MAXIMISING SUBSTANTIVE FORMAL FEATURES: MOVEMENT WITHOUT DIACRITICS

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Roberts (2010) proposes a theory of syntactic head-movement eschewing the movement diacritics (EPP, EF, etc.) commonly assumed in minimalist analyses of movement phenomena. Here, substantive formal features ([F]s) are key, with head movement being predicted to occur wherever a Probe Agrees with a Defective Goal, defined as in (1):

(1) **Defective Goal:** A Goal G is defective iff G's formal features are, following Agree-driven valuation, a proper subset of those of G's Probe P. (Roberts 2010:62 modified)

This leads to a hybrid theory of movement in general: while XP-movement is caused by a dedicated EPP-style diacritic, head-movement is not. Given that EPP-features have idiosyncratic formal properties of various kinds (they cannot be valued, checked, deleted, etc.), developing an approach to XP-movement eliminating these features seems desirable. Extending the Defective-Goal approach seems particularly attractive as this approach simply exploits the relations among independently needed [F]s. This is what we will try to do here.

Our central proposal is that XP-movement is *like* head-movement in not requiring EPP-features, but *unlike* head-movement in arising where the [F]s of the Probe are properly included in those of the Goal, i.e. the inverse featural relationship holds compared to head-movement. We therefore introduce a notion of **Defective Probe**, as follows:

(2) **Defective Probe:** A Probe P is defective iff P's formal features are, following Agree-driven valuation, a proper subset of those of P's Goal G.

Consider first A-movement, e.g. external-argument raising to SpecTP. By (2), A-movement to SpecTP will only arise where T's nominal-probing [F]s are included in those of the external-argument nominal. If T lacks one/more φ-[F]s, but nevertheless probes for nominal [F]s, we expect DP-subjects, bearing a full set of interpretable φ- (and D-) [F]s, to raise. Hence we can make a connection between obligatory raising of the external argument to SpecTP of the kind found in English and Mainland Scandinavian and the φ-defectivity of T. Assuming *there*-type expletives to be [Person]-bearing D-elements (Chomsky 2000), the behaviour of expletives in these systems follows if T's φ-defectivity centres on [Person]. A corollary of this idea is that in languages where T clearly is not φ-defective, e.g. canonical null-subject languages like Italian, (overt) subjects do not have to raise to SpecTP: this underlies the well-known phenomenon of "free inversion" (Belletti 2004) and the associated extractability of the subject over a complementizer (Rizzi 1982). It follows that we must treat French as having defective T since it patterns like English and not Italian; we take it that the overt morphophonological evidence available to acquirers is not sufficiently regular to cause them to posit a fully φ-specified T. By contrast, the (paradigmatic) morphophonological evidence from TMA marking (Schifano 2015) indicates that French T is *non*-defective in V-[F]s, hence accounting for V-movement. In general, it is important to highlight that T's [F]s must be seen as divided into distinct verbal and nominal "strands", i.e. bundles of [F]s which probe independently of one another (Biberauer 2010), with the nature of the probe determining the (nominal vs verbal) subset of T-[F]s that is evaluated for (non-)defectivity in relation to the Goal.This explains why subjects can raise despite lacking verbal [F]s.

Turning next to A'-movement, consider English *wh*-movement. If *wh*-elements are visible to higher probes by virtue of their containing an unvalued [F], and if elements bearing unvalued [F]s must move to the edge of a phase in order to avoid Transfer/Spellout (cf. Chomsky 2000's Indirect Feature-driven Movement/IFM), then it follows that EPP-features are not needed to trigger *wh*-movement to the lowest vP-edge; and the same holds for all successive-cyclic *wh*-movements up to the last one. At the last step, the *wh*-D will raise to "*wh*-C" as long as "*wh*-C" is a Defective Probe. More precisely, we characterise "*wh*-C" in English-type languages as bearing a valued/interpretable Polarity [F], [Pol:Q], which conveys interrogative force, and an unvalued [Wh]-[F]. *Wh*-DPs, meanwhile, have the inverse properties: [Pol:_] and valued [wh], and, additionally a quantificational [F] associated with D, which C lacks. DP thus has a superset of C's [F]s; hence C is a Defective Probe in relation to the *wh*-DP. In *yes/no*-questions, C lacks the [wh]-[F]. T-to-C movement is triggered in matrix interrogatives by the [Pol:Q] [F] and C's [Tense]-[F], giving C a superset of the [F]s of T, triggering T-to-C movement. In relatives, C has the [wh]-[F], but lacks the [Pol:Q] feature, while (assuming a raising approach) the nominal, which, following Kayne (1994), Bianchi (2001), may not be a complete DP, lacks unvalued [Pol], a [F] we, following Laka (1994), take to be associated with the DP-edge/outer phase. The unvalued [F] causing relative DPs to raise is associated with the inner nP-phase, corresponding to the nominal-internal variable which requires binding for the nominal to refer.

