Optionality Implies Islandhood

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(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?

Questions

- Why do some phrases block extraction?
- Can they be given a theory-neutral characterization?

Mathematical Solution

- Island effects are an inevitable consequence of optionality.
- Non-islands are not optional for syntax or semantics.
(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?  

Questions

- Why do some phrases block extraction?  
- Can they be given a theory-neutral characterization?

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- Island effects are an inevitable consequence of optionality.  
- Non-islands are not optional for syntax or semantics.
Outline

1. Three Strong Islands
   - Adjuncts
   - Coordination
   - Relative Clauses

2. The Math: Optionality and Grammaticality Inferences
   - Ojunctions: Formalizing Optionality
   - Optionality Closure

3. Deriving Island Effects

4. Empirical Challenges
   - Not all Constructions Satisfy Optionality
   - Optional Non-Islands?
   - Two Open Problems

5. Conclusion & Outlook
Adjuncts

- extraction usually blocked

  (2)  a. Which book did John complain that he lost \textit{t}?
  
  b. * Which book did John complain \textit{because he lost} \textit{t}?
  
  c. * Which book did John complain \textit{after losing} \textit{t}?

- gaps licensed

  (3) Which book did John burn \textit{t} \textit{after reading} \textit{e}?

- usually optional

  (4) (Obviously) I will \textit{(easily)} ace this ((very) challenging) exam \textit{(because I (really) am that smart)}.  

Coordination

- Extraction usually blocked
  
  (5) a. Ed brewed beer and Greg drank it.
  
  b. * Which beer did Ed brew and Greg drink it?
  
  c. * Which wine did Ed brew beer and Greg drink it?

- Across-the-board extraction possible
  
  (6) a. Which wine did Ed brew and Greg drink it?

- Mostly optional (modulo morphological/semantic agreement)
  
  (7) a. Ed brewed beer and Greg drank it.
  
  b. Ed brewed beer.

  (8) a. Ed and Greg are brewing beer.
  
  b. * Ed are brewing beer.

  (9) a. Ed and Greg met.
  
  b. * Ed met.
Relative Clauses

- usually block extraction

  (10) * Which politician does John dislike the reporter that/who interviewed $t$?

- gaps only if created by movement

  (11) a. Which politician does John dislike $t$ that the reporter interviewed $e$?
  b. * Which politician did John tell the reporter that/who interviewed $e$ that Mark dislikes $t$?

- usually optional

  (12) a. the man that John works with that I admire
  b. the man that John works with
  c. the man that I admire
  d. the man
As a rule of thumb, adjuncts, coordinations and relative clauses

1. block extraction,
2. allow for gaps,
3. are optional.

The Big Question

Could (1) and (2) be related to optionality?
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5. Conclusion & Outlook
The notion of an ojunct provides an abstract characterization of optional phrase markers.

**Intuitive Definition (Ojunct)**

A phrase marker is an ojunct iff it can be removed from every well-formed tree without affecting grammaticality.

Under most Minimalist conceptions of movement, ojuncts are necessarily islands:

**Theorem (Islandhood)**

No ojunct can be extracted from if the extraction step involves checking a dependency at the target site.
The notion of an ojunct provides an abstract characterization of optional phrase markers.

**Intuitive Definition (Ojunct)**

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Definition (Footed Tree)

A footed tree is a tree that contains exactly one instance of the placeholder symbol □.

Example

```
VP
 □ yesterday

DP
 Ed D'
   and □

DP
 □ D'
   and Greg
```
Footed trees are combined with other trees via *tree substitution*.

**Definition (Tree Substitution)**

For $s$ a tree and $t$ a footed tree, $s +_n t$ is the tree obtained by inserting $t$ above node $n$ in $s$ such that $\square$ in $t$ is replaced by $n$.

**Example**

```
TP  +_VP  VP  =  TP
    John  VP  yesterday  John  VP
               □  yesterday
                           met  Sue
                                 Sue
```

```
TP  +_VP  VP  =  TP
    John  VP  yesterday  John  VP
               □  yesterday
                           met  Sue
                                 Sue
```
**Optionality**

**Definition (Optionality)**

Given a grammar $G$, a footed tree $t$ is **optional** wrt $G$ iff it holds for every tree of the form $s +_n t$ that $s +_n t$ is generated by $G$ only if $s$ is generated by $G$.

**Definition (Ojunct)**

A phrase marker is an **ojunct** of grammar $G$ iff it is the result of removing □ from a footed tree that is optional wrt $G$. 
What does optionality tell us about grammars with ojuncts? What is the general shape of the generated language?

