(Im)perfect Domains: Yet Another Theory of Syntactic Movement

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1. Prologue: QR vs. wh-movement

Consider the following two questions:[1]

(1) a. **Question 1:** Why is QR clause-bound, while wh-movement is not?
b. **Question 2:** Why is there lexical selection (e.g., by a subordinating verb) for clauses in which wh-movement has occurred, but not for clauses in which QR has occurred?

As a first step, consider the following restriction on lexical selection:

(2) Local Crash-Proofness: If the lexical sub-array contains an (unpaired) instance of the feature $[F]$, and a head H^0 is then selected that has variants with and without $[F]$, then the variant of H^0 that has $[F]$ must be selected—"pairing" the $[F]$ on H^0 with the existing $[F]$

Where the *lexical sub-array* is chosen per CP (and possibly per v/VP). This can be construed as "local crash-proofness" because it ensures, when possible, that features will end up being checked.[2]

Assuming (2), let X^0 be the category against which [*wh*]—the feature on wh-DPs—is checked. If X^0 were selected in the same lexical sub-array as the wh-DP (e.g., if X^0 were C^0), then by (2), the instance of X^0 in the wh-DP's sub-array would have to carry a [*wh*] feature. [*wh*] on the wh-DP would then be checked by a head in its own sub-array, and wh-movement would thus be clause-bound. The fact that it is not therefore entails that the matching instance of [*wh*] is carried by a head that is not selected in the same sub-array as the wh-DP. A likely candidate—at least as a first approximation—would be the head that selects the clause (this choice will be defended in §4): verbs which embed questions would be equipped with a [*wh*] feature. "Matrix questions" would be the complement of a discourse-related head, which carries a [*wh*] feature (in the spirit of Ross' 1970 *Performative Hypothesis*).

In the same vein, the clause-boundedness of QR would lead us to assume that the relevant features of Q(uantificational)N(oun)P(hrases)—call them [*quan*]—are checked against a head in the same sub-array as the QNP.[3] In this case, a likely candidate might be C^0 (this choice will also be defended in §4).

*The original idea behind this proposal appears in Jones (2006). The same basic intuition underlies other recent proposals by Stroik (1999), and Putnam and Stroik (to appear), and by van Craenenbroeck (2006)—though the implementation and predictions differ substantially. Thanks to Elena Anagnostopoulou, Cedric Boeckx, Amy Rose Deal, Danny Fox, Patrick Jones, Andrea Moro, David Pesetsky, and Norvin Richards. All errors are my own.

[1] Regarding A(ntecedent)C(ontained)D(eletion): if ACD involves QR—as proposed by Sag (1980)—then it is necessarily a kind of QR that can escape finite clauses (see Fox, 2002). Since all other instances of QR cannot do so, the discussion of QR in this paper will assume that such a restriction exists. See Bachrach and Katzir (to appear) for an account of ACD in terms of VP-sharing, which solves the containment problem of ACD without recourse to QR.

Furthermore, I follow Larson (1985) in assuming that yes/no-questions and conditionals, just like constituent-questions, involve wh-movement. Therefore, lexical selection for interrogative clauses constitutes an instance of lexical selection for wh-movement in the selected clause.

[2] This differs from an approach such as Heck and Muller's (2000) *Phase Balance*, in that (2) crucially does not involve inspecting the derivation currently in progress. The decision in (2) is made based on the contents of the current lexical sub-array alone (see §4.2 for a more detailed discussion). There is some independent motivation for a principle along the lines of (2). Imagine that the sub-array already contains a DP with a [*Case*] feature. The sub-array must also contain either T^0 or, in the case of a transitive verb, a v/V^0 head. If it were possible to select the variant of T^0 or v/V^0 which is Caseless (infinitival T^0, or raising/unaccusative v/V^0, respectively), checking the DP's [*Case*] feature would have to be deferred until the next sub-array. This, however, is precisely *super-raising*—which is unattested in natural language. Therefore, something like the principle in (2) is likely to be operative.

[3] I make the assumption that QNPs have syntactic features identifying them as such. There are at least two reasons to assume this. First, insofar as QR is indeed a sub-case of syntactic movement, the null hypothesis is that

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Notice that the two configurations that would arise, for wh-movement and for QR, share a common property. For wh-movement, the target position is [Spec,CP], which is "just below" the head that would carry the [*wh*] feature (e.g., V^0; (3a)). For QR, work by Hornstein (1995) and by Johnson and Tomioka (1997) shows that QR can move a QNP as far as, but no further than, the TP projection—so QR targets a position "just below" the head that would carry the [*quan*] feature (C^0; (3b)).

(3) a. wh-elements move to *just-below*-V^0: $[_{VP}\ V^0 \langle wh \rangle\ [_{CP}\ wh\text{-}DP \langle wh \rangle\ [_{C'} \ldots t_{wh\text{-}DP} \ldots]]]$
b. QNPs QR to *just-below*-C^0: $[_{CP}\ C^0 \langle quan \rangle\ [_{TP}\ QNP \langle quan \rangle\ [_{T'} \ldots t_{QNP} \ldots]]]$

(4) ECM subjects move to *just-below*-V^0: $[_{VP}\ V^0 \langle acc \rangle\ [DP \langle Case \rangle\ [\ldots t_{DP} \ldots]]]$

To put it differently, the structural relation between a head H^0 and the specifier of its complement XP—e.g., a question-subordinating V^0 and a wh-DP in [Spec,CP] of the embedded clause—would be the norm, as far as feature-checking is concerned. Let us refer to this property as *ECM Everywhere*.

