1. Introduction

Claims:
(i) Pied-piping has properties that hold across languages; it is less idiosyncratic than is often assumed (cf. Postal 1971, 99 & 200; Riemsdijk & Williams 1986, 68).
(ii) Percolation of wh-features does not exist. Rather, the probe-goal relation in wh-constructions is mediated by Agree.

Background:

Caveat:
(i) Only embedded questions and restrictive relative clauses are considered.
(ii) Pied-piping as it can occur in non-embedded questions and appositive relative clauses (massive pied-piping, see Safr 1986) is a different phenomenon (see Breman 1976, Emonds 1976, Cinque 1982, Sells 1985, Safr 1986, Bosley 1992, among others).

Structure of the talk:
(i) The problem of pied-piping and its standard solution are introduced.
(ii) I argue that feature percolation has no place in the minimalist program.
(iii) I propose an alternative, based on (a) the concept of Agree, (b) the notions of a phase and the PIC, and a violable constraint LOCAL AGREE.
(iv) Three properties of pied piping are predicted: (a) recursive pied piping, (b) secondary wh-movement, (c) last-resort effects. I show that all three properties are attested cross linguistically.

2. The Problem

Descriptive Generalization on Wh-Movement:
A wh-clause begins with a wh-expression which is associated with a gap at some clause-internal position.

Interpretation:
A wh-expression moves from the position where it is merged to SpecC in order to establish a local relationship between the wh-feature of the wh-expression and the wh feature of the (interrogative or relative) C-head.

Remark:
In theory, (1) has been expressed by (i) or (ii):
(i) the wh Criterion (see Aoun, Hornstein & Sportiche 1981, Kayne 1983),
(ii) a locality condition on feature-checking (see Chomsky 1995).

Terminology:
Chomsky (2001) calls the wh-feature of the C-head the probe and the wh-feature of the wh expression the goal.

Observation (see Ross 1967/68):
There are cases where the category that occupies SpecC of the interrogative or relative clause is not a wh-element but rather contains a wh-element: pied-piping.

Regular Instances of Pied Piping in English:

Problem:
(i) Probe and goal are not in a local configuration in (2), in disagreement with (1).
(ii) It does not seem to be attractive to give up (1), because it derives wh-movement.

Consequence:
The gap in locality between probe and goal has to be bridged.

3. The Standard Approach

Introduction (Chomsky 1977): Non-locality between wh-goal and wh-probe is only apparent. The moved constituents in (2) actually do bear the wh-goal (see, e.g., Cooper 1987, Grimshaw 1991/2000, Weibelhuth 1992, Kayne 1994 for implementations of this idea).

Generalization (Lieber 1988, Scull & Williams 1987):
Features of a head H project up to HP but not beyond HP.

Consequence:
The wh-moved phrases in (2) cannot have acquired the wh-goal by ordinary feature projection.

Irregular Instances of Pied Piping in English:

a. *a man [p] the dockchair of whom [t] you spilled coffee on t2
b. "a man [AP enamored by whom] t2 she found herself t2
   c. "a man [VP to address whom] t2 she hesitated t2
   d. "a man [CP that we trust whom] t2 you should not believe t2

4. Against the Standard Approach

The only construal operations in syntax are Merge and Move.

Standard Argumentation:
(i) Feature percolation should be reducible to Merge or Move,
(ii) Otherwise, a new concept would have to be introduced,
(iii) This should be avoided if there is a theory that does without feature percolation.

4.1. Percolation Reduced to Merge

Assumptions for (2 a):
(i) [WH] is available on empty D as a lexical property, or
(ii) [WH] is merged onto D after D has been introduced into the derivation to save the structure.

Problem for (i-a):
There is no independent (e.g., morphological) motivation for the assumption that D bears [WH] (cf. "a man John's deckchair you spilled coffee on").

Problem for (i-b):
(i) Merge must be able to manipulate feature structures [WH] has to become a part of the feature set of D in order to get projected,
(ii) Separate Merge of [WH] violates a strict version of the SCC (see (5); strict – Merge exclusively applies at the root, see Chomsky 1995, 327f.),
(iii) Separate Merge of [WH] violates the IC (5), see Chomsky 1995, 228.

5. An Agree-Based Approach

Proposal:
(i) The interpretation (1) is too strict,
(ii) Wh-feature checking can in principle apply in a remote fashion.

