Abstract
Our point of departure is the problem of the locality of selection in the cartographic model. Grimshaw’s notion of extended projection, modified and updated, can be fruitfully applied to this problem, with consequences for a number of phenomena. In particular, the ban on non-wh material in the CP remnant of sluicing and the triggering conditions for I→C in Hebrew can be fairly naturally expressed in the proposed framework.

1. The problem
*Penser* 'think' selects an indicative complement in French while *vouloir* 'want' selects a subjunctive one:

(1)  
   a. Jean pense que Marie dort  
      Jean thinks that Marie sleeps.Ind
   
   b. Jean veut que Marie dorme  
      Jean wants that Marie sleeps.Subj

Mood selection appears to be implemented ‘at a distance’, as it were, in that the matrix verb determines the mood inflection on the embedded verb, across the complementizer *que*. Perhaps French possesses two homophonous complementizers, *que*<sub>IND</sub> and *que*<sub>SUB</sub> and these heads, in turn, determine the mood of the verb. If so, then mood selection may be implemented by a series of local steps. The matrix verb would select the complementizer and the latter would transmit the mood information to the embedded Infl.

The facts are more complex - and more revealing - in Turinese and Ligurian. As Paoli 2007 shows, the second *che* in (2) and (3) only occurs with subjunctive complements in these North-Western Italian dialects.

(2)  
   Gioanin a spera che Ghitin ch’as nè  
      John SCL hope.Ind.3s that Margaret that SCL PARTITIVE
   vada to’st  
   go.Subj.3s soon
   'John hopes that Margaret will leave soon'

(3)  
   A Teeja a credda che a Maria ch’apart  
      the Teresa SCL believe.Ind.3s that the Mary that SCL leave. Subj.3s
   'Teresa believes that Mary is leaving'

If the second *che* is a subjunctive mood marker, as Paoli argues, then mood selection by the matrix verb is nonlocal, since it seems so skip over or to ignore the first *che*, presumably the complementizer.

The problem posed by these examples is much more general: How does UG impose the locality of semantic or categorical selection across intervening categories?
Consider another illustration of the problem. Indirect questions are selected by verbs such as 'ask'. In Hebrew, topicalized arguments can appear to the left of a wh expression in indirect questions, as shown in (4b). ((4a) illustrates the order of constituents without topicalization.)

(4) a. ša'alta oti le mi le ha haxzir et ha sefer
(you).asked me to whom to return acc the book
‘You asked me who to return the book to.’
lit: ‘You asked me the book to who to return’

b. ša'alta oti et ha sefer le mi le ha haxzir
(you).asked me acc the book to whom to return
lit: ‘You asked me the book to whom to return’

One used to say that the complementizer of indirect questions is marked +wh or +Q and CP thus satisfies the selectional requirements of the verb. Topicalized material was assumed to be adjoined (to IP or to CP) and did not interfere with the locality of selection because adjuncts were ignored in the calculation of locality for government.

In the ‘cartographic’ model, (e.g., Belletti 2004, Cinque 1999, 2002, Rizzi 1997, 2004), however, locality of selection cannot be straightforwardly expressed in terms of sisterhood or local government. The problem here is partly technical and partly conceptual.

To illustrate the problem, consider the representation that Rizzi’s 1997 model would attribute to an indirect question such as (4b). In (5), the highest category in the CP domain is ForceP while the wh operator sits in a lower Spec/Foc. The topic is in Spec/Top.

(5) [ForceP [Force' [Force] [TopP [DP this book] [Top' [Top] [FocusP [PP to whom] [Focus' [Focus] . . .]]]]]]

How does selection work here? If a verb such as ask selects its sister, then it must select ForceP. But since the wh or Q feature is represented on Foc⁰, then some mechanism must be devised to allow Force⁰ to ‘communicate’, as it were, with FocusP. Such ‘communication’ faces the problem of the intervening Topic Phrase. Alternatively, if selection is not strictly local, then how does one prevent a verb from freely selecting the complement of its complement?

2. The Proposal

What is needed is a device for building the locality of selection into the cartographic model. Implemented in a particular way, Grimshaw’s 2000 ‘extended projection’ is precisely such a device.

For Grimshaw, an extended projection is headed by a lexical category which is paired with a functional specification. This head can project upwards as long as the categorical feature (i.e., N or V) is retained. In this system, I and C are projections of V, differing only in the type of functional features they are paired with.
It makes intuitive sense to think of the inflectional domain of the verb, essentially IP, as lying within the extended projection of V: The various functional features defining this domain are for the most part verb-related, both semantically and morphologically.