As it stands, *ECM Everywhere* would raise several problems. First, the structural relation between a head H^0 and the specifier of its complement XP must be explicitly stipulated (though it could be derived from *Minimal Search*, if the latter is stipulated).

Even more problematic, however, is that a multitude of look-ahead operations would propagate throughout the system. In a bottom-up incremental model of structure-building, the system would have to know in advance that if it moves a constituent α with an active feature $[F]$ to [Spec,XP], a feature-matched head H^0 will subsequently be merged with XP, checking the feature $[F]$ on α.

The intuition underlying the current proposal can be stated as follows: elements with active features are moved **until** (rather than **because**) the next head to be merged carries a matching feature.

2. Proposal

(5) a. *Imperfect Domain*: Any maximal projection XP which has unchecked features outside of its specifier (i.e., which has unchecked features within X')
b. The *Purification Hypothesis*: A (set of consecutive) movement operation(s) takes place **iff** it will *purify* some XP (i.e., turn it into a *perfect domain*—the opposite of (5a))

Conceived in this way, movement does not directly affect features—it can only move them around: whatever features an element α had in its original position, are relocated to the landing-site along with α itself.[4] In order for features to be anything but inert diacritics, there must be a separate operation which can manipulate them. A rather conservative notion of such an operation is given below:

(6) *Agreement*: A feature $[F]$ on a head H^0 can check an instance of $[F]$ on a c-commanded head Z^0

Movement and agreement are completely divorced from one another (cf. movement being "parasitic" on agreement). Also, unlike many contemporary approaches which include complex typologies of features or feature states (e.g., *(un)interpretable*, *(un)valued*, *(in)active*, etc.), this notion of agreement reduces the number of states that a feature can have to two:[5]

(7) a. unchecked: $\langle F \rangle$—the feature $[F]$ is visible to syntax (making domains imperfect)
b. checked: $\langle \not{F} \rangle$—the feature $[F]$ is invisible to syntax

it is driven by the very same mechanism as any other movement—namely, the existence of unchecked features.

Second, QR has very different PF-realization than other cases of syntactic movement; QR results in the tail of the chain, rather than the head, receiving phonological realization. A feature on the quantificational element, and hence on the chain formed of it, could be taken as the interpretive signal to PF triggering this distinctive pronunciation.

[4]One might wonder about the compatibility of this proposal with theories of movement that dispense with the notion of "trace" (e.g., the *Copy/Re-Merge* theories of movement). If a moved element is another instance/copy of the lower element, then prima facie, whatever features are present upstairs are present downstairs as well. However, the current proposal is largely orthogonal to this issue, so long as only features on the higher copy are relevant to the computational system—an assumption that seems necessary to a certain extent even in a *Probe-Goal* framework, once re-merge/copy theories of movement are adopted. Formally, this assumption can be captured as follows: an occurrence of $[F]$ which is c-commanded by another occurrence of the very same object $[F]$, is ignored by (5a).

[5]Visibility to syntax is at issue—rather than deletion altogether—because syntactically inactive features still have, in many cases, both morphological and semantic reflex (cf. Chomsky, 1995).

Another important consequence of (5b) is (8):

(8) *Freezing*: If α has no unchecked features, α will never be subjected to a movement operation

This is not, in itself, a particularly revolutionary result; any feature-driven theory of movement would arrive at the same conclusion. It is simply the case that (8) will prove to be a useful lemma in the following sections, and is therefore formulated here for convenience.

The following assumptions are also necessary for the system to work:[6]

(9) a. “structure preservation”: heads move to head positions, XPs move to XP positions
b. tucking-in of multiple specifiers (Richards, 2001)
c. (i) the Head-Movement Constraint (Travis, 1984)
(ii) X^0-to-Y^0 head-movement contingent on X^0 and Y^0 sharing some unchecked feature
d. purification is preferred over agreement whenever possible

3. General consequences

3.1. *Movement*

Consider a configuration such as (10), below. X^0 has no remaining unchecked features—therefore, moving ZP to [Spec,XP] would *purify* XP. Thus, by hypothesis, movement as in (11) is obligatory:[7]

(10) $[_{XP}\ X^0\ [_{ZP}\ Z^0\langle F\rangle]]$

(11) $[_{XP}\ [_{ZP}\ Z^0\langle F\rangle]\ [_{X'}\ X^0\ t_{ZP}]]$

For convenience, let us refer to this scenario as *Expel* of ZP from (the complement domain of) XP.

Consider a different scenario—very similar to (10), but where X^0 has an unchecked feature $[F]$ as well—such as (12), below. Since X^0 carries an unchecked feature, movement of ZP to [Spec,XP] would not purify XP. It is therefore barred, by hypothesis. On the other hand, Z^0-to-X^0 head-movement would remove the unchecked feature $[F]$ from within Z’, thereby purifying ZP.

Thus, by hypothesis, such movement is obligatory:

(12) $[_{XP}\ X^0\langle F\rangle\ [_{ZP}\ Z^0\langle F\rangle]]$

(13) $[_{XP}\ X^0\langle F\rangle{+}Z^0\langle F\rangle\ [_{ZP}\ t_{Z^0}]]$

For convenience, let us refer to this scenario as *Head-Expel* of Z^0 from ZP.

