Unifying Adjunct Islands and Freezing Effects in Minimalist Grammars

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TAG+10
Goal of This Talk

**Goal**

Present a unified account of two well-known conditions on extraction domains: the adjunct island effect and freezing effects.
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Present a unified account of two well-known conditions on extraction domains: the adjunct island effect and freezing effects.

Descriptively speaking, extraction is generally problematic out of

- adjoined/modifier constituents:
  
  (1)  
  a. Who do you think [that John saw ____]?  
  b. * Who do you sleep [because John saw ____]?

- constituents that have moved (“freezing”):

  (2)  
  a. Who did you send [a big heavy picture of ____] to John?  
  b. * Who did you send to John [a big heavy picture of ____]?

(Cattell, 1976; Huang, 1982; Wexler and Culicover, 1981)
Background and Contextualisation

- Islands are a major issue in “mainstream generative grammar” (Ross, 1969; Chomsky, 1973, 1986)
- TAGs have been used to argue that island constraints follow from independently-motivated properties of grammar (Kroch, 1987, 1989; Frank, 1992)
- MGs have been used to study the effects (on generative capacity) of stipulating island constraints (Gärtner and Michaelis, 2005, 2007)
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My proposal is in the spirit of the TAG work, aiming to derive empirically desirable effects from existing ideas:

- movement as re-merge (Epstein et al., 1998; Kitahara, 1997)
- adjuncts as “loosely attached” (Chametzky, 1996; Hornstein and Nunes, 2008) (motivated by neo-Davidsonian semantics (Parsons, 1990; Pietroski, 2005))
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My proposal is in the spirit of the TAG work, aiming to derive empirically desirable effects from existing ideas:

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The Plan

- develop a formalism incorporating these two ideas (building on Stabler 2006)
- show that in the resulting system it naturally emerges that adjoined constituents and moved constituents share a certain status
Outline

1. Overview of Stabler 2006's variant of MGs

2. Adding an Implementation of Adjunction

3. Empirical Payoff: Adjunct Islands and Freezing Effects Unified

4. Conclusion
Outline

1. **Overview of Stabler 2006’s variant of MGs**

2. **Adding an Implementation of Adjunction**

3. **Empirical Payoff: Adjunct Islands and Freezing Effects Unified**

4. **Conclusion**
“Destructive” and “Non-destructive” Displacement

The traditional conception of movement destroys certain previously-established structure:

\[
\text{see} :: +d+d-V \\
\text{merge ‘who’ to discharge object requirement} \rightarrow \text{see who} :: +d-V \\
\text{merge ‘we’ to discharge subject requirement} \rightarrow \text{we see who} :: -V \\
\text{...} \\
\text{did we see who} :: +\text{wh} \\
\text{move ‘who’ to discharge question requirement} \rightarrow \text{who did we see who}
\]
“Destructive” and “Non-destructive” Displacement

The traditional conception of movement destroys certain previously-established structure:

\[ \text{move ‘who’ to discharge question requirement } \rightarrow \text{who did we see who} \]
“Destructive” and “Non-destructive” Displacement

The traditional conception of movement destroys certain previously-established structure:

\[
did \, we \, see \, who :: + wh
\]

move ‘who’ to discharge question requirement \(\rightarrow\) \( who \, did \, we \, see \, who \)

Stabler (2006) formulates a “non-destructive” alternative:

\[
\langle \, see \, , \, \{\} \rangle
\]

insert ‘who’ \(\rightarrow\) \(\langle \, see \, , \, \{ \, who \} \rangle\)

discharge object requirement \(\rightarrow\) \(\langle \, see \, , \, \{ \, who \} \rangle\)

insert ‘we’ \(\rightarrow\) \(\langle \, see \, , \, \{ \, who \, , \, we \} \rangle\)

discharge subject requirement \(\rightarrow\) \(\langle \, we \, see \, , \, \{ \, who \} \rangle\)

\[\ldots\]

\[
\langle \, did \, we \, see \, , \, \{ \, who \} \rangle
\]

discharge question requirement \(\rightarrow\) \(\langle \, who \, did \, we \, see \, , \, \{\} \rangle\)
Some Definitions

