Unifying Adjunct Islands and Freezing Effects in Minimalist Grammars

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TAG+10

Goal of This Talk

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

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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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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

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"Destructive" and "Non-destructive" Displacement

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

	see :: `+d+d-V`
merge 'who' to discharge object requirement $\longrightarrow$	*see who* :: `+d-V`
merge 'we' to discharge subject requirement $\longrightarrow$	*we see who* :: `-V`
	...
	did we see who :: `+wh`
move 'who' to discharge question requirement $\longrightarrow$	*who did we see ~~who~~*

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$$\begin{array}{rl} & \textit{did we see who} :: \texttt{+wh} \\ \text{move `who' to discharge question requirement} \longrightarrow & \textit{who did we see } \cancel{\textit{who}} \end{array}$$

Stabler (2006) formulates a "non-destructive" alternative:

$$\begin{array}{rl} & \langle \textit{ see },\ \{\}\rangle \\ \text{insert `who'} \longrightarrow & \langle \textit{ see },\ \{ \textit{ who } \}\rangle \\ \text{discharge object requirement} \longrightarrow & \langle \textit{ see },\ \{ \textit{ who } \}\rangle \\ \text{insert `we'} \longrightarrow & \langle \textit{ see },\ \{ \textit{ who },\ \textit{we } \}\rangle \\ \text{discharge subject requirement} \longrightarrow & \langle \textit{ we see },\ \{ \textit{ who } \}\rangle \\ & \ldots \\ & \langle \textit{ did we see },\ \{ \textit{ who } \}\rangle \\ \text{discharge question requirement} \longrightarrow & \langle \textit{ who did we see },\ \{\}\rangle \end{array}$$

Some Definitions

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

$$\mathbb{U} = \Sigma^* \times \texttt{+}\mathbb{F} \times \texttt{-}\mathbb{F} \qquad \text{where } \mathbb{F} = \{\texttt{d}, \texttt{V}, \texttt{wh}, \dots\}$$

eg. *the* :: $\texttt{+n-d}$, *the dog* :: $\texttt{-d}$, *which dog* :: $\texttt{-d-wh}$

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$$\mathbb{E} = \mathbb{U} \times \mathbf{2}^{\mathbb{U}} \qquad \text{(this will be revised)}$$

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Derivations proceed via two (partial) functions on expressions:

- $\mathrm{INS} : \mathbb{E} \times \mathbb{E} \longrightarrow \mathbb{E}$
- $\mathrm{MRG} : \mathbb{E} \longrightarrow \mathbb{E}$

Some Definitions

Binary $\textsc{ins} : \mathbb{E} \times \mathbb{E} \rightarrow \mathbb{E}$

Inserts units into the set component of an expression

$$\textsc{ins}\Big(\langle u_0,\ \{u_1, u_2, \ldots\}\rangle, \langle v_0,\ \{v_1, v_2, \ldots\}\rangle\Big) = \langle u_0,\ \{u_1, u_2, \ldots, v_0, v_1, v_2, \ldots\}\rangle$$

Example:

$$\begin{aligned}\textsc{ins}\Big(\langle\, \textit{see} :: \texttt{+d+d-V}\,,\ \{\}\rangle, \langle\, \textit{a picture of} :: \texttt{-d}\,,\ \{\, \textit{who} :: \texttt{-wh}\,\}\rangle\Big)\\ = \langle\, \textit{see} :: \texttt{+d+d-V}\,,\ \{\, \textit{a picture of} :: \texttt{-d}\,,\ \textit{who} :: \texttt{-wh}\,\}\rangle\end{aligned}$$

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Unary $\textsc{mrg} : \mathbb{E} \rightarrow \mathbb{E}$

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:

$$\textsc{mrg}\big(\langle\, \textit{see} :: \texttt{+d+d-V}\ ,\ \{\ \textit{John} :: \texttt{-d}\ \}\rangle\big) = \langle\, \textit{see John} :: \texttt{+d-V}\ ,\ \{\}\rangle$$

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- This is a result of including the operation that "inserts" units without checking features.
- This operation will also permit our implementation of adjunction.

