Edge features and phase head allomorphy

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This paper argues that much of the crosslinguistic variation involving *wh*-movement follows from the answers to two simple questions: (i) what are the lexical hosts for "edge features" (*EFs*; features that trigger successive cyclic movement) in the language?; and (ii) are these EFs intrinsically valued or unvalued? Chomsky (2000, 2001) suggests that EFs are hosted by phase heads, whereas Bošković (2007) proposes that they should be located on *wh*-elements. While Bošković's proposal provides a straightforward account of multiple *wh*-fronting languages, it does not have room to account for the close relation between *wh*-movement and specific phase heads in some languages (e.g. *that*-trace effects). A proposal along the lines of Chomsky's may in turn be better equipped to handle this, as it associates EFs with phase heads. Assuming with Nunes (2014) that these two possibilities are not mutually exclusive and that languages may vary in this regard, I propose that when a phase head is lexically endowed with EF, it assigns it to a *wh*-element in its probe domain, triggering successive cyclic movement. More specifically, I argue that the types of allomorphy related to phase heads that one usually finds in natural languages can be accounted for in terms of the answers to (i) and (ii) above. Standard *that*-trace effects in English, for instance, can be accounted for if *v* and the null declarative complementizer C$_{Ø}$ may be lexically associated with EF, but not the declarative complementizer *that*. Thus, (1a) below is obtained under a derivation where the embedded *v* is associated with EF and assigns it to its object and (1b), under a derivation where C$_{Ø}$ assigns its EF to the embedded subject. By contrast, (2a) cannot be derived because the embedded subject does not receive any EF-fuel if *that* is not an EF-bearer. Observe that even if the embedded or the matrix *v* in (2b) had EF, they could not assign it to the embedded subject: *who* is not in the probe domain of the embedded *v* and the PIC would prevent the matrix *v* from assigning its EF to *who*. Also notice that *that* in (1a) can license an escape hatch specifier, provided that the moving *wh*-element has acquired its EF from some other head (the embedded *v* in (1a)). This predicts that *that*-trace effects should be voided if some other head lower than C is able to assign EF to the local subject. Under this view, well known instances of circumvention of *that*-trace effects such as (3) (Cullicover 1993, Browning 1996) can be accounted for if the head X that has the PP adjunct in its Spec may be specified for EF and assign it to the embedded subject. Similarly, lack of *that*-trace effects in pro-drop languages with "strong" agreement (Rizzi 1982) follows if the relevant Infl head that is associated with "strong" agreement and is able to license null subjects may bear EF and assign it to a *wh*-subject, rendering it independent from the local complementizer. In other words, it is no accident that both phenomena make (tacit) reference to a functional head intervening between C and the local subject.

(1) a. **What**$_{\surd EF}$ did you [$_{vP}$ ***t*** [~~you~~ *v* say [$_{CP}$ ***t*** (that) [$_{TP}$ John [$_{vP}$ ***t*** [~~John~~ [$_{vP}$ *v* bought *t*]]]]]]]
b. **Who**$_{\surd EF}$ did you [$_{vP}$ ***t*** [~~you~~ *v* say [$_{CP}$ ***t*** C$_{Ø}$ [$_{TP}$ ***t*** [$_{vP}$ *t* [*v* brought the wine]]]]]]]

(2) a. *Who did you say that brought the wine?
b. [did you [$_{vP}$ ~~you~~ *v* say [$_{CP}$ that [**who** [$_{vP}$ *t* [*v* brought the wine]]]]]

(3) John forgot [**what**$_{\surd EF}$ Mary [$_{vP}$ ***t*** [~~Mary~~ *v* said [$_{CP}$ ***t*** that [$_{XP}$ [under normal circumstances] [$_{X'}$ X [$_{TP}$ ***t*** should be put ***t*** on the table]]]]]]]

EF may be optionally or obligatorily associated with a given phase head. Consider English C$_{Ø}$ and French *qui* in (4) and (5), for instance. The lower instances of C$_{Ø}$ and *qui* are required to license movement of a local subject, which indicates that they assign EF to the subject in their domain. In turn, the contrast between the upper C$_{Ø}$ in (4) and the upper *qui* in (5) suggests that the specification for EF is optional for C$_{Ø}$ but obligatory for *qui*; if so, Last Resort prevents the upper instance of *qui* in (5) from assigning EF to an element already bearing EF (the moving *wh*-subject) and the derivation with two instances of *qui* crashes.