A **unit** is a string along with a sequence of **requirements** and a sequence of **properties**

\[ U = \Sigma^* \times +F \times -F \]  
where \( F = \{d, V, \text{wh}, \ldots \} \)

eg.  *the::+n-d*,  *the dog::-d*,  *which dog::-d-wh*
Some Definitions

A **unit** is a string along with a sequence of **requirements** and a sequence of **properties**

\[ U = \Sigma^* \times +F \times -F \quad \text{where } F = \{d, V, wh, \ldots \} \]

e.g.  the:: +n-d ,  the dog:: −d ,  which dog:: −d-wh

An **expression** is a certain kind of collection of units

\[ E = U \times 2^U \quad \text{(this will be revised)} \]

e.g.  ⟨ the dog:: −d , \{\} ⟩ ,  ⟨ a picture of:: −d , \{ who:: −wh \} ⟩
Some Definitions

A **unit** is a string along with a sequence of **requirements** and a sequence of **properties**

\[ U = \Sigma^* \times +F \times -F \quad \text{where} \quad F = \{ d, V, wh, \ldots \} \]

eg.  *the*: +n-d,  *the dog*: -d,  *which dog*: -d-wh

An **expression** is a certain kind of collection of units

\[ E = U \times 2^U \quad \text{(this will be revised)} \]

eg.  \( \langle \, \text{the dog}: -d \, , \, \{ \} \, \rangle \, , \, \langle \, \text{a picture of}: -d \, , \, \{ \, \text{who}: -wh \, \} \, \rangle \)

Derivations proceed via two (partial) functions on expressions:

- **INS**: \( E \times E \rightarrow E \)
- **MRG**: \( E \rightarrow E \)
Some Definitions

Binary $$\text{INS} : E \times E \rightarrow E$$

Inserts units into the set component of an expression

$$\text{INS}\left( \langle u_0, \{ u_1, u_2, \ldots \} \rangle, \langle v_0, \{ v_1, v_2, \ldots \} \rangle \right) = \langle u_0, \{ u_1, u_2, \ldots, v_0, v_1, v_2, \ldots \} \rangle$$

Example:

$$\text{INS}\left( \langle \text{see}:: +d+d-V, \{\} \rangle, \langle \text{a picture of}:: -d, \{ \text{who}:: -\text{wh} \} \rangle \right)$$

$$= \langle \text{see}:: +d+d-V, \{ \text{a picture of}:: -d, \text{who}:: -\text{wh} \} \rangle$$
Some Definitions

**Binary** \( \text{INS} : \mathbb{E} \times \mathbb{E} \rightarrow \mathbb{E} \)

Inserts units into the set component of an expression

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\text{INS}\left( \langle u_0, \{u_1, u_2, \ldots \} \rangle, \langle v_0, \{v_1, v_2, \ldots \} \rangle \right) = \langle u_0, \{u_1, u_2, \ldots, v_0, v_1, v_2, \ldots \} \rangle
\]

Example:

\[
\text{INS}\left( \langle \text{see}:: +d+d-V, \{\} \rangle, \langle \text{a picture of}:: -d, \{ \text{who}:: -\text{wh} \} \rangle \right)
\]

\[
= \langle \text{see}:: +d+d-V, \{ \text{a picture of}:: -d, \text{who}:: -\text{wh} \} \rangle
\]

---

**Unary** \( \text{MRG} : \mathbb{E} \rightarrow \mathbb{E} \)

When applied to \( \langle u, \{u_1, u_2, \ldots \} \rangle \)

- checks a requirement (\( +f \)) of \( u \) against a property (\( -f \)) of a unique relevant \( u_i \)
- concatenates strings only if \( u_i \) has no remaining properties

