Some hallmarks of $\overline{\text{A}}$-movement

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1. Overview

Movement dependencies comes in two major types.
- *Movement:* a non-local syntactic dependency between a phrase (XP_1) and a trace (t_1)

(1)   <u>Examples of A-movement</u>

    a. Amy_1 seems t_1 to meditate.   *Raising*

    b. Bob_1 was impressed t_1 by us.   *Passive*

    c. Cat_1 warmed t_1 up.   *Unaccusative*

(2)   <u>Examples of $\overline{\text{A}}$-movement</u>

    a. Who_1 did the monk impress t_1 yesterday?   Wh-*movement*

    b.   This is the nun who_1 the monk impressed t_1 yesterday.   *Relativization*

    c. Abe_1, we impressed t_1 — but Bea_2, we disappointed t_2.   *Topicalization*

Today's goals
- Learn some empirical hallmarks of $\overline{\text{A}}$-movement, and how that compares to A-movement
- Practice classifying new types of movement, and deriving sentences with them
- Sketch a theory of $\overline{\text{A}}$-movement, generalizing over construction-specific transformations

2. Theoretical assumptions

Phrase structure: $\overline{\text{X}}$-Theory
- XP = maximal projection; $\overline{\text{X}}$ = intermediate projection; X^0 = head
- Specifier (ZP) = child of XP and sibling to $\overline{\text{X}}$
- Complement (YP) = sibling to X^0
- Adjunct (WP) = sibling and child of $\overline{\text{X}}$

(3) $[_{XP}\ ZP\ [_{\overline{x}}\ [\ X^0\ YP\ ]\ WP\ ]\ ]$ (NB: $[_{XP}\ X^0\ YP\ ]$ abbreviates $[_{XP}\ [_{\overline{x}}\ X^0\ YP\ ]\ ]$)

Syntactic derivations and levels of representation
- *D-Structure*
  - 'Underlying form' where subcategorization is satisfied & theta-roles are assigned
- *Transformations*
  - Changes to phrase structure, linear order, morphology triggered in certain configurations
- *S-Structure*
  - Observed surface string of words

Sample transformation, deriving (1a) — a warm up!

(4) <u>Raising transformation</u>

Structural description: $[_{TP} [_{T'} T^0 [_{VP} V^0 [_{CP} Ø [_{TP} \textbf{DP}_1 [_{T'} \textit{to} \ldots]]]]]]$,
where V^0/Pred is one of {*seem, be likely, happen…*}

Structural change: $[_{TP} \textbf{DP}_1 [_{T'} T^0 [_{VP} V^0 [_{CP} Ø [_{TP} \textbf{\textit{t}}_1 [_{T'} \textit{to} \ldots]]]]]]$

3. *Wh*-movement

In a *wh*-question, a XP_{+WH} (abbreviated *wh*P) appears at the leftmost position of the clause.
- The *wh*P 'fills a gap': it corresponds thematically to an empty phrasal position that it c-commands.

(5) a. They might have [$_{VP}$ put [$_{DP}$ the book] [$_{PP}$ on the table]].

b. They might have [$_{VP}$ put [$_{DP}$ it] [$_{PP}$ there]].

c. *They might have [$_{VP}$ put [$_{PP}$ on the table]].

d. *They might have [$_{VP}$ put [$_{DP}$ the book]].

e. *They might have [$_{VP}$ put].

(6) a. [$_{wh}$P Which book] might they have put __ on the table?

b. [$_{wh}$P What] might they have put __ on the table?

c. [$_{wh}$P On which table] might they have put the book __?

d. [$_{wh}$P Where] might they have put the book __?

e. *[$_{wh}$P What] might they have put the book on the table?

Analytical intuition: a transformation moves the *wh*P from its DS position to Spec-CP, leaving behind a trace.
- (T-to-C movement might also take place.)

