The Price of Freedom: Why Adjuncts are Islands

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Outline

The Talk in a Nutshell

(1) a. Which book did John complain that he lost?
b. * Which book did John complain **because he lost**?
c. * Which book did John complain **after losing**?

Take-Home Message

Why do adjuncts constitute islands?
Because they are not as tightly integrated as arguments.

Adjuncts in the Literature

Adjuncts . . .

- have no special operational status (CG; Cinque 1999),
- are pair-merged (Chomsky 1995),
- are late-merged (Stepanov 2001),
- are inserted but not merged immediately (Hunter 2012),
- involve asymmetric feature checking (Frey and Gärtner 2002),

⋮

Problem

Can we abstract away from these details?
Properties that hold of every conceivable implementation?

Two Surface Properties of Adjuncts

- **Optionality**
  Adjuncts can be omitted.
  (2) **(Obviously)** I will **(easily)** ace this **((very) challenging)** exam **(because I (really) am that smart)**.
- **Independence**
  Independently well-formed adjuncts can be combined.
  (3) a. **Obviously** I will ace this exam.
  b. I will **easily** ace this exam.
  c. **Obviously** I will **easily** ace this exam.

Definition (Adjuncts)

Phrase marker *a* is an **Adjunct** iff it is optional and independent.

Adjunct Extension

What do these properties tell us about grammars with Adjuncts?
What is the general shape of the **generated language**?

Definition (Adjunct Extensions)

Let **s** and **t** be (multi-dominance) trees.
Then **t** is an **Adjunct extension** of **s** for grammar G ($\mathbf{s} <_G \mathbf{t}$) iff **t** is the result of inserting one or more Adjuncts of G in **s**.

Example

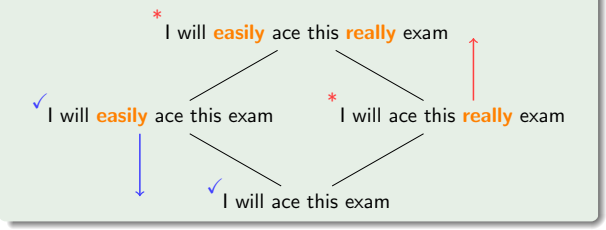
- **Obviously** I will ace this exam $<_G$ **Obviously** I will **easily** ace this exam
- I will ace this exam $<_G$ **Obviously** I will **easily** ace this exam
- **Obviously** I will ace this exam $\not<_G$ I will **easily** ace this exam
- I will ace this exam $\not<_G$ I will **easily** ace this test
- exam will this I ace $<_G$ **easily** exam will this I ace

Characterizing Adjunct Languages

Theorem (Optionality Closure)

If **t** *is an Adjunct extension of* **s** *for* G *and* G *generates* **t**, *then* G *generates* **s**.

Example

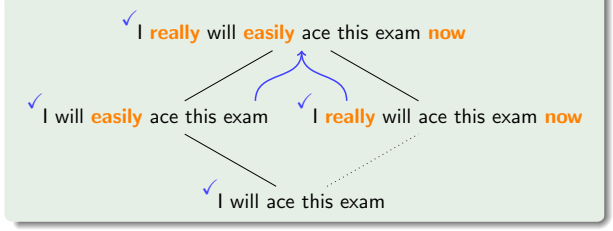


Characterizing Adjunct Languages

Theorem (Independence Closure)

For **s** *and* **t** *adjunct extensions of some tree,* G *generates the "fusion" of* **s** *and* **t** ($\mathbf{s} \vee \mathbf{t}$) *if it generates both* **s** *and* **t**.