Examples:

\[
\text{MRG}\left( \langle \text{see}:: +d+d-V, \{ \text{John}:: -d \} \rangle \right) = \langle \text{see \, John}:: +d-V, \{\} \rangle
\]

\[
\text{MRG}\left( \langle \text{see}:: +d+d-V, \{ \text{who}:: -d-\text{wh} \} \rangle \right) = \langle \text{see}:: +d-V, \{ \text{who}:: -\text{wh} \} \rangle
\]
A Derivation, More Formally

\[ e_1 \]
\[ e_2 = \text{INS}(e_1, \langle \text{who} :: -d-\text{wh}, \{\}\rangle) \]
\[ e_3 = \text{MRG}(e_2) \]
\[ e_4 = \text{INS}(e_3, \langle \text{we} :: -d, \{\}\rangle) \]
\[ e_5 = \text{MRG}(e_4) \]
\[ e_6 \]
\[ e_7 = \text{MRG}(e_6) \]

\[ = \langle \text{see} :: +d+d-V, \{\} \rangle \]
\[ = \langle \text{see} :: +d+d-V, \{ \text{who} :: -d-\text{wh} \} \rangle \]
\[ = \langle \text{see} :: +d-V, \{ \text{who} :: -\text{wh} \} \rangle \]
\[ = \langle \text{see} :: +d-V, \{ \text{who} :: -\text{wh}, \text{we} :: -d \} \rangle \]
\[ = \langle \text{we see} :: -V, \{ \text{who} :: -\text{wh} \} \rangle \]
\[ \ldots \]
\[ = \langle \text{did we see} :: +\text{wh}-c, \{ \text{who} :: -\text{wh} \} \rangle \]
\[ = \langle \text{who did we see} :: -c, \{\} \rangle \]
A Derivation, More Formally

\[
\begin{align*}
\text{e}_1 & = \langle \text{see} :: +d+d-V, \{\} \rangle \\
\text{e}_2 & = \text{INS}(\text{e}_1, \langle \text{who} :: -d-\text{wh}, \{\} \rangle) = \langle \text{see} :: +d+d-V, \{ \text{who} :: -d-\text{wh} \} \rangle \\
\text{e}_3 & = \text{MRG}(\text{e}_2) = \langle \text{see} :: +d-V, \{ \text{who} :: -\text{wh} \} \rangle \\
\text{e}_4 & = \text{INS}(\text{e}_3, \langle \text{we} :: -d, \{\} \rangle) = \langle \text{see} :: +d-V, \{ \text{who} :: -\text{wh}, \text{we} :: -d \} \rangle \\
\text{e}_5 & = \text{MRG}(\text{e}_4) = \langle \text{we see} :: -V, \{ \text{who} :: -\text{wh} \} \rangle \\
\text{e}_6 & = \langle \text{did we see} :: +\text{wh-c}, \{ \text{who} :: -\text{wh} \} \rangle \\
\text{e}_7 & = \text{MRG}(\text{e}_6) = \langle \text{who did we see} :: -c, \{\} \rangle 
\end{align*}
\]

- Notice that “merging steps” and “moving steps” are achieved by exactly the same mechanism.
- This is a result of including the operation that “inserts” units without checking features.
A Derivation, More Formally

\[ e_1 = \langle \text{see} :: +d+d-V , \{\} \rangle \]
\[ e_2 = \text{INS}(e_1, \langle \text{who} :: -d-\text{wh} , \{\} \rangle) = \langle \text{see} :: +d+d-V , \{ \text{who} :: -d-\text{wh} \} \rangle \]
\[ e_3 = \text{MRG}(e_2) = \langle \text{see} :: +d-V , \{ \text{who} :: -\text{wh} \} \rangle \]
\[ e_4 = \text{INS}(e_3, \langle \text{we} :: -d , \{\} \rangle) = \langle \text{see} :: +d-V , \{ \text{who} :: -\text{wh} , \text{we} :: -d \} \rangle \]
\[ e_5 = \text{MRG}(e_4) = \langle \text{we see} :: -V , \{ \text{who} :: -\text{wh} \} \rangle \]
\[ e_6 = \text{MRG}(e_5) = \langle \text{who did we see} :: -c , \{ \} \rangle \]

Notice that “merging steps” and “moving steps” are achieved by exactly the same mechanism.

