vs below the NP are interpreted using different mechanisms, **we predict different behavior above vs below the NP.**

[2] Sauerland 1998: ch. 5 discusses a general approach to rewriting quantificational determiner meanings of type $\langle et, \langle et,t\rangle\rangle$(D) as functions of predicates of choice functions ($\mathcal{D}$); see also Sauerland 2000 and Abels and Martí 2010. In Appendix A, we present a more general approach that allows the (re)use of quantifiers' $\langle et, \langle et,t\rangle\rangle$ denotations with predicates of choice functions.

3 Ā-movement above and below the NP

- If we force a particular copy to be privileged for NP interpretation at LF (via Condition A reconstruction), we can force different behaviors above and below the NP.

3.1 Parasitic gaps

Ā-movement licenses *parasitic gaps* (pg) (Engdahl, 1983; Nissenbaum, 2000a,b):

(10) [Which articles] did John file ___ without reading $_{pg}$? (Engdahl, 1983: 5)

Nissenbaum (2000a,b) argues that pg-containing adjuncts must adjoin to a derived predicate of type $\langle e, t \rangle$, formed via intermediate movement:

(11) [Which articles] λx did [$_{vP}$ x [$_{\langle e,t \rangle}$ λy John file y] [$_{\langle e,t \rangle}$ λz without PRO reading z]]?[3]
$\approx$ Which articles x are such that John filed x without PRO reading x?

This assumes that movement abstracts over individual (type e) variables.

- Adopting Nissenbaum's theory for parasitic gaps, pg-containing adjuncts must adjoin to a position that abstracts over an individual (type e), rather than over a choice function. **We predict parasitic gaps to be licensed *below the NP* but not above it.**

(12) **Low pg-containing adjunct (modifying *treasure*):**

a. [Which picture of *herself*$_A$] did Amy say [that Bob will treasure ___ after receiving $_{pg}$].

b. [Which picture of *himself*$_B$] did Amy say [that Bob will treasure ___ after receiving $_{pg}$].

(13) **High pg-containing adjunct (modifying *say*):**

a. [Which picture of *herself*$_A$] did Amy say [that Bob would love ___] before buying $_{pg}$.

b. *[Which picture of *himself*$_B$] did Amy say [that Bob would love ___] before buying $_{pg}$.

(14) **High pg-containing adjunct (modifying *say*) in parenthetical position:**

a. [Which picture of *herself*$_A$] did Amy say, before buying $_{pg}$, that Bob would love ___.

b. *[Which picture of *himself*$_B$] did Amy say, before buying $_{pg}$, that Bob would love ___.

[3] illustrated with agent reconstructed into base position; see related discussion in Nissenbaum 2000b

- In the grammatical cases, the pg-containing adjunct adjoins *below the NP* — i.e. to a chain interpreted via abstraction of individual (type e) variables.

  Himself in (13b, 14b) requires the NP to be interpreted within the lower clause (*love*) to be bound by *Bob*, with higher links interpreted via choice function abstraction. But choice function abstraction doesn't license parasitic gaps.

(15) **Parasitic gaps are licensed below the NP:**

a. $\mathcal{D}\ \lambda f_{cf}$ ... [$_{vP}$ [f **NP**] λy_e ... [$_{CP}$ ... [$_{vP}$ [the y] [λz_e ... z] [...*pg*...]]]] (12a)

b. $\mathcal{D}\ \lambda f_{cf}$ ... [$_{vP}$ [f **NP**] [λy_e ... [$_{CP}$ ... [$_{vP}$ [the y] λz_e ... z]]] [...*pg*...]] (13a, 14a)

c. $\mathcal{D}\ \lambda f_{cf}$ ... [$_{vP}$ f λg_{cf} ... [$_{CP}$ ... [$_{vP}$ [g **NP**] [λz_e ... z] [...*pg*...]]]] (12b)

d. *$\mathcal{D}\ \lambda f_{cf}$ ... [$_{vP}$ f [λg_{cf} ... [$_{CP}$ ... [$_{vP}$ [g **NP**] λz_e ... z]]] [...*pg*...]] (13b, 14b)

