Illuminating the black hole of PF

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Introduction: Studying something that’s not there by observing its effects on surrounding objects

(1) Possible (in fact, obligatory) movements that become impossible in elliptical structures.
   (i) I-to-C movement in matrix sluices

(2) Impossible movements that become possible in elliptical structures.
   (ii) wh-movement out of islands under sluicing
   (iii) I-to-C movement in comparative clauses

1.1 Background on sluicing

(3) a. Jack bought something, but I don’t know what.
   b. A: Someone called. B: Really? Who?
   c. Beth was there, but you’ll never guess who else.
   d. Jack called, but I don’t know {when/how/why/where from}.
   e. Sally’s out hunting — guess what!
   f. A car is parked on the lawn — find out whose.

Two components to sluicing
1. Movement of a wh-phrase out of an IP
2. Deletion of the IP

(4) \[ \begin{array}{c}
\text{XP}^{+[wh]} \\
\text{C'} \\
\text{C'0}^{[wh,+Q]} \\
\text{IP} \\
\text{... t ...} \\
\end{array} \]
Licensing the Deletion

Deletion triggered by a feature E on C:

Lobeck 1995: only the null [+wh, -pred] C\(^0\) of interrogatives license a null IP. (ECP, government approach)

Recast: Featural matching requirements in a head-head (or feature of a head) relation.

- Call this feature E.

The syntax of E: (traditional licensing)

(5) \(E[\sim[+wh], \sim[+Q]]\) (co-opting Frampton and Gutmann’s 1999 notation)

- E must be checked by C[[+wh], [+Q]]

The phonology of E:

(6) \([\varphi_{IP}] \rightarrow \emptyset / E\)____

- E instructs PF not to parse its complement: this is PF-‘deletion’

The semantics of E: (traditional identification)

(7) \([E] = \lambda p : p \text{ is e-GIVEN } [p]\)

- E gives us a locus to impose the e-GIVENness requirement

(8) Abby was reading, but I don’t know what.