7. Agree

Probe \( \beta \) can establish Agree with goal \( \gamma \) iff \( a, b, \) hold,
- a. \( \beta \) command \( \gamma \),
- b. There is no goal \( \alpha \) such that \( \beta \) command \( \alpha \) and \( \alpha \) command \( \gamma \).

Questions to be answered:
(i) Why is the target in the first place?
(ii) Why are there illicit instances of pied-piping?

Conclusion:
From now on, \( \Sigma \) shall denote the current phrase marker of the derivation.

Chomsky (1995):
(i) All movement is driven by feature checking,
(ii) Certain features (probes) have to be checked by other features (goals), see (8),
(iii) Unmotivated movement is blocked, see (9).
(iv) There is a locality requirement on checking, in the spirit of (1).

8. Feature Condition (FC)

If \( \beta \) is a probe in \( \Sigma \), then \( \beta \) must be checked on the \( \Sigma \) cycle.

Prediction:
If percolation is an instance of Move, then it should show properties of Move.

Problem 1:
(i) Non-complements are islands for movement (see Cattell 1976, Huang 1982).
(ii) Percolation in (2 a) must be able to leave an island.

Problem 2:
(i) Movement from SpecH to H violates the SCC (see Baker 1988),
(ii) If percolation in (2a) targets the Dhead, then it violates the SCC.

Problem 3:
(i) Movement targets a c commanding position (PROPER BINDING, see Fiengo 1977),
(ii) If percolation in (2a) targets DP, then it violates PROPER BINDING.

Conclusion:
(i) Feature percolation is not reducible to Merge or Move,
(ii) The concept of feature percolation should be eliminated if possible.
(9) **LAST RESORT**

If γ moves within Σ, then γ must check some probe on the Σ-cycle.

(i) Movement is detached from feature checking.
(ii) Movement is triggered by the need to fill a specifier position, expressed by a generalised EPP feature on the specifier’s head.
(iii) Feature checking can apply in a non-local fashion (via Agree).

**Alternative:**
(i) Adopt the Agree-based approach (i.e., give up the absolute locality requirement).
(ii) But retain the idea that wh-movement is dependent on wh-feature checking.

**Proposal:**
There is a viable constraint which minimizes the distance between probe and goal in terms of intervening phrasal boundaries.

(10) **LOCAL AGREE (LA)**

If goal γ in Σ matches active probe β, then no XP dominates γ but not β.

(11) **Active Probe**

A probe β is active iff a. or b. hold,

a. β is part of Σ,

b. β is a single in the numeration.

**Some Remarks:**
(i) LA must be violable pied-piping.
(ii) Violability is expressed optimality theoretically (see Prince & Smolensky 2004).
(iii) When Σ extends to Σ, a set of Σ-variants is created. The set is optimized, the optimal output is selected into the derivation (see Heck & Müller 2000).
(iv) LR can be violated, too, if violation is forced by a constraint which is more important than LR (for instance LA). Consequence non feature movement.
(v) Motivation for the concept of active probe will become obvious when successive cyclic movement is considered; until then ignore the concept of “activeness.”

(12) **Short Wh-Movement without Pied-Piping**

a. a person who adores you

b. [VP wh0 adores v TV 2 you] → (Merge v + verb raising)

c. [VP wh0 adores v TV t2 2 you] → (Merge who)

d. [VP wh0 adores v TV t3 2 you] → (Merge T + Move who)

e. [VP wh0 t1 T [VP t1 2 you] adores v TV t2 2 you] → (Merge C + Move who)

f. [CP wh0 2 C [TV t1 T [VP t1 2 you] adores v TV t2 2 you] → (Merge C + Move who)

**Comments:**
(i) [EPP] on T seeks for a goal to establish Agree with and encounters who.
(ii) LA forces raising of who to SpecT, which eliminates the VP induced LA violation.
(iii) Agree between T and who eliminates [EPP] on T; neither LA nor LR are violated.
(iv) C is merged and seeks for a goal; it encounters [Wh] on who.

(13) **Short Wh-Movement with Pied-Piping**

a. a person whose son adores you

b. [VP adores you] → (Merge v + verb raising)

c. [VP adores v TV t2 you] → (Merge who)

d. [VP wh0 adores v TV t3 2 you] → (Merge T + Move who)

e. [TV wh0 t1 T [VP t1 2 you] adores v TV t2 2 you] → (Merge C + Move who)

f. [CP wh0 t0 C [TV t1 T [VP t1 2 you] adores v TV t2 2 you] → (Merge C + Move who)

**Comments:**
(i) Raising to subject applies as in (13).
(ii) C is merged and seeks for a goal; it encounters [Wh] on who.
(iii) Two phrase boundaries intervene between probe and goal: TP and DP.
(iv) Raising of who would eliminate both violations; but it would also violate the LEFT BRANCH CONDITION (LBC, see Ross 1967/86).
(v) Assumption: LBC is more important than LA.
(vi) Pied-piping of DP eliminates at least the TP-induced LA-violation.
(vii) The DP-induced LA-violation is not fatal due to lack of better alternatives.