(7) <u>*Wh*-movement transformation (first pass)</u>

Structural description: $[_{CP} [_{\bar{C}} C^0_{WHQ} [_{TP} \ldots \textbf{\textit{wh}P} \ldots]]]$
Structural change: $[_{CP} \textbf{\textit{wh}P}_1 [_{\bar{C}} C^0_{WHQ} [_{TP} \ldots \textbf{\textit{t}}_1 \ldots]]]$

Note that *wh*-movement targets no particular position – in fact, it's *unbounded*!

(8) a. [$_{wh}$P Who]$_1$ did Amy impress t_1?

b. [$_{wh}$P Who]$_1$ did Amy say [$_{CP}$ that Bob impressed t_1]?

c. [$_{wh}$P Who]$_1$ did Amy say [$_{CP}$ that Bob thinks [$_{CP}$ that Cat impressed t_1]]?

This contrasts starkly with movement transformations like Passive, Raising, and Unaccusative.

(8) a. [$_{DP}$ Amy]$_1$ was introduced t_1 to Bob. *Passive from Obj1*

   b. *[$_{DP}$ Bob]$_1$ was introduced Amy to t_1. *Passive from Obj2*

   c. *[$_{DP}$ Cat]$_1$ was said [$_{CP}$ t_1 introduced Amy to Bob.] *Cross-clausal Passives*

   d. *[$_{DP}$ Amy]$_1$ was said [$_{CP}$ that Cat introduced t_1 to Bob.]

4. Island effects

While *Wh*-movement is unbounded, it cannot leave a trace in any possible syntactic position.
- For example, the *wh*-trace can't be in an adjunct clause.

(9) Abe impressed Bea [$_{CP}$ after finding Cal]. *Baseline with nonfinite adjunct CP*

(10) a. Who$_1$ did Abe impress t_1 [$_{CP}$ after finding Cal]? *Traces can be <u>by</u> adjunct CPs…*

   b. *Who$_1$ did Abe impress Bea [$_{CP}$ after finding t_1]? *…But not <u>in</u> adjunct CPs!*

Adjunct clauses are one of several *syntactic islands*: XPs out of which movement is not grammatically possible.

(11) a. *Who$_1$ did Abe impress Bea [$_{CP}$ after finding t_1]? *Adjunct CP*

   b. *Who$_1$ did Abe impress [$_{\&P}$ Bea and t_1]? *Coordinate XP*

   c. *Who$_1$ did Abe spread the [$_{NP}$ rumor [$_{CP}$ that Bea impressed t_1]]? *Complex NP*

   d. *Who$_1$ did Abe forget [$_{CP}$ whether Bea impressed t_1]? *Embedded Question*

Let's update our *wh*-movement transformation:

(12) <u>*Wh*-movement transformation (final version)</u>
   Structural description: [$_{CP}$ [$_{\bar{C}}$ C$^0_{WHQ}$ [$_{TP}$ … **whP** …]]],

                      such that no island boundary occurs between C$^0_{WHQ}$ and *wh*P
   Structural change: [$_{CP}$ **whP$_1$** [$_{\bar{C}}$ C$^0_{WHQ}$ [$_{TP}$ … **t_1** …]]]

5. Relativization

Another type of movement: formation of relative clauses (RCs)
- A CP-modifier to an NP, which contains a gap. The gap is interpreted as the modified NP.

(13) a. This is the monk. We impressed the monk. *Baseline: Two clauses*

   b. This is the [$_{NP}$ [$_{\bar{N}}$ [$_{\bar{N}}$ monk] [$_{CP}$ who we impressed __]]]. *RC with* wh-*pronoun*

NB: we'll focus on RCs that contain *wh*P pronouns ('relative pronouns'), not RCs that lack them.

(14) a. This is the [$_{NP}$ [$_{\bar{N}}$ [$_{\bar{N}}$ monk] [$_{CP}$ that we impressed __]]]. that-*relative*

     b. This is the [$_{NP}$ [$_{\bar{N}}$ [$_{\bar{N}}$ monk] [$_{CP}$ we impressed __]]]. *bare relative*

RCs parallel *wh*-questions in many ways: both involve unbounded filler–gap dependencies.