(9) but I don’t know

```
CP
   DP\(_2\)
     what
   C'
     C
       IP
         [E]
       Abby was reading \(t_2\)
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(10) \(\llbracket E \rrbracket(\llbracket IP \rrbracket)\)

\[= \lambda p : p \text{ is e-GIVEN } . \ p (\llbracket IP \rrbracket)\]

Computation up the tree proceeds only if IP is e-GIVEN.

Advantage: The licensing (the local featural requirements of E) and identification (the semantic condition E imposes on its complement) requirements on ellipsis can be directly linked.

- No separate ‘ellipsis module’ of the grammar is needed (i.e., no global, late, well-formedness condition need be imposed just on the structures containing ellipsis); cf. Giannakidou’s 1998, 2001 elimination of a ‘polarity’ module by encoding polarity requirements as local, lexical semantic well-formedness conditions (using type-combinatorics).
1.2 Form identity effects in sluicing (Why sluicing is deletion, not LF-copy or worse)

1.2.1 Case-matching

(11) *Form-identity generalization I: Case-matching*  
The sluiced wh-phrase must bear the case that its correlate bears (would bear).

*Old news* (from Ross 1969)  
*schmeichlen* assigns dative, *loben* assigns accusative

*German*  
(12) Er will jemandem *schmeicheln*, aber sie wissen nicht, {*wer / wen* / *wem*}.  
*he wants someone.*DAT flatter *but they know not* who.NOM  
who.ACC who.DAT  
‘He wants to flatter someone, but they don’t know who.’

(13) Er will jemanden *loben*, aber sie wissen nicht, {*wer / wen / *wem*}.  
*he wants someone.*ACC praise *but they know not* who.NOM who.ACC who.DAT  
‘He wants to flatter someone, but they don’t know who.’

*Cf.*  
(14) Sie wissen nicht, {*wer / wen / *wem*} er *schmeicheln* will.  
*they know not* who.NOM who.ACC who.DAT he flatter *wants*  
‘They don’t know who he wants to flatter.’

(15) Sie wissen nicht, {*wer / wen / *wem*} er *loben* will.  
*they know not* who.NOM who.ACC who.DAT the praise *wants*  
‘They don’t know who he wants to praise.’

English, Greek, Dutch, Finnish, Hungarian, Russian, Polish, Czech, Slovene, Hindi, Basque, Turkish

(16) The police found someone’s car, but they wouldn’t tell us {whose / *who*}.

(17) *German*  
Sie will jemanden finden, der einem der Kandidaten *geschmeichelt* hat,  
*she wants someone find* who one.DAT of the candidates flattered *has*  
aber ich weiss nicht, {welchem / *welchen / *welcher*}/  
*but I don’t know which.*DAT which.ACC which.NOM  
‘She wants to find someone who flattered one of the candidates, but I don’t know which.’
1.2.2 Preposition stranding

Form-identity generalization II: Preposition-stranding

A language $L$ will allow preposition stranding under sluicing if $L$ allows preposition stranding under regular wh-movement.

Preposition-stranding languages:

(19) English
   a. Peter was talking with someone, but I don’t know (with) who.
   b. Who was he talking with?
(20) Frisian
   a. Piet hat mei ien sprutsen, mar ik wyt net (mei) wa.
      *Piet has with someone talked but I know not with who
   b. Wa hat Piet mei sprutsen?
(21) Swedish
   a. Peter har talat med någon; jag vet inte (med) vem.
      *Peter has talked with someone I know not with who
   b. Vem har Peter talat med?
(22) Norwegian
   a. Per har snakket med noen, men jeg vet ikke (med) hvem.
      *Per has talked with someone but I know not with who
   b. Hvem har Per snakket med?
(23) Danish
   a. Peter har snakket med en eller anden, men jeg ved ikke (med) hvem.
      *Peter has talked with one or another but I know not with who
   b. Hvem har Peter snakket med?
(24) Icelandic
   a. Pétur hefur talað við einhvern en ég veit ekki (við) hvern.
      *Peter has spoken with someone but I know not with who
   b. Hvern hefur Pétur talað við?

Non-Preposition-stranding languages:

(25) Greek
   a. I Anna milise me kapjon, alla dhe ksero *(me) pjon.
      *the Anna spoke with someone but not I.know with who
   b. * Pjon milise me?
(26) German
   a. Anna hat mit jemandem gesprochen, aber ich weiß nicht, *(mit) wem.
      *Anna has with someone spoken but I know not with who
   b. * Wem hat sie mit gesprochen?
(27) Swiss German (Glarus dialect)
   a. Dr Ruedi hät des ganz Läbe vumene Land träumt, aber ich wäiss nüd *(vu) welem.
      *Ruedi has dreamt his whole life of a land dreamt, but I don’t know of which.
   b. * Welem Land häsch ds ganz Läbe vu träumt?
(28) Yiddish
   a. Zi hot mit emetsn geredt, ober ikh veys nit *(mit) vemen.
      she has with someone spoken but I know not with who
   b. * Vemen hot zi mit geredt?

(29) Dutch
   a. Anna heeft met iemand gesproken, maar ik weet niet ??/?√ (met) wie.
      Anna has with someone spoken but I know not with who
   b. */??/? Wie heeft zij mee gesproken?

(30) Czech
   a. Anna mluvila s n_k_m, ale nevím *(s) k_m.
