

## Pied-Piping

### Goals:

- Raise challenges for the Charlow/Demirok system (C/D).
- Use these challenges as the basis for an argument in favor of von Stechow's view (vS) that pied-piping requires reconstruction (joint work with Jon Nissenbaum, which I might present in greater detail later on).

### 1. C/D's theory of Pied-piping as presented by Patrick (Demirok's version)

- Type-flexible ? allows (by Karttunen's procedure) for the generation not only sets of propositions, but also sets of objects of other types.
- Such objects can be turned into complex existential QPs if combined with  $\exists$ , a covert type flexible existential quantifier.
- These complex existential QPs can move (like *wh-phrases*) and be specifiers of ?, thereby forming new sets of objects of other types.
- vS's problem is resolved if we limit type-flexibility and allow ? to take only intensional arguments (and make certain syntactic assumptions that we will go over).

(1) a. Which book is on the table? (\**which* is the spell-out of *some* when it is an LF Spec of ?\*)

LF:  $\lambda p$  [some book]<sub>2</sub>

? p [t<sub>2</sub> is on the table]

b. Whose book is on the table?

LF:  $\lambda p$  [ $\exists \lambda X_{se}$  someone<sub>1</sub> [? X [t<sub>1</sub>'s book]]]

? p [t<sub>2</sub> is on the table]

$\llbracket \lambda X_{se} \text{ someone}_1 [? X [t_1 \text{'s book}]] \rrbracket^{w0}$

= { $x_{se}$ :  $\exists y \in \llbracket \text{person} \rrbracket^{w0}$  &  $x = \lambda w. y \text{'s book in } w$ }

= { $\lambda w. y \text{'s book in } w$ :  $y \in \llbracket \text{person} \rrbracket^{w0}$ }

The LF in (1)b derives the appropriate meaning. The alternative LF in (1)b' would derive the wrong meaning, hence the assumption that ? can only combine with intensional arguments.<sup>1</sup>

(1)b' LF:  $\lambda p$  [ $\exists \lambda x_e$  someone<sub>1</sub> [? x [t<sub>1</sub>'s book]]]

? p [t<sub>2</sub> is on the table]

$\llbracket \lambda x_e \text{ someone}_1 [? x [t_1 \text{'s book}]] \rrbracket^{w0}$

= { $x_e$ :  $\exists y \in \llbracket \text{person} \rrbracket^{w0}$  &  $x = y \text{'s book in } w^0$ }

= { $x_e$ :  $x$  is a book in  $w^0$ }.<sup>2</sup>

<sup>1</sup> As pointed out by Patrick, Demirok adopts the scope theory of intensionality. He uses the machinery introduced for pied-piping to derive so-called third readings, and therein we might find his more important argument for the C/D machinery. (A similar argument was made independently by Patrick, hence the C/E/D mechanism when I talk about intensionality.)

<sup>2</sup> assuming that all books were written by someone, if *written by* is the relevant possessive relation.

## 2. Necessary Syntactic assumption

## 2.1. C/D is semantically richer than the Karttunen system that Kai presented

Hence, it cannot generate less.

So, also under C/D we need to block LFs such as the following that von Stechow thought he needed to block.

[illegible]

In other words, we need a syntactic condition that would block a derivation in which [whose book]<sub>2</sub> moves to Spec CP and *who* moves out to become an outer specifier. Patrick suggested the claim that *whose book* is an island for extraction, but that might not be general enough.<sup>3</sup>

The same issue arises for (2).<sup>4</sup> We need to block covert movement of *a book about t* “tucking-in” below *who*.

(2) Who did Mary read a book about t  
 \*LF:  $\lambda p.$  Who<sub>1</sub> [a book about t<sub>1</sub>]<sub>2</sub>  
   ? p you read t<sub>2</sub>  
 $\llbracket \text{*LF} \rrbracket^{w^0} = \{p: \exists y \in \llbracket \text{person} \rrbracket^{w^0} \& \exists x \in \llbracket \text{book about } t_1 \rrbracket^{w^0, 1 \rightarrow x}$   
   &  $p = \lambda w. \text{Mary read } x \text{ in } w\}$   
   =  $\{\lambda w. \text{Mary read } x \text{ in } w: \text{in } w^0 \text{ } x \text{ is a book about some person}\}$

## 2.2. Auxiliary Syntactic Assumption

So there has to be an auxiliary syntactic condition.

(3) **Possible auxiliary assumption:** Only (phrases headed by) +wh existential quantifier can move to Spec, CP (and silent  $\exists$  is +wh).

**Question:** is this obviously better than the auxiliary assumption needed by vS?

(4) **von Stechow's auxiliary assumption:** Only (phrases headed by) +wh existential quantifiers can be at LF in Spec, CP (and silent  $\exists$  is not +wh).

(4)' **Another possibility** (to which we should return): The *wh*P in Pied-Piping constructions is the inner-specifier of CP: [[t's book] *who* C...]. The outer specifier needs to reconstruct (as is generally the case in remnant movement) for binding of the trace of the *wh*P.

<sup>3</sup> I also don't see a reason to think that DP is an island. Consider Sauerland's *Mary was eager to find a solution to every problem you were*. Maybe the relevant island is the CED, but consider *which politician did you wonder which books about were on sale*, as well as the structures for nested *wh* questions in Bulgarian from Norvin's paper..

<sup>4</sup> The issue is raised by Demirok (pg. 172 on the version here: <https://ling.auf.net/lingbuzz/004951>).

### 3. Challenges to Charlow/Demirok

#### 3.1. Evidence for syntactic Reconstruction

- pied piping in relative clauses
- Condition A/C
- Parasitic Gap Licensing

##### 3.