(15) a. You asked [$_{CP}$ who __ impressed us]. *Embedded* wh-*questions*

     b. You asked [$_{CP}$ who we impressed __].

     c. You asked [$_{CP}$ who we introduced Amy to __].

     d. You asked [$_{CP}$ who we insulted Amy in front of __].

     e. You asked [$_{CP}$ who Amy said [$_{CP}$ that we impressed __]].

(16) a. This is the monk [$_{CP}$ who __ impressed us]. *Relative clauses*

     b. This is the monk [$_{CP}$ who we impressed __].

     c. This is the monk [$_{CP}$ who we introduced Amy to __].

     d. This is the monk [$_{CP}$ who we insulted Amy in front of __].

     e. This is the monk [$_{CP}$ who Amy said [$_{CP}$ that we impressed __]].

RCs are also island-sensitive.

(17) a. *This is the monk [$_{CP}$ who Abe impressed Bea [$_{CP}$ after he found __]].

     Adjunct Clause

     b. *This is the monk [$_{CP}$ who Abe impressed [$_{\&P}$ Bea and __].

     Coordinate XP

     c. *This is the monk [$_{CP}$ who Abe spread the [$_{NP}$ rumor [$_{CP}$ that Bea impressed __]]].

     Complex NP

     d. *This is the monk [$_{CP}$ who Abe forgot [$_{CP}$ whether Bea impressed __]].

     Embedded Question

This motivates a transformational rule like this. Let's use it to derive (13b).

(18) <u>Relativization Transformation</u>

     Structural description: [$_{NP}$ NP$_1$ [$_{CP}$ [$_{\bar{C}}$ C$^0_{REL}$ [$_{TP}$ … ***wh*P$_1$** …]]]],
                                      such that no island boundary occurs between C$^0_{REL}$ and *wh*P

     Structural change: [$_{NP}$ NP$_1$ [$_{CP}$ ***wh*P$_1$** [$_{\bar{C}}$ C$^0_{REL}$ [$_{TP}$ … ***t*$_1$** …]]]]

6. Parasitic gaps

One more parallel between *wh*-questions and RCs: the ability to license *parasitic gaps*
- A gap is grammatical within an island (e.g. adjunct clause) just in case there is also a grammatical gap elsewhere — a gap that is parasitic on another

(19)   a. Amy photographed the nuns [Adj-CP after interviewing them].   *Baseline*

       b. *Amy photographed the nuns [Adj-CP after interviewing __].   *Baseline*

       c. Who did Amy photograph __ [Adj-CP after interviewing them]?   *Gap in matrix*

       d. *Who did Amy photograph the nuns [Adj-CP after interviewing __]?   *Gap in island*

       e. Who did Amy photograph __ [Adj-CP after interviewing __]?   *Gap in both places!*

Relativization also licenses parasitic gaps.

(20)   These are the nuns [RC-CP who Amy photographed __ [Adj-CP after interviewing __]].

Other types of movement (Passive, Unaccusative, Raising) do not.

(21)   a.   *The nuns were photographed __ [Adj-CP after interviewing __].

       b.   *The nuns left __ [Adj-CP after interviewing __].

       c.   *The nuns seem __ to meditate [Adj-CP after interviewing __].

Summarizing our empirical observations, we see two coherent classes of movement

	Leaves a gap	Related to case/EPP	Unbounded	Island-Sensitive	Licenses PGs	Mvmt Type
Raising	✓	✓	✗	n/a	✗	A-mvmt
Passive	✓	✓	✗	n/a	✗	A-mvmt
Unaccusative	✓	✓	✗	n/a	✗	A-mvmt
***Wh*-mvmt**	✓	✗	✓	✓	✓	Ā-mvmt
Relativization	✓	✗	✓	✓	✓	Ā-mvmt

Challenge: using these empirical diagnostics, show that *topicalization* (22) indeed involves Ā-rather than A-mvmt (2c).