      Anna spoke with someone, but not I.know with who
   b. * K_m mluvila Anna s?

(31) Russian
   a. Anja govorila s kem-to, no ne znaju *(s) kem.
      Anja spoke with someone, but not I.know with who
   b. * Kem ona govorila s?

(32) Slovene
   a. Anna je govorila z nekom, ampak ne vem *(s) kom.
      Anna aux spoken with someone but not I.know with who
   b. * Kom je govorila Anna s?

(33) Polish
   a. Anna rozmawia a z kim , ale nie wiem *(z) kim.
      Anna aux spoken with someone but not I.know with who
   b. * Kim rozmawia a Anna z?

(34) Bulgarian
   a. Anna e govorila s njakoj, no na znam *(s) koj.
      Anna AUX spoken with someone but not I.know with who
   b. * Koj e govorila Anna s?

(35) Serbo-Croatian
   a. Ana je govorila sa nekim, ali ne znam *(sa) kim.
      Ana AUX spoken with someone but not I.know with who
   b. * Kim je govorila Ana sa?

(36) Catalan
   a. L’Anna va parlar amb algú, però no sé ??(amb) qui.
      the-Anna aux speak with someone but not I.know with who
   b. * Qui va parlar l’Anna amb?

(37) French
   a. Anne l’a offert à quelqu’un, mais je ne sais pas *(à) qui.
      Anne it-has offered to someone but I NEG know not to who
   b. * Qui est-ce qu’elle l’a offert à?

(38) Spanish
   a. Ana habló con alguien, pero no sé ??(con) quién.
      Ana spoke with someone but not I.know with who
   b. *¿Quién habló con?

(39) Italian
   a. Pietro ha parlato con qualcuno, ma non so *(con) chi.
      Pietro has spoken with someone but not I.know with who
   b. *Chi ha parlato Pietro con?

(40) Persian
      Ali with someone talk PROG-hit.3sg but not-PROG-know-I with who
   b. * Ki Ali ba harf mi-zad?
(41) Hebrew
a. Dani katav le-mishehu, aval ani lo yode’a *(le-)mi.
   *Dani wrote to-someone, but I not know to-who
b. *Mi Dani katav le?

(42) Moroccan Arabic
a. Driss tkəllem məa ʃi wahad, walakin ma ˈraft ʃ *(mə) mən.
   *Driss talked with someone but not know-NEG with who
b. * Mən tkəllem Driss məa?

(43) Basque
a. Ana-k norbait-ekin hitzegin zuen, baina ez dakit nor-*(ekin).
   *Ana-ERG someone-with talk.to aux but not know who- with
b. * Nor hitzegin zuen -ekin?

(44) Hindi
Gautam-ne kisi se baat kii thii, lekin mujhe pataa nahi-i~ kis *(se).
   *Gautam-ERG someone with talk do.PFV PAST but I-DAT knowldg. NEG who with
2 Feature movement, PF strong features, and economy in ellipsis

2.1 Sluicing and I-to-C movement

[Lasnik 1999, 2001a,b, Merchant 2001]

(45) a. Who has Max invited?                      [English]
b. Wa hat Jelle útnoege?                    [Frisian]
c. Wen hat Max eingeladen?                [German]
d. Wie heeft Max uitgenodigd?          [Dutch]
e. Hvem har Max inviteret?             [Danish]
f. Hvem har Anna inviteret?          [Norwegian]
g. Vem har Anna bjudit?                   [Swedish]
h. Vemen hot Moyshe ayngelodn?       [Yiddish]
i. Hverjum hefur Anna bjudit?         [Icelandic]

(46) [CP who has [IP Max t\textsubscript{has} invited t\textsubscript{who}]] ?

(47) a. A: Max has invited someone.  B: Really?  Who (*has)?     [Eng]
b. A. Jelle hat ien útnoege.       B. Soa?  Wa (*hat)?         [Fri]
d. A: Max heeft iemand uitgenodigd. B: Ja?  Wie (*heeft)?       [Dut]
e. A: Max har inviteret en eller anden. B: Ja?  Hvem (*har)?   [Dan]
f. A: Anna har invitert noen.      B: Ja?  Hvem (*har)?         [Nor]
g. A: Anna har bjudit någon.        B: Ja?  Vem (*har)?          [Swe]
h. A: Moyshe hot emetsn ayngelodn.    B: Nu?  Vemen (*hot)? [Yid]
i. A: Anna hefur bjudit vini sínum. B: Ær  að?  Hverjum (*hefur)? [Ice]

(48) * [CP who has [IP Max t\textsubscript{has} invited t\textsubscript{who}]] ?

Swiping


(49) a. Lois was talking (to someone), but I don’t know who to.
    b. A: Lois was talking (to someone). B: Really? Who to (*was)?

(50) [CP who C [IP Max has invited t\textsubscript{who}]] ?
Two possibilities:

**Option 1:** Remnants of moved features are unpronouncable

‘Breakup’ = strong F (T-feature) on C, attracts FF(I), I-FF causes PF crash theory’

(Lasnik 1999, 2001a,b; Merchant 2001:73)

(51) Who C\[strong F\] \[IP Max has[strong F] invited t\]? \[Breakup\]

[box indicates the locus of the item responsible for the crash]

**Option 2:** Features don’t move by themselves (‘strong lexicalism’, cf. Chomsky 2000’s *Agree*)

‘Lexicalist’ = strong F (C-feature) on I: Move and delete (checking), or stay and delete (ellipsis)


(52) Who C\[F\] \[IP Max has[strong F] invited t\]? \[Lexicalist\]

(No movement)

Problems for option 1: Failure of repair in two environments


(53) *Jack saw someone, but you’ll never guess [Jack saw who].

(54) a. ... guess [CP C\[strong wh\] \[IP Max has invited who\]]. \[Breakup\]

b. *... guess [CP C\[strong wh\] \[IP Max has invited who\]]. \[Lexicalist\]

[2] EPP [Lasnik 2001a (16)-(19); Lasnik 2001b (10)-(11)]