The CP domain is rather different, though, comprising essentially clause typing, quantificational and discourse-related features which are less tightly associated to the lexical verb. For instance, in many languages, lexical properties of the verb determine the choice of the auxiliary but not the choice of its c-commanding complementizer. Let us, therefore, assume that CP is not a projection of V but of C, in a sense to be made more precise below. Note that this assumption entails that not all extended projections are projections of lexical heads.

As Rizzi 1997 observes, the minimal contents of the complementizer system is a specification of force and a specification of finiteness. This can be expressed in the following terms: C is a Force feature (e.g., declarative) paired with a finiteness feature. At a certain point in the derivation (I leave open the question of how the grammar figures this out), C is merged and both the force and the finiteness features enter into the syntactic computation and must be assigned a value or check a feature.

Rizzi argues that Force and Finiteness are split when topics, foci etc. are present in the structure. So this suggests a more complex type of representation.1 Suppose that the initially-merged force head is associated with an ordered set of (sub-) features $<F_1...F_n>$. These precompiled features correspond to Rizzi’s Fin, Foc, Top, etc. 2 The computational system accesses or activates these features for valuation one by one, respecting the order of compilation. The mechanism exploited is that of copy and remerge and it is subject to the following procedure: Each time C is remerged, the leftmost unvalued feature in the set is activated. The feature cannot be activated later, i.e., after C has remerged. Thus, in order to activate $F_m$, 1<m, C must be copied and remerged up till $F_m$. Conversely, $F_{m-1}$ cannot be activated once $F_m$ has projected. This procedure ensures that the order of features associated with C is matched by their hierarchical articulation. Assuming that Fin is the leftmost feature of the set, it follows that the initial merger of C will activate it.

Assume, further, that once C’s own signature, i.e., the force specification, is syntactically valued, C becomes inert for further movement and the CP domain is, as it were, closed off. Consequently, Force will end up being represented on the highest copy of C, or, if C is merged only once, both Fin (the leftmost feature) and force, C’s ‘signature’ feature, will both be activated.

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1 Our approach resembles that of Giorgi & Pianesi 1997. In particular, it incorporates the essence of their Universal Ordering Constraint for the projection of features (p.14). The discussion below is not fully compatible, however, with their Feature Scattering Principle, (p.15), which associates language variation with the degree to which multiple features are scattered on distinct heads or condensed into a single syncretic head.

2 Rizzi 2001 argues for a distinct (int)errogative head in CP. Benincà 2001 and Benincà & Poletto 2004 propose a richer representation of the topic and focus layers. The nature, number and order of features precompiled on C do not alter the proposal advanced here. It might also be the case that Benincà & Poletto’s 2004 proposal to the effect that the C domain is comprised of three ‘sublayers’ entails the presence of three extended projections in CP and not just one. It isn’t clear, however, how such a proposal would handle the phenomena discussed further down.
Finally, let us say that a valued feature is not erased when valued (viz. Chomsky 2004). This ensures that at every level, C maintains its featural integrity.

In (4a), *ask* selects for an indirect question. Selection can be satisfied locally, i.e., by the highest occurrence of C, because the interrogative feature is present on this copy (albeit as an already valued feature.) The fact that the Wh-Criterion is satisfied in a lower C projection, say, FocP, is independent of the satisfaction of the selectional properties of the matrix verb. No problem is posed by the intervention of a topialized argument, and hence of a TopicP, as in (4b). Information travels up and down the extended C projection independently of the particular order of projected features. Crucially, this depends on the presence of a single C projection, as opposed to distinct, independently labeled categories such as TopicP or FocusP.

Similar reasoning extends to the selection of subjunctive complements in (1)-(3). Take French to be essentially like Turinese and Ligurian in possessing a mood feature in the array associated with C. The matrix verb selects indicative or subjunctive on the highest copy of C. A lower copy – assume, for the sake of simplicity, that it is the lowest - values the particular mood specification. This copy is lexicalized in the Italian varieties and null in French. This low copy interfaces with the TP system and the appearance of mood inflection on the embedded verb is therefore not surprising.

3. Applications
   3.1. The Sluicing-COMP Generalization
Sluicing is a form of ellipsis that deletes a clausal constituent, stranding a wh phrase:

(6) The students read some books but I don’t know which books [the students read t].

