What Explains the Prohibition Against Movment from Verb-Second Clauses Into Verb-Final Clauses?

1. Background Extraction from declarative complement clauses in German reveals a curious pattern: Whereas verb-final complement clauses headed by *dass* ('that') permit movement both into a verb-second and a verb-final clause (1-ab), verb-second complement clauses only permit movement into a verb-second clause again (1-c), but not movement into a verb-final clause (1-d).

(1) a. (Ich weiß nicht) [$_{CP_1}$ wen$_i$ (dass) du meinst [$_{CP_2}$ t$'_i$ dass sie t$_i$ getroffen hat]]
I know not whom that you think that she met has

b. [$_{CP_1}$ Wen$_i$ meinst du [$_{CP_2}$ t$'_i$ dass sie t$_i$ getroffen hat]] ?
whom think you that she met has

c. [$_{CP_1}$ Wen$_i$ meinst du [$_{CP_2}$ t$'_i$ hat sie t$_i$ getroffen]] ?
whom think you has she met

d. *(Ich weiß nicht) [$_{CP_1}$ wen$_i$ (dass) du meinst [$_{CP_2}$ t$'_i$ hat sie t$_i$ getroffen]]
I know not whom that you think has she met

This systematic pattern has been addressed by invoking *locality* constraints, *directionality* constraints, *improper movement* constraints, and *pragmatic constraints*; a non-exhaustive list of references includes Tappe (1981), Haider (1984; 1993b), Reis (1985; 1996), Shin (1988), Stechow & Sternefeld (1988), Sternefeld (1989; 1992), Müller (1989; 2004), Staudacher (1990), Müller & Sternefeld (1993), Fanselow & Mahajan (1996), Williams (2003), and Heck (2010). Still, a conceptually simple minimalist analysis (Chomsky (2001; 2008)) is still outstanding.

2. Goal The goal of the present paper is to show that a locality-based analysis suggests itself under the phase-based approach to Condition on Extraction Domain (CED) phenomena developed in Müller (2010), provided that verb-second is *reprojection* movement. The restriction on movement from verb-second clauses will then be shown to follow from Chomsky's (2001) Phase Impenetrability Condition (PIC): An edge feature that is needed to trigger movement from the verb-second complement to the next phase edge cannot be inserted on matrix V in (1-d), which produces a PIC violation on the next cycle.

3. CED Effects In Müller (2010) it is shown that a version of the CED (Huang (1982), Chomsky (1986)) can be derived from the PIC in Chomsky (2001; 2008) if four assumptions are made: (i) All syntactic operations are driven by features of lexical items: *Structure-building* features (edge features, subcategorization features) trigger (external or internal) Merge operations ([•F•]); *probe* features trigger Agree operations ([∗F∗]). (ii) These features are ordered in stacks. (iii) All phrases are phases. (iv) Edge features that trigger intermediate movement steps can be added only as long as the phase head is still active, in the sense that it bears some [•F•] or [∗F∗] feature that may trigger an operation. The version of the CED that then follows as a theorem is this: Movement must not cross a barrier, where some item α is a barrier if the operation that has merged α in a phase Γ is the final operation in Γ. Here is why: When a head γ of a phase Γ has discharged all its structure-building and probe features, it becomes inert, and an edge feature cannot be inserted anymore that would permit extraction of some item α to a specifier in the edge domain of Γ; consequently a PIC violation arises once the derivation moves beyond Γ. Given that specifiers are non-first-merged items, and complements are first-merged items, this situation always obtains with *last-merged specifiers*: By definition, the stack of structure-building features of a phase head is empty once a last-merged specifier has entered the structure; and the stack of probe features must also be empty at this point because a probe feature could neither be checked with a specifier (because of the c-command requirement for Agree) nor with the complement (because of the Strict Cycle Condition; SCC). In contrast, the approach predicts that *non-last-merged specifiers* and *non-last-merged complements* are transparent for extraction: The phase head is still active at this stage (it has at least one [•F•] left), so an edge feature can be inserted, and a PIC violation on the next cycle is avoided. But what about *last-merged complements*, which discharge the sole structure-building feature of a phase head? There are two options: If the phase head has some probe feature left, it is still active, and extraction is possible (the probe feature can be discharged under c-command without violating the SCC); if it does not have some probe feature left at this point, extraction is impossible because of a PIC violation on the next cycle. This will become relevant for (1).