(55) Mary said she can’t swim, even though she really can.

(56) *Mary said she can’t swim, even though really can.

(57) a. ... even though [IP can+I \[strong D\] \[VP she swim\]]. \[Breakup\]

b. *... even though [IP can+I \[strong D\] \[VP she swim\]]. \[Lexicalist\]

(58) Mary is here, even though John is not.

(59) *Mary is here, even though John not.

(60) a. ...even though John \[strong V\] not \[VP is here\]. \[Breakup\]

b. *...even though John \[strong V\] not \[VP is here\]. \[Lexicalist\]

(Note that *not can license VP-ellipsis:

(61) I was worried I’d be the only one going to the dinner, and in the end, I’m the only one not! Also Lobeck 1995, Potsdam 1997 for subjunctives.)
CONCLUSIONS: 1. Strong features can appear on attractors or moved items: they are not restricted to appearing only on attractors. ‘Virus’ theory is wrong (Cf. multiple wh-movement as well.)
2. ‘Lexicalist’ option makes no recourse to head vs. XP-movement distinction, captures the data uniformly; the EPP is not sui generis; ‘breaking up’ is harder to do than you thought

- So we have a theory of why the otherwise obligatory I-to-C need not take place. But why must it not? Answer: Economy (No movement of I in (50) vs. movement in (48).)
- ‘Look ahead’ is also eliminated: C in (52) is Merged with the E feature, so the information that deletion occurs (on the PF side) is available in the syntax (as it must be, if syntax alone feeds the semantics).

2.2 Complementizers in sluicing

(62) 
**Sluicing-COMP generalization**

In sluicing, no non-operator material may appear in COMP.

\[ \text{Dutch and Frisian} \quad \text{((63a) modified from Bennis 1986: 234, (63b) from Zwart 1993: 169; see also den Besten 1978: 647, 1989)} \]

\[ \begin{align*}
(63) & \quad \text{a. Ik weet niet, wie (of) (dat) hij gezien heeft.} \\
& \quad \text{[I know not who if that he seen has]} \\
& \quad \text{‘I don’t know who he has seen.’} \\
& \quad \text{b. Hy freget wa (of) *(‘t) jûn komt.} \\
& \quad \text{[he asks who if that.cl tonight comes]} \\
& \quad \text{‘He’s asking who’s coming tonight.’} \\
(64) & \quad \text{Hij heeft iemand gezien, maar ik weet niet} \\
& \quad \text{[he has someone seen but I know not]} \\
& \quad \text{a. wie.} \\
& \quad \text{b. * wie of.} \\
& \quad \text{c. * wie dat.} \\
& \quad \text{d. * wie of dat.} \\
& \quad \text{who if that} \\
& \quad \text{‘He saw someone, but I don’t know who.’} \\
(65) & \quad \text{Ien komt jûn, en hy freget} \\
& \quad \text{[someone comes tonight and he asks]} \\
& \quad \text{a. wa.} \\
& \quad \text{b. * wa of.} \\
& \quad \text{c. * wa ‘t.} \\
& \quad \text{d. * wa of ‘t.} \\
& \quad \text{who if that.cl} \\
& \quad \text{‘Someone’s coming tonight, and he’s asking who.’} \\
\end{align*} \]
Slovene

(66) a. Rad bi vedel, koga da je Peter videl. (Marvin 1997: 50)
   *glad subj know whom C[-wh] aux Peter seen*
   ‘I would like to know who Peter saw.’

b. Spra ujm se, koga ali pela ljubi.
   *I ask refl whom C[+wh] Spela loves*
   ‘I wonder who Spela loves.’

c. Nisem ga vpra al, komu kaj da zameri.
   *not him asked whom what C[-wh] blames*
   ‘I didn’t ask him who he blames for what.’

(67) a. Peter je videl nekoga in rad bi vedel, koga (*da).
   *Peter aux seen someone and glad subj know whom that*
   ‘Peter saw someone and I would like to know who.’

b. pela ljubi nekoga, a nisem vpra al, koga (*ali).
   *Spela loves someone but I not aux asked who if*
   ‘Spela loves someone, but I didn’t ask who.’

c. Nekomu nekaj ocita, a nisem ga vpra al, komu kaj (*da).
   *someone dat something he.blames but not I aux asked who dat what that*
   ‘He blames someone for something, but I didn’t ask him who he blames for what.’

Serbo-Croatian (modified from Bošković 2001:34)

(68) Vidi nekoga. Koga (*li)? ‘He sees someone. Who?’
   *sees someone who Q*

Irish

(69) Cheannaigh sé leabhar inteacht ach níl fhios agam céacu ceann (*a / *ar).
   *bought he book some but not.is knowledge at.me which one C trace / C pro*
   ‘He bought a book, but I don’t know which.’

(colloq.) Danish

(70) Vi ved hvem (som) (at) der snakker med Marit. ‘We know who is talking with Marit.’
   *we know who C C C? talks with Marit*

(71) En eller anden snakker med Marit, men vi ved ikke
   *someone talks with Marit but we know not*
d. * hvem at. e. * hvem at der. f. * hvem som at der.

Two possibilities:
1. Complementizers must cliticize to their right (at least in right-branching languages), as claimed for Hebrew and Irish Cs in Shlonsky 1988 and McCloskey 1996 (cf. lack of aux-reduction before VP-ellipsis sites; King 1970; cf Bresnan/Lightfoot rightward cliticization)
2. Assimilate these entirely to the I-to-C effects, assuming that etc. is a spell-out of a moved I (Pesetsky and Torrego 2001)