**Further Assumptions:**
(i) Chomsky (2000, 2001b) classifies CP and vP as special derivational units “phases.”
(ii) Phases create opaque domains, as expressed in (14).

(14) **Phase Impenetrability Condition (PIC)**

The domain of a head H of a phase HP is not accessible to operations at ZP (the next phase). Only H and its edge domain are accessible to such operations.

**Conventions:**
(i) Ω is dominated by Σ; Σ a phrase, and that there is no phase between Ω and Σ.
(ii) For the moment, conceive of the edge of a phase as its specifiers.

(15) **Accessibility**

γ is accessible in Ω if a. or b. hold.

a. Ω is a phase and γ is in the edge domain of Ω.

b. Ω is not a phase and γ is in the domain of Ω.

(16) **Edge domain**

γ is in the edge domain of a phase Ω if a. or b. hold.

a. γ is a specifier of Ω.

b. (i) α is a specifier of Ω and

(ii) γ is accessible in α.

(17) **Domain**

γ is in the domain of Ω if a. or b. hold.

a. γ is immediately dominated by Ω,
b. $\alpha$ is immediately dominated by $\Omega$ and $\gamma$ is accessible in $\alpha$.

(18) **Long Wh-Movement without Pied-Piping**

a. John wonders why Dickens died

b. $[\text{VP} \text{ die} \text{ why} \text{ Dickens}]_5 \rightarrow \text{[Merge v + verb raising]}

c. $[\text{VP} \text{ die} \text{ why} \text{ Dickens}]_5 \rightarrow \text{[Merge Dickens]}

d. $[\text{VP} \text{ die} \text{ why} \text{ Dickens}]_5 \rightarrow \text{[More why]}

e. $[\text{VP} \text{ why} \text{ Dickens} \text{ die} \text{ why} \text{ Dickens}]_5 \rightarrow \text{[Merge T + More Dickens, why]}

(19) **Long Wh-Movement with Pied-Piping**

a. John wonders why Dickens died

b. $[\text{VP} \text{ die} \text{ why} \text{ Dickens}]_5 \rightarrow \text{[Merge v + verb raising]}

c. $[\text{VP} \text{ die} \text{ why} \text{ Dickens}]_5 \rightarrow \text{[Merge Dickens]}

d. $[\text{VP} \text{ die} \text{ why} \text{ Dickens}]_5 \rightarrow \text{[More why]}

e. $[\text{VP} \text{ why} \text{ Dickens} \text{ die} \text{ why} \text{ Dickens}]_5 \rightarrow \text{[Merge T + More Dickens, why]}

\text{Comments:}

(i) Goal why in (18d) must raise to the edge of VP in order to be accessible at the CP-level and to ultimately check the wh-probe on C.
(ii) [11b] extends the domain of active probes to “singles” in the enumeration N.
(iii) A single probe $\beta$ in N is a probe for which there is no matching goal in N.
(iv) Recall LA triggers movement of a goal $\gamma$ to Spec$\Sigma$ after a new head has been merged; this may violate LR, if $\gamma$ does not check some probe on the $\Sigma$ cycle.
(v) The same holds if a phrasal head is merged; goal $\gamma$ is placed at the phrase edge.
(vi) If another constraint blocks movement to the phrase edge (in violation of LA), then a violation of the FC will cause the derivation to crash at some later point.

\text{Side Remark:}
Point (iii) above makes sure that a probe $\beta$ triggers successive cyclic movement of a wh-phrase $\gamma$ if $\beta$ will ultimately be checked by another goal $\gamma'$ (see *Who thinks what John bought*).

\text{Consequence:}
(i) The derivation proceeds by raising why to Specv, thereby violating LR in favor of LA (why does not check any probe on the VP cycle).
(ii) This movement is triggered by the active wh-probe in N (which is not dominated by VP, in contrast to the goal; see [10]).