4. Verb-Second by Reprojection Verb-second movement is often conceived of as adjunction to C that proceeds by intermediate adjunction to T and v. There are various well-known problems with this

view, both conceptual (relating, i.a., to the nature of the triggering features involved and the c-command requirement for movement; Brody (2001), Mahajan (2001), Abels (2003), Matushansky (2006)) and empirical (relating, i.a., to the difference in distribution of the two clause types and the evidence against intermediate movement steps with verb-second; Haider (1993a), Roberts (2009; 2010), *pace* Sabel (1996)). In view of this, I will develop a reprojection approach to verb-second movement (Stechow & Sternefeld (1988), Sternefeld (1989), Ackema et al. (1993), Koeneman (2000), Haider (2000), Fanselow (2003)) that is based on Fanselow (2008) and Georgi & Müller (2010). The central assumption is that there is an optional feature [∗T∗] on V indicating a special relation that a verb-second V has to enter with a (higher) TP projection. This triggers V movement through intermediate phase edges to a position outside of TP, where V reprojects a clausal VP and [∗T∗] can be discharged (this is incompatible with the Head Movement Constraint (HMC); see Roberts (2009; 2010).) This leaves open the question of how specifiers of verb-second are introduced. The issue is orthogonal, but various options arise; e.g., suppose that a V:[∗T∗] has an additional edge feature that can only be discharged after [∗T∗] is discharged.

5. Analysis Now the pattern in (1) can find a simple explanation. Suppose first that complement clauses are always last-merged in VP; independent evidence for this comes from VP topicalization. Next, following Staudacher (1990), assume that verb-second complements are not as strictly selected as *dass* clauses. This asymmetry can be captured by postulating a *categorial probe* feature [∗C∗] as a special selectional feature on V if it subcategorizes a CP, whereas there is no such probe feature on V if it subcategorizes a verb-second VP. This difference can be shown to be responsible for certain root-like properties of embedded verb-second clauses that set them apart from other complement clauses (Hooper & Thompson (1973), Meinunger (2004), among others). This accounts for the transparency of *dass* clauses in (1-ab): V is active when CP has been merged because it still bears [∗C∗], so an edge feature can be inserted for some item in CP, and a PIC violation with the matrix VP phase (recall that every phrase is a phase) can be avoided. In contrast, the embedded verb-second clause in (1-d) emerges as a barrier: After matrix V has merged with the verb-second complement, it has no structure-building or probe feature left, which makes edge feature insertion in the VP (hence, an intermediate movement step to a phase edge) impossible and triggers a PIC violation once the derivation moves on. Finally, extraction from verb-second clauses in the presence of verb-second movement in the matrix clause as in (1-c) is correctly predicted to be possible again: Here matrix V is equipped with [∗T∗], which will subsequently trigger reprojection; therefore an edge feature can still be inserted after the embedded verb-second clause has been merged. (V would not be active in this sense under a standard theory of verb-second; given a local derivational approach to syntax, without look-ahead, the effect of V movement would therefore remain a mystery.) To sum up, at the relevant stage of the derivation when an edge feature needs to be inserted to extract some item from the complement clause to the VP edge, the edge feature can be inserted in (1-a) (V bears [∗C∗]), in (1-b) (V bears [∗C∗] and [∗T∗]), in (1-c) (V bears [∗T∗]), but not in (1-d) (V has no probe feature left). Hence, only in (1-d) is there a "search that goes to deeply into a phase already passed" (Chomsky (2008)).

6. Comparative Germanic Perspective Embedded verb-second clauses in the Scandinavian languages differ from their German counterparts in being embedded under a complementizer; interestingly, they block extraction across the board, independently of V movement in the matrix clause (Vikner (1995), Holmberg & Platzack (1995)). (The same goes for *C∼topic∼verb-second* sequences in Old High German and substandard varieties of Modern German; Lenerz (1984), Müller & Sternefeld (1993), Axel (2007), Freywald (2009).) This correlation is expected: Embedded verb-second clauses show root properties throughout, and they have a restricted distribution in virtually all Scandinavian languages (Bentzen (2009), Wiklund et al. (2009)); this signals the absence of a categorial probe feature on V (or C). Crucially, matrix V and the embedded verb-second V are separated by a CP phase; therefore V movement in the matrix cannot avoid a PIC violation arising from a ban on edge feature insertion in CP.

7. Further Issues The approach just sketched raises a number of further questions. I will address four of them. First, why does verb-second movement of an auxiliary (rather than a main verb) also circumvent a PIC violation in cases like (1-c)? Second, to what extent is the fact that embedded verb-second clauses obligatorily undergo extraposition in German relevant? Third, what does the approach have to say about the bridge verb/non-bridge verb distinction? And fourth, how does the present approach relate to other recent theories that envisage an interaction of V movement and locality domains (Bobaljik & Wurmbrand (2003), Gallego & Uriagereka (2006), den Dikken (2007))?

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