3.2. *How features get checked*

As discussed in §3.1, when a head H^0 has an unchecked feature $[F]$, HP is not a candidate for purification. In other words, *Expel* of some α to [Spec,HP] will never apply. Thus, what is traditionally referred to as a *Spec-Head* configuration will never arise, with respect to a feature $[F]$ on a given head.

How does feature-checking work, then?

Assume the $[F]$-carrying head H^0 has an XP complement. An $[F]$-matched ZP can be *Expelled* as far [Spec,XP] (assuming X^0 has no remaining unchecked features of its own):

[6] The assumptions in (9a), (9b) and (9c.i) are hopefully uncontroversial—and regardless, they are necessary in a *Probe-Goal* framework as well. (9d), namely *agreement* being a dispreferred operation, is derivable when embedded within the current proposal, from considerations regarding the computational complexity of *agreement* vs. that of evaluating *(im)perfect domain* status (due to space limitations, this cannot be shown here; see Preminger, 2007). (9c.ii) remains, at present, a stipulation.

[7] Movement as in (11) may appear to conflict with certain anti-locality conditions, which forbid movement of the entire complement of a head H^0 to [Spec,HP] (Abels, 2003; Pesetsky and Torrego, 2001; Saito and Murasugi, 1998; *a.o.*). However, these restrictions are meant to forbid movement of the complement as a result of a feature on H^0 itself; in *Probe-Goal* terms: when H^0 probes, the goal cannot be its entire complement. Crucially, movement of ZP in (11) does not occur in response to a feature on X^0, nor does it “take care of” a feature on ZP. The feature $[F]$ on ZP persists, unchecked, when ZP has been relocated to [Spec,XP].

In this sense, the proposal can be seen to reconcile anti-locality with a large body of research suggesting that movement cannot exit a maximal projection without passing through the edge of that projection (Boeckx, 2003; Koster, 1978; Muller, 2004; Uriagereka, 1999; *a.o.*).

(14) $[_{HP}\ H^0\langle F\rangle\ [_{XP}\ ZP\langle F\rangle\ [_{X'}\ X^0\ [_{whateverP} \ldots t_{ZP} \ldots]]]]$

As mentioned above, ZP is barred from moving further (to [Spec,HP]), as such movement would not purify HP. *Head-Expel* is also barred, since the structural relation between Z^0 and H^0 does not satisfy the HMC (see (9ci), in §2). Since no further movement is possible, *agreement* (which is dispreferred to movement; see (9d), in §2) can now apply. The instance of $[F]$ on H^0 can check $[F]$ on ZP:

(15) $[_{HP}\ H^0\langle \cancel{F}\rangle\ [_{XP}\ ZP\langle \cancel{F}\rangle\ [_{X'}\ X^0\ [_{whateverP} \ldots t_{ZP} \ldots]]]]$

Here, ZP has no remaining unchecked features. Thus, it will be frozen in place (by the *Freezing* lemma; §2). Hence, a post-hoc *Spec-Head* configuration—after feature-checking between H^0 and ZP—cannot arise either. The structure in (15) is essentially the same one shown in (3)-(4), in §1: *ECM Everywhere*.

This particular difference between conventional syntactic theory and the current proposal means posited features are generally "one head higher" than previously assumed. It may therefore seem that the proposal is no more than an isomorphic way of representing familiar configurations—but this is not the case. In §4, I demonstrate several advantages of the proposed system over the *Probe-Goal* framework.

Returning to a configuration like (14), consider X^0 having unchecked features of its own, as in (16). Here, ZP cannot be *Expelled* past the complement of X^0 (namely, past [Spec,*whatever*P]), since the unchecked feature $[G]$ on X^0 prevents XP from being purified, regardless of where ZP is:[8]

(16) $[_{HP}\ H^0\langle F\rangle\ [_{XP}\ X^0\langle G\rangle\ [_{whateverP} \ldots ZP\langle F\rangle \ldots]]]$

(17) $[_{HP}\ H^0\langle F\rangle\ [_{XP}\ X^0\langle G\rangle\ [_{whateverP}\ ZP\langle F\rangle\ [_{whatever'} \ldots t_{ZP} \ldots]]]]$

In contrast to (15), agreement between H^0 and ZP will now span across XP:

(18) $[_{HP}\ H^0\langle \cancel{F}\rangle\ [_{XP}\ X^0\langle G\rangle\ [_{whateverP}\ ZP\langle \cancel{F}\rangle\ [_{whatever'} \ldots t_{ZP} \ldots]]]]$

Agreement can of course span across more than one projection. This will occur when there are multiple projections with unchecked features of their own standing in between H^0 and ZP—as in (19), below:

(19) $[_{HP}\ H^0\langle \cancel{F}\rangle\ [_{XP}\ X^0\langle G\rangle\ [_{YP}\ Y^0\langle H\rangle\ [_{whateverP}\ ZP\langle \cancel{F}\rangle\ [_{whatever'} \ldots t_{ZP} \ldots]]]]]$

The proximity of an agreement relation is therefore determined by the number of heads that stand in between the pair of agreeing features, and have unchecked features of their own.