(20) **Generalization on Recursive Pied-Piping**

If $\alpha$ can pied-pipe $\beta$, and $\beta$ is in a canonical position to pied pipe $\gamma$, then $\alpha$ can also pied-pipe $\gamma$.

\text{Terminology:}
A canonical pied-piping position within $\beta$ is a position $P$ such that if $P$ is occupied by a wh phrase $\alpha$, then $\beta$ can be pied piped by $\alpha$.

6. **Recursive Pied-Piping**

(21) **Recursive Specifiers in English (see, e.g., Sells 1985, Cooper 1987):**

a. a man [DP whose deckchair $\exists$ you spilt coffee on $\text{t}_2$]

b. a man [DP whose sister's deckchair $\exists$ you spilt coffee on $\text{t}_2$]

c. a man [DP whose sister's lawyer's deckchair $\exists$ you spilt coffee on $\text{t}_2$]

(22) **Recursive Specifiers in German 1:**

a. ein Mann [DP dessen Liegestuhl $\exists$ du $\text{t}_2$ ruiniert hast]

b. ein Mann [DP dessen Vaters Liegestuhl $\exists$ du $\text{t}_2$ ruiniert hast]

c. ein Mann [DP dessen Vaters Bruders Liegestuhl $\exists$ du $\text{t}_2$ ruiniert hast]

(23) **Recursive Specifiers in German 2:**

a. jemand [DP dem seine Tochter $\exists$ du $\text{t}_2$ magst]

b. jemand [DP dem seiner Tochter ihren Sohn $\exists$ du $\text{t}_2$ magst]

c. jemand [DP dem seiner Tochter ihren Sohn seine Art $\exists$ du $\text{t}_2$ magst]

\text{Note:}
Recursive pied-piping is impossible, if the pied-piper is embedded in a complement cascade below DP;
(24) **No Recursive DP Complements in English:**
   a. "a man [DP the deckchair of whom] 12 you spilled coffee on t2
   b. "a man [DP the deckchair of the sister of whom] 12 you spilled coffee on t2
   c. "a man [DP the deckchair of the sister of the lawyer of whom] 12 you spilled coffee on t2

(25) **No Recursive DP Complements in German:**
      someone the deckchair of whom you ruined have
      someone the deckchair of the father of whom you ruined have
      someone the deckchair of the brother of the father of whom you ruined have

**Assumption:**
Alongside with vP and CP, DP constitutes a phrase (see Szemerszegi 2003).

**Derivation of (24a):**
(i) When the deckchair of whom is constructed, whom must move to SpecD, otherwise the goal will not be accessible for further computation.
(ii) Ultimately, this leads to a violation of the FC on the CP cycle.
(iii) The same holds for (24b,c).

**Derivation of (24a):**
The wh-goal occupies SpecD and hence remains accessible. Pied-piping is possible.

**Derivation of (24b):**
(i) (24a) showed: the goal is accessible in SpecD.
(ii) In (24b) whose does not occupy SpecD of whose sister's deckchair.
(iii) Rather, this position is occupied by whose sister.
(iv) But it follows from (24a) in one recursive step (see (16b)) that whose is accessible in whose sister's deckchair.

**Derivation of (24c):**
(24c) simply involves one more recursive step in the argument.

**Remark:**
Pied-piping of specifier cascades of the English type is not well formed in Tzotzil (see Aissen 1996) or San Diocézio Zapotec (see Brodwell 2001). Later, I will offer an explanation for this fact.

6.2. **Recursive Complements**

Illustrates that if the PP of (26a) occupies the complement position of another preposition, then the matrix PP is also pied-piped.

(26) **Recursive PP Complements in German**
   a. ein Punkt, [PP zu dem] 1 man t2 gehen kann 
      a point to which one can
   b. ein Punkt, [PP bis zu dem] 1 man t2 gehen kann 
      a point until to which one can

**Derivation of (26a):**
PP2 in (26a) is not a phase and immediately dominates the wh-goal dem. Thus dem is accessible in PP2 (see (17a)).

**Derivation of (26b):**
(i) The wh-goal is not immediately dominated by PP1, but PP2 is.
(ii) Thus, it follows by one recursive step (see (17b)) that the wh-goal is also accessible in PP2, too.