3 Variable island repair under ellipsis: Are islands PF phenomena or not?

3.1 Wh-extraction out of islands and sluicing


(See Pesetsky 1997, Kennedy and Merchant 2000, Bošković 2001:114ff for other evidence for PF islandhood)

Caveat: This does not hold for all kinds of sluicing in all languages: Fukaya 1998, Hoji and Fukaya 1999, 2001

(72) Relative clause island:
   a. They want to hire someone who speaks a Balkan language, but I don’t remember which.
   b. *I don’t remember which (Balkan language) they want to hire someone [who speaks__].

(73) Left-branch (attributive adjective case):
   a. She bought a big car, but I don’t know how big.
   b. *I don’t know how big she bought [a __ car].

(74) Derived position islands (subjects, topicalizations)
   A biography of one of the Marx brothers is going to be published this year — guess which!

(75) COMP-trace effects: (cf. Chung et al’s 1995 (90), (91a), Perlmutter 1971:112)
   a. It appears that someone will resign, but it’s not yet clear who.
   b. Sally asked if somebody was going to fail Syntax One, but I can’t remember who.

(76) Coordinate Structure Constraint:
   a. They persuaded Kennedy and some other Senator to jointly sponsor the legislation, but I can’t remember which one. (Chung et al’s 1995 (88b))
   b. Bob ate dinner and saw a movie that night, but he didn’t say which.

(77) Adjuncts:
   a. Ben will be mad if Abby talks to one of the teachers, but she couldn’t remember which.
   b. Ben left the party because one of the guests insulted him, but he wouldn’t tell me which.

(78) Complement to nouns: (Chung et al’s 1995 (84c))
   The administration has issued a statement that it is willing to meet with one of the student groups, but I’m not sure which one.
(79) **Sentential subject:** (Chung et al’s 1995 (84b))
That certain countries would vote against the resolution has been widely reported, but I’m not sure which ones.

(80) **Embedded question:** (Chung et al’s 1995 (84a))
Sandy was trying to work out which students would be able to solve a certain problem, but she wouldn’t tell us which one.

**Option 1:** Crossed island nodes are marked with * (“*AS A FEATURE OF ISLAND NODES”)

[Ross 1969, Chomsky 1972, Lasnik 2001a; Kennedy and Merchant 2000 for the Left Branch Condition; also Fox and Lasnik 2001]

(81) a. They want to hire someone who speaks a Balkan language, but I don’t remember which.

   b. ![Diagram](image)

   \[\text{IP-deletion eliminates} \ *CP\]

   \[\text{they} \ (\text{do}) \ \text{VP} \]

   \[\text{want to hire} \ [\text{NP} \ [\text{NP} \ \text{someone}]] \ *CP] \]

   \[\text{who speaks} \ t_1\]

3.1 **Wh-extraction out of islands and VP-ellipsis**

(82) **Relative clause island:**
*They want to hire someone who speaks a Balkan language, but I don’t remember which they do.

(83) **Left-branch** (attributive adjective case):
*She bought a big car, but I don’t know how big she did.

(84) **Derived position islands (subjects, topicalizations)**
*He said that a biography of one of the Marx brothers is going to be published this year — guess which he did!

(85) **COMP-trace effects:**

   a. *It appears that someone will resign; it’s just not clear yet who it does.
b. *Sally asked if somebody was going to fail Syntax One, but I can’t remember who she did.

(86) **Coordinate Structure Constraint:**
a. *They persuaded Kennedy and some other Senator to jointly sponsor the legislation, but I can’t remember which one they did.
b. Bob ate dinner and saw a movie that night, but he didn’t say which he did.

(87) **Adjuncts:**
a. *Ben will be mad if Abby talks to one of the teachers, but she couldn’t remember which he will.
b. *Ben left the party because one of the guests insulted him, but he wouldn’t tell me which he did.

(88) **Complement to nouns:**
*The administration has issued a statement that it is willing to meet with one of the student groups, but I’m not sure which one it has.

(89) **Embedded question:**
*Sandy was trying to work out which students would be able to solve a certain problem, but she wouldn’t tell us which one she was.

=> The problem of wh-extracting out of VP-ellipsis sites is even more severe (Lasnik 2001a):

(90) They said they heard about a Balkan language, but I don't know
   a. which they said they heard about.          NO ELLIPSIS
   b. which.                  SLUICING
   c. *which they did.          VP-ELLIPSIS

(91) They attended a lecture on a Balkan language, but I don't know
   a. which they attended a lecture about.       NO ELLIPSIS
   b. which.                  SLUICING
   c. *which they did.          VP-ELLIPSIS

(92) They studied a Balkan language, but I don't know
   a. which they studied.          NO ELLIPSIS
   b. which.                  SLUICING
   c. ??which they did.          VP-ELLIPSIS