Example



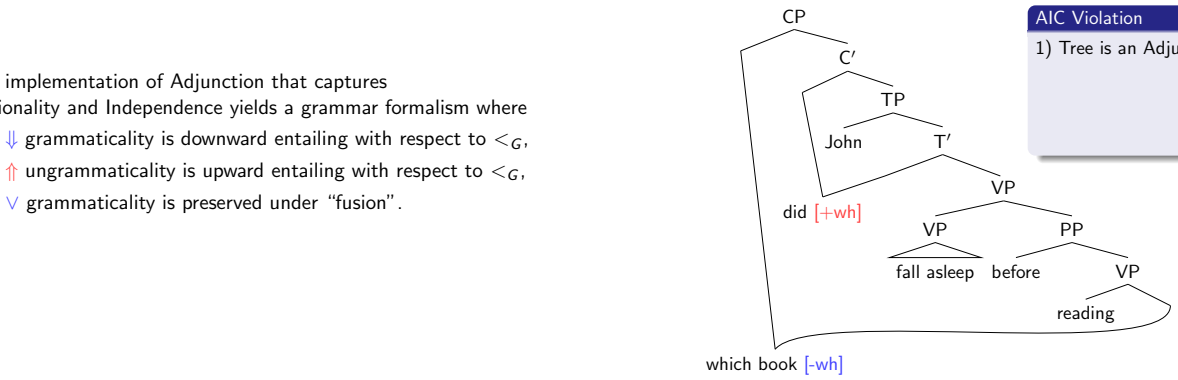
Interim Summary

Any implementation of Adjunction that captures Optionality and Independence yields a grammar formalism where

- $\Downarrow$ grammaticality is downward entailing with respect to $<_G$,
- $\Uparrow$ ungrammaticality is upward entailing with respect to $<_G$,
- $\vee$ grammaticality is preserved under "fusion".

Deriving the AIC

The AIC follows from **optionality closure and feature checking**.



AIC Violation

1) Tree is an Adjunct extension

Deriving the AIC

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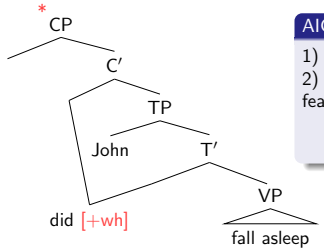


AIC Violation

1) Tree is an Adjunct extension
2) Tree without Adjunct violates feature calculus

Deriving the AIC

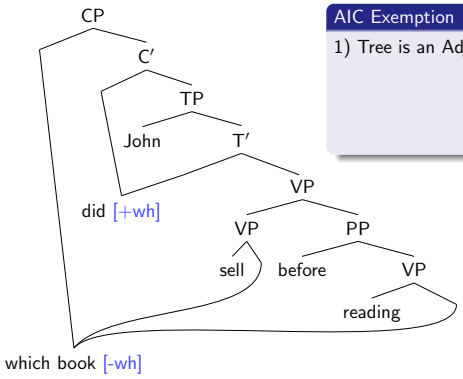
The AIC follows from **optionality closure and feature checking**.

AIC Violation

1) Tree is an Adjunct extension
2) Tree without Adjunct violates feature calculus
3) Ungrammaticality is upward entailing

Why Parasitic Gaps are Different

PGs piggyback on a **mandatory feature checker**.



AIC Exemption

1) Tree is an Adjunct extension

Why Parasitic Gaps are Different

PGs piggyback on a **mandatory feature checker**.

AIC Exemption

1) Tree is an Adjunct extension
2) Tree without Adjunct satisfies feature calculus

Why Parasitic Gaps are Different

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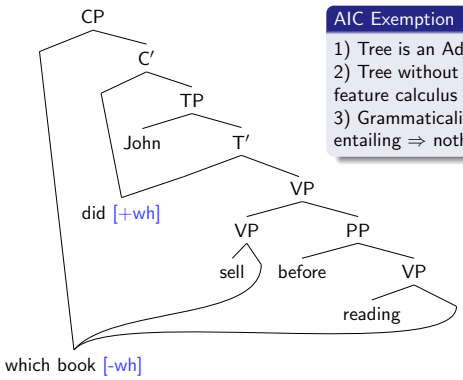


AIC Exemption

1) Tree is an Adjunct extension
2) Tree without Adjunct satisfies feature calculus
3) Grammaticality isn't upward entailing $\Rightarrow$ nothing follows

Why Parasitic Gaps are Idempotent

Multiple PGs may piggyback on a single mover.

(4) Which movie did John **whilst mocking** throw in the trash **after watching**?

Follows from **independence closure**

(5) a. Which movie did John **whilst mocking** throw in the trash?

b. Which movie did John throw in the trash **after watching**?

Constraints through Operations

Constraints and operations are **closely connected**.

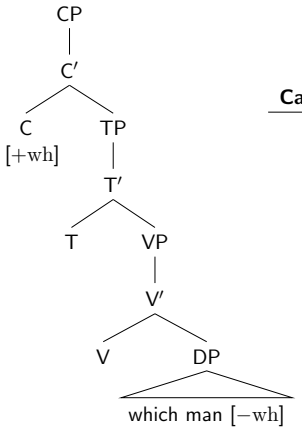
Theorem (Graf 2011; Kobele 2011)

A constraint can be expressed via Merge iff it can be computed using only a finitely bounded amount of working memory.