6.3. **Hybrid Recursion**

**Observation:**
The two types of recursive pied-piping can be mixed.

(27) a. jemand [PP über dessen Geschmack] 12 man t2 streiten kann 
    someone about whose taste one argue can
   b. jemand [PP über - dem seinen Geschmack] 12 man t2 streiten kann 
    someone about who his taste one argue can

**Derivation of (27):**
The argument proceeds along the same lines as above.

**Summary:**
(i) Recursive pied-piping is derived by interaction of the recursive definition of accessibility, the notion of a phase, and Agree.
(ii) Recursive pied-piping is attested in different languages (Danish, Russian might be other cases in point).
(iii) Recursion is a core properties of the syntax of human language. This suggests that pied-piping is determined by general principles, rather than by idiosyncrasies.

7. **Secondary Wh-Movement**

(28) **Edge generalization**

If a pied pipes β, then α has to be at the edge of β.

**Note:**
The notion "edge of β" is usually to be understood as 'specifier of β'. This is not to be
confused with the notion of “edge domain.”

7.1. Possessors in Tzotzil

Observations (Aissen 1996):
(i) Possessors appear strictly postnominal (see (29)),
(ii) Pied-piping by possessor requires obligatory inversion of the possessor who phrase and the head noun (see (30)),
(iii) The same observation can be made if pied-piping affects a PP and if the pied-piper is a genitive phrase that originates within the complement DP of P (see (31)).

(29) Genitives in Tzotzil:
a. s'p'in li Manueh e
   A3:pot the Manueh ENC
   'Manueh's pot'
b. *Manueh s'p'in
   Manueh A3:pot

(30) Pied-Piping DP by Genities in Tzotzil:
a. [NP Buch'u s'ch'amal t2 | i/cham t4?
   who A3 child CP died
   'Whose child died?'
b. *[NP X ch'amal buch'u | i/dham t2?
   A3:child who CP died

(31) Pied-Piping PP by Genities in Tzotzil:
a. [PP Buch'u ta [NP t2 s'na t3 | i/chabat t2?
   who to A3:house CP=go
   'To whose house are you going?'
b. *[PP Ta [NP s'na buch'u | i/chabat t2?
   to A3:house who CP=go

Claime:
These cases of secondary wh-movement follow without further ado from the system proposed so far.

(32) Secondary Wh-Movement within DP in Tzotzil:
a. Buch'u ta s'na chabat?
   who to A3:house CP=go
b. *[NP s'na buch'u
   (Merge D = Move buch'u
(c. [NP buch'u D [NP s'na t2] -> (Merge P = Move buch'u
d. [PP buch'u ta [NP t2 D [NP s'na t3]]
   (Merge V)
e. [CP chabat [PP buch'u ta [NP t2 D [NP s'na t3]]
   (Merge V)

Comment:
(i) There is an active wh-globe in N at point (32b), Consequence: LA is relevant,
(ii) Raising of buch'u from SpecN to SpecD reduces the number of LA violations from two to one (NP is skipped),
(iii) The same holds at point (32c), where raising from SpecD to SpecP is forced,
(iv) The bare possessor cannot raise to SpecN, because PP is an island in Tzotzil,
(v) The LA violation due to the PP boundary is not fatal due to lack of alternatives.

7.2. French Relatives with dont

Observations:
(i) French nominals select their prepositional arguments to the right (see (33)),
(ii) When DP is pied-piped by dont, then dont has to appear at the left edge of DP (see (34), adapted from Godard 1992),
(iii) In other French, pied-piping of a PP by dont was only possible if dont appeared at the left edge of the matrix PP (see Kayne 1975, Kayne 1976); see (35).

(33) Don't Genities in French:
   a. la soliddité de l'argument
   the soundness of the argument
   b. *de l'argument la soliddité
   of the argument the soundness

(34) Pied Piping DP by dont in French:
   a. un argument [NP dont2 la soliddité t2 | i t3 est indisputable
   an argument of which the reliability is not disputable
   b. *un argument [NP la soliddité dont2 | i t3 est indisputable
   an argument the reliability of which is not disputable

(35) Pied Piping PP by dont in French:
   a. la fille [PP dont2 au frère t2 | i t3 tu plais t4
   the girl of whom to the brother you please
   b. *la fille [PP au frère dont2 | i t4 tu plais t1
   the girl to the brother of whom you please

Derivation of Secondary Wh-Movement in French:
(i) Secondary wh-movement is equally derived by LA, just as in the case of Tzotzil,
(ii) Only different Tzotzil genitives start off in SpecN (according to Aissen), dont starts off as the complement of N.