A widely-held view is that the category targeted by Sluicing is TP (or IP; see Merchant 2001). This view raises the question of why only the wh-phrase may appear in the pre-sluice Comp. Merchant’s discussion of this observation, which he calls the *Sluicing-COMP Generalization, (SCG),* is confined to material that might be expected to appear in CP below the wh phrase (I in C in V2 languages, Wackernagel clitics in South Slavic, low complementizers, etc.). He discusses a number of possible explanations, none of which can handle the following robust fact.

(7) *Pre-wh material, such as topics or high complementizers, is banned under sluicing.*

(4b) establishes that fronted topics can precede wh elements in Hebrew. Against this background, consider the following paradigm. (8a) can be licitly answered by (8b), with a (contrastive) topic to the immediate left of the wh phrase. The topic presumably occupies Spec/Top of the embedded clause.

(8) a. mi yelamed safot šemiyot?
   who Fut.teach languages Semitic
   ‘Who will teach Semitic languages?’
(8c) shows that sluicing is possible in Hebrew. Note that an argument originating in the sluiced clause may be topicalized and appear in a higher CP.

c. aravit mišehu yelamed aval ani lo yode’a aramit mi
   Arabic someone Fut.teach but I neg know Aramaic who
   yelamed
   Fut.teach
   ‘Arabic, someone who will teach but I don’t know Aramaic, who will teach’

The topic cannot appear in the Comp of the sluiced clause and therefore cannot immediately precede the wh-expression in (8d). The sharp contrast between (8d) and the perfectly acceptable (8b) demonstrates that this problem is specific to a sluicing environment.3

d. *aravit mišehu yelamed aval ani lo yode’a aramit mi
   Arabic someone Fut.teach but Aramaic I neg know who
   ‘Arabic, someone who will teach but Aramaic, I don’t know who’

A similar issue arises in languages in which a lexical complementizer co-occurs with a wh-expression in indirect questions. (9a), from Suñer 1994, illustrates a prevalent situation in many regional varieties of Spanish, namely, the appearance of a ‘that’-like complementizer to the left of a wh expression in indirect questions. This complementizer cannot appear in a sluicing environment, however, as shown in (9b).

(9)  a. Briana preguntó (que) qué había comprado Mara ayer.
   Briana asked (that) what has bought Mara yesterday
   ‘Briana asked what Mara bought yesterday’

   b. Briana sabia que Mara había comprado algo ayer
   Briana knew that Mara has bought something yesterday
   pero no sabia (*que) qué
   but not knew (that) what
   ‘Briana knew that Mara bought something yesterday, but (she) didn’t know what’

Taking CP to be an extended projection, in the manner discussed in the previous section, in tandem with some auxiliary assumptions, paves the way to an explanation of these restrictions. Our starting point is (10).4

(10)  Sluicing targets CP.

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3 The sluicing paradigm in (8) is not specific to Hebrew. The following sentences illustrate the same pattern in Italian.

(i)  Chi insegherà le lingue semitiche ?
(ii)  L’arabo qualcuno l’insegherà ma non so l’aramaico chi l’insegherà.
(iii) L’arabo qualcuno l’insegherà ma l’aramaico non so chi.
(iv)  *L’arabo qualcuno l’insegherà ma non so l’aramaico chi

4 (10) might be derivable from a more general constraint banning syntactic manipulation (e.g., movement) of TP. Abels 2003, for example, argues that complements of phase heads cannot be moved or deleted.
Assume, further, that specifiers are configured as sisters of XP (Chomsky 1995, Kayne 1994), rather than of X' – which may simply not exist as a category label. Given a representation such as (11), with YP a “specifier” of XP, a full XP (or, more generally, a full category) can either include or exclude the higher XP segment. In other words, “specifiers” can be either included or excluded in their full category (see May 1985 for relevant discussion.)

(11) \[ \begin{array}{c}
\text{XP} \\
\text{YP} \hspace{1cm} \text{XP} \\
\end{array} \]

Assume, finally, that only full extended projections can be subject to ellipsis. To put it differently, only the extended CP projection can be elipted (with or without its highest specifier); partial ellipsis is not a legitimate operation.

The SCG now follows: Post-wh material cannot remain after sluicing, because it is included in the elipted CP. But (8d) and (9b) also receive an explanation: In these examples, CP extends above the wh, so the entire CP projection must be sluiced.

But why can CP not be sluiced above the topic in the Hebrew examples, giving rise to (12a), or just below the topic, as in (12b)? After all, sluicing here would not be inconsistent with (10).

