

## Feature Stacking: The Kashmiri Clause Edge<sup>1</sup>

### 0. Introduction

- Accounts of the left-periphery of the clause to this point have relied on a hierarchy of functional projections to host this material (Rizzi 1997, 2001; Benincà 2001)
- Clear source of empirical discovery, describing a wide range of left-edge phenomena.
- This paper explores theoretical and empirical ramifications of the so-called cartographic approach, emphasizing how this work interacts with current theoretical developments
- Case study: the Indic language Kashmiri (rich left periphery in both main and subordinate clauses with rigid ordering and co-occurrence restrictions)

### 1. The Kashmiri Left Periphery

Characteristics of Kashmiri:

- A symmetric Verb-second (V2) language
- Rich left periphery, including the second position verb, topic, focus, and wh-phrase(s)
- Any argument (or constituent) may precede the V2 verb

(1) a. *aslaman dits mohnas kita:b ra:mini khə:trɪ ra:th* (Wali and Koul, 1997)

*aslam-erg gave Mohan-dat book Ram-dat for yesterday*  
Aslam gave Mohan a book for Ram yesterday.

b. *mohnas dits aslaman kita:b ramini khə:trɪ ra:th*  
Mohan-dat gave Aslam-erg book Ram-dat for yesterday  
Aslam gave Mohan a book for Ram yesterday.

c. *kita:b dits aslaman mohnas ramini khə:trɪ ra:th*  
Book gave Aslam-erg Mohan-dat Ram-dat for yesterday  
Aslam gave Mohan a book for Ram yesterday.

d. *ra:mini khə:trɪ dits aslaman mohnas kita:b ra:th*  
Ram-dat for gave Aslam -erg Mohan-dat book yesterday  
Aslam gave Mohan a book for Ram yesterday.

e. *ra:th dits aslaman mohnas kita:b ra:mini khə:trɪ*  
Yesterday gave Aslam-erg Mohan-dat book Ram-erg for  
Aslam gave Mohan a book for Ram yesterday.

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<sup>1</sup> Thanks to my Kashmiri informants, Jaya Chowdhury, Tara Chowdhury, Pran Kaul, and their families.

Focus:

- The non-subject pre-verbal constituents in (1b-e) are generally interpreted as focused.
- The focus-particle *-ti* may be suffixed to a constituent in this position (Bhatt 1999)  
(2) bɪ ti go:s garɪ vakhtas peth  
I foc went home time-dat on  
I too went home on time.
- In constituent questions, the focused interrogative phrase also appears before the verb  
(3) a. kəm' hə:v shi:las nəv kita:b ra:th  
who showed Sheila new book yesterday  
Who showed a new book to Sheila yesterday?  
b. kəmis chi va:riya:h pə:sɪ?  
who-dat has lot money  
Who has a lot of money?

Topic:

- In one important case, an additional topic constituent can precede the verb
- Topic may occur in this position just when wh-word is present (Bhatt, 1999).  
(4) a. ra:jan kəmis hə:v nəv kita:b?  
Raj whom showed new book  
As for Raj, to whom did he show his new book?  
b. mohnan k'a: khev ra:th  
Mohan what ate yesterday  
As for Mohan, what did he eat yesterday?
- At any clause edge in Kashmiri it is ungrammatical to have more than one topic (as in (5a)), to have the wh-phrase precede the topic (5b), or to have a topic with a non-interrogative focus (5c).  
(5) a. \*rajan nəv kita:b kəmis hə:v  
Raj new book whom showed  
Intended: As for Raj, as for the new book, to whom did he show it?  
b. \*kəm' tse chu-y ba:sa:n ki mohn-as dits kita:b  
who you aux think that Mohan gave book  
Intended: As for you, who do you think Mohan gave the book to?  
c. \*gari bɪ go:s vakhtas peth  
home I went time-dat on  
Intended: As for home, I went there on time.