A general ban on wh-extraction out of VP-ellipsis sites? (à la Sag 1976, Williams 1977)
No: (as pointed out in Evans 1988)

(93) a. I know what I LIKE and what I DON’T.
    b. I know which books she READ, and which she DIDN’T.
    c. What VP-ellipsis CAN do, and what it CAN’T. (Johnson 2001)

(94) a. GREEK, you should take; DUTCH, you shouldn't.
    b. I know which books ABBY read, and which ones BEN did.

(95) a. I think YOU should ride the TALLEST camel, but I don't know which one PHIL
    should. (Schuyler 2001 (48))
    b. I think you SHOULD adopt one of these puppies, but I can't predict which one
    you actually WILL. (Schuyler 2001 (49))
    c. ABBY took GREEK, but I don't know what language BEN did.
    d. We know that Abby DOES speak [Greek, Albanian, and Serbian], -- we need to
    find out which languages she DOESN’T want to take. (Merchant 2001:115 fn 5 (ii))
    e. (I know) ABBY wants to take GREEK, but I don't know what language BEN does
    want to take.
    f. ABBY₁ said she₁ took GREEK, but I don't remember what language BETH₂ did
    say she₂ took. [cf. bound subject restrictions in gapping, multiple sluicing]
    g. ABBY attended a lecture on KEATS, but I don't know what poet BEN did.

Observation: Some kind of contrast is required in the cases where VP-ellipsis is licit. (See
Schuyler 2001 for one formulation)

Perhaps, as Merchant 2001 and Lasnik 2001a suggest, there is a ban on eliding less than possible
under wh-extraction (whose ultimate source remains obscure):

(96) MaxElide [Definition]
    Let XP be an elided constituent containing an A'-trace
    Let YP be a possible target for deletion
    YP must not properly contain XP ( XP ⊄ YP )

Roughly: “Elide as much of XP as possible” (when XP contains a wh-trace)

    (this constraint may be in part derivable from economy: putting the E feature on IP over VP
    allows for less pronunciation)

Compare similar constraints discussed in Hirschbühler 1978, Williams 1986, Tancredi 1992:123,
Merchant 2001:58:

(97) a. Ben knows who she invited, but Charlie doesn’t.
    b. ?? Ben knows who she invited, but Charlie doesn’t know who.
    c. Ben knows who she invited, but Charlie doesn’t know who she invited.
    d. ?? Ben knows who she invited, but Charlie doesn’t know who she did.
John knows how to do something, but I don’t what (*he knows how).

Ben knows that she invited Klaus, but her father doesn’t.

Ben knows that she invited Klaus, but her father doesn’t *know that she did.*

a. Abby knew that he had quit, but Beth didn’t *know that he had.*

b. Abby asked if he had quit, but Beth didn’t *ask if he had.*

c. ?? Abby knew when he had quit, but Beth didn’t *know when he had.*

d. ?? Abby asked when he had quit, but Beth didn’t *ask when he had.*

But contrast alone fails to have a similar ameliorating effect on island extraction cases:

*(101) Relative clause island:

*Abby DOES want to hire someone who speaks {GREEK/a certain Balkan language}, but I don’t remember what kind of language she DOESN’T.*

*(102) Left-branch (attributive adjective case):

*ABBY bought a big car, but I don’t know how big BEN did.*

*(103) Derived position islands (subjects, topicalizations)

*Abby DID said that a biography of HARPO is going to be published this year — guess which Marx brother she DIDN’T.*

*(104) COMP-trace effects:

a. *It appears to ME that SEN. HATCH will resign, but I don't know which senator it does to YOU.*

b. *ABBY asked if I was going to fail Syntax One, but I can’t remember who BEN did.*

*(105) Coordinate Structure Constraint:

a. *They got the president and 37 Democratic Senators to agree to revise the budget, but I can’t remember how many Republican ones they DIDN’T.*

b. BOB ate dinner and saw five movies that night, but he didn’t say how many ABBY did.

*(106) Adjuncts:

a. *BEN will be mad if Abby talks to Mr. Ryberg, and guess who CHUCK will.*

(Merchant 2001:115 (15))

b. *BEN left the party because {Charlene / some guest} insulted him, but God only knows which guest ABBY did.*

*(107) Complement to nouns:

*The dean’s office has issued a statement that it is willing to meet with {Students for a Democratic Society / a certain student group}, but I’m not sure which student group the provost’s office has.*
(108) *Embedded question:*

*Sandy was trying to work out how many students would be able to solve (problem #4 / a certain problem), but she wouldn’t tell us which problem she wasn’t.*

<table>
<thead>
<tr>
<th>Option 2: Intermediate traces of island-escaping XPs are * (<strong>AS A FEATURE OF TRACES</strong>)</th>
</tr>
</thead>
<tbody>
<tr>
<td>[Lasnik and Saito 1984, 1992’s γ-marking; Chomsky and Lasnik 1993, Kitahara 1999]</td>
</tr>
</tbody>
</table>

(109) a. They want to hire someone who speaks a Balkan language, but I don’t remember which.

b. ... CP

