

Pied-Piping with Inversion and Labeling: a new perspective.

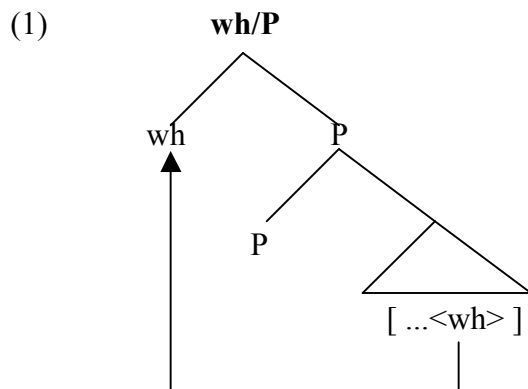
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1. Introduction

- I propose that pied-piping with inversion (PPI) (Smith Stark (1988)) can be explained in terms of the labeling algorithm in Chomsky (2005).
- I predict a well-known restriction on PPI: only heads may invert.
- This suggests that there is a Phase boundary associated with PP's.

Theoretical claim: *PPI involves movement of a wh-element from (within) the complement of P to its specifier.*

- This produces a category with a label ambiguous between wh and P.



2. The Basic Pattern

- The phenomenon of interest involves wh-movement of prepositional objects.¹
- There are two options in English:
 - the wh-element alone may move, stranding the preposition in situ (2)
 - the preposition may pied-pipe with the questioned element (3).

(2) **Who_i** did you go to the party **with t_i**?

(3) [**With whom**]_i did you go to the party t_i?

- PPI languages (prevalent in Meso-America) have prepositions and overt wh-movement.
- In PPI, the preposition pied-pipes with the wh-element, but appears in inverted order (Wh + P), as in (4).

(4) ***Who with** did you go to the party t_i?

- Jacaltec is a PPI language.
- (5a) illustrates the base order.

¹ PPI occurs in other contexts as well, e.g. possessor constructions. I believe my analysis can be extended to cover those facts as well, but I restrict my attention here to PPI in prepositional phrases.

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- In interrogatives:
 - PPI is available (ex. 5b.)
 - alongside the option of stranding the preposition (ex. 5c.).
- (5) a. chin to munil **yiŋ hin mam**
I-go work for my father
“I am going to work for my father”
- b. **mac yiŋ** chach to munil **t_i**
whom for you-go work
“Whom are you going to work for?”
- c. **mac** chach to munil **yiŋ t_i**
whom you-go work for
“Whom are you going to work for?”
(Craig 1976: p. 15)

Importantly, PPI does not occur with complex wh-phrases.

- That is, structures like (6) are impossible:
- (6) ***Which man with** did you go to the party **t_i**?
- Kichee', another PPI language, shows this restriction.
 - First, it allows pied-piping both with and without inversion (inversion is preferred):
- (7) a. **Chuxe'** **jäs** k'o wi le **tz'i'**?
under.3SERG WH.NHUM exist LOC DET dog
‘What is the dog under?’
- b. **Jäs chuxe'** k'o wi le **tz'i'**?
WH.NHUM under.3SERG exist LOC DET dog
‘What is the dog under?’
(Broadwell 2005: pp.2-3)
- Note that in the grammatical (7b) the wh-element is a single head.
 - When the questioned prepositional object is complex, PPI is *ungrammatical*.
- (8)a. **Chuxe'** **jäs tem** k'o le **tz'i'**?
under.3SERG WH.NHUM chair exist DET dog
‘Which chair is the dog under?’
- b. ***Jäs tem chuxe'** k'o le **tz'i'**?
WH.NHUM chair under.3SERG exist DET dog
(Broadwell 2005: 4)

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3. A Labeling Algorithm

- My account of PPI relies on the labeling algorithm given in Chomsky (2005).
- Traditional view:
 - Category labels are relevant for syntactic operations.
 - Therefore, they must be present in the syntax.
 - In Minimalist terms, Merge of α and β produces $\{\gamma, \{\alpha, \beta\}\}$, where γ (the label of $\{\alpha, \beta\}$) = the label of α or the label of β .
- Chomsky (2005): labels are not distinct elements in syntactic representations.
- So Merge of α and β just produces $\{\alpha, \beta\}$, a simpler object.
- Labels are *implicit*, determined for any given structure by search.
- He gives the following algorithm, which has two conditions:

- (9) a. In $\{H, \alpha\}$, H an LI, H is the label.
b. If α is internally merged to β , forming $\{\alpha, \beta\}$, then the label of β is the label of $\{\alpha, \beta\}$.
(Chomsky 2005: 10-11)

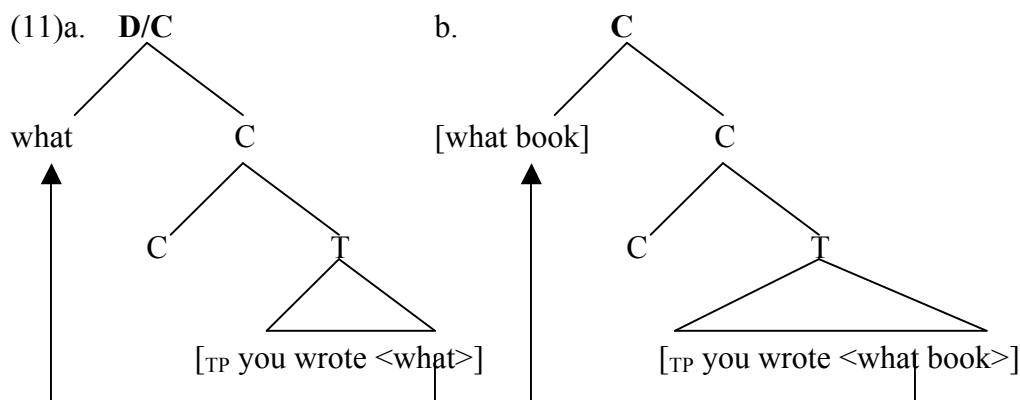
Crucially, these conditions do not always determine a unique label!

- In particular, if a Lexical Item (head) moves (undergoes Internal Merge), both conditions apply.
- Chomsky (2005) appeals to the ambiguity in these circumstances to account for a contrast in the interpretations available to (10a) and (10b):

(10)a. [what_i you wrote t_i]

(10)b. [what book_i you wrote t_i]

- In (10a), a single Lexical Item (*what*) has been moved, so either (or both) of *what* or C may project.
- This contrasts with (10b), where the moved wh-element is complex; only the (b) condition of the algorithm may apply, so C projects.



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- This explains the contrast in interpretation of these elements under embedding:

(12)a. I wondered [what_i you wrote t_i].

b. I read [what_i you wrote t_i].

(13)a. I wondered [what book_i you wrote t_i].

b. *I read [what book_i you wrote t_i].

- In (12), the label is ambiguous according to Chomsky's algorithm.
- Interrogative clause (12a) and nominal (12b) readings are available, corresponding to projection of C and *what*, respectively.
- The wh-phrase is complex in (13); according to the algorithm, only C may project.
- Thus we predict that only the interrogative clause reading is possible in (13).

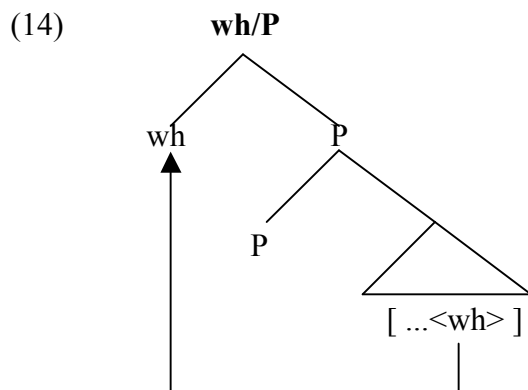
What happens when the labeling algorithm does not give a unique result?

- I pursue Chomsky's suggestion that, within the syntax, both labels coexist.