In *wh*-in-situ languages, the counterparts of *wh*-DPs are indefinites,lacking both a [wh]-feature and [Pol:_], while C has both valued [Pol] and valued [wh] (often realised by particles on separate C-heads; Cheng 1997, Rizzi 1997). D, then, does not have a superset of C's [F]s, precluding movement. Building on work pointing to the role of the internal (vP) phase-edge in licensing operations (i.a. Belletti 2006, Duffield 2007, 2013, Poletto 2014), we assume these *wh*-DPs to be bound under existential closure from the vP-edge. In some languages, e.g. certain varieties of Quechua (Cable 2010, Sánchez 2010), an extra *wh*-particle can be added to an otherwise in-situ indefinite DP, causing it to undergo movement. These particles can be straightforwardly treated as introducing an unvalued [wh]/[Pol:]-[F]; as noted above, movement to the CP-edge, via the vP-edge, follows automatically given our approach. More generally, our system predicts that in cases of optional movement, either the moving XP has an additional [F], making the Probe defective, or the attracting head has an additional [F], making an otherwise defective Probe non-defective. Differential object-marking, as analysed by Bárány (2015), is a case where the XP has an extra [F], causing it to take an extra step of movement; the same is true for the topicalisation cases discussed below. The relatively strong islandhood of definite as opposed to indefinite DPs (Fiengo & Higginbotham 1977) is a case where an extra [F] on D renders the DP-edge inaccessible to XP-movement (since an otherwise defective Probe is now non-defective), effectively creating an island.

Canonical (i.e. non-contrastive) topicalisation and scrambling can be accounted for along broadly similar lines. We take topicalised elements to have an extra structural "shell" containing unvalued φ-[F]s (in clitic-doubling languages, this is realised as a clitic; Torrego 1988, Uriagereka 1988); this causes movement to the nearest phase edge and onwards as described above. At the left periphery of the root, the [F]s are valued by Speech-Act heads assumed to be universally present (Kratzer 2009, Sigurðsson 2011). Hence no movement trigger or dedicated [Top]-feature is required. Scrambling is essentially the same, except that scrambled categories can be valued at lower phase edges in the presence of an appropriately specified v. Hence the difference between "scrambling languages" and others turns on the availability of φ-valuing heads at the vP-edge, in the spirit of Belletti(2004); the connection between scrambling and cliticisation was first pointed out by Sportiche (1996). In this system, the key difference between topicalisation/scrambling and core cases of A'-movement such as *wh*-movement lies in the fact that the latter, but not the former involve quantificational DPs requiring a left-peripheral root licensing head bearing the relevant [F]s (as described above). Certain types of topicalisation, e.g. contrastive topicalisation, do in fact require a special licensor and hence behave more like canonical *wh*-movement.

The one kind of movement that we have not treated so far is that which creates surface head-final orders (assuming Kayne 1994). Some types of OV order (e.g. Vata; Koopman 1984) seem to feature short A-movement of the object, and this can be accounted for as above. Rigidly head-final languages are more problematic, however. Generally speaking, the lexical V and its complement do not share [F]s and so Defective Goals and Probes as defined above do not play a role here. Nonetheless, in the spirit of the foregoing, we want to account for the occurrence and non-occurrence of rigid head-finality-creating "roll-up" movement in purely featural terms. It is known that languages vary significantly in the morphological complexity seen on categories whose roots are lexical verbs and nouns. Suppose that this follows from the structural point at which a categorising head (v, n, etc.) is added to the structure, i.e. that categorising heads can be thought of as instantiating a "morphological-closure" feature whose position in the extended projection of a lexical category may vary. In rigidly head-final languages, this feature is located at the top of extended projections, with two consequences: (i) all heads in the clausal spine are defective in relation to their complements, triggering roll-up; (ii) morphology is agglutinating. This accounts for two central aspects of Haider et al.'s (2014) "OV syndrome". Conversely, if the feature is located on the lexical head, no suffixation is permitted and VO order is predicted, accounting for the strong cross-linguistic tendency for analyticity in head-initial languages. Crucially, OV languages with morphologically unmarked verbs and analytic verbal systems are not excluded; these are predicted to have A-movement-type O-movement, as indicated above, which accounts for the OVX languages discussed in Hawkins (2009). Similarly, inflectionally richer VO-systems are not ruled out; these are just predicted to exhibit head-movement of some kind, which again seems correct. Further, given that the categorising feature necessarily requires all heads defining the spine it "closes off" to behave identically, we have an account of the Final-over-Final Constraint (Biberauer, Holmberg & Roberts 2014).

In terms of our proposal, then, we can reduce all movement types to simple inclusion relations among independently needed formal features. If correct, this would allow us to understand movement as one respect in which syntax seeks to make maximal use of minimal means, in line with a general principle of Feature Economy.