This is a result of including the operation that “inserts” units without checking features.

This operation will also permit our implementation of adjunction.
Outline

1. Overview of Stabler 2006’s variant of MGs
2. Adding an Implementation of Adjunction
3. Empirical Payoff: Adjunct Islands and Freezing Effects Unified
4. Conclusion
Feature-checking and Composition

The existing \texttt{MRG} operation does two things:
- checks features, establishing head-argument relations
- composes (concatenates) yields

\[ \text{see} :: +d-V, \quad \text{John} :: -d \xrightarrow{\text{MRG}} \quad \text{see John} :: -V \]
Feature-checking and Composition

The existing \textsc{Mrg} operation does two things:
- checks features, establishing head-argument relations
- composes (concatenates) yields

\[
\text{see}:: +d-V, \quad \text{John}:: -d \quad \xrightarrow{\text{Mrg}} \quad \text{see John}:: -V
\]

We can instead divide this labour between two functions:
- \textsc{Mrg} checks features, establishing head-argument relations
- \textsc{Spl} composes (concatenates) yields

\[
\text{see}:: +d-V, \quad \text{John}:: -d \quad \xrightarrow{\text{Mrg}} \quad \text{see}:: -V \quad \xrightarrow{\text{Spl}} \quad \text{see John}:: -V
\]
Feature-checking and Composition

The existing MRG operation does two things:
- checks features, establishing head-argument relations
- composes (concatenates) yields

\[
\text{see} :: +d-V, \ John :: -d \xrightarrow{\text{MRG}} \text{see John} :: -V
\]

We can instead divide this labour between two functions:
- MRG checks features, establishing head-argument relations
- SPL composes (concatenates) yields

\[
\begin{tikzcd}
\text{see} :: +d-V, \ John :: -d \xrightarrow{\text{MRG}} & < \\
\text{see} :: -V \quad \text{John} \xrightarrow{\text{SPL}} \text{see John} :: -V
\end{tikzcd}
\]

This decoupling leaves room for certain constituents to contribute to (phonological) interpretation, without participating in head-argument relations — i.e. adjunction.
Phases/Cycles of Interpretation

This division of labour between MRG and SPL raises a question: “How often” should SPL apply, in the course of the derivation?
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Logical possibilities:

- after every MRG step \( \rightarrow \) “direct compositionality” (Barker and Jacobson, 2007)
- just once, at the end \( \rightarrow \) “single spellout” (Chomsky, 1995; Stabler, 1997)
- something in between \( \rightarrow \) “multiple spellout” (Uriagereka, 1999; Chomsky, 2001)
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I adopt a version of the third possibility where SPL applies at, and only at, the completion of each maximal projection.

Justification Omitted

To encode the “buffered” structure within the current maximal projection, we record a sequence of strings (the arguments’ yields) in our expressions:

$$E = U \times (\Sigma^*)^* \times 2^U$$

\[
\begin{align*}
E_1 &= \text{INS}((\text{the}::+n-d, \{\}), (\text{man}::-n, \{\})) = (\text{the}::+n-d, \{ \text{man}::-n \}) \\
E_2 &= \text{MRG}(E_1) = (\text{the}::-d, \text{man}, \{\}) \\
E_3 &= \text{SPL}(E_2) = (\text{the man}::-d, \{\}) \\
E_4 &= \text{INS}((\text{saw}::+d+d-V, \{\}), E_3) = (\text{saw}::+d+d-V, \{ \text{the man}::-d \}) \\
E_5 &= \text{MRG}(E_4) = (\text{saw}::+d-V, \text{the man}, \{\}) \\
E_6 &= \text{INS}(E_5, (\text{we}::-d, \{\})) = (\text{saw}::+d-V, \text{the man}, \{ \text{we}::-d \}) \\
E_7 &= \text{MRG}(E_6) = (\text{saw}::-V, \text{the man}, \text{we}, \{\}) \\
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Phases/Cycles of Interpretation