**Definition (Adjunct Extensions)**

Let \( s \) and \( t \) be trees. Then \( t \) is an **ojunct extension** of \( s \) for grammar \( G \) (\( s <_G t \)) iff \( t \) is the result of inserting one or more ojuncts 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
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**Example**

- **Obviously** I will ace this exam \( <_G \) 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
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- Exam will this I ace \( <_G \) easily exam will this I ace
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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 $<_G$ I will easily ace this exam

- I will ace this exam $<_G$ I will easily ace this test

- exam will this I ace $<_G$ *easily* exam will this I ace
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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 $\nless_G$ I will easily ace this exam
- I will ace this exam $\nless_G$ I will easily ace this test
- exam will this I ace $<_G$ easily exam will this I ace
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  I will easily ace this exam

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What does optionality tell us about grammars with ojuncts?
What is the general shape of the **generated language**?

**Definition (Adjunct Extensions)**

Let $s$ and $t$ be trees. Then $t$ is an **ojunct extension** of $s$ for grammar $G$ ($s \prec_G t$) iff $t$ is the result of inserting one or more ojuncts of $G$ in $s$.

**Example**

- **Obviously** I will ace this exam $\prec_G$
  - Obviously I will **easily** ace this exam
- I will ace this exam $\prec_G$ **Obviously** I will **easily** ace this exam
- **Obviously** I will ace this exam $\not\prec_G$ I will **easily** ace this exam
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- **Obviously** I will ace this exam $\not\prec_G$ I will **easily** ace this exam
- I will ace this exam $\not\prec_G$ I will **easily** ace this exam
- exam will this I ace $\prec_G$ **easily** exam will this I ace

Ojunct Extension
Characterizing Ojunct Languages

Theorem (Optionality Closure)

*If* \( t \) *is an ojunct extension of* \( s \) *for* \( G \) *and* \( G \) *generates* \( t \), *then* \( G \) *generates* \( s \).

Example

- *I will* easily ace this *really* exam
- I will *easily* ace this exam
- *I will* ace this really exam
- I will ace this exam
Theorem (Optionality Closure)

If \( t \) is an ojunct extension of \( s \) for \( G \) and \( G \) generates \( t \), then \( G \) generates \( s \).

Example

I will \textbf{easily} ace this \textbf{really} exam

I will \textbf{easily} ace this exam \hspace{1cm} I will ace this \textbf{really} exam

I will ace this exam
Characterizing Ojunct Languages

Theorem (Optionality Closure)

If $t$ is an ojunct extension of $s$ for $G$ and $G$ generates $t$, then $G$ generates $s$.

Example

I will **easily** ace this **really** exam

✓ I will **easily** ace this exam  I will ace this **really** exam

I will ace this exam
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If $t$ is an ojunct extension of $s$ for $G$ and $G$ generates $t$, then $G$ generates $s$.

Example

I will easily ace this really exam

✓ I will easily ace this exam

I will ace this really exam

I will ace this exam
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I will **easily** ace this **really** exam

✓ I will **easily** ace this exam

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I will easily ace this really exam

✓ I will easily ace this exam

* I will ace this really exam

✓ I will ace this exam
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Example

I will *easily* ace this *really* exam

- I will *easily* ace this exam
- I will ace this *really* exam
- I will ace this exam

✓

* ✓
Theorem (Optionality Closure)

If \( t \) is an ojunct extension of \( s \) for \( G \) and \( G \) generates \( t \), then \( G \) generates \( s \).

Example

* I will *easily* ace this *really* exam

✓ I will *easily* ace this exam

✓ I will ace this exam

✓ I will ace this exam

* I will ace this *really* exam
Intuitive Definition (Ojunct)

A phrase marker is an **ojunct** iff it can be removed from every well-formed tree without affecting grammaticality.

Any grammar with ojuncts has the following inference patterns:

- $\downarrow$ grammaticality is downward entailing with respect to $<_G$,
- $\uparrow$ ungrammaticality is upward entailing with respect to $<_G$. 
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Deriving the Adjunct Island Constraint

The AIC follows from optionality closure and feature checking.