3.2 Weak crossover

Weak crossover refers to the inability of a pronoun to be bound by a phrase Ā-moved across it, where the pronoun does not bind the Ā-gap (Postal, 1971; Wasow, 1972; see Safir, 2017):

(16) ?? Who$_i$ does [his$_i$ mother] like ___$_i$? (Ruys, 2000: 513)

WCO effects are notoriously "weaker" (Wasow, 1972) and variable, depending on the type of movement (see e.g. Lasnik and Saito, 1991; also below) and pronoun's position:

(17) **WCO even weaker with lower pronouns in long-distance movement:**
(based on Mahajan 1991: 92 reproduced in Ishii 2006: 158)

a. ? [Which man]$_i$ do they believe [that [*his*$_i$ mother] hates ___$_i$]?

b. ??? [Which man]$_i$ does [*his*$_i$ mother] believe [that they hate ___$_i$]?

Theoretically, Sauerland (1998) and Ruys (2000) propose that WCO is a property of movement that abstracts over choice functions (18a), but that movement that abstracts over individuals instead allows variable binding (18b).

(18) a. λf_{cf} ... [... pro_{i} ...] ... $f(\ldots)$ ...
⇒ variable binding impossible

b. λx_e ... [... pro_{i} ...] ... x ...
⇒ variable binding possible if $[\![pro]\!] = x$ (coindexed with trace)

► **We predict that Ā-movement exhibits WCO effects *above the NP* but successfully binds pronouns *below the NP*.**

This prediction is borne out:

(19) a. ✓ [Which painting of *himself*$_{\text{j}}$]$_{\text{i}}$ did George$_{\text{j}}$ say [that [its$_{\text{i}}$ owner] hates ___]?

b. ?? [Which painting of *herself*$_{\text{k}}$]$_{\text{i}}$ did George say [that [its$_{\text{i}}$ owner]$_{\text{k}}$ hates ___]?[4]

- The reflexive forces the NP to be interpreted in a medial position in (19a), to be bound by *George*. Individual (type e) abstraction there can bind the pronoun *its*.
- In contrast, the reflexive forces the NP to be in the embedded clause, below the subject, in (19b). Choice function abstraction above the NP cannot bind the pronoun.

3.3 Summary

From data on reconstruction for reflexive binding (building on Barss 1986), we claimed that *the NP restrictor is interpreted once* in an Ā-chain, with different modes of interpretation above and below the NP (also cf Sauerland, 1998), with different behaviors:

(20) **Two sets of behaviors in an Ā-chain, above and below the NP at LF:**

$\underbrace{[_{\text{DP}}\ \mathcal{D}]\ \lambda f_{\text{cf}}\ \ldots\ [_{\text{DP}}\ f]\ \lambda g_{\text{cf}}\ \ldots}\ [_{\text{DP}}\ g\ \textbf{NP}]\ \underbrace{\lambda x_e\ \ldots\ [_{\text{DP}}\ \text{the}\ x]\ \lambda y_e\ \ldots\ [_{\text{DP}}\ \text{the}\ y]\ \ldots}$

Above the NP:	Below the NP:
Choice function abstraction	Individual (type e) abstraction
WCO (Sauerland, 1998; Ruys, 2000)	Variable binding; no WCO
No parasitic gaps	Parasitic gaps (Nissenbaum, 2000a,b)

[4] Similarly, without the reflexive bound by the pronoun-container itself:

(i) a. ✓ [Which painting of *himself*$_{\text{j}}$]$_{\text{i}}$ did George$_{\text{j}}$ say [that [its$_{\text{i}}$ current owner] told Laura to buy ___]?

b. ?? [Which painting of *herself*$_{\text{k}}$]$_{\text{i}}$ did George say [that [its$_{\text{i}}$ current owner] told Laura$_{\text{k}}$ to buy ___]?