Summary:

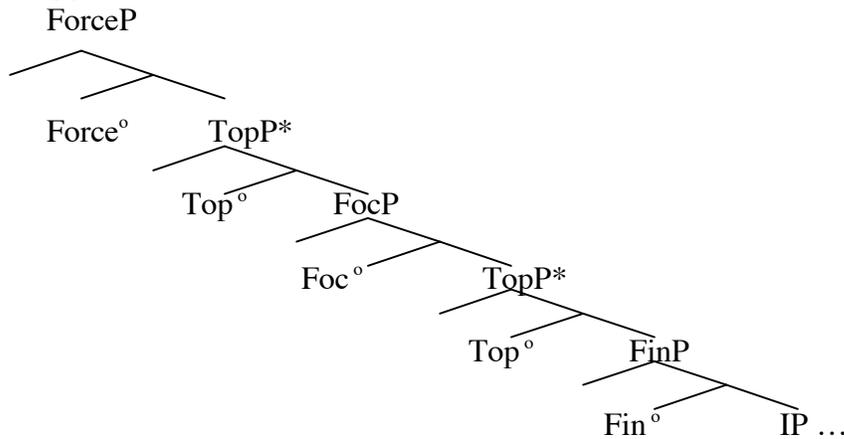
- The left periphery of Kashmiri can take two essential forms  
(6) a. [Focused (wh or non-wh) XP] [verb] [TP]  
b. [Topic XP] [Focused wh-XP] [verb] [TP]

## 2. The Cartographic Approach to the Left Periphery of Kashmiri

### The Cartographic Account:

- The left periphery is comprised of sequence of functional projections whose hierarchical order is fixed (Rizzi 1997)

- Each head hosts a unique element in its single specifier  
(7)



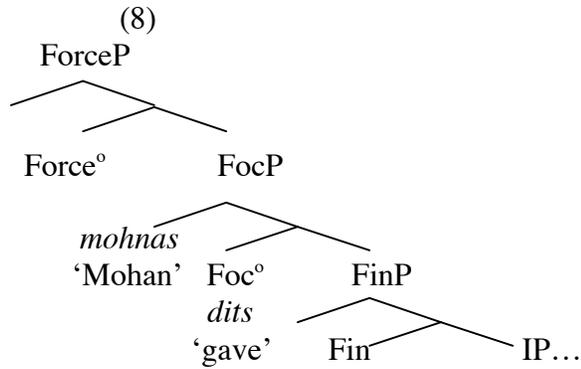
- Two types of projections:  
Force and Finiteness projections - required
  - Force projection contains information which determines the force of the clause to follow (i.e. interrogative, exclamative).
  - Finiteness head contains information about whether the clause will be finite or non-finite
  - Each of these heads may (or may not) host morphological material.
- Topic and Focus - appear in structure “when needed”
  - This is when a constituent with topic or focus features in the main clause needs to enter into a specifier-head relation with the applicable functional head
  - Topic head can be recursive, allowing for multiple topics in a single clause edge, while the Focus head is not for interpretive reasons
- All movements to the left periphery are driven by the satisfaction of some criterion
- Constituents with a topic or focus feature must ultimately be in the specifier-head relation with a head bearing those same features.

#### A Cartographic Account of Kashmiri

- In (1b), repeated here, we find a focused constituent on the left edge, followed immediately by the second position verb

(1b) mohnas dits aslamān kita:b ramini khətrɪ ra:th  
 Mohan gave Aslam book Ram for yesterday  
 Aslam gave Mohan a book for Ram yesterday.