Other Potential Cases:
(i) Genitives in Polish relative clauses (see Rappaport 1995),
(ii) Palienversion in Irish (see McClorey 1979, Noonan 1997),
(iii) PP-raising in Spanish (see Ormazaabal 1992),
(iv) Clausal pied-piping in Basque (see Ortiz de Urbina 1989) and Quechua (see Derom 1985).

Note:
(i) There seems no alternative trigger for secondary wh-movement available.
(ii) Rather, secondary wh-movement is contingent on pied-piping,
8. Last Resort Effects

(37) Repair generalization
Pied-piping of $\beta$ by $\alpha$ is possible only if movement of $\alpha$ from $\beta$ is blocked.

Comment:
Evidence for (37) comes from cases where pied-piping is avoided in favor of moving the bare wh-phrase and cases where the amount of structure being pied-piped is minimized.

8.1. French dont-Relatives Again

Observation:
DPs in object position cannot become pied piped by dont.

(38) Pied-Piping of Object by dont blocked:

*la fille dont tu as rencontré $t_3$
the girl of whom the brother you have met

Explanation:
(i) French subjects are islands (see 39a) from Sportiche 1998, complements are not.
(ii) The DP-complement in (38) is transparent for extraction; see (39b).
(iii) Thus, LA blocks (38) in favor of (39b).

(39) Extraction from Subject and Object in French:

a. *la ville dont $t_2$, la destruction $t_2$ serait entreprise
the city of which the destruction would be undertaken
b. la fille dont tu as rencontré $t_2$
the girl of whom you have met

8.2. Possessors in Chamorro

Observation (Chung 1998, 39f, footnote 5):
A wh-possessor in Chamorro cannot pied-pipe a DP if it can strand the DP (which is the case if the D head is null; see also Chung 1991).

(40) Pied-Piping by Possessor blocked in Chamorro:

a. *$t_2$ Hài $t_3$ muklicka$\eta$ $t_2$ un-yu-lang $t_3$?
who? dOlAGRN

"Whose doll did you break?"

b. Hài $t_3$ un-yu-lang [DP muklicka $t_2$]?

"Who? inf.12s break doll-AGRNS"

Explanation:
(i) As extraction of the possessor from DP is possible, it must apply, thereby optimizing the structure with respect to LA.
(ii) The alternative which involves pied-piping is blocked.

8.3. Predicates

Observation:
Predicates usually cannot be pied piped.

(41) Pied-Piping of Participle in German blocked:

a. *jemand, dem $t_1$ Maria [VP mit $t_2$ getanzet] $t_3$ hat

somebody whom Maria danced has

b. jemand, [VP mit $t_1$] Maria [VP mit $t_2$ getanzet] $t_3$ hat

somebody with whom Maria danced has

c. *jemand, [VP mit $t_1$ getanzet] $t_3$ hat

somebody with whom danced Maria has

Explanation:
(i) Participles are transparent for extraction (see (41b)).
(ii) Pied-piping of VP and PP incurs two LA-violations, pied-piping of PP only one.

Note:
The analysis thus directly rules out an whole class of illicit instances of pied-piping like the cases in (4), simply because they all involve pied-piping of categories that are transparent for extraction (except perhaps for the first case).

8.4. Possessors in Tzotzil Revisited

Recall:
I mentioned that pied-piping recursive specifiers of the English type is not possible in Tzotzil and San Diálogo Zapotec; see (42b) for Tzotzil (from Aissen 1996, 481).
9. A Problem

Recall: The present theory conceives of pied-piping as a "last resort" strategy, which can only apply in order to avoid an island violation.

Consequence:

One would therefore expect pied-piping and stranding to never exist simultaneously: the standing variant should block the pied-piping variant.

Problem:

This expectation is not borne out.

(44) Optional Pied-Piping by R-Pronouns in German

a. Wo2 stimmt Fritz immer [PP t2 gegen] t3?
   where votes Fritz always against
   "What does Fritz always vote against?"

b. [PP Wo2 gegen] t3 stimmt Fritz immer t2?
   where votes Fritz against always

9.1. Unattested Anti-Freezing

Another Problem:

(i) The present system forces a goal to move into higher specifiers as soon as possible.
(ii) This threatens to undermine the generalization that extraction out of moved ("frozen") constituents is impossible (see Ross 1967/86, Weder & Culicover 1980).