AIC Violation

1) Tree is an ojunct extension
2) Tree without ojunct violates feature calculus
3) Ungrammaticality is upward entailment
The AIC follows from **optionality closure and feature checking**.
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AIC Violation

1) Tree is an ojunct extension
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Deriving the Adjunct Island Constraint

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

* CP
  \[ \begin{array}{c}
  \text{did} \\
  \text{John} \\
  \text{T'}
  \end{array} \]

**AIC Violation**

1) Tree is an ojunct extension
2) Tree without ojunct violates feature calculus
3) Ungrammaticality is upward entailing
Why Parasitic Gaps are Different

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

```
CP
   /  
 /    
C'    TP
   /  
did [+wh] T'
     /  
John T'   
      / 
      T VP
      / 
      VP PP
      /  
sell before VP
      /  
reading e
```

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

**AIC Exemption**

1) Tree is an ojunct extension
Why Parasitic Gaps are Different

PGs piggyback on a mandatory feature checker.

AIC Exemption

1) Tree is an ojunct extension
2) Tree without ojunct satisfies feature calculus
Why Parasitic Gaps are Different

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

AIC Exemption
1) Tree is an ojunct extension
2) Tree without ojunct satisfies feature calculus
3) Grammaticality isn’t upward entailing $\Rightarrow$ nothing follows
Deriving the Coordinate Structure Constraint

CSC Violation

1) Ojunct extension of two trees

\[
\text{CP} \\
\text{C'} \\
\text{did [+wh]} \quad \&' \quad \text{TP} \\
\text{Ed} \quad \text{VP} \\
\text{brew} \\
\text{TP} \\
\text{and} \\
\text{Greg} \quad \text{VP} \\
\text{drink} \quad \text{wine} \\
\text{which beer [-wh]}
\]
Deriving the Coordinate Structure Constraint

CSC Violation
1) Ojunct extension of two trees
2) Fine without second conjunct
Deriving the Coordinate Structure Constraint

CSC Violation
1) Ojunct extension of two trees
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3) Nothing follows
Deriving the Coordinate Structure Constraint

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1) Ojunct extension of two trees
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Why ATB Extraction is Different

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Why ATB Extraction is Different

Cx

C'

did [+wh]

TP

Greg

VP

drink

which beer [-wh]

CSC Exemption

1) Ojunct extension of two trees
2) Fine without second conjunct
3) Nothing follows
4) Fine without first conjunct
Why ATB Extraction is Different

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2) Fine without second conjunct
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5) Nothing follows
Why Islands May Move

Displacement of an ojunct possible via base merger

Base Merge Exemption
1) Tree is an ojunct extension
Displacement of an ojunct possible via base merger

Base Merge Exemption
1) Tree is an ojunct extension
2) Tree without ojunct satisfies feature calculus
Why Islands May Move

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1) Tree is an ojunct extension
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Base Merger Extraction from Ojuncts is Still Impossible

AIC Violation
1) Tree is an ojunct extension
Base Merger Extraction from Ojuncts is Still Impossible

AIC Violation

1) Tree is an ojunct extension
2) Tree without ojunct has no valid “origin” e

- Tree is an ojunct extension
- Tree without ojunct has no valid “origin” e
Base Merger Extraction from Ojuncts is Still Impossible

AIC Violation
1) Tree is an ojunct extension
2) Tree without ojunct has no valid “origin” e
3) Ungrammaticality is upward entailing
Interim Summary

- Ojuncts are incompatible with instances of extraction that depend on the presence of the ojunct.
  - feature-driven movement
  - origin-controlled base merger

- All other kinds of extraction should be subject to cross-linguistic variation.
  - ATB (mover originates outside ojunct)
  - parasitic gaps (ojunct imposes constraints on tree, but not the other way round)
  - base merger displacement of entire ojunct (like parasitic gaps)
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The Account So Far

- **Mathematical Fact**
  With minimal assumptions about Move, all ojuncts are islands while still allowing for parasitic gaps and ATB extraction.

- **Empirical Assumption**
  Adjuncts, coordinations and relative clauses are ojuncts. But is this true?

Two Issues

- Not all relevant constructions qualify as ojuncts.
- Some phrases look like ojuncts yet are not islands.
Mathematical Fact
With minimal assumptions about Move, all ojuncts are islands while still allowing for parasitic gaps and ATB extraction.

Empirical Assumption
Adjuncts, coordinations and relative clauses are ojuncts. But is this true?

Two Issues
- Not all relevant constructions qualify as ojuncts.
- Some phrases look like ojuncts yet are not islands.
Obligatory Adjuncts

Not all adjuncts are optional.

(13)  
 a. This child reads well.
 b. This book reads *(well).
 c. John laughed a *(quiet) laugh.
 d. John behaved *(badly/like a brute) to Chris.