```
[DP which ]_2

C

IP

*C

*IP

they (do) VP

*IP-deletion eliminates all *-traces

want to hire [NP [NP someone ] CP ]

VP-deletion leaves *t’’_2

who speaks t_2
```

Tabulating the data:

<table>
<thead>
<tr>
<th></th>
<th>MaxElide</th>
<th>*t</th>
<th></th>
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<td><strong>Sluicing</strong></td>
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<td>✓</td>
<td>Island-containing</td>
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<tr>
<td>(90b),(91b),(92b)</td>
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<td>✓</td>
<td>Non-island-containing</td>
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<tr>
<td><strong>VP-ellipsis</strong></td>
<td>*(82)-(89)</td>
<td>*</td>
<td>Island-containing</td>
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<tr>
<td>*(90c),(91c),(92c)</td>
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<td>(93)-(95)</td>
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<tr>
<td>*(101)-(104)</td>
<td>✓</td>
<td>*</td>
<td>Island-containing</td>
</tr>
</tbody>
</table>
3.2 Nonindefinite correlates

(110) a. Abby speaks GREEK, but I don’t remember what OTHER languages.
    b. She met RINGO, but I don’t know who else.
    c. He said he talked to ABBY, but I don’t know who else <he said he talked to>.
    d. John met most applicants, but I can’t remember exactly which ones.

(111) a. ABBY took GREEK, but I don’t know what language BEN did.
    b. We know that Abby DOES speak [Greek, Albanian, and Serbian] -- we need to
       find out which languages she DOESN’T <speak>! (Merchant 2001:115 fn 5 (ii))
    c. (I know) ABBY wants to take GREEK, but I don’t know what language BEN
does <want to take>.
    d. ABBY interviewed two-thirds of the applicants, but I don’t remember exactly
   how many of them BEN did <interview>.

(112) a. *Abby wants to hire someone who speaks GREEK, but I don’t remember what
OTHER languages <she wants to hire someone who speaks>.
    b. *The radio played a song that RINGO wrote, but I don’t know who else.

(113) a. *Abby DOES want to hire someone who speaks GREEK, but I don’t remember
what kind of language she DOESN’T.
    b. *BEN will be mad if Abby talks to Mr. RYBERG, and guess who CHUCK will.
   (Merchant 2001:115 (15))

(114) I only played a song that RINGO wrote because you did.

(115) GREEK₉ x [IP Abby [VP x λx [speaks x']]]
(116) what OTHER languages λx [IP Abby [VP x λx [speaks x']]]
(117) I only *RINGO₉ x [VP played a song that x wrote] because you did <play a song that
x wrote>]
(118) [IP Abby [VP *GREEK₉ x [VP wants to hire someone who speaks x ] ]]

(119) a. Abby met most applicants, but I can’t remember exactly which ones.
    b. ABBY interviewed exactly two-thirds of the applicants, but I don’t remember
   how many of them BEN did.

(120) a. *If most senators resign, Abby will stop her hunger strike, but I can’t remember
exactly which ones.
    b. *If exactly two-thirds of the senators resign, ABBY will stop protesting, but I
can’t remember how many of them BEN will.

(121) ??Abby met most applicants, but I can’t remember exactly which ones she did.
4 PF output constraints and ellipsis

Fact?: I-to-C movement is impossible in comparative clauses

I-to-C in comparative clauses:
(122)  a. Abby knows more languages than does her father.
       (cf. Abby knows more languages than her father does.)
   b. Abby can play more instruments than can her father.
       (cf. Abby can play more instruments than her father can.)
   c. Abby is taller than is her father.
       (cf. Abby is taller than her father is.)

VP-ellipsis is obligatory in these cases:

(123)  a. *Abby knows more languages than does her father know.
   b. *Abby can play more instruments than can her father play.
(124)  a. Abby knows more languages than her father knows.
   b. Abby can play more instruments than her father can play.
(125)  a. Abby has been awarded more accolades than has her father (*been awarded).
   b. Abby has been awarded more accolades than her father has been awarded.
(126)  a. Abby has been awarded a more prestigious accolade than has her father (*been awarded).
   b. Abby has been awarded a more prestigious accolade than her father has (been awarded).
(127)  a. Abby has been playing piano longer than has her father (*been playing piano).
   b. Abby has been playing piano longer than her father has been playing piano.

Lower VP-ellipsis is not enough

(128)  a. *Abby has been awarded more accolades than has her father been.
   b. *Abby has been awarded a more prestigious accolade than has her father been.
   c. *Abby has been playing piano longer than has her father been.
(129)  a. Abby has been awarded more accolades than her father has been.
   b. Abby has been awarded a more prestigious accolade than her father has been.
   c. Abby has been playing piano longer than her father has been.

(130)  Comparative SAI and VP-ellipsis generalization
       I-to-C movement in comparative clauses can occur only if VP complement to I⁰ is deleted.

I-to-C in comparatives with VP-ellipsis is not rare (support for (130) from two corpus searches):

---

1 This generalization was noted independently in Potts 2000.
<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
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<tr>
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<td>Number of hits</td>
<td>Sample available</td>
<td>Sample inspected</td>
<td>Number of than + SAI (N)</td>
<td>Number of N containing VP-ellipsis (V)</td>
<td>V as a percentage of N</td>
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<td>100 %</td>
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<td>200</td>
<td>20</td>
<td>22</td>
<td>22</td>
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</tr>