Finally, as discussed in §3.1, a configuration such as (12) (repeated below), results in *Head-Expel* of Z^0 (as shown in (13), repeated below). Since head-adjunction results in a structure in which X^0 c-commands Z^0, *agreement* will be possible, checking both instances of $[F]$, as in (20), below:

(12) $[_{XP}\ X^0\langle F\rangle\ [_{ZP}\ Z^0\langle F\rangle]]$

(13) $[_{XP}\ X^0\langle F\rangle{+}Z^0\langle F\rangle\ [_{ZP}\ t_{Z^0}]]$

(20) $[_{XP}\ X^0\langle \cancel{F}\rangle{+}Z^0\langle \cancel{F}\rangle\ [_{ZP}\ t_{Z^0}]]$

4. Advantages

4.1. *QR vs. wh-movement: Clause-boundedness and lexical selection*

Recall that within the current proposal, features on QNPs (i.e., [*quan*]) are checked against matching features on C^0, while features on wh-elements (i.e., [*wh*]) are checked against matching features on V^0. An immediate result is the existence of verbs which select for clauses in which wh-movement has occurred, vs. the absence of verbs which select for clauses in which QR has occurred—since in the current system, the ability to subordinate a clause which has a wh-element at its periphery is intrinsic to the selecting verb proper (namely, the existence of [*wh*] on V^0). In contrast, having a QNP which has QRed to the clausal periphery is a property of C^0 (namely, the existence of [*quan*] on it).

Next, recall (2), repeated below:

(2) Local Crash-Proofness: If the lexical sub-array contains an (unpaired) instance of the feature $[F]$, and a head H^0 is then selected that has variants with and without $[F]$, then the variant of H^0 that has $[F]$ must be selected—"pairing" the $[F]$ on H^0 with the existing $[F]$

[8] Note that X^0-to-H^0 head-movement is barred, as the heads do not share an unchecked feature (see (9cii), in §2).

By (2), the C^0 that is selected in the same lexical sub-array as the QNP must be of the [*quan*]-carrying variety. Thus, the QNP will necessarily get its [*quan*] feature checked within the same clause (see §4.3.1 for details), yielding the clause-boundedness of QR. On the other hand, as far as wh-movement is concerned, the higher (subordinating) V^0 (which carries the [*wh*] feature) is not selected in the same sub-array as the wh-DP, hence wh-movement does not have to be clause-bound.[9] Notice that there is an empirical correlation here, between whether a given type of movement can be lexically selected for, and whether that type of movement is clause-bound or not. This correlation—essentially left unexplained in contemporary frameworks—receives a natural explanation within the current proposal.

4.2. Successive-cyclicity without pseudo-features

Consider the sentences in (21). In §4.3, it will prove crucial to have a projection that is lower than TP and higher than the verb-phrase, and that hosts the semantic negative operator. For consistency, let us assume that such a projection is always present—even in sentences that do not contain negation.[10] Rather than referring to this projection as NegP (as it is commonly labeled), I will refer to it as PolP (short for *polarity*).[11] The derivation of the embedded clause in (21a) begins as in (22):

(21) a. Who did Mary think [$_{CP}$ arrived]?
b. Mary asked [$_{CP}$ who arrived].

(22) $V^0(\textit{arrive})\left\langle\begin{smallmatrix}\textit{tense}\\ \textit{polarity}\end{smallmatrix}\right\rangle, \mathrm{DP}(\textit{who})\left\langle\begin{smallmatrix}\textit{wh}\\ \textit{Case}\\ \varphi\end{smallmatrix}\right\rangle \underset{\textit{merge}}{\longrightarrow} [_{\mathrm{VP}}\ V^0\left\langle\begin{smallmatrix}\textit{tense}\\ \textit{polarity}\end{smallmatrix}\right\rangle\ \mathrm{DP}\left\langle\begin{smallmatrix}\textit{wh}\\ \textit{Case}\\ \varphi\end{smallmatrix}\right\rangle]$

Given that there are unchecked features on the head of VP, movement of the DP to [Spec,VP] would not purify VP, and is therefore barred. There are no pairs of matching features, so *agreement* cannot obtain, either. The head of PolP is then merged, in (23). This, in turn, is a *Head-Expel* configuration (see §3.1) with respect to the feature [*polarity*]. Therefore, V^0-to-Pol^0 movement will occur, followed by the checking of both instances of [*polarity*] in (24) (as argued in §3.2). Since the head of VP has no remaining unchecked features, VP can be purified by *Expel* of the DP, in (25). The "affirmative operator" is then merged, in (26) (see the discussion of PolP, above). The head of PolP contains unchecked features, and therefore PolP cannot be purified, and there are no pairs of unchecked features, so no *agreement* relations can obtain, either. The head T^0 is then merged, in (27). This is once again a *Head-Expel* configuration—this time with respect to the feature [*tense*]. Consequently, Pol^0-to-T^0 movement takes place, as well as the checking of [*tense*], in (28).