4 Types of Ā-movement

So far we've primarily discussed (English) *wh*-movement, claiming that the NP position may split a single Ā-chain into two parts, with distinct WCO and parasitic gap behavior.

- ► Postal (1994, 1998) observed that different types of Ā-movement can be classified into those which are susceptible to WCO and those which license parasitic gaps.

(21) **Postal's (1994) two types of Ā-movement:**

a. Susceptible to WCO (*"A-extraction"*):
wh, restrictive relatives, neg-inversion, free relatives, comparative extraction...

b. Licenses parasitic gaps (*"B-extraction"*):
wh, restrictive relatives, topicalization, non-restrictive relatives, clefting...

This classification also tracks a number of other contrasting behaviors:

(22) **Behaviors of Postal's A- vs B-extractions:**

Diagnostic	"A-extraction"	"B-extraction"
Licenses parasitic gaps	×	◯
Shifts nuclear stress	×	◯
Susceptible to WCO	◯	×
Ok from anti-pronominal position	◯	×
Weak island sensitive	◯	×
Allows extraposition	◯	limited

(Richards, 2018)

(23) **Antipronominal position: change of color contexts** (Postal, 1994: 169, 163–164)

a. *They painted their porch green$_i$ but I refused to paint mine *it*$_i$.

b. *No such color* would I ever paint my car ___. (neg-inversion = A)

c. **That color*, he never painted the car ___. (topicalization = B)

English *wh*-movement is ambiguous, and thus may have both A- and B-properties. But it can only have one set at a time: (see also Postal 1994: 180)

(24) **From antipronominal position ⇒ A, parasitic gap ⇒ B:**
Which color did you paint your house ___ (*[despite not really liking $\underline{pg}$])?

(25) **From antipronominal position ⇒ A, extraction from weak island ⇒ B:**
**Which color* did you wonder [whether John painted his house ___]?

(26) **Postal's intuition:**
"B-extractions obligatorily involve (invisible) resumptive pronouns in their extraction sites, whereas A-extractions do not." — Postal 1994: 162

See similar intuitions in Cinque 1990 (discussed by Postal) and Lasnik and Stowell 1991.

Postal's A- and B-extractions track where the chain's NP is interpreted at LF:

- "A-extractions" interpret the NP in the base/gap position.
- "B-extractions" *do not* interpret the NP in the base/gap position.
- A/B-ambiguous extractions (like English *wh*-movement and restrictive relatives) allow for the NP to be interpreted in different positions.

(27) **A (convenient!) mnemonic for Postal's extraction types:**
"A" = Above the NP = interpreted via choice function abstraction
"B" = Below the NP = interpreted via individual abstraction

- We already discussed how **above the NP (A) is sensitive to WCO** (Sauerland, 1998; Ruys, 2000) and **below the NP (B) licenses parasitic gaps** (Nissenbaum, 2000a,b).
- Below the NP (B), we create minimal definite descriptions (e.g. [the x]). We therefore derive Postal's intuition that **"traces" of B-extraction are (null) pronouns**, and that B-extraction is therefore **disallowed from antipronominal positions**.[5]

  See Appendix B for the stress shift interaction and its explanation.
- It remains to understand why...
  - A-extraction is sensitive to weak islands, but B-extraction isn't;
  - A-extraction allows certain forms of extraposition, but B-extraction doesn't;
  - multiple B-extractions can't overlap (Appendix C).

[5] For two recent approaches to antipronominal positions, see Stanton 2016 or Poole 2017. Note that, as we interpret above the NP using choice functions which do not force quantificational reconstruction (see Appendix A), in the account here, we do not derive Poole's generalization that movement from antipronominal positions obligatorily quantificationally reconstruct.