(45) A Case of Freezing in German:

*Wo2 stimmt Fritz [VP t2 gegen] t3 immer t2?
   where votes Fritz against always

(46) Anti-Freezing:

a. [PP wo2 gegen] t3 — (Merge V + Move wo)
   b. [VP wo2 [PP t2 gegen] t3 stimmt] t3 — (Move immer)
   c. [VP immer wo1 [VP t2 gegen] t3 stimmt] t3 — (Merge v, Fritz)
   d. [VP Fritz [VP immer wo1 [VP t2 gegen] t3 stimmt] v] t3 — (Move PP1, wo)
   e. [VP wo1 [VP t2 gegen] t3 Fritz [VP immer t2] t3 stimmt] v] t3 — ...

Comment:

(i) In (46a) wo has left PP1, which still occupies a complement position.
(ii) Later the remnant PP undergoes scrambling to SpecV.
(iii) The rest of the derivation proceeds without problems, an unwanted result.

Note 1:

The same problem arises under the view that successive cyclic wh-movement targets intermediate phrase edges (instead of phrase edges), assuming that PP-scrambling can target the edge of VP.

Note 2:

The derivation (46) involves "chain interleaving" (Collins 1994) offers a proposal how such derivations can be blocked. His account is incompatible with the present theory, however, because it invokes competition of complete derivations.

Description of the Problem:

(i) Movement of a goal γ must not leave a category α if α is supposed to be moved at some later point, too, and if α ultimately targets a position that is lower than the ultimate position targeted by γ.
(ii) The second conjunct in (i) is necessary due to the existence of remnant movement (see, Müller 1998, Hiraiwa 2003, and references therein).

(47) Remnant VP Topicalization in German:

[VP t2 Gelesen] t3 hat [PP das Buch] t2 kehrt t3
   read has the book home
Idea:
Define a restriction that prohibits creation of the remnant in (46), but allows it in (47).

Look-Ahead Problem:
The remnant creating movement step must be blocked long before the ultimate configuration is reached.

Solution:
Read off from the features of the goal $\gamma$ and the remnant $\alpha$ what type of positions $\gamma$ and $\alpha$ will finally target.

(48) A Hierarchy of Features (see Sternefeld 1992, Möller 1998):
- [top] $>$ [wh] $>$ [scr]

(49) Williams Cycle (see Williams 1974):
Goal $\gamma$ must not move to a position associated with probe $\beta$, if $a$, and $b$, hold:
- $a$: $\gamma$ has already moved to a position associated with $\beta$,
- $b$: $\beta > \beta_i$.

(50) Extended Williams Cycle, EWC (see Grevenstorf 2001):
An active goal $\gamma'$ deactivates a goal $\gamma$ iff $a$, and $b$, hold:
- $a$: $\gamma'$ dominates $\gamma$,
- $b$: $\gamma' \neq \gamma$.

(51) Active Goal
A goal $\gamma$ is active iff $\gamma$ matches an active probe $\beta$.

Assumption:
A goal $\gamma$ must be active if $\gamma$ is to be affected by Move.

Remnant Movement in (47) is Possible:
(i) At the VP$_c$-cycle, both VP$_v$ and DP$_v$ bear an active goal, [top] and [scr].
(ii) [top] dominates [scr], but since [top] is ranked higher than [scr], DP$_v$ remains active and can move out of VP$_v$.

Chain deletion in (45) is Blocked:
(i) When wo is supposed to move out of PP$_v$, PP$_v$ bears an active scgoal.
(ii) This scgoal dominates the active whgoal of wo.
(iii) Moreover, [scr] is ranked lower than [wh].
(iv) Therefore the whgoal of wo is deactivated and movement of wo out of PP$_v$ is blocked.

9.2. Freezing Induced Pied Piping

Question:
How can the EWC help to solve problem of optional pied-piping?

Idea:
To reduce the optionality of pied-piping to another operation of the grammar that is optional, namely optional movement.

(52) Optional Pied-Piping by R-Phrase in German:
- a. Wo$_2$ stimmt Fritz immer [PP t$_2$ gegen ]?
  where votes Fritz always against
- b. [PP Wo$_2$ gegen ] t$_2$ stimmt Fritz immer?
  where against votes Fritz always

Implementation:
(i) If (52 a) and (52 b) would not compete, then it would follow automatically why the former cannot block the latter.
(ii) Standard assumption in competition based frameworks: two objects can only compete if they are based on the same lexical array (see the notion of “reference set” in Chomsky 1990).
(iii) Assume that (52 b) bears a scprobe on $\nu$ and a matching scgoal on P$_v$, whereas (52 a) does not.