- **Intuition**: Use feature calculus to emulate how information flows through the tree during computation
- Doable for almost all constraints from the syntactic literature
- Relies on symmetry of c-selection (category features & selection features)

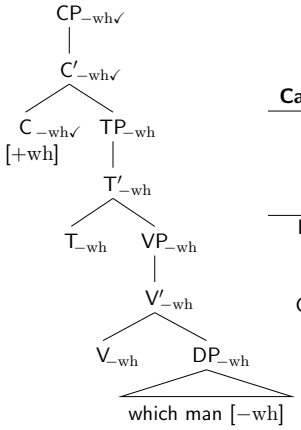
head-argument relation ≡ information pipeline

Example: Keeping Track of Movers



Category	Selects	Selected by
D	N	V
V	D	T
T	V	C
C	T	V,N

Example: Keeping Track of Movers



Category	Selects	Selected by
D	N	V
V	D	T
T	V	C
C	T	V,N
D_{-wh}	N	V_{-wh}
V_{-wh}	D_{-wh}	T_{-wh}
T_{-wh}	V_{-wh}	C_{-wh}
C_{-wh}✓	T_{-wh}	V,N
C_{-wh}	T_{-wh}	V_{-wh},N_{-wh}

Adjuncts: The Price of Freedom

- Adjuncts very free due to Optionality and Independence
- Freedom reflected in feature calculus, limits information flow
  ⇒ feature calculus cannot emulate all constraints correctly

Semi-Permeability

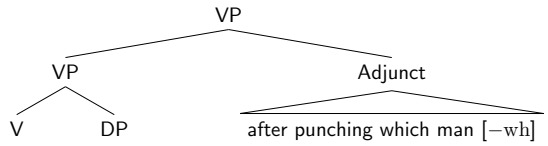
- Information flow into Adjuncts reliable
  ⇒ Adjuncts can put restrictions on shape of tree
  (cf. parasitic gaps)
- Information flow out of Adjuncts unreliable
  ⇒ Adjuncts cannot be depended on

Adjunct ≡ black hole

Example: Adjunction a la Frey and Gärtner (2002)

Adjunction as Asymmetric Selection

Adjuncts select XP they adjoin to, but are not themselves selected.



Category	Selects	Selected by
Adjunct	V	—
V	D	T

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Adjunction as Asymmetric Selection

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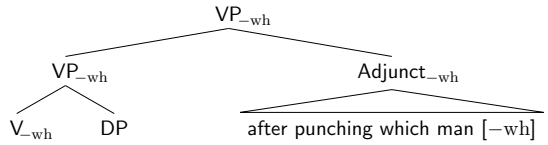

Category	Selects	Selected by
Adjunct	V	—
V	D	T
$Adjunct_{-wh}$	V_{-wh}	—
V_{-wh}	**D**	T_{-wh}

Example: Adjunction a la Frey and Gärtner (2002)

Adjunction as Asymmetric Selection

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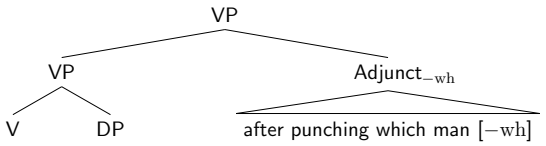

Category	Selects	Selected by
Adjunct	V	—
V	D	T
$Adjunct_{-wh}$	V	—

Summary

- Adjuncts characterized by Optionality and Independence
- enforces certain grammatical inferences
  - ⇓ grammaticality is preserved under Adjunct removal
  - ⇑ ungrammaticality is preserved under Adjunct insertion
  - ∨ grammaticality is preserved under Adjunct combination

  ⇒ AIC falls out naturally, yet allow for parasitic gaps
- Information flow metaphor: Adjuncts ≡ black holes

Work in Progress

- **Not all adjuncts are Adjuncts**
  Some adjuncts can be extracted from (Truswell 2007):

  (6) Which car did John drive Mary crazy **trying to fix**?

  Truswell's event-based generalization ≈
  some adjuncts more tightly integrated semantically

	sem-argument	sem-adjunct
syn-adjunct	Truswell adjuncts	Adjuncts
syn-argument	arguments	**???**

- **Extension to Other Cases**
  DP-conjuncts are also optional and independent
  ⇒ **CSC ≡ AIC & ATB extraction ≡ PGs**
  Caveat: agreement, binding, NPI-licensing

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