5 Conclusion

Today we pursued a new conception of Ā-chain interpretation at LF, motivated by Barss's observations on Condition A reconstruction.

- ► **The NP restrictor of an Ā-chain is interpreted in one copy at LF. Ā-links above and below this position behave differently,** corresponding to Postal's independently observed classification of Ā-chain types:
  - Above the NP = Postal's "A" extractions
  - Below the NP = Postal's "B" extractions
- We propose that these behaviors are explained by **two different modes of chain conversion** above and below the NP, yielding different kinds of traces:
  - Above the NP = interpreted via choice function abstraction
  - Below the NP = interpreted via individual abstraction
- Directions for future work:
  - consider the effects of Condition A reconstruction in other Ā-movement types;
  - pursue explanations for other properties of above-the-NP (A) vs below-the-NP (B) behavior;
  - reconcile with existing work on Condition C reconstruction (e.g. Lebeaux, 1991; Heycock, 1995; Romero, 1998; Fox, 1999) and related work on A-movement (e.g. Takahashi and Hulsey, 2009).

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Appendix A: Composing quantifiers with predicates of choice functions

We claim (with Sauerland 1998, Ruys 2000, van Urk 2015) that one way to interpret a copy-chain is via choice function abstraction:

(28) [D NP] ... [D NP] $\overset{\text{LF}}{\longrightarrow}$ D [$_P$ λf_{cf} ... f(NP)]

Suppose $D = [\![\text{D}]\!]$ is a quantificational determiner of type $\langle et, \langle et, t\rangle\rangle$.

- ► How does the quantifier compose with its scope, a predicate of choice functions? Here we sketch one approach. (See also Sauerland 1998, 2000 and Abels and Martí 2010 for discussion of related proposals.)

For concreteness, suppose $P = \lambda g_{\text{cf}}$. Sarah read g(book) .

- First, for any individual z, let f_z be the constant choice function, defined as follows:

  (29) $f_z(X) = z$ if $z \in X$; otherwise, $f_z(X)$ is undefined

  Notice: $P(f_x)$ is defined iff x is a book; $P(f_x) = 1$ iff x is a book and Sarah read x
- Second, define two utility functions, A and B:

  (30) a. $A = \lambda S_{\langle \text{cf},t\rangle}$. λz_e . $P(f_z)$ defined

  b. $B = \lambda S_{\langle \text{cf},t\rangle}$. λz_e . $P(f_z)$ defined and true

  (31) For example:

  a. $A(\lambda g_{\text{cf}}$. Sara read g(book)) = λz_e . z is a book

  b. $B(\lambda g_{\text{cf}}$. Sara read g(book)) = λz_e . z is a book and Sarah read z

- Now we can introduce the requisite type shifter:

  (32) $D_{\langle et, \langle et, t\rangle\rangle} \mapsto \mathcal{D} = \lambda S_{\langle \text{cf},t\rangle}$. $D(A(S))(B(S))$

Claim: For any quantificational determiner D, "[D NP] ... [D NP]" interpreted via Trace Conversion and individual-type Predicate Abstraction ("[D NP] λx_e ... [the NP x] ...") is truth-conditionally equivalent to the same interpreted via choice function abstraction as in (28) using (32), as long as the DP does not bind any other variable besides its "trace."

Sketch of proof:

- Let $D = [\![D]\!]$ (type $\langle et, \langle et, t\rangle\rangle$), $R = [\![\text{NP}]\!]$ (type $\langle e, t\rangle$), and S be the nuclear scope of the DP, following individual-type Predicate Abstraction (also type $\langle e, t\rangle$).
- Assume for demonstration that (a) D is conservative (Barwise and Cooper, 1981), (b) S is a total function and does not contain a presupposition trigger.
- The former interpretation is $[\![\text{[D NP] } \lambda x_e \text{ . } S(x)]\!] = D(R)(S)$.
- We now want to show that the choice function abstraction variant, using the interpretational mechanisms above, yield this same interpretation:

  $[\![\mathcal{D}[\lambda f_{\text{cf}} \text{ . } S(f(R))]]\!] = D(A(\lambda f_{\text{cf}} \text{ . } S(f(R))))(B(\lambda f_{\text{cf}} \text{ . } S(f(R))))$

  - By definition, $A(\lambda f_{\text{cf}} \text{ . } S(f(R)))(z)$ iff $S(f_z(R))$ is defined. By assumption (b), the only way $S(f_z(R))$ might be undefined would be if $\neg R(z)$. So $A(\lambda f_{\text{cf}} \text{ . } S(f(R)))(z)$ iff $R(z)$.
  - By definition, $B(\lambda f_{\text{cf}} \text{ . } S(f(R)))(z)$ iff $S(f_z(R))$ is defined and true. Again, by assumption (b), the only way $S(f_z(R))$ might be undefined would be if $\neg R(z)$, and when defined, $S(f_z(R)) = S(z)$. So $B(\lambda f_{\text{cf}} \text{ . } S(f(R)))(z) = R(z) \wedge S(z)$.
  - Therefore $D(A(\lambda f_{\text{cf}} \text{ . } S(f(R))))(B(\lambda f_{\text{cf}} \text{ . } S(f(R)))) = D(R)(R \cap S)$. By conservativity (assumption (a)), $D(R)(R \cap S) = D(R)(S)$.

Notes:

- This demonstration assumes that S does not contain any other presupposition triggers. If the presupposition doesn't depend on the value of f, we're fine; either the whole structure is defined or not. If the presupposition depends on the value of f: This immediately gives us domain restriction by presupposition (e.g. *No student did her own homework*), which isn't an obviously bad result.
- A variant of this type shifter preserves the first, type $\langle e, t\rangle$ restrictor argument of D in $\mathcal{D}$, but intersects it with the set $A(S)$:

  (33) $\quad \text{D}_{\langle et, \langle et, t\rangle\rangle} \quad \mapsto \quad \lambda S_{\langle \text{cf}, t\rangle} \text{ . } \boldsymbol{\lambda \mathbf{X}_{\langle e,t\rangle}} \text{ . } \mathcal{D}(A(S) \cap \mathbf{X})(B(S))$

  In most cases where no NP is interpreted with D/$\mathcal{D}$, the first argument of $\mathcal{D}$ would then simply be the trivial restrictor (λx . 1) in place of the deleted NP. But this formulation allows for the late adjunction of restrictive modifiers to copies in a chain that are higher than the interpreted NP restrictor, and therefore retain the Lebeaux/Fox approach to argument/adjunct differences in Condition C reconstruction (Lebeaux, 1991; Fox, 1998; see also Takahashi and Hulsey 2009). We thank Stefan Keine for asking us about this possibility.

Appendix B: PF effects of trace conversion

As noted in Richards 2018, B-extraction bleeds nuclear stress assignment while A-extraction does not (see also Bresnan 1971 for other relevant examples and discussion):

(34) **Optional stress shift in A/B-ambiguous context:**

a. Which *books* has Helen written __?

b. Which books has Helen *written* __?

(35) **Stress shift obligatory in B-extraction (pg-licensing):**

a. *Which *books* has Helen written __ [without publishing $_{pg}$]?

b. Which books has Helen *written* __ [without publishing $_{pg}$]?

Note that weak pronouns in English generally resist being assigned nuclear stress even when they appear in a position in which stress could be assigned.

(36) **Weak pronouns resist stress:** (Bresnan, 1971)

a. Helen *teaches* it.

b. *Helen teaches *it*.

► Stress shift (35) is explained as the traces of B-extraction are akin to null pronouns.