(23) $\underset{\textit{merge}}{\longrightarrow} [_{\mathrm{PolP}}\ \mathrm{Pol}^0\langle\textit{polarity}\rangle\ [_{\mathrm{VP}}\ V^0\left\langle\begin{smallmatrix}\textit{tense}\\ \textit{polarity}\end{smallmatrix}\right\rangle\ \mathrm{DP}\left\langle\begin{smallmatrix}\textit{wh}\\ \textit{Case}\\ \varphi\end{smallmatrix}\right\rangle]]$

(24) $\underset{\textit{Head-Expel}}{\longrightarrow} [_{\mathrm{PolP}}\ \mathrm{Pol}^0\langle\cancel{\textit{polarity}}\rangle{+}V^0\left\langle\begin{smallmatrix}\textit{tense}\\ \cancel{\textit{polarity}}\end{smallmatrix}\right\rangle\ [_{\mathrm{VP}}\ t_{V^0}\ \mathrm{DP}\left\langle\begin{smallmatrix}\textit{wh}\\ \textit{Case}\\ \varphi\end{smallmatrix}\right\rangle]]$

(25) $\underset{\textit{Expel}}{\longrightarrow} [_{\mathrm{PolP}}\ \mathrm{Pol}^0{+}V^0\langle\textit{tense}\rangle\ [_{\mathrm{VP}}\ \mathrm{DP}\left\langle\begin{smallmatrix}\textit{wh}\\ \textit{Case}\\ \varphi\end{smallmatrix}\right\rangle\ [_{V'}\ t_{V^0}\ t_{\mathrm{DP}}]]]$

(26) $\underset{\textit{merge}}{\longrightarrow} [_{\mathrm{PolP}}\ [\lambda\psi.\psi]\ [_{\mathrm{Pol}'}\ \mathrm{Pol}^0{+}V^0\langle\textit{tense}\rangle\ [_{\mathrm{VP}}\ \mathrm{DP}\left\langle\begin{smallmatrix}\textit{wh}\\ \textit{Case}\\ \varphi\end{smallmatrix}\right\rangle\ [_{V'}\ t_{V^0}\ t_{\mathrm{DP}}]]]]$

(27) $\underset{\textit{merge}}{\longrightarrow} [_{\mathrm{TP}}\ T^0\left\langle\begin{smallmatrix}\textit{tense}\\ \varphi\end{smallmatrix}\right\rangle\ [_{\mathrm{PolP}}\ [\lambda\psi.\psi]\ [_{\mathrm{Pol}'}\ \mathrm{Pol}^0{+}V^0\langle\textit{tense}\rangle\ [_{\mathrm{VP}}\ \mathrm{DP}\left\langle\begin{smallmatrix}\textit{wh}\\ \textit{Case}\\ \varphi\end{smallmatrix}\right\rangle\ [_{V'}\ t_{V^0}\ t_{\mathrm{DP}}]]]]]$

(28) $\underset{\textit{Head-Expel}}{\longrightarrow} [_{\mathrm{TP}}\ T^0\left\langle\begin{smallmatrix}\cancel{\textit{tense}}\\ \varphi\end{smallmatrix}\right\rangle{+}\mathrm{Pol}^0\langle\cancel{\textit{tense}}\rangle{+}V^0\ [_{\mathrm{PolP}}\ [\lambda\psi.\psi]\ [_{\mathrm{Pol}'}\ t_{\mathrm{Pol}^0+V^0}\ [_{\mathrm{VP}}\ \mathrm{DP}\left\langle\begin{smallmatrix}\textit{wh}\\ \textit{Case}\\ \varphi\end{smallmatrix}\right\rangle\ [_{V'}\ t_{V^0}\ t_{\mathrm{DP}}]]]]]$

The head of PolP now has no unchecked features, therefore PolP can be purified by *Expel* of DP, in (29). Since the head of TP still has unchecked features, TP will not be purified by movement of the DP to

[9] Of course, a verb (that is not the subordinating verb) may very well be part of the same sub-array as the wh-DP. Thus, one might expect **I forgot who,* on its non-Echo-Question, non-sluiced reading to be felicitous, contra to fact. I would suggest that the infelicity of this example is not unlike that of **I think Mary's table*—in other words, a mismatch in semantic type between *forgot* and its complement.

[10] In affirmative sentences, it would host the "affirmative operator" (i.e., $[\lambda\psi.\psi]$) instead of the negative operator. Following Larson (1985), this projection could also be the base-position of conditional operators (e.g., *whether*).

[11] Assuming this projection is gratuitous for the purposes of the current section. It is here to demonstrate that a single clausal skeleton can be used for the purposes of both this section and of §4.3.

[Spec,TP], and such movement is hence barred. *Agreement* can now obtain, checking both instances of [φ], in (30).[12] The head of TP now contains no remaining unchecked features. Thus, *Expel* of the DP to [Spec,TP] will purify TP, and is therefore obligatory, as in (31).