To encode the “buffered” structure within the current maximal projection, we record a sequence of strings (the arguments’ yields) in our expressions:

\[ E = U \times (\Sigma^*)^* \times 2^U \]

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e_1 = \text{INS}(\langle \text{the}::+n-d, \{\}\rangle, \langle \text{man}::-n, \{\}\rangle) = \langle \text{the}::+n-d, \{\text{man}::-n\}\rangle
\]

\[
e_2 = \text{MRG}(e_1) = \langle \text{the}::-d, \text{man}, \{\}\rangle
\]

\[
e_3 = \text{SPL}(e_2) = \langle \text{the man}::-d, \{\}\rangle
\]

\[
e_4 = \text{INS}(\langle \text{saw}::+d+d-V, \{\}\rangle, e_3) = \langle \text{saw}::+d+d-V, \{\text{the man}::-d\}\rangle
\]

\[
e_5 = \text{MRG}(e_4) = \langle \text{saw}::+d-V, \text{the man}, \{\}\rangle
\]

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e_6 = \text{INS}(e_5, \langle \text{we}::-d, \{\}\rangle) = \langle \text{saw}::+d-V, \text{the man}, \{\text{we}::-d\}\rangle
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e_7 = \text{MRG}(e_6) = \langle \text{saw}::-V, \text{the man}, \text{we}, \{\}\rangle
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e_8 = \text{SPL}(e_7) = \langle \text{we saw the man}::-V, \{\}\rangle
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Adjunction as (Just) Insertion

- Consider now a sentence with an adjunct:

  (3) We saw the man yesterday
Adjunction as (Just) Insertion

- Consider now a sentence with an adjunct:
  
  (3) We saw the man yesterday

- Before worrying about the adjunct, we have:

  ![Adjunction tree diagram]

- What shall we do with ‘yesterday’?
Adjunction as (Just) Insertion

Consider now a sentence with an adjunct:

(3) We saw the man yesterday

Before worrying about the adjunct, we have:

What shall we do with ‘yesterday’?

At least this:
Adjunction as (Just) Insertion

- Consider now a sentence with an adjunct:

  (3) We saw the man yesterday

- Before worrying about the adjunct, we have:

\[
\begin{array}{c}
> \\
\text{we} \\
< \\
\{ \} \\
\text{saw} :: -V \\
\text{the man}
\end{array}
\]

- What shall we do with 'yesterday'?
- At least this:

\[
\begin{array}{c}
> \\
\text{we} \\
< \\
\{ \text{yesterday} :: *V \} \\
\text{saw} :: -V \\
\text{the man}
\end{array}
\]

And I propose only this.
Adjunction as (Just) Insertion

\[ we \rightarrow \{ \} \]

\[ saw :: \neg V \quad \text{the man} \]

\[ \text{we saw the man ::} \neg V \quad \{ \} \]
Adjunction as (Just) Insertion

\[
\begin{array}{c}
\text{we} \\
\text{saw} :: -V \\
\text{the man}
\end{array}
\Rightarrow
\begin{align*}
\{ & \\
\text{we saw the man} :: -V & \{ & 
\end{align*}
\]

\[
\begin{array}{c}
\text{we} \\
\text{saw} :: -V \\
\text{the man}
\end{array}
\Rightarrow
\begin{align*}
\{ & \text{yesterday} :: *V & \\
\text{we saw the man yesterday} :: -V & \{ & 
\end{align*}
\]
Adjunction as (Just) Insertion

\[ \text{we saw the man} :: -V \}\]

\[ \text{we saw the man yesterday} :: -V \}\]

\[ \text{we saw yesterday} :: -V \}\]
Adjunction as (Just) Insertion

Semantic Side Note

This merely insertion in syntax corresponds to mere conjunction in semantics:

$$\exists e [seeing(e) \land Agent(e, \text{we}) \land Patient(e, \text{the-man}) \land yesterday(e)]$$