If these adjuncts are not optional, they should allow for extraction. This seems to be the case:

(14)  
 a. How does the book read?
 b. How did John behave to Chris?
 c. What did John behave like to Chris?
At a surface-level, conjuncts matter for $\phi$-agreement and semantic number requirements.

(15) Ed *(and Greg) are brewing beer.
(16) Ed *(and Greg) met.

Possible Answer
- Optionality must hold with respect to morphological dependencies, not specific feature values.
- Semantic requirements are ignored.
(17)  a.  ? Every woman and no man has ever had a period.
b.  * Every woman has ever had a period.

(18)  * (Jón og) afar sínir voru
       Jón and grandpas POSS-REFL.NOM.PL were
glaðir.
happy.NOM.PL

‘(Jón and) his grandpas were happy.’

Worrying, but all relevant examples are deviant for independent reasons:

(19)  a.  * Which actress has (every TMZ reporter and) no
       fanboy of t ever talked to?
b.  * Which field did the dean introduce every professor
       (of t) and no student of t to any senators?
Optionality must be computed over \textit{abstract structures} that allow us to ignore

- concrete $\phi$-feature instantiations,
- some semantic requirements
  - size of set denoted by DP,
  - NPI-licensing,
  - binding requirements.

If one relegates these conditions to PF and LF, then optionality — over syntactic trees with Agree dependencies — should apply to these cases.

\textbf{Problem}

This still leaves us with ojuncts that are not islands!
Interim Summary

Optionality must be computed over abstract structures that allow us to ignore

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If one relegates these conditions to PF and LF, then optionality — over syntactic trees with Agree dependencies — should apply to these cases.

Problem

This still leaves us with ojuncts that are not islands!
Subject by-Phrases and Instrumentals

In passives, by-phrases are optional but do not block extraction. The same holds for instrumentals.

(20)   a. Mary was assaulted (by John) (with a hammer).
       b. Which man was Mary assaulted by t?
       c. What kind of weapon was Mary assaulted with t?

However, these phrases are **semantic arguments of the verb**.
Truswell Sentences

Truswell adjuncts also allow for extraction (Truswell 2007).

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

**Truswell’s Generalization**

Adjunct denotes an event $e'$ that is related via $R$ to the event $e$ of the matrix clause

⇒ does not have standard (Neo-Davidsonian) denotation
⇒ adjunct behaves more like a **semantic argument**
The Big Picture

- more fine-grained classification than just argument vs adjunct
  (cf. Dowty 2003; Needham and Toivonen 2011)

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- whatever mechanism gives rise to the optionality of ojuncts also limits their semantic denotation
- non-adjunct semantics implies usage of a different mechanism that does not give rise to optionality
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non-adjunct semantics implies usage of a different mechanism that does not give rise to optionality
Remainng Challenge 1: Cross-linguistic variation

- The class of ojuncts should be relatively stable across languages.
- But there is cross-linguistic variation, e.g. extractability from relative clauses in Scandinavian (Erteschik-Shir 1973).

A (Stipulative) Solution

Extraction from ojuncts is possible if the feature at the target site need not be checked. Languages could differ as to which features must always be checked.
Remaining Challenge 1: Cross-linguistic variation

- The class of ojuncts should be relatively stable across languages.
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**A (Stipulative) Solution**

Extraction from ojuncts is possible if the feature at the target site need not be checked. Languages could differ as to which features must always be checked.
Remaining Challenge 2: Resumptive Pronouns

No island violations with resumptive pronoun instead of trace (e.g. Lebanese Arabic)

\[(22)\] ha-l-muttahame tfee3a?to lamma/la?anno this-the-suspect.SG.FEM surprised.2 when/because fr@fto ?anno hiyye nhabasit. know.2 that she imprisoned.3SG.FEM

‘This suspect, you were surprised when/because you knew that she was imprisoned.’ Aoun et al. (2001:575)

follows if binding rather than movement is involved

Problems

- Antecedent and adjunct must both be dropped
  ⇒ discontinuous ojuncts?
- Why only licit with overt pronouns?
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Conclusion

- Why do we see (strong) island effects?
  Because islandhood is a necessary consequence of optionality given standard feature checking requirements.

- Why are there exceptions?
  - Because not all adjuncts/conjuncts are indeed optional.
  - Because not all extractions involve movement.

- So what counts as optional?
  That’s the $10^7$ question!

Conjecture

Ojuncts are created by some mechanism that differs from standard Merge and gives rise to their optionality and intersective semantics. Whatever cannot be handled by this mechanism is not an ojunct.