(22)   The monk, we impressed __.

7. Towards a general theory

Our new transformations, side by side:

(12) <u>*Wh*-movement transformation</u>

    Structural description: $[_{CP} [_{\bar{C}} C^0_{WHQ} [_{TP} \dots \textbf{\textit{wh}P} \dots]]]$,
                                              such that no island boundary occurs between C^0_{WHQ} and *wh*P

    Structural change: $[_{CP} \textbf{\textit{wh}P}_1 [_{\bar{C}} C^0_{WHQ} [_{TP} \dots \textbf{\textit{t}}_1 \dots]]]$

(18) <u>Relativization Transformation</u>

    Structural description: $[_{NP} NP_1 [_{CP} [_{\bar{C}} C^0_{REL} [_{TP} \dots \textbf{\textit{wh}P}_1 \dots]]]]$,
                                                such that no island boundary occurs between C^0_{REL} and *wh*P

    Structural change: $[_{NP} NP_1 [_{CP} \textbf{\textit{wh}P}_1 [_{\bar{C}} C^0_{REL} [_{TP} \dots \textbf{\textit{t}}_1 \dots]]]]$

Including both of these rules in our grammar seems awfully redundant.
- (Especially as we discover more and more types of movement that have identical empirical properties.)

A more concise and insightful theory would employ a single transformational rule to derive this class of dependencies.
- This captures our generalizations, and makes a strong prediction: *wh*-movement and relativization should behave the same in all respects!

(23) <u>Generalized $\bar{A}$-Movement Transformation</u>

    Structural description: $[_{CP} [_{\bar{C}} C^0_{\alpha\bar{A}} [_{TP} \dots \textbf{\textit{wh}P}_{\alpha\bar{A}} \dots]]]$,

                                                where $\bar{A}$-features include {WHQ, REL, TOP…},

                                                such that no island boundary occurs between C^0 and *wh*P

    Structural change: $[_{CP} \textbf{\textit{wh}P}_{\alpha\bar{A}1} [_{\bar{C}} C^0_{\alpha\bar{A}} [_{TP} \dots \textbf{\textit{t}}_1 \dots]]]$,

This line of reasoning parallels previous developments in our theory of syntax:
- Phrase-structural parallels across categories motivated $\bar{X}$-Theory
- Structural parallels across A-movements motivated theories of EPP and Case
- More and more meta-generalizations eventually motivate modern Minimalist Syntax

Open questions
- Just which XPs are islands, and why?
- Why are parasitic gaps only licensed by $\bar{A}$-movement?
- Are there any syntactic differences between *wh*-movement and relativization? If so, how can we maintain a unified account (23)?

8. Homework questions

Question 1: Provide a derivation of the following sentence, from DS to SS. Formalize necessary transformational rules, and their order of application.

(24)   Who did you say seemed to have been impressed?

Question 2: Formulate a general T-to-C head-movement transformation that accounts for the position of auxiliary verbs in *yes/no*-questions and *wh*-questions. Then, extend the analysis to handle *do*-support facts.

(25)   a. Have you been photographing us?

        b. Who have you been photographing?

        c. Who has been photographing us?

        d. They asked who you have been photographing.

(26)   a. Did you photograph us?

        b. Who did you photograph?

        c. Who photographed us?

        d. They asked who you photographed.

Question 3: Evaluate the following proposal, on both empirical and theoretical grounds:
- In *wh*-questions, subject *wh*Ps stay in situ; they not move from Spec-TP to the immediately higher Spec-CP.

Question 4: Propose an analysis of parasitic gap formation by formulating a new transformational rule.
- Demonstrate that parasitic gaps are traces of movement, and classify that as A- or $\bar{\text{A}}$-movement using our empirical diagnostics.
- Discuss how we can ensure that the Parasitic Gap Transformation is indeed parasitic on another $\bar{\text{A}}$-Transformation (cf. 19d ~ 19e).