(12) a. *aravit mišehu yelamed aval ani lo yode’a aramit mi
    Arabic someone Fut.teach but I neg know Aramaic who yelamed
    Fut.teach
    Lit: ‘Arabic, someone who will teach but I don’t know’

b. *aravit mišehu yelamed aval ani lo yode’a aramit mi
    Arabic someone Fut.teach but I neg know Aramaic who yelamed
    Fut.teach
    Lit: ‘Arabic, someone who will teach but I don’t know Aramaic’

For reasons which are independent of the category of the sluice, CP ellipsis is only grammatical if the remnant contains a wh expression. Hence, (12a,b) are not legitimate sluices (albeit being full CPs).

(9b) is excluded on similar grounds. CP ellipsis can target the extended C projection, deleting both the head que and the homophonous wh word, but this would not give rise to a legitimate sluice, which requires a wh-remnant. Alternatively, the wh que can be retained, but then it must be taken to occupy the specifier of the extended CP projection. Hence, no comp material can appear to its left.

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5 If VP ellipsis, unlike sluicing, incorporates a stage of (VP) Topicalization (followed by deletion of the lower VP copy), then the fact that the subject cannot be stranded in such ellipsis (e.g., and write the book he *(will)) might be due to a restriction on the topicalization of a subjectless TP and not on the ellipsis process itself.

6 It could be that the sluiced CP in (8c) contains an (intermediate) trace of the topic, above or below the wh-expression.
3.2. Hebrew Triggered Inversion

Triggered Inversion, (TI), is an optional operation fronting the inflected verb to C over the subject, see Shlonsky 1997. It is conditioned by the presence of lexical material in CP other than or in addition to the declarative complementizer. Due to the absence of a trigger, TI is impossible in (13). The sentences in (14), however, are all acceptable, since they include triggers for inversion, namely, a fronted topic in (14a), a wh-expression in (14b) and interrogative ‘if’ in (14c).

(13) ^ani yode’a şe yaskim Dani la haca’a ha-zot
I know that will.agree Dani to.the proposal the-this
‘I know that Dani will agree to this proposal.’

(14) a. ani yode’a şe la haca’a ha-zot yaskim
I know that to.the proposal the-this will.agree
Dani
Dani
‘I know that to this proposal Dani will agree.’

b. ani lo yode’a matai yaskim Dani la haca’a ha-zot
I not know when will.agree Dani to.the proposal the-this

(14c) c. ani lo yode’a im yaskim Dani la haca’a ha-zot
I not know if will.agree Dani to.the proposal the-this

Hebrew TI is insensitive to the type of constituent serving as a trigger (like Germanic V2 and unlike, say, English interrogative inversion) and to the number of preverbal constituents (similar to but freer than Rhaeto-Romance and Medieval Romance inversion, see e.g., Benincà 2004, Poletto 2002.) Moreover, it is not restricted neither to root sentences nor to embeddings under a particular class of verbs (contrasting with embedded V2 in Icelandic and Yiddish.)

Although TI is barred from applying under a declarative complementizer, as (13) shows, it can apply under a filled interrogative complementizer. We take im ‘if’ in (14c) to be a head and not an XP in specifier position as it is homophonous with conditional ‘if’, cannot support sluicing and doesn’t bear any formal resemblance to wh-expressions.

The CP projection in (13) contains a single head position, projecting Force and Fin features, as discussed above. Den Besten’s 1983 explanation for the impossibility of I→C in Dutch/German sentences displaying an overt complementizer carries over to the ungrammaticality of (13): I cannot raise to a lexically-filled C. But what allows (14c)?

The inversion triggers in Hebrew all have the effect of forcing multiple merger of C and open up a position into which I can raise. More precisely, the inversion triggers force C to remerge at least once in order to activate the features associated with a topic, a focus, a wh or, as in (14c), a Q or Int feature (see Rizzi 2001). In all of these cases, the lowest C copy, which activates the leftmost feature on C’s feature matrix, namely Fin, becomes accessible to movement of a lower head. The optionality of TI is due to verbal nature of the Fin feature which enters into a relationship with T, optionally attracting it.
4. Conclusion

By way of conclusion, let us consider a consequence which our analysis of the architecture of CP might have for the Germanic V2 languages.

Suppose that, differently from Hebrew, the feature matrix associated with C is not an ordered set in Dutch or German. Consequently, the projection procedure can select any feature from the array and activate it. Access to, say, a topic feature, does not require the prior merger of C and the activation of a Fin feature, because the Top feature can be arbitrarily picked for valuation from C’s feature matrix. Indeed, it is sufficient that C be merged only once, for any of its features to become visible. This answers the question of why the verb in V2 seems to move to the same position, regardless of the (cartographic) position of the raising trigger in other languages.

References