- The focus projection must appear on the left edge, sandwiched between ForceP and FinP.
- According to Rizzi’s approach to other I-to-C movements, the Focus head/features also attract the finite verb



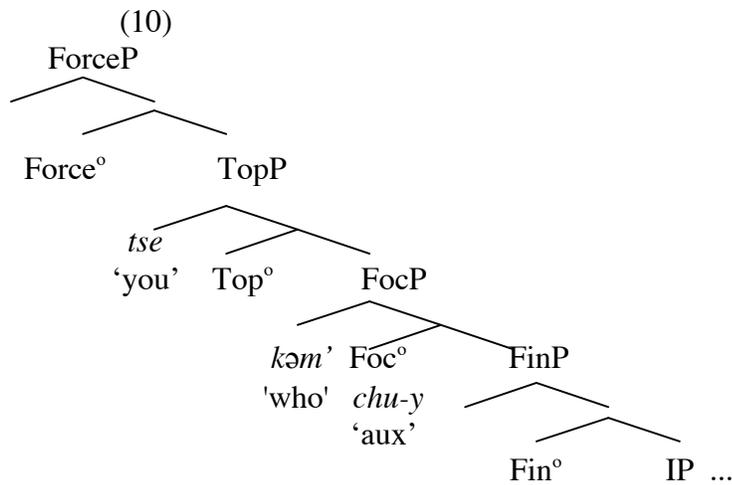
- Note that in this Kashmiri sentence there is no audible material in Force or Fin
- In the case of a more complex interrogative clause as in the matrix clause in (9) below, the preverbal position is occupied by a focused wh-word

(9) *tse kəm' chu-y ba:sa:n ki mohn-as dits kita:b*

you who aux think that Mohan gave book

As for you, who do you think Mohan gave the book to?

- Preceding the wh-element is a constituent interpreted as a topic.
- Under the cartographic approach, in this sentence a Foc projection must again appear between ForceP and FinP
- A single Topic projection (recursive topics are not possible in Kashmiri as seen in (5a)), must appear between ForceP and FocP



- There is no audible linguistic material in the head or specifier of either the ForceP or FinP, nor in the head of TopP.

### 3. Theoretical Opportunities and the Cartographic Approach

- Cartographic approach to this point has been the most successful analysis
- Since the cartographic account was proposed, there have been several theoretical developments that may be relevant to this project

#### 3.1 The Specifier-Head Relation

- Cartographic: the specifier-head relation satisfies criteria on the peripheral heads
- For each projection, there is a single specifier in a unique relationship to its head
- If we are committed to a single specifier for each projection, we are committed to a unique projection for each constituent that undergoes A-bar movement to the left edge

#### Multiple Specifiers

- Chomsky (2000) argues that the restriction to a single specifier is theoretically undesirable and empirically unmotivated (see also Ura 2000)
- While evidence for a sequence of phrasal constituents on the left periphery is overwhelming, evidence for a sequence of distinct head positions among these is delicate at best.
- Without this restriction a given projection could have an unlimited number of specifiers, we could escape our commitment to a projection for every A-bar constituent

#### Empirical Observation

- In Kashmiri, the finite verb appears immediately following the focused wh or non-wh phrase
- In the cartographic view, the V2 verb is located in the Focus head
- However in (7) there are at least four heads: Force<sup>0</sup>, Topic<sup>0</sup>, Focus<sup>0</sup>, and Fin<sup>0</sup>.
- Given this structure, the verb could follow the topic in Topic<sup>0</sup>, or precede the topic in Force<sup>0</sup>, yet both of these alternative orders are ungrammatical:  
(11) a. \*tse chu-y kəm' ba:sa:n ki mohn-as dits kita:b  
          you aux who think that Mohan gave book  
          Intended: As for you, who do you think Mohan gave the book to?  
          b. \*chu-y tse kəm' ba:sa:n ki mohn-as dits kita:b  
          aux you who think that Mohan gave book  
          Intended: As for you, who do you think Mohan gave the book to?
- We will have to require that head movement only raises the Kashmiri verb as far as Foc<sup>0</sup>, tying the Focus head or focus features themselves to verb attraction (Rizzi 1997)
- Is there a way to amend cartographic view to in some way limit the descriptive options here, while adopting a position more in line with current theoretical work?