Consequences:
(i) (52 a,b) do not compete ($\nu$ and P in (52 a) and (52 b) are not the same items),
(ii) Pied-piping of PP$_v$ is forced in (52 b) but not in (52 a).

(53) Derivation of (52 b):
- a. [PP wo$_2$ gegen ] $\rightarrow$ (Merge V)
- b. $\nu$ [PP wo$_2$ gegen ] t$_2$ stimmt $\rightarrow$

Comment:
(i) Usually the system forces raising of wo to SpecV at point (53 b), because this removes the PP induced LA violation.
(ii) But recall: PP$_v$ in (53 b) bears a scgoal, by assumption. This goal dominates the whgoal of wo.
(iii) Both goals are active, but as [scr] is not ranked higher than [wh], EWC will deactivate the whgoal.
(iv) This blocks movement of the whphrase out of PP$_v$, at the costs of one LA violation.

(53) Derivation of (52 b) continued:
- b. $\nu$ [PP wo$_2$ gegen ] t$_2$ stimmt $\rightarrow$ (Merge in)
- c. $\nu$ [PP wo$_2$ gegen ] t$_2$ stimmt $\rightarrow$ (Merge $\nu$, Fritz + Move PP$_v$)
- d. [PP Wo$_2$ gegen ] t$_2$ stimmt [ $\nu$ ] $\rightarrow$

Comment:
(i) PP$_v$ has moved to SpecV, which avoids the VP-induced LA violation with respect to the relation between the scprobe on $\nu$ and the scgoal on P$_v$.
(ii) Agree eliminates the scprobe on $\nu$. This renders the scgoal on P$_v$ inactive.
(iii) The whgoal is reactivated: it is no longer dominated by an active scgoal.
Movement of wo to an outer Spec position would thus be possible, it would also optimize the structure with respect to IA.

But scrambling has turned PP into an island. This forces pied piping of PP, the intermediate scrambling step of PP is undone by (successive cyclic) pied piping of PP, which creates the illusion that the variants in (52) involve identical numerations.

A Prediction:
If a language L exhibits an optional movement operation which targets category α, then it exhibits optional pied-piping of α.

German:
(i) Optional scrambling of PP and DP, (ii) Optional pied-piping of PP (see above) and DP (see (54)), (iii) Generally, no scrambling of predicates (see Stechow & Stiefefeld 1988, Haider 1993), (iv) Generally, no (optional) pied-piping of predicates.

(54) Optional Was für Split in German:
   a. Was hast du [dp t₁] für Leute [l] eingeladen?
      what have you for people invited
   b. [dp Was] für Leute [l] hast du t₁ eingeladen?
      what for people have you invited

(55) No Optional Predicate Pied-Piping in German:
   a. *Fritz will wissen [ap wen] getrunken [l] noch keiner t₂ gesehen hat
      Fritz wants know whom drunk yet no-one seen has
   b. *Fritz will wissen [vp wen] geküsst [l] keiner t₂ wollte
      Fritz wants know whom kissed no-one wanted

English:
(i) No scrambling in English, (ii) Virtually no optional pied piping in English either.

Chamorro:
(i) No optional scrambling of objects in Chamorro (see Chung 1990, 89), (ii) No optional pied-piping of objects by possessor in Chamorro.

Slovene:
(i) Optional scrambling of DP is available, (ii) Both pied-piping or stranding of DP by possessor is possible (see, e.g., Ross 1967/86, 145, Curver 1990, 330).

(56) Optional Pied Piping in Russian:
   a. Ja prostoi [dp kakaju] knigu [l] čital t₁
      I asked whose book you read

   b. Jìe sprosl [dp kakaju] knigu [l] čital t₁

Problem:
Cases of optional pied-piping in languages that lack optional scrambling, like for instance French or some Scandinavian languages,

(57) Optional Combien-Split in French (see OLENFLER 1976):
   a. Je me demande combien de personnes Marie a décidé d'engager [dp t₁] de
      I REFQ ask how-many Marie has decided to employ of
      personnes [l] persons
   b. Je me demande de personnes [l] Marie a décidé
      I REFQ ask how-many of persons Marie has decided
d'engager t₁ to employ

(58) Optional hva for Split in Norwegian:
   a. Jeg lurer på hva du har bedt [dp t₁] for slags folk [l]
      I wonder on what you have invited for type people
   b. Jeg lurer på [dp hva] for slags folk [l] du har bedt t₂
      I wonder on what type people you have invited

Possible Interpretation:
Optional pied-piping has heterogeneous sources.

References