4. PPI as a result of Labeling

I propose that:

- PPI is motivated by labeling
- Its restriction to inversion of single wh-heads is derived in the same way as the contrast in (12)-(13).
- I claim that PPI involves movement of the wh-element to the specifier of P (previous to wh-movement to the edge of the clause):



- When the object of the preposition is a single wh-word, this produces a phrase with a label ambiguous between wh and P.
- When the wh-phrase is complex, movement to the specifier of PP does not change the label (still P).
- Note that questioning the object of a preposition produces tension between two preferences that can be observed in natural language:
 - To move the smallest category possible

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- Not to disrupt the surface contiguity of prepositional phrases.²
- PPI is an elegant way to satisfy both desires; the moved category bears the attracted [wh] feature, and the P is not stranded in situ.

5. A Potential Problem

- There is a problem with this analysis.
 - When movement yields an ambiguous label (viz., when the moved phrase is a single LI), the label should *already* be ambiguous.
 - On the surface the phrase consists of just two LI's, the [+wh] D and P.
 - Then both items Merged are LI's, and the first clause of the labeling algorithm should allow either (or both) choices.
 - It is mysterious, then, why a further operation would be required to again yield ambiguity of labeling.
- My claim: the structure contains other null elements.
- If so, the labeling is not ambiguous until movement occurs.
- There are several candidates for null heads which might be present:
 - a nominal head which is the complement of D
 - K, a case head between DP and PP (Bittner & Hale 1996).
 - P itself may be internally complex (Svenonius 2004).
 - D may be a complex of functional heads (Cinque 2002).
- If so, the LI P will Externally Merge with a complex structure.
- The labeling algorithm will unambiguously give P as the label of such structures.
- If D subsequently Internally Merges with P, both conditions of the labeling algorithm will apply.

6. Implication: PP is a Phase

- The analysis suggests that PP's in PPI languages may be Phases.
- In the framework of Chomsky (2005), Agree-features and Case assignment are the exclusive province of Phase heads, as is the ability to drive Internal Merge.
- In PPI languages, I claim that all three of these properties (Agreement, Case, and EPP) hold of prepositions.
- It is a striking feature of many PPI languages that prepositions agree overtly with their complements.
- I suggest this is a syntactic phenomenon reflecting an Agree relation.
- Support for this idea can be drawn from Kichee'.
 - In that language, some prepositions do not agree with their complements.
 - These prepositions also do not participate in PPI:

(15) a. P=**jäs** k'o wi le lej?

² If the idea I pursue below that PP is a phase is on the right track, this preference could reduce to Chomsky's (2001) observation that the complements of Phase heads generally resist movement.

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on=WH.NHUM exist LOC DET tortilla

‘What is the tortilla on?’

b. ***jäs=P** k'o wi le lej?

WH.NHUM=ON exist LOC DET tortilla

(Broadwell 2005: 3)

- In Phase theory, movement is ‘parasitic’ on the Agree relation.
 - The EPP feature is the mechanism which drives movement
 - EPP determines whether the Agree relation established between probe and goal is accompanied by move (Internal Merge), but does not itself probe.
- Thus movement is a subcase of Agree.
- So lack of movement is precisely what we expect with non-agreeing prepositions.
- This supports two elements of my analysis:
 - The agreement relation is present in the syntax.
 - The preposition itself drives the movement.
- Case assignment is also a property of prepositions, uncontroversially.
- Phase heads *v* and C assign accusative and nominative Case, respectively (the latter through T as a sort of surrogate; see Chomsky (2005) on this point).
- My analysis suggests a general unification of Case assignment: Case is assigned by Phase heads, including P.
- My analysis involves Internal Merge to the edge of PP
- This again falls into place if P is a Phase head.
- One last interesting point:
 - It is very common for a single phonological form to be employed as both a complementizer and a preposition:
 - *for* in English, *go* in Irish, *a* and *de* in Spanish, (and their cognates in French and Italian), etc.
 - I propose that this is more than accidental homophony.
 - It reflects a parallelism of function (as Phase heads).

6. Conclusion

- Chomsky's (2005) labeling algorithm predicts that some structures will not have a unique label; I claim that the phenomenon of PPI bears out this prediction.

The account explains:

- why PPI occurs (to produce a wh-labeled element)
- when it may occur (only when the wh-element is a single lexical item).
- The account relies on Internal Merge to the [spec, PP] position.
- This requires that PP be a phase, at least in PPI languages.
- This fits nicely with other phase-like properties of PP's, such as agreement and case-assignment.

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