(Hornstein and Nunes, 2008; Hunter, 2010)
Outline

1 Overview of Stabler 2006’s variant of MGs

2 Adding an Implementation of Adjunction

3 Empirical Payoff: Adjunct Islands and Freezing Effects Unified

4 Conclusion
Adjuncts and Moving Things

(1) a. Who do you think [that John saw ____]?
b. * Who do you sleep [because John saw ____]?

(2) a. Who did you send [a big heavy picture of ____] to John?
b. * Who did you send to John [a big heavy picture of ____]?

From a complement:

```
<
  
think :: -V
  that John saw who :: c

{ who :: -wh }
```

From a complement:

```
<
  
send :: -V
  a big heavy picture of who :: d

{ who :: -wh }
```
Adjuncts and Moving Things

(1)  
  a. Who do you think [that John saw ____]?
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  b. * Who did you send to John [a big heavy picture of ____]?
Adjuncts and Moving Things

- It emerges that **moving constituents** and **adjuncts** are alike
- Slightly more precisely: **being merged into a non-final position** is relevantly like **being adjoined**

```
From an adjunct:

sleep :: -V { because John saw who :: *V,
who :: -wh }

From a moving thing:

<

send :: -V :: d { a big heavy picture of who :: -f,
who :: -wh }
```
It emerges that moving constituents and adjuncts are alike.

Slightly more precisely: being merged into a non-final position is relevantly like being adjoined.

Nothing currently rules out extraction from these domains.

But with the two kinds of domains unified, a single constraint will cover adjunct islands and freezing effects.
Adjuncts and Moving Things

- It emerges that moving constituents and adjuncts are alike.
- Slightly more precisely: being merged into a non-final position is relevantly like being adjoined.

From an adjunct:

\[
\text{sleep} :: -V \quad \{ \text{because John saw who} :: *V, \text{ who} :: -\text{wh} \} 
\]

From a moving thing:

\[
\text{send} :: -V \quad \text{:: d} \quad \{ \text{a big heavy picture of who} :: -f, \text{ who} :: -\text{wh} \} 
\]

- Nothing currently rules out extraction from these domains.
- But with the two kinds of domains unified, a single constraint will cover adjunct islands and freezing effects.

- I will first focus on extraction from adjuncts, and then show how the relevant difference between arguments and adjuncts also distinguishes in-situ constituents from moved ones.
Extraction from Adjuncts vs. Arguments

(1)  
a. Who do you think [that John saw ____]?

b. * Who do you sleep [because John saw ____]?

Extraction from an argument (1a):

\[
\langle \text{that John saw::-c}, \{ \text{who::-wh} \} \rangle
\]

INS \[\rightarrow\] \[
\langle \text{think::+c-V}, \{ \text{that John saw::-c}, \text{who::-wh} \} \rangle
\]

MRG \[\rightarrow\] \[
\langle \text{think::-V}, \text{that John saw}, \{ \text{who::-wh} \} \rangle
\]

SPL \[\rightarrow\] \[
\langle \text{think that John saw::-V}, \{ \text{who::-wh} \} \rangle
\]
Extraction from Adjuncts vs. Arguments

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\text{INS} \rightarrow \langle \text{think} :: +c-V , \{ \text{that John saw} :: -c , \text{who} :: -wh \} \rangle \\
\text{MRG} \rightarrow \langle \text{think} :: -V , \text{that John saw} , \{ \text{who} :: -wh \} \rangle \\
\text{SPL} \rightarrow \langle \text{think that John saw} :: -V , \{ \text{who} :: -wh \} \rangle \\
\]