- But for this to work, copy conversion will need to be quite early, since it feeds stress assignment. Conclusion: **Copy conversion isn't part of the LF branch.**
- We might wonder if there is a structural correlate for whether or not an element may be assigned nuclear stress, which would interact with our theory of copy conversion.
- Note that it is not just pronouns which resist being assigned nuclear stress. Certain "light" nominals also resist being assigned nuclear stress.

(37) a. Helen *taught* something.

b. *Helen taught *something*.

- Part of the theory of copy conversion here developed involves the NP restrictor of a B-extraction trace being replaced with a bindable identity function (following Fox 2002 and subsequent work).

- If this predicate is part of the class of "light" nominals, and thus may not be assigned stress, then we have an explanation for this property of B-extraction: lower copy conversion alters the trace so that it is an element which cannot be stressed, even when the trace is in a position to receive nuclear stress and is linked to an element which might bear nuclear stress.

Appendix C: Restrictions on B-extraction

► There is evidence which suggests that **overlapping Ā-dependencies must be of different extraction types**. In particular, two B-extractions cannot overlap.[6]

- Two relevant diagnostics for Postal extraction type: parasitic gap licensing (B-extraction behavior) and weak island sensitivity (A-extraction behavior).

- As noted in Pesetsky 1982, "inner" dependencies in nested Ā-configurations are restricted in ways that they normally are not. For example, the inner dependency in such a construction fails to license a parasitic gap, i.e. behaves unlike B-extraction:

  (38) *This Volvo is the kind of car [OP_i that I know who_j to persuade [owners of $\underline{pg}_j$] to talk to $\_\_\__j$ about$_i$]

- Further evidence comes from weak island configurations. As noted in Marantz 1994 (as reported in Richards 1999), the inner dependency in a nested Ā-configuration is locked into such an island.

  (39) a. *[Which congressman]$_i$ did you wonder [which lobbyist]$_j$ to inquire whether to send $\_\_\__j$ to $\_\_\__i$.

  b. [Which congressman]$_i$ did you wonder whether to inquire [which lobbyist]$_j$ to send $\_\_\__j$ to $\_\_\__i$.

  Weak island sensitivity is a signature of A-extraction, again suggesting that the inner dependency in these configurations cannot be B-extraction.

[6] The question of overlapping A-extractions is somewhat difficult to test, as the easiest way to set up such overlapping dependencies — embedded questions — are (perhaps independently) ruled out by the weak island sensitivity of A-extraction.

- None of this follows from the theory we've described here (unfortunately).
- One possibility for explaining the lack of overlapping B-extractions:
  - Different sorts of Ā-movement are triggered by different sorts of features, including an A-extraction feature and a B-extraction feature.
  - Nested B-extraction is out for relativized minimality/shortest/. . . reasons, since they're triggered by the same sort of feature.
  - Nesting A-extraction within B-extraction is allowed because movement is triggered by different features.
  - Nesting B-extraction within A-extraction is (potentially) out once a theory of the island sensitivity of A-extraction is developed.
- Perhaps more mysteriously, there are interactions between regular A-movement — of the type that an internal argument undergoes in the passive — and B-extraction.
- Legate (1998) notes that A-movement and B-extraction out of a ditransitive verb phrase aren't possible at the same time (B-extraction being forced by making the extracted element the licensor of a parasitic gap). As shown below, WCO in the ameliorative context seems to behave the same way: WCO emerges in just these configurations, WCO being a hallmark of A-extraction.

(40) a. Which painting$_i$ did John say that its$_i$ new owner bought on Tuesday?

b. *Which painting$_i$ did John say that its$_i$ new owner was sold on Tuesday?

- This seems less amenable to a featural analysis as suggested above.
  - Possibility: What fails is the moved elements correctly associating with/binding their own traces.
  - Takahashi and Hulsey (2009) develop a theory of A-movement for which A-traces look a lot like the traces of B-extraction as described here.
  - Idea: Either A-movement or B-extraction "tries" to bind both traces unselectively, as they are representationally equivalent up to indexing, leading to an uninterpretable structure.