(29) $\underset{Expel}{\longrightarrow}$ $[_{TP}\ T^0\langle\varphi\rangle{+}Pol^0{+}V^0\ [_{PolP}\ [\lambda\psi.\psi]\ [_{PolP}\ DP\left\langle\begin{smallmatrix} wh \\ Case \\ \varphi \end{smallmatrix}\right\rangle\ [_{Pol'}\ t_{Pol^0+V^0}\ [_{VP}\ t_{DP}\ [_{V'}\ t_{V^0}\ t_{DP}]]]]]]$

(30) $\underset{agreement}{\longrightarrow}$ $[_{TP}\ T^0\langle\cancel{\varphi}\rangle{+}Pol^0{+}V^0\ [_{PolP}\ [\lambda\psi.\psi]\ [_{PolP}\ DP\left\langle\begin{smallmatrix} wh \\ Case \\ \cancel{\varphi} \end{smallmatrix}\right\rangle\ [_{Pol'}\ t_{Pol^0+V^0}\ [_{VP}\ \ldots]]]]]$
$\longrightarrow$ $[_{TP}\ T^0{+}Pol^0{+}V^0\ [_{PolP}\ [\lambda\psi.\psi]\ [_{PolP}\ DP\left\langle\begin{smallmatrix} wh \\ Case \end{smallmatrix}\right\rangle\ [_{Pol'}\ t_{Pol^0+V^0}\ [_{VP}\ \ldots]]]]]$

(31) $\underset{Expel}{\longrightarrow}$ $[_{TP}\ DP\left\langle\begin{smallmatrix} wh \\ Case \end{smallmatrix}\right\rangle\ [_{T'}\ T^0{+}Pol^0{+}V^0\ [_{PolP}\ [\lambda\psi.\psi]\ [_{PolP}\ t_{DP}\ [_{Pol'}\ t_{Pol^0+V^0}\ [_{VP}\ \ldots]]]]]]$

The C^0 head is then merged, in (32). Note that the embedded clause in *Who did Mary think arrived?* (21a) is no less "declarative" than the embedded clause in *Mary thinks that John arrived.* It therefore makes little sense to assume that the featural content of the embedded C^0 in (21a) is any different than that of declarative C^0 in other contexts (this will be discussed in detail below).[13] Since the head of CP carries an unchecked [*nom*], CP cannot be purified by movement of the DP. It is then possible for *agreement* to apply, between C^0 and the DP—checking the [*nom*/*Case*] feature on both, in (33).

(32) $\underset{merge}{\longrightarrow}$ $[_{CP}\ C^0\langle nom\rangle\ [_{TP}\ DP\left\langle\begin{smallmatrix} wh \\ Case \end{smallmatrix}\right\rangle\ [_{T'}\ T^0{+}Pol^0{+}V^0\ [_{PolP}\ \ldots]]]]$

(33) $\underset{agreement}{\longrightarrow}$ $[_{CP}\ C^0\langle\cancel{nom}\rangle\ [_{TP}\ DP\left\langle\begin{smallmatrix} wh \\ \cancel{Case} \end{smallmatrix}\right\rangle\ [_{T'}\ T^0{+}Pol^0{+}V^0\ [_{PolP}\ \ldots]]]]$
$\longrightarrow$ $[_{CP}\ C^0\ [_{TP}\ DP\langle wh\rangle\ [_{T'}\ T^0{+}Pol^0{+}V^0\ [_{PolP}\ \ldots]]]]$

Notice that if the DP were not a wh-DP, it would have no further unchecked features at this point, and would therefore be frozen in place (by the *Freezing* lemma; §2). The result would be an SVO clause.[14]

The head of CP in (33) has no remaining unchecked features. Given that the DP is in fact a wh-DP, and carries an unchecked [*wh*] feature, it will be *Expelled* to [Spec,CP], to purify CP:

(34) $\underset{Expel}{\longrightarrow}$ $[_{CP}\ DP\langle wh\rangle\ [_{C'}\ C^0\ [_{TP}\ t_{DP}\ [_{T'}\ T^0{+}Pol^0{+}V^0\ [_{PolP}\ \ldots]]]]]$

[12] Two comments are in order here. First, if T^0 were equipped with a Case feature—contra (27)-(30)—then the [*Case*] feature on the DP could be checked via agreement in (30), just like the [φ] feature. If the DP were not a wh-DP (i.e., it lacked a [*wh*] feature), it would then have no remaining features, and be frozen in place (by the *Freezing* lemma; §2). This would give rise to a VSO configuration (see below for SVO).

Second, even when T^0 is not equipped with Case—as in (27)-(30)—and the subject subsequently moves to form an SVO structure (as will be shown below), φ-agreement obtains while the subject is still in a position lower than T^0 (see (30)). This means that nothing special needs to be assumed to get agreement to work in this top-down fashion in expletive-associate constructions. Assume, following a rich body of work on expletive-associate constructions, that so-called expletive *there* starts out in a position that is structurally adjacent to the associate (Hoekstra and Mulder, 1990; Moro, 1991, 1997; *a.o.*). In the current system, it is sufficient to assume that *there* requires Case (i.e., carries its own [*Case*] feature), while lacking the relevant φ-features. Thus, φ on T^0 will agree directly with φ on the associate. Thus, T^0 agrees with a lower DP, on par with φ-agreement with non-expletive subjects.

[13] A related but distinct issue is the morphological marking of C^0 across which wh-movement has occurred—as attested, e.g., in Irish (McCloskey, 2002). This has been taken by some as evidence that the featural makeup of each morphologically distinct C^0 is different (e.g., morphology signaling the presence or absence of an EPP feature).

However, this is far from being the only conceivable state of affairs which would yield the empirically-attested pattern. It could be the case that the morphological difference in complementizers which have been moved across is just that—morphological marking that is left by the moving element itself. This becomes more plausible under the *Re-Merge/Copy Theories of Movement*, since the morphological marking on intermediate complementizers could be the PF reflex of the lower copies of a moved element (see, for example, Boskovic and Nunes, 2007).