Outline

Feature-checking and Composition

The existing MRG operation does two things:

- checks features, establishing head-argument relations
- composes (concatenates) yields

$$\textit{see} :: \texttt{+d-V} \; , \; \textit{John} :: \texttt{-d} \xrightarrow{\text{MRG}} \textit{see John} :: \texttt{-V}$$

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We can instead divide this labour between two functions:

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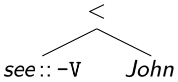

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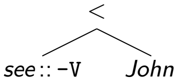

$$\xrightarrow{\text{SPL}} \textit{see John} :: \texttt{-V}$$

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

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Logical possibilities:

- after every MRG step $\longrightarrow$ "direct compositionality" (Barker and Jacobson, 2007)
- just once, at the end $\longrightarrow$ "single spellout" (Chomsky, 1995; Stabler, 1997)
- something in between $\longrightarrow$ "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

Justification for the choice of maximal projections as cycles of interpretation comes from a restrictive, independently-motivated theory of neo-Davidsonian semantic composition. (Parsons, 1990; Krifka, 1992; Schein, 1993) (Pietroski, 2005, 2006; Hunter, 2010)

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

$$\mathbb{E} = \mathbb{U} \times (\Sigma^*)^* \times \mathbf{2}^{\mathbb{U}}$$

$$\begin{aligned}
e_1 &= \textsc{ins}(\langle\, \textit{the} :: \texttt{+n-d}\,,\ \{\}\rangle\,,\langle\, \textit{man} :: \texttt{-n}\,,\ \{\}\rangle) && = \langle\, \textit{the} :: \texttt{+n-d}\,,\ \{\ \textit{man} :: \texttt{-n}\ \}\rangle \\
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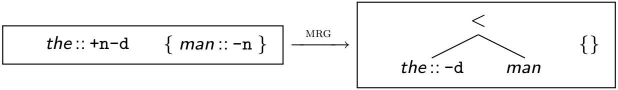

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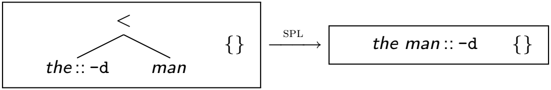

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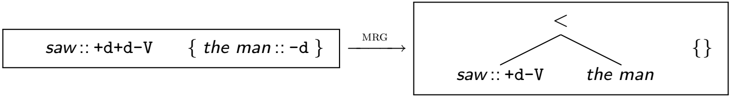

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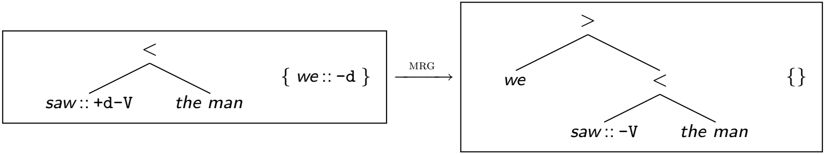
e_8 &= \text{SPL}(e_7) && = \langle \textit{we saw the man} :: \texttt{-V}\ ,\ \{\}\rangle
\end{aligned}
$$



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:

$$\mathbb{E} = \mathbb{U} \times (\Sigma^*)^* \times \mathbf{2}^{\mathbb{U}}$$

$$\begin{array}{lll}
e_1 = \text{INS}(\langle \textit{the} :: \texttt{+n-d}\ ,\ \{\}\rangle, \langle \textit{man} :: \texttt{-n}\ ,\ \{\}\rangle) & = \langle \textit{the} :: \texttt{+n-d}\ ,\ \{\ \textit{man} :: \texttt{-n}\ \}\rangle \\
e_2 = \text{MRG}(e_1) & = \langle \textit{the} :: \texttt{-d}\ ,\ \textit{man}\ ,\ \{\}\rangle \\
e_3 = \text{SPL}(e_2) & = \langle \textit{the man} :: \texttt{-d}\ ,\ \{\}\rangle \\
e_4 = \text{INS}(\langle \textit{saw} :: \texttt{+d+d-V}\ ,\ \{\}\rangle, e_3) & = \langle \textit{saw} :: \texttt{+d+d-V}\ ,\ \{\ \textit{the man} :: \texttt{-d}\ \}\rangle \\
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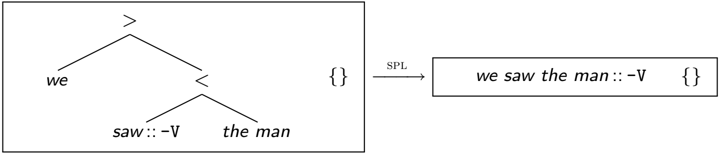