Extraction from an adjunct (1b) (incorrectly permitted, at the moment):

\[
\langle \text{because John saw} :: *V , \{ \text{who} :: -wh \} \rangle \\
\text{INS} \rightarrow \langle \text{sleep} :: -V , \{ \text{because John saw} :: *V , \text{who} :: -wh \} \rangle \\
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\[
\text{INS} \quad \rightarrow \quad \langle \text{think} :: +c-V , \{ \text{that John saw} :: -c , \text{who} :: -wh \} \rangle
\]

\[
\text{MRG} \quad \rightarrow \quad \langle \text{think} :: -V , \text{that John saw} , \{ \text{who} :: -wh \} \rangle
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\[
\text{SPL} \quad \rightarrow \quad \langle \text{think that John saw} :: -V , \{ \text{who} :: -wh \} \rangle
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\text{INS} \quad \rightarrow \quad \langle \text{sleep} :: -V , \{ \text{because John saw} :: *V , \text{who} :: -wh \} \rangle
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\text{SPL} \quad \rightarrow \quad \langle \text{sleep because John saw} :: -V , \{ \text{who} :: -wh \} \rangle
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The ability of ‘who’ to merge into higher positions should be contingent upon the merging of ‘that/because John saw’ into an argument position.
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\[
\langle \text{because John saw} :: *V , \ \{ \text{who} :: -wh \} \rangle
\]

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SPL \[\rightarrow\] \[\langle \text{sleep because John saw} :: -V , \ \{ \text{who} :: -wh \} \rangle\]

- The ability of ‘who’ to merge into higher positions should be contingent upon the merging of ‘that/because John saw’ into an argument position.
- But at the moment, the relationship between these two units is destroyed too early.
Retaining More Structure

We can reconstrue \( \langle a, \{ b, c, d, e \} \rangle \) as a tree with root \( a \) and children \( b, c, d, e \)

\[
\begin{array}{c}
a \\
\downarrow \\
b \\
\downarrow \\
c \\
\downarrow \\
d \\
\downarrow \\
e \\
\end{array}
\]

Thus the (licit) extraction from arguments, previously written like this . . .

\[
\langle \text{that John saw}::-c , \{ \text{who}::-\text{wh} \} \rangle \\
\text{INS} \rightarrow \langle \text{think}::+c-V , \{ \text{that John saw}::-c , \text{who}::-\text{wh} \} \rangle \\
\text{Mrg} \rightarrow \langle \text{think}::-V , \text{that John saw} , \{ \text{who}::-\text{wh} \} \rangle \\
\text{SPl} \rightarrow \langle \text{think that John saw}::-V , \{ \text{who}::-\text{wh} \} \rangle
\]

. . . will be re-written like this:

\[
\begin{array}{c}
\text{that John saw}::-c \\
\mid \\
\text{who}::-\text{wh} \\
\downarrow \\
\text{that John saw}::-c \\
\mid \\
\text{who}::-\text{wh} \\
\end{array}
\quad
\begin{array}{c}
\text{think}::+c-V \\
\end{array}
\quad
\begin{array}{c}
\text{think}::-V , \text{that John saw} \\
\mid \\
\text{who}::-\text{wh} \\
\end{array}
\quad
\begin{array}{c}
\text{think that John saw}::-V \\
\mid \\
\text{who}::-\text{wh} \\
\end{array}
\]
Let us modify the INS operation, such that we retain the relationship between ‘who’ and ‘that/because John saw’ for longer:
Retaining More Structure

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- for INS

<table>
<thead>
<tr>
<th>that John saw :: -c</th>
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<th>think :: -V, that John saw</th>
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</tr>
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<td>who :: -wh</td>
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- for MRG

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<td>who :: -wh</td>
<td>who :: -wh</td>
</tr>
</tbody>
</table>