[14] As discussed in fn. 12, this means that the difference between SVO and VSO languages reduces to whether the feature [*nom*] (nominative Case) is on C^0 (giving rise to SVO) or on T^0 (giving rise to VSO). This locates the factor responsible for this variation within the lexical component.

As often suggested, I assume that English and French differ with respect to the overtness vs. covertness of verb movement—at the very least, the overtness vs. covertness of the last step (i.e., Pol^0-to-T^0 movement).

Consider now the subordinating V^0. If this verb is of the type that selects interrogatives (e.g., *asked* in (21b)), then by hypothesis, it is equipped with a [*wh*] feature, as in (35). Since VP cannot be purified (due to [*wh*] and [*tense*] on V^0), *agreement* can apply, checking [*wh*] on V^0 and on the wh-DP, as in (36). The DP in (36) has no remaining features, and is hence frozen in place (by the *Freezing* lemma; §2).

(35) $\underset{\textit{merge}}{\longrightarrow} [_{\text{VP}}\ \text{V}^0 \left\langle \begin{smallmatrix} \textit{tense} \\ \textit{polarity} \\ \textit{wh} \end{smallmatrix} \right\rangle [_{\text{CP}}\ \text{DP}\langle \textit{wh} \rangle\ [_{\text{C}'}\ \text{C}^0\ [_{\text{TP}} \ldots]]]]$

(36) $\underset{\textit{agrmt.}}{\longrightarrow} [_{\text{VP}}\ \text{V}^0 \left\langle \begin{smallmatrix} \textit{tense} \\ \textit{polarity} \\ \cancel{\textit{wh}} \end{smallmatrix} \right\rangle [_{\text{CP}}\ \text{DP}\langle \cancel{\textit{wh}} \rangle\ [_{\text{C}'}\ \text{C}^0\ [_{\text{TP}} \ldots]]]] \longrightarrow [_{\text{VP}}\ \text{V}^0 \left\langle \begin{smallmatrix} \textit{tense} \\ \textit{polarity} \end{smallmatrix} \right\rangle [_{\text{CP}}\ \text{DP}\ [_{\text{C}'}\ \text{C}^0\ [_{\text{TP}} \ldots]]]]$

If, on the other hand, the subordinating verb is not of the type that selects interrogatives (e.g., *think* in (21a)), it is not equipped with a [*wh*] feature, as in (37). Here, VP cannot be purified (ruling out *Expel* of wh-DP), nor can *agreement* apply (there is no pair of matching features). When the last feature on V^0 is checked, however, it will be possible to purify VP, and the wh-DP will be *Expelled* to [Spec,VP]. The same will obtain for subsequent projections, until a head with a [*wh*] feature is merged.

(37) $\underset{\textit{merge}}{\longrightarrow} [_{\text{VP}}\ \text{V}^0 \left\langle \begin{smallmatrix} \textit{tense} \\ \textit{polarity} \end{smallmatrix} \right\rangle [_{\text{CP}}\ \text{DP}\langle \textit{wh} \rangle\ [_{\text{C}'}\ \text{C}^0\ [_{\text{TP}} \ldots]]]]$

(38) $[_{\ldots} \ldots [_{\text{V}'}\ \text{V}^0 \left\langle \begin{smallmatrix} \cancel{\textit{tense}} \\ \cancel{\textit{polarity}} \end{smallmatrix} \right\rangle [_{\text{CP}}\ \text{DP}\langle \textit{wh} \rangle\ [_{\text{C}'}\ \text{C}^0\ [_{\text{TP}} \ldots]]]]]$

$\underset{\textit{Expel}}{\longrightarrow} [_{\ldots} \ldots [_{\ldots} \ldots [_{\text{VP}}\ \text{DP}\langle \textit{wh} \rangle\ [_{\text{V}'}\ \text{V}^0\ [_{\text{CP}}\ t_{\text{DP}}\ [_{\text{C}'}\ \text{C}^0\ [_{\text{TP}} \ldots]]]]]]]$

Thus, movement of a wh-DP out of an embedded declarative clause, such as the embedded clause in *Who did Mary think arrived?* (21a), is derived.

This stands in contrast with *Probe-Goal* accounts of movement: these must postulate some feature on the declarative C^0, to account for the fact that it is capable of attracting a wh-element;[15] but if this feature is always present on declarative C^0, it is a new kind of feature, for it never crashes the derivation of declarative clauses that lack a wh-element (e.g., *The man arrived*). To quote McCloskey (2002), it is a kind of "spurious intermediate feature" or "pseudo-feature".[16]

Alternatively, one may claim that there are two types of declarative C^0: one which has a [*wh*] feature, and one which does not. Knowing in advance which type of declarative C^0 to select cannot be based on the lexical sub-array alone, since a wh-element could have moved into the clause from a lower clause. Thus, this alternative forces one to complicate the grammar significantly—either by allowing the current sub-array to "peek" into the computational workspace to examine its contents (cf. *Phase Balance*; Heck and Muller, 2000), or by adopting a model of syntax in which 50% of the derivations of declaratives crash, merely by having selected the "wrong" type of C^0—clearly an undesirable result.

The current proposal accounts for wh-movement out of declaratives, while avoiding any of these complications. This is done without appealing to notions such as "general economy"[17]—though, of course, this notion could still factor into why language would work in this particular way.