Adjunction as (Just) Insertion

- Consider now a sentence with an adjunct:

(3) We saw the man yesterday

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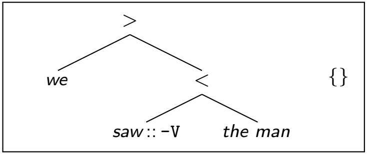

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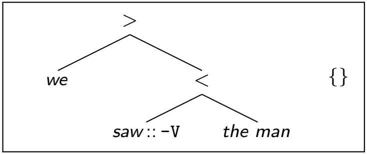

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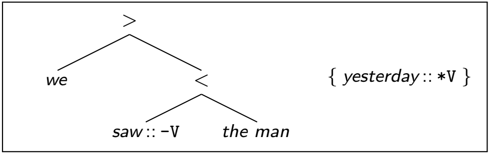
- At least this:



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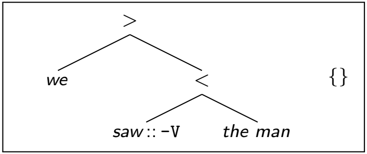

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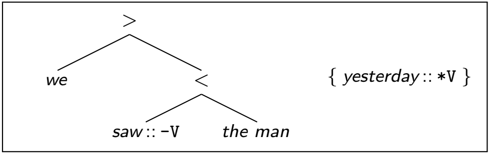
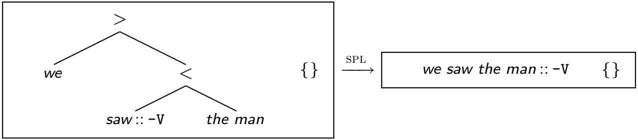


And I propose **only** this.

Adjunction as (Just) Insertion



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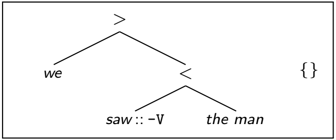
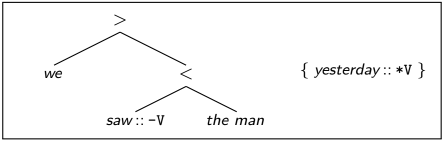


$\xrightarrow{\text{SPL}}$ *we saw the man* :: `-V` {}



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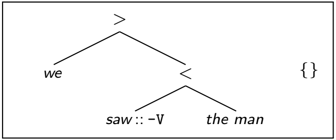

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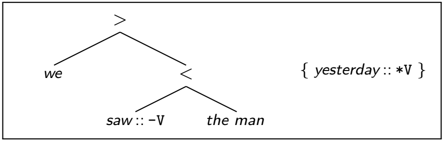

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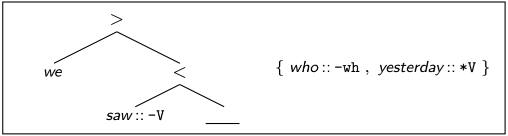
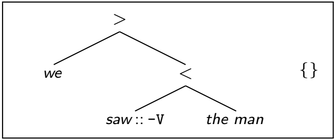


$\xrightarrow{\text{SPL}}$ *we saw yesterday* :: `-V` { *who* :: `-wh` }

Adjunction as (Just) Insertion



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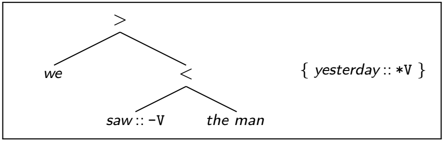

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Semantic Side Note

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

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

(Hornstein and Nunes, 2008; Hunter, 2010)

Outline

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?

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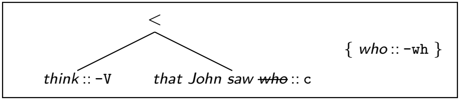
From a complement:



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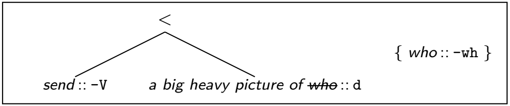

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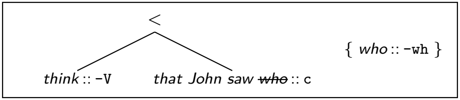

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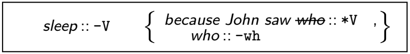