- for SPL

<table>
<thead>
<tr>
<th>because John saw :: *V</th>
<th>INS</th>
<th>sleep :: -V</th>
<th>SPL</th>
<th>???</th>
</tr>
</thead>
<tbody>
<tr>
<td>who :: -wh</td>
<td>INS</td>
<td>because John saw :: *V</td>
<td>SPL</td>
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</tbody>
</table>
Retaining More Structure

Let us modify the *INS* operation, such that we *retain the relationship between* ‘who’ and ‘that/because John saw’ for longer:

Prohibiting Extraction from Adjuncts

*SPL* can not apply if there exist units at a distance $\geq 2$ from the root.
Freezing Effects

(4) * Who did [a picture of ____] fall on the floor?

(5) A picture of John fell on the floor

For illustration, I assume that (4) is ruled out because the subject is frozen as a result of movement for Case/EPP reasons.

First consider (5), a complex subject without extraction:

\[
\begin{align*}
a \text{ picture of John} &\rightarrow -d-k & \text{INS} & \quad \text{fall} &\rightarrow +d-V & \text{MRG} & \quad \text{fall} &\rightarrow -V \\
\downarrow & & & a \text{ picture of John} &\rightarrow -d-k & & a \text{ picture of John} &\rightarrow -k
\end{align*}
\]
**Freezing Effects**

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```
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\text{a picture of John} & \quad \text{INS} \quad \text{MRG} \quad \text{SPL} \\
\end{align*}
\]
```

Crucially, the subject remains separated from the root just as adjuncts do.
- Therefore extraction from the subject is ruled out via the constraint introduced above:

```
\[
\begin{align*}
\text{a picture of John} & \quad \text{INS} \quad \text{fall} \quad \text{MRG} \quad \text{fall} \\
\text{a picture of John} & \quad \text{INS} \quad \text{MRG} \\
\end{align*}
\]
```

- who :: -wh
- who :: -wh
- who :: -wh
**Summary: Non-final positions \( \approx \) adjoined positions**

### A Single Constraint on SPL

SPL can not apply if there exist units at a distance \( \geq 2 \) from the root.

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<td>who :: -wh</td>
<td>that John saw :: -c</td>
<td>who :: -wh</td>
<td>who :: -wh</td>
</tr>
<tr>
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because John saw :: *V  

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fall :: -V  

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<th>fall :: +d-V</th>
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Goal

Present a unified account of two well-known conditions on extraction domains: the adjunct island effect and freezing effects.
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- Developed an independently justified implementation of adjunction.
  - parsimonious fit with move as re-merge
  - motivated by semantic composition

- It follows from this implementation of adjunction that adjuncts and moving constituents are the same kind of thing.
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Goal

Present a unified account of two well-known conditions on extraction domains: the adjunct island effect and freezing effects.

- Developed an independently justified implementation of adjunction.
  - parsimonious fit with move as re-merge
  - motivated by semantic composition
- It follows from this implementation of adjunction that adjuncts and moving constituents are the same kind of thing.
- They both remain “disconnected” beyond the point where they are inserted.
  - adjuncts remain disconnected because they never become connected
  - moving constituents remain disconnected in order to re-merge later
- As a result, the two (seemingly unrelated) conditions on extraction domains can be reconstrued as one.
References


Subject islands and freezing effects

(6)  a. Who is there a picture of on the wall?
    b. * Who is a picture of on the wall?

(7)  a. Was haben denn für Ameisen einen Postbeamten gebissen?
    b. * Was haben für Ameisen denn einen Postbeamten gebissen?
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(7)  a. Was haben denn für Ameisen einen Postbeamten gebissen?
b. * Was haben für Ameisen denn einen Postbeamten gebissen?

(6)  a. Who is there [vP [a picture of who] on the wall] ?
b. * Who is a [picture of who] [vP [a picture of who] on the wall] ?

(7)  a. Was haben denn [vP [was für Ameisen] einen Postbeamten gebissen] ?
b. * Was haben [was für Ameisen] denn [vP [was für Ameisen] einen Postbeamten gebissen] ?