(4) Who did you say **Cø/that** Mary thought **Cø/*that** wrote a nice paper?
(5) Qui est-ce Jean a dit **que/*qui** Pierre croit **qui/*que** viendra?

An important aspect of the present proposal is that the relevant subject-object asymmetries are not tied to subjects, but to phase heads. Thus, we may find the reverse pattern of subject-object asymmetry in languages like Bahasa Indonesia, where local object extraction is exceptional in that it triggers deletion of the "transitivity marker" *men-*, but local subject extraction does not, as illustrated in (6) (from Saddy 1991). The contrast in (6) can be accounted for if *men-* and *Ø-* are allomorphs of *v* (Aldridge 2008), with the latter being specified for EF, but not the former. Hence, the object in (6b) can move only if it receives EF from the null *v*, whereas local subject extraction does not trigger the presence of the *Ø*-allomorph because the subject is not in the probe domain of *v*.

(6) a. Siapa yang **men-cintai** Sally (moved *wh*-subject: 'Who loves Sally?')
who FOC TRANS-loves Sally
b. Siapa yang Sally **cintai** (moved *wh*-object: 'Who does Sally love
who FOC Sally loves

Assuming that the relation between interpretability and intrinsic valuation is not biconditional (Pesetsky and Torrego 2007), EF should behave like any other uninterpretable feature in potentially being intrinsically valued (+Q, +Foc, +Top, +Rel, *etc.*) or unvalued. If unvalued, it must be licensed by entering into an agreeing relation with a matching valued feature, as in (7). However, if a language explicitly associates a given phase head with [EF:u], the only way for such a specification to be computed nonvacuously, in consonance with Last Resort, is for the presence of EF on the phase head to be equated with the ability to license an A'-specifier. Familiar Elsewhere Condition computations then ensure that any other phase heads of the same type in the language that are not specified for EF will be incapable of licensing an A'-specifier as an escape hatch. This scenario is found with the type of complementizer allomorphy exhibited by Irish, where a C particle crossed by a *wh*-element is always realized as *aL*, whereas the C particle *go* always prevents *wh*-movement across it (McCloskey 2002). From the current perspective, *aL* bears an unvalued instance of EF, whereas *go* is not associated with EF. A similar scenario can also be found with respect to *v*. In Defaka, for instance, if a focus-moved phrase is anything other than a local subject, a special post-verbal clitic *-ke* appears obligatorily; interestingly, this *-ke* particle must surface on any verb crossed by the moved focused phrase (Bennett, Akinlabi, and Connell 2012), as shown in (8). From the perspective of the proposal explored here, the data in (8) can receive a straightforward account if the particle *-ke* in Defaka is actually the allomorph of *v* when it is associated with an unvalued EF. In other words, *-ke* and $v_{Ø}$ are examples of counterparts of Irish *aL* and *go* within *v*P.

(7) a. $[_{\text{Phase2}} \ldots \mathbf{Ph_{2[EF:u]}} \ldots [_{\text{Phase1}} \text{WH}_{[\text{EF:+Q}]} [\ldots \text{Ph}_1 \ldots t \ldots]]]$
$\lfloor$_____Agree_____$\rfloor$

(8) a. ándù$_i$ ndò Bòmá fàà-**kè** [ìní t_i été-**kè**] (Bennett, Akinlabi, and Connell 2012)
canoe FOC Boma say-KE they have-KE 'It's a canoe that Boma said they have'
b. Bruce$_i$ ndò Bòmá jírí-**kè** [t_i á ésé-mà]
Bruce FOC Boma know-KE her see-NFUT 'Boma knows (that) Bruce saw her'

In sum, this proposal provides a unified analysis for why one may usually find allomorphy affecting phase heads tied to A'-movement (EFs may be lexically hosted by phase heads); why some languages impose restrictions on local subject extraction, whereas others impose restrictions on local object extraction (subjects and objects may be assigned EF by the local phase heads); why this allomorphy may be exclusively related to local A'-extraction in some languages but not in others (lexical specification for EF may be optional or obligatory); and why some phase heads in some languages do not allow extraction from their domains, while others require that their domain contain an extraction site (an instance of EF:u signals that only its host licenses an escape hatch for A'-movement).