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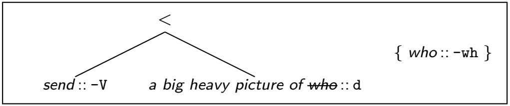
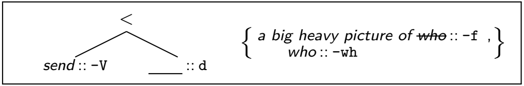


From a moving thing:



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 $\left\{ \begin{array}{l} \textit{because John saw } \cancel{\textit{who}} :: \texttt{*V} \;, \\ \quad \textit{who} :: \texttt{-wh} \end{array} \right\}$

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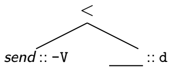

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From a moving thing:

<

send :: `-V` ____ :: `d`

$\left\{ \begin{array}{l} \textit{a big heavy picture of } \cancel{\textit{who}} :: \texttt{-f} \\ \quad \textit{who} :: \texttt{-wh} \end{array} , \right\}$

- 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

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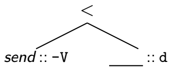

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- Nothing currently rules out extraction from these domains
- But with the two kinds of domains unified, a single constraint will cover adjunct islands and freezing effects

- 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):

$$
\begin{aligned}
& \langle\ \textit{that John saw} :: \texttt{-c}\ ,\ \{\ \textit{who} :: \texttt{-wh}\ \}\rangle \\
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Extraction from an adjunct (1b) (incorrectly permitted, at the moment):

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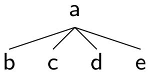
- The ability of ‘who’ to merge into higher positions should be contingent upon the merging of ‘that/because John saw’ into an argument position.
- But at the moment, the relationship between these two units is destroyed too early.

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



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

$$
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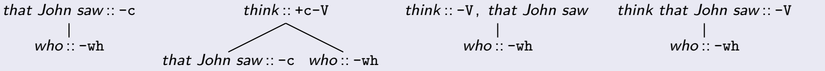
\end{array}
$$

... will be re-written like this:



Retaining More Structure

$$\begin{array}{c} \textit{that John saw} :: \texttt{-c} \\ | \\ \textit{who} :: \texttt{-wh} \end{array} \qquad \begin{array}{c} \textit{think} :: \texttt{+c-V} \\ \swarrow \quad \searrow \\ \textit{that John saw} :: \texttt{-c} \quad \textit{who} :: \texttt{-wh} \end{array} \qquad \begin{array}{c} \textit{think} :: \texttt{-V}\,,\ \textit{that John saw} \\ | \\ \textit{who} :: \texttt{-wh} \end{array} \qquad \begin{array}{c} \textit{think that John saw} :: \texttt{-V} \\ | \\ \textit{who} :: \texttt{-wh} \end{array}$$

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

$$\begin{array}{c} \textit{that John saw} :: \texttt{-c} \\ | \\ \textit{who} :: \texttt{-wh} \end{array} \xrightarrow{\text{INS}} \begin{array}{c} \textit{think} :: \texttt{+c-V} \\ | \\ \textit{that John saw} :: \texttt{-c} \\ | \\ \textit{who} :: \texttt{-wh} \end{array} \xrightarrow{\text{MRG}} \begin{array}{c} \textit{think} :: \texttt{-V}\,,\ \textit{that John saw} \\ | \\ \textit{who} :: \texttt{-wh} \end{array} \xrightarrow{\text{SPL}} \begin{array}{c} \textit{think that John saw} :: \texttt{-V} \\ | \\ \textit{who} :: \texttt{-wh} \end{array}$$

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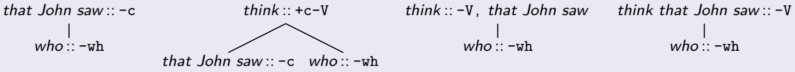

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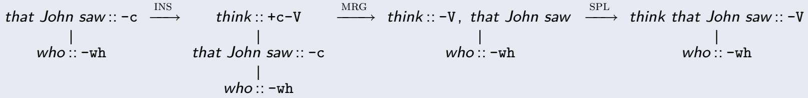