<tr>
<td>than did</td>
<td>46,086</td>
<td>200</td>
<td>20</td>
<td>21</td>
<td>21</td>
<td>100 %</td>
</tr>
</tbody>
</table>

TABLE 1: AltaVista search for SAI with VP-ellipsis in comparatives

The second corpus search was a search for the same strings in J. Hoeksema’s 16 million word database of texts. The number of hits were as follows: 24 occurrences of *than does*, 26 occurrences of *than do*, and 28 occurrences of *than did*. All cooccurred with VP-ellipsis.

Contrast with matrix questions:

(131) a. How many languages does Abby know?
    b. How many instruments can Abby play?
    c. How many accolades has Abby been awarded?
    d. How prestigious an accolade has Abby been awarded?
    e. How long has Abby been playing the piano?

(132) a. Abby can play more instruments than her father can play.
    b. ... than [[CP Op₁ her father can [VP t₁′ [VP tᵢ play t₁]]]


(133) *The Empty Category Principle at PF (ECPₚᵣ):*
    At PF, a trace of A'-movement must either be
    i. PF-head-governed, or
    ii. PF-antecedent-governed

(134) $\alpha$ PF-head-governs $\beta$ iff
    i. a. $\alpha$ is a head, and
    b. $\alpha$ c-commands $\beta$, and
    c. $\alpha$ respects Relativized Minimality wrt $\beta$, and
    ii. $\alpha$ is PF-active

(135) A link $\alpha_i$ in a chain $< \alpha_1, \ldots, \alpha_n >$ is PF-active iff $\alpha_i$ is the link at which lexical insertion occurs
\(\alpha \text{ PF-antecedent-governs} \beta \) iff

1. \(\alpha \) and \(\beta\) are co-indexed, and
2. \(\alpha\) c-commands \(\beta\), and
3. \(\alpha\) respects Relativized Minimality wrt \(\beta\), and

ii. \(\alpha\) is PF-visible

(137) An expression \(\alpha\) is PF-visible iff \(\alpha\) has phonetic exponence

(138) a. *Abby can play more instruments than can her father play.
   b. \(\ldots \text{than } [\text{CP Op}_1 \text{can } [\text{IP her father } t_{\text{can }} [\text{VP } t_{1}' [\text{VP } t_{SU} \text{play } t_{1} ]]]]\)

(139) Abby can play more instruments than can her father.
(140) \(\ldots \text{than } [\text{CP Op}_1 \text{can } [\text{IP her father } t_{\text{can }} [\text{VP } t_{1}' [\text{VP } t_{SU} \text{play } t_{1} ]]]]\)

(141) a. *Abby has been awarded more accolades than has her father been.
   b. \(\ldots \text{than } [\text{CP Op}_1 \text{has } [\text{IP her father } t_{\text{has }} [\text{VP } t_{1}' [\text{VP } \text{awarded } t_{SU} t_{1} ]]]]\)

(142) How many instruments can Abby play?
(143) \([\text{CP} \text{How many instruments}_1 \text{can } [\text{IP Abby } t_{\text{can }} [\text{VP } t_{1}' [\text{VP } t_{SU} \text{play } t_{1} ]]]] \) ?

I-to-C with ...

1. no wh-extraction from VP:
   Yes-no questions (144), literary counterfactuals and concessives (145), non-wh-exclamatives (146), and imperatives and hortatives (147).

(144) a. Can she play the piano?
   b. Does he know many languages?

(145) a. Had he been on time, we might have made it.
   b. Be it ever so humble, there’s no place like home.

(146) a. Man, can she play the piano!
   b. Am I ever glad to see you!

(147) a. Don’t everybody get up at once!
   b. May he be a joy to you forever!

2. other PF-visible operators:
(148) Rarely have I ever been so surprised.
(149) a. No sooner had he arrived than it started to rain.
   b. Little did he suspect that he had already been betrayed.

(150) Abby can swim a mile, and so can Ben.
(151) Abby got the Nobel Prize, as did her father.
3.1 SAI, VP-ellipsis, and pseudogapping

(152) a. I eat meat, but I don’t seafood.
   b. ... I don’t \[ {\text{VP seafood} {\text{t}_u {\text{eat} {\text{t}_o {\text{t}}}}} } ]

Pseudogapping is compatible with SAI, as the examples in (153) show (from Sag 1976 and Kempson et al. 1999:282 fn 43, respectively), though as Levin 1986 points out, such examples are somewhat marked.

(153) a. A: Hey! I’ve never seen you on campus before. B: Nor have I you!
    b. John didn’t give a nickel to Mary, nor did I a dime to Sue.

Pseudogapping in comparatives:
(154) Abby plays the flute better than her father does the trumpet.

But not with I-to-C:
(155) *Abby plays the flute better than does her father the trumpet.

So (156) must be a possible derivation, but not (157) (the latter excluded perhaps on principled grounds (PIC effect?))

(156) ... than \( O_p \) does her father \( t_{does} \) \[ {\text{VP } t_1 {\text{ play } {\text{t}_o {\text{t}}}}} \]
(157) ... than \( O_p \) does her father \( t_{does} \) \[ {\text{VP the trumpet } {\text{t}_u {\text{play} {\text{t}_o {\text{t}}}}}} \]

[Restriction holds for multiple A'-extractions, not for (presumably VP-)adjuncts:
(158) Klaus would be happier in the north than would Chuck in the south. (Potts 2000: (61a))]
5 Conclusions

A number of deviancies that have been ascribed to other parts of the grammar may best be located at the PF interface.

The nature of PF and the constraints that operate there can, prima facie paradoxically, be illuminated by investigating structures that have no PF exponence.

Extensions to other possible repair effects:
1. lack of complementizer agreement in Bavarian sluicing (Lobeck 1995, Merchant 2001);
2. lack of Wackernagel clitics in S.Slavic sluicing (Merchant 2001);
3. multiple sluicing in Germanic, Greek, and Turkish (and perhaps in Bulgarian, Japanese, Russian, and Serbo-Croatian as well) (Merchant 2001);
4. remnant movements in gapping (Johnson 1996, Richards 1998);
5. remnant movements in pseudogapping (Johnson 2001);
6. lack of verb-movement in pseudogapping (Lasnik 1995, 2001a);
7. swiping in English, Norwegian, Danish (Merchant to appear);
8. ‘vehicle change’ effects in anti-pronominal contexts (Potts 1999);
9. long-distance reflexives in English (Kennedy and Lidz 2001);
10. wh-movement in wh-in-situ languages (Fukaya 1998)

References