4.3. More on QR

4.3.1. Deriving properties of QR/reconstruction

Given the current proposal (and the derivational approach sketched in §4.2), a clause with QNPs in both subject and object position would end up with the following structure:[18]

[15] Note that the mere postulation of *phases* (Chomsky, 2000, 2001)—or their equivalent—does not explain what sets the moving element in motion. It merely forces such movement, if it should occur, to be successive-cyclic.

[16] A possibility is to assume a more complex typology of features, introducing the possibility for features that can attract, but do not crash the derivation in the absence of a matching goal (e.g., Pesetsky and Torrego, in press). However, in enlarging the repertoire of feature-types, this departs from the simple assumptions made here (see §2).

[17] To mention one example where such a notion is problematic, consider the "general economy" argument for phases (Chomsky, 2001, *a.o.*): since wh-movement is unbounded, phases (e.g., at the CP level) reduce computational load by limiting the search-space of a probe. However, A-movement can also be unbounded, so long as one controls for the finiteness of clauses. This argument for phases is therefore inherently flawed. It "closes the door halfway" on unbounded search (ruling it out for wh-movement but not for A-movement)—but such is the nature of infinity, that halving it does not make it finite.

[18] The derivation cannot be elaborated here, due to space limitations. See Preminger (2007) for details.

(39) $[_{CP}\ C^0\ [_{TP}\ \text{subj}\ [_{TP}\ \text{obj}\ [_{T'}\ T^0\text{+Pol}^0\text{+}v/V^0$
$[_{PolP}\ [\lambda\psi.\psi]\ [_{PolP}\ t_{subj}\ [_{PolP}\ t_{obj}\ [_{Pol'}\ t_{Pol^0+v/V^0}\ [_{v/VP}\ t_{subj}\ [_{v/VP}\ t_{obj}\ [_{v/V'}\ t_{v/V^0}\ t_{obj}]]]]]]]]]]$

Consider the list of properties of QR/reconstruction in (40), collected from the work of Hornstein (1995), and Johnson and Tomioka (1997):

(40) a. QR cannot escape finite clauses
b. inverse scope (i.e., *object-scope* > *subject-scope*) is achieved by "lowering" of the subject, rather than by "raising" of the object
(i) the subject loses scope with respect to clausal adjuncts
(ii) the subject loses scope with respect to negation
c. reconstruction is unavailable into "bare" structures (e.g., small-clauses)

Johnson and Tomioka (1997) derive (40c) from a general ban on reconstruction into thematic positions, as in (41), building on work by Heim (1997):

(41) Johnson and Tomioka (1997): Reconstruction into thematic positions is barred

Assuming this is correct, let us turn to (40a)-(40b). First, notice that neither *subj* nor *obj* in (39) has any remaining unchecked features. This means neither can QR any further, deriving (40a). Thus, the only way *obj* could out-scope *subj* is by reconstruction of *subj*. Second, (41) rules out reconstruction of *subj* to [Spec,v/VP], leaving only [Spec,PolP] as a possible reconstruction site—and in particular, an inner specifier of PolP, which is c-commanded by the polarity operator. Thus, if the sentence had a negative operator in it (instead of $[\lambda\psi.\psi]$), inverse scope would result in the subject losing scope with respect to negation—deriving (40bii). Under the assumption that clausal adjuncts adjoin to or above PolP, the subject would lose scope over them as well—deriving (40bi).

4.3.2. A further prediction

The structure in (39) in fact makes a further prediction: if both subject and object scope below clause-mate negation, they necessarily have surface scope with respect to each other (i.e., *subj* > *obj*). The sentence in (42) is carefully designed so that its only coherent reading will be precisely the reading paraphrased in (43), where negation scopes over *obj* which scopes over *subj*.[19] However, speakers judge (42) to have no coherent reading whatsoever (under focus-neutral intonation). To the extent that this is robust, it can be seen as further evidence in support of §4.3.1.

(42) ?? /# A new daffodil didn't bloom (into existence) on every window sill.

(43) It is not the case that for every window sill *y*, there exists a daffodil *x* such that the daffodil *x* bloomed (into existence) on the window sill *y*

5. Conclusion

In this paper, I proposed a novel account for the nature of syntactic movement, which is intended as an alternative to the *Probe-Goal* approach (Chomsky, 1995). The proposal is based on the idea that an XP that has unchecked features outside of its specifier (i.e., within X') constitutes an *imperfect domain*—and that *purifying* XPs (turning them into *perfect domains*) is the sole motivation for movement in syntax.

I demonstrated the workings of the proposed system, and highlighted several of its advantages in comparison to conventional syntactic frameworks: in capturing the distinction between movement and so-called "long-distance" agreement; in deriving certain key properties of QR and reconstruction, including a novel prediction regarding the interaction of inverse scope with clause-mate negation; in deriving wh-movement out of embedded declaratives (without recourse to features postulated for this purpose alone); in accounting for the clause-boundedness of QR, vs. the unboundedness of wh-movement; and in deriving the possibility of lexical selection for clauses in which wh-movement has occurred, vs. the impossibility of selection for clauses in which QR has occurred. The latter two were derived from a single property, accounting for their previously unexplained correlation.

[19] See Preminger (2007) for details on why each of the other (five) possible readings is ruled out.

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