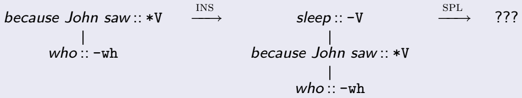

Retaining More Structure

that John saw :: `-c`
|
who :: `-wh`

think :: `+c-V`
/ \
that John saw :: `-c` *who* :: `-wh`

think :: `-V`, *that John saw*
|
who :: `-wh`

think that John saw :: `-V`
|
who :: `-wh`

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

that John saw :: `-c` | *who* :: `-wh` $\xrightarrow{\text{INS}}$ *think* :: `+c-V` | *that John saw* :: `-c` | *who* :: `-wh` $\xrightarrow{\text{MRG}}$ *think* :: `-V`, *that John saw* | *who* :: `-wh` $\xrightarrow{\text{SPL}}$ *think that John saw* :: `-V` | *who* :: `-wh`

because John saw :: `*V` | *who* :: `-wh` $\xrightarrow{\text{INS}}$ *sleep* :: `-V` | *because John saw* :: `*V` | *who* :: `-wh` $\xrightarrow{\text{SPL}}$ ✗

Prohibiting Extraction from Adjuncts

SPL can not apply if there exist units at a distance ≥ 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:

$$\textit{a picture of John} :: \texttt{-d-k} \xrightarrow{\text{INS}} \begin{array}{c} \textit{fall} :: \texttt{+d-V} \\ | \\ \textit{a picture of John} :: \texttt{-d-k} \end{array} \xrightarrow{\text{MRG}} \begin{array}{c} \textit{fall} :: \texttt{-V} \\ | \\ \textit{a picture of John} :: \texttt{-k} \end{array}$$

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- 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:

$$\begin{array}{c} \textit{a picture of} :: \texttt{-d-k} \\ | \\ \textit{who} :: \texttt{-wh} \end{array} \xrightarrow{\text{INS}} \begin{array}{c} \textit{fall} :: \texttt{+d-V} \\ | \\ \textit{a picture of} :: \texttt{-d-k} \\ | \\ \textit{who} :: \texttt{-wh} \end{array} \xrightarrow{\text{MRG}} \begin{array}{c} \textit{fall} :: \texttt{-V} \\ | \\ \textit{a picture of} :: \texttt{-k} \\ | \\ \textit{who} :: \texttt{-wh} \end{array} \xrightarrow{\text{SPL}} ✗$$

Summary: Non-final positions ≈ adjoined positions

A Single Constraint on SPL

SPL can not apply if there exist units at a distance ≥ 2 from the root.

$$\begin{array}[t]{c}\textit{that John saw} :: \texttt{-c}\\ | \\ \textit{who} :: \texttt{-wh}\end{array} \qquad \begin{array}[t]{c}\textit{think} :: \texttt{+c-V}\\ | \\ \textit{that John saw} :: \texttt{-c}\\ | \\ \textit{who} :: \texttt{-wh}\end{array} \qquad \begin{array}[t]{c}\textit{think} :: \texttt{-V}\,,\ \textit{that John saw}\\ | \\ \textit{who} :: \texttt{-wh}\end{array} \xrightarrow{\text{SPL}} \begin{array}[t]{c}\textit{think that John saw} :: \texttt{-V}\\ | \\ \textit{who} :: \texttt{-wh}\end{array}$$

$$\begin{array}[t]{c}\textit{because John saw} :: \texttt{*V}\\ | \\ \textit{who} :: \texttt{-wh}\end{array} \qquad \begin{array}[t]{c}\textit{sleep} :: \texttt{-V}\\ | \\ \textit{because John saw} :: \texttt{*V}\\ | \\ \textit{who} :: \texttt{-wh}\end{array} \xrightarrow{\text{SPL}} ✗$$

$$\begin{array}[t]{c}\textit{a picture of} :: \texttt{-d-k}\\ | \\ \textit{who} :: \texttt{-wh}\end{array} \qquad \begin{array}[t]{c}\textit{fall} :: \texttt{+d-V}\\ | \\ \textit{a picture of} :: \texttt{-d-k}\\ | \\ \textit{who} :: \texttt{-wh}\end{array} \qquad \begin{array}[t]{c}\textit{fall} :: \texttt{-V}\\ | \\ \textit{a picture of} :: \texttt{-k}\\ | \\ \textit{who} :: \texttt{-wh}\end{array} \xrightarrow{\text{SPL}} ✗$$

Outline

Conclusion

Goal

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

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

Conclusion

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 I

Barker, C. and Jacobson, P., editors (2007). *Direct Compositionality*. Oxford University Press, Oxford.