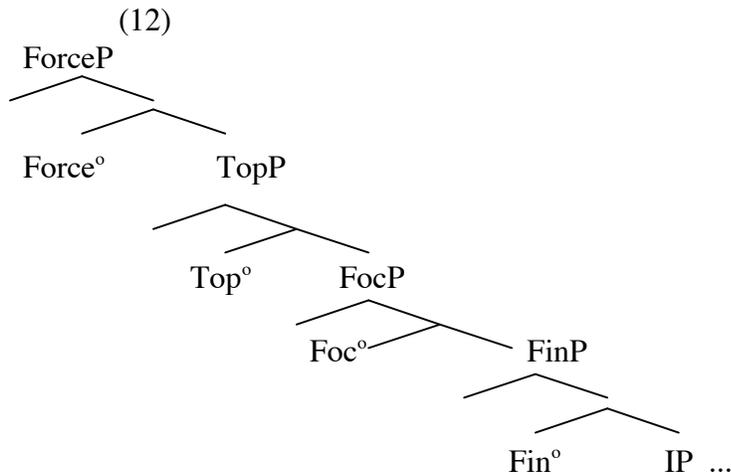
#### 3.2 The Cartographic Project and the Phase

- Clause edge is also a transition point between one clause and another, particularly for successive-cyclic movement – hence the recent development of the concept of the ‘phase’, as defined in Chomsky (2000, 2004, 2005).
- Phases are self-contained subsets of a derivation (CP and vP, possibly others)

- Constituents on the phase edge remain accessible to interact with probes in the next higher phase  
*Phase Impenetrability Condition* – “In a phase  $\alpha$  with head H, the domain of H is not accessible to operations outside  $\alpha$ , only H and its edge are accessible to such operations” (Chomsky 2000:108), where the edge includes specifiers and adjuncts to H

#### The Phase-Defining Head

- Which of the left peripheral heads is phase-defining?
- The Kashmiri left periphery:



- Because wh-material is hosted by FocusP, we might expect this head to be phase-defining
- Of course, Topic<sup>0</sup> must also probe into the clause below
- Presumably, we must view the entire left periphery as the phase edge – we must re-vamp the PIC so that an array of heads is the phase-defining unit, and the array of specifiers are all on the phase edge (see also Cecchetto 2004)
- The concept of the phase and the cartographic hierarchy are something of an imperfect fit
- How can we better understand the left periphery in both of its capacities: as a position for dislocated elements with specific discourse-functions and as a transition point for movement between two clauses?

### 3.3 Order of Projections

- What is the source of the language-to-language variation of the order and number of the constituents on the left periphery?

#### Use of the Left Periphery

- While some languages, like Kashmiri or Italian, make very rich use of the left periphery, other languages, such as Irish and English, do not seem to use this region of syntactic space as much

### Crosslinguistic Variation in Projection Order

- Kashmiri, like Yiddish and Icelandic, exhibits V2 in subordinate clauses
- In indirect questions in Yiddish and Icelandic, the order of the constituents is wh-topic-verb, but never \*topic-wh-verb (Diesing 1990, Bhatt 1999)

(13) a. Ikh veys **vos bay mir** tut zikh.  
I know what by me does refl.  
I know what goes on with me.

b. \*Ikh veys **bay mir vos** tuto zikh.

- In Kashmiri, the order is the reverse: topic-wh-verb, but never \*wh-topic-verb

(14) a. me chi patah ki **batı kemyi** khyav (Bhatt 1999)  
I aux know that rice who ate.

I know (that) , as for rice, who ate it.

b. \* me chi patah ki **kemyi batı** khyav

### Variation from Template in (7)

- The hierarchy in (7) suggests that the Topic projection can iterate, but only one topic is permitted per clause in Kashmiri (\*topic-focus-topic & \*topic-wh-topic (see (5))).

### How to State Constraints on Number/Order

- We would also need some device (such as phrase structure rules) to state the following restrictions on Kashmiri ((15))

(15) a. ForceP → TopP → FocP (wh only) → FinP

b. ForceP → FocP → FinP

- For other languages, these rules might look quite different, so (7) is something of a template, indicating an upper bound for the left periphery.

### 3.4 Summary

(i) Multiple specifiers

(ii) Phases

(iii) Number/Order of Projections

- Below I present an amended account of the left periphery which fits with these theoretical assumptions that we may want to make for independent reasons, but also maintains the empirical gains of the cartographic work

#### 4. Feature Stacking

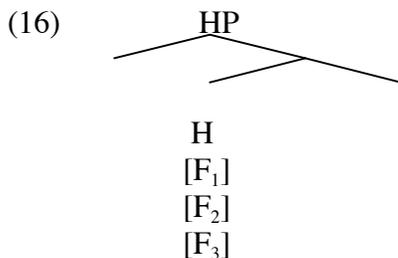
- I propose that the attributes of the left periphery can be accounted for with a single functional head that contains a stack of features (see Bobaljik and Thrainsson 1998, Ura 2000, Anderson 1977).
- Constituents that interact with this head can undergo Move, creating multiple specifiers
- Most importantly, the order of features in the stack is intended to mirror (as well as capture) the pattern being uncovered in cartographic work.

##### 4.1 Features and the Lexicon

- Features are linguistic properties that are made available by UG
- A language makes a one-time selection from these features and forms a lexicon
- I propose that features are grouped into bundles, which function as units with respect to interactions between Probes and Goals
- Each syntactic head in the lexicon is comprised of a stack, or ordered list, of one or more bundles of features
  
- The composition of the bundles and the order in which they appear in a stack on a head is language-specific; the mechanisms by which these features are valued are universal
- That said, the process which assembles lexical items from features must be governed by regularities which restrain the range of possible variation
- In this way, the generalizations discovered in cartographic work will be seen to apply to the construction of functional vocabulary, rather than stated on phrase structure

##### Defining Feature Stacking

- When a head H is introduced into the derivation as in (16), the features of feature bundle F1 must be accessed in the derivation first, followed by those in F2 to F<sub>n</sub> sequentially



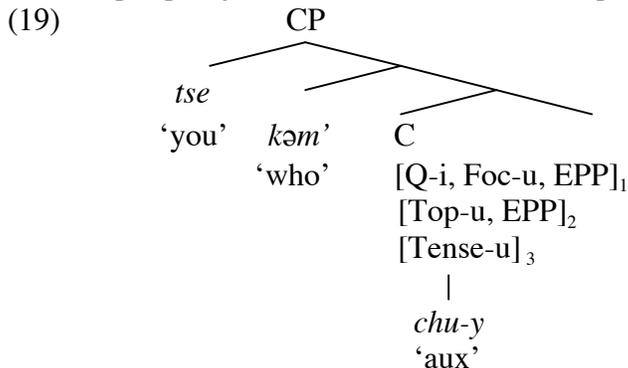
- In a stack of feature bundles F1, F2, and F3, all features in F1 (a, b, c) will be valued before all features in F2 (d, e), which will be valued before all features in F3 (g).  
(17) <{F1=a,b,c}, {F2=d, e}, {F3=g}>
- If a feature bundle is made simply of interpretable and uninterpretable features, it will interact with an available goal via the Agree operation
- If a feature bundle in addition contains the EPP property, the relevant Goal will undergo Move (Agree + Internal Merge) to successive specifiers of the head H<sup>2</sup>

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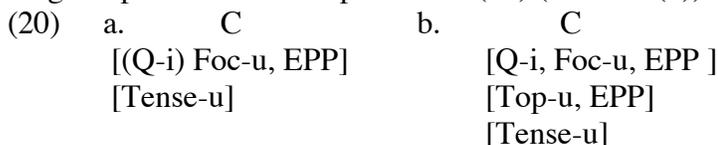
<sup>2</sup> It makes no difference whether we assume that those specifiers attach successively further outward from the head or “tuck in” (Richards 2001) and are successively more proximate to the head. It only matters that the order of the feature stack determines the relative surface order among the specifiers. Here I will assume for illustrative purposes

### Feature Stacking in Kashmiri

- Consider the matrix clause in (18)
- (18) tse kəm' chu-y ba:sa:n ki mohn-as dits kita:b  
 you who aux think that Mohan gave book  
 As for you, who do you think Mohan gave the book to?
- The left periphery of this matrix clause is comprised of a single CP projection



- [Q-i, Foc-u, EPP] is the first bundle on this interrogative C, interacts with *kəm'* 'who', which undergoes Move to Spec, CP
- [Top-u, EPP] is the second bundle, interacting with the Topic *tse* 'you', which undergoes Move to Spec, CP
- [Tense-u] is the third bundle, causing the verb to undergo movement to the C head
- The C head in (19) is one of the C heads available in the lexicon of Kashmiri. The full range of possibilities is expressed in (20) (also see (6)).



### 4.2 More on Feature Stacking

- Feature bundling and stacking clearly represent an increase in technological complexity, but not beyond the kind of complexity seen in other work on lexical structure
- We will need to have systems for distributing and organizing features on lexical items.

Recent proposals: calling for as much or more articulated feature structuring than discussed here

- Chomsky (2005) recognizes “multiple probes” within C, and suggests that perhaps only one functional head may be necessary to account for the left peripheral region
- Cowper (2005) introduces a feature geometric account of the inflectional node that requires that entailment relations holding among a set of features
- Greater structure and organization of features may also be needed at another phase-defining head, transitive *v* (discussed further below)

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that specifiers attach successively further outward, but this is an arbitrary choice from the point of view of the feature stacking process.

## Lexicon Construction

- How are C heads themselves constructed, and what accounts for the crosslinguistic generalizations we see on the left periphery?
- In the feature-stacking account this information must be encoded in the operation which selects features from UG and creates lexical items in each language
- Other crosslinguistic lexical patterns and tendencies need to be encoded in such a way
- In this account these patterns will be encoded as generalizations about the way in which functional vocabulary is structured
- This account then contributes to our understanding of how lexical objects are structured

## 4.3 Returning to the Theoretical Discussion

- We can now align the account of the left periphery with certain theoretical developments.

## Specifiers

- The feature-stacking account clearly takes advantage of the notion that a single projection can have more than one specifier
- One head may act as the target of head-movement in Kashmiri (and in general)
- The mechanism which ensures that the verb always immediately follows the focused element in Kashmiri is in fact the order of feature bundles in the stack – this is a property of the Kashmiri lexicon

## Phases

- In the case of the feature-stacking account, the single C head is phase-defining, as is widely claimed – its specifiers are unambiguously at the phase edge
- This achieves the expected results in the case of successive cyclic wh-movement and topicalization in Kashmiri

## Constituent Order

- The order, number, and nature of elements found on the left edge of the clause is dictated by the presence and structuring of features on the functional head C
- The attributes of the left-periphery in a specific language reduce to the presence of certain features in the lexicon

## **5. Conclusion**

- The feature-stacking account allows us to take advantage of theoretical opportunities that have arisen since its development and solve empirical puzzles that come with them, while maintaining the understanding of the left edge advanced by the cartographic view

## Future Prospects

- Feature stacking may have ramifications beyond accounting for the left periphery
- Chomsky (2005) has suggested that certain properties of a language not only reduce to the properties of the functional heads, but specifically the phase-defining heads
- Recent research indicates that C and *v* may have a number of characteristics in common

- In the case of successive-cyclic movement, constituents must move to the edge of each phase in order to be accessible to the higher phase
- Rackowski and Richards (2005) propose that  $vP$  is the position at which the wh-criterion is satisfied in Tagalog
- In work in progress (Manetta, to appear) I argue that we can also find wh-expletives at the  $vP$  phase edge (in Hindi-Urdu), just as we find them in the CP domain
- If these investigations are on the right track, we might expect to find a similar constellation of constituents appearing at the  $vP$ -phase edge as at the CP phase
- Feature stacking may then account not just for the left periphery, but also for the range of constituents appearing at the edge of  $vP$
- Perhaps a major locus of crosslinguistic variation will then turn out to be the internal featural structure of the phase-defining heads

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