Cattell, R. (1976). Constraints on movement rules. *Language*, 52(1):18–50.

Chametzky, R. A. (1996). *A Theory of Phrase Markers and the Extended Base*. State University of New York Press, Albany, NY.

Chomsky, N. (1973). Conditions on transformations. In Anderson, S. R. and Kiparsky, P., editors, *A Festschrift for Morris Halle*, pages 232–286. Holt, Rinehart and Winston, New York.

Chomsky, N. (1986). *Barriers*. MIT Press, Cambridge, MA.

Chomsky, N. (1995). *The Minimalist Program*. MIT Press, Cambridge, MA.

Chomsky, N. (2001). Derivation by phase. In Kenstowicz, M. J., editor, *Ken Hale: A Life in language*. MIT Press, Cambridge, MA.

Epstein, S. D., Groat, E., Kawashima, R., and Kitahara, H. (1998). *A Derivational Approach to Syntactic Relations*. Oxford University Press, Oxford.

Frank, R. (1992). *Syntactic Locality and Tree Adjoining Grammar*. PhD thesis, University of Pennsylvania.

Gärtner, H.-M. and Michaelis, J. (2005). A note on the complexity of constraint interaction: Locality conditions and Minimalist Grammars. In Blache, P., Stabler, E. P., Busquets, J., and Moot, R., editors, *Logical Aspects of Computational Linguistics*, volume 3492 of *Lecture Notes in Computer Science*, pages 114–130. Springer.

Gärtner, H.-M. and Michaelis, J. (2007). Locality conditions and the complexity of Minimalist Grammars: A preliminary survey. In *Model-Theoretic Syntax at 10,* Proceedings of the ESSLLI Workshop (Dublin), pages 87–98.

Hornstein, N. and Nunes, J. (2008). Adjunction, labeling, and bare phrase structure. *Biolinguistics*, 2(1):57–86.

Huang, C. T. J. (1982). *Logical relations in Chinese and the theory of grammar*. PhD thesis, MIT.

Hunter, T. (2010). *Relating Movement and Adjunction in Syntax and Semantics*. PhD thesis, University of Maryland.

Kitahara, H. (1997). *Elementary Operations and Optimal Derivations*. MIT Press, Cambridge, MA.

References II

Krifka, M. (1992). Thematic relations as links between nominal reference and temporal constitution. In Sag, I. A. and Szabolcsi, A., editors, *Lexical Matters*. CSLI Publications, Stanford, CA.

Kroch, A. (1987). Unbounded dependencies and subjacency in tree adjoining grammar. In Manaster-Ramer, A., editor, *Mathematics of Language*, pages 143–172. John Benjamins, Amsterdam.

Kroch, A. (1989). Asymmetries in long distance extraction in tree adjoining grammar. In Baltin, M. and Kroch, A., editors, *Alternative conceptions of phrase structure*, pages 66–98. University of Chicago Press, Chicago.

Parsons, T. (1990). *Events in the semantics of English*. MIT Press, Cambridge, MA.

Pietroski, P. M. (2005). *Events and Semantic Architecture*. Oxford University Press, Oxford.

Pietroski, P. M. (2006). Interpreting concatenation and concatenates. *Philosophical Issues*, 16(1):221–245.

Ross, J. R. (1969). *Constraints on Variables in Syntax*. PhD thesis, MIT.

Schein, B. (1993). *Plurals and Events*. MIT Press, Cambridge, MA.

Stabler, E. P. (1997). Derivational minimalism. In Retoré, C., editor, *Logical Aspects of Computational Linguistics*, volume 1328 of *Lecture Notes in Computer Science*, pages 68–95. Springer.

Stabler, E. P. (2006). Sidewards without copying. In Monachesi, P., Penn, G., Satta, G., and Wintner, S., editors, *Proceedings of the 11th Conference on Formal Grammar*.

Uriagereka, J. (1999). Multiple spell-out. In Epstein, S. D. and Hornstein, N., editors, *Working Minimalism*, pages 251–282. MIT Press, Cambridge, MA.

Wexler, K. and Culicover, P. (1981). *Formal Principles of Language Acquisition*. MIT Press, Cambridge, MA.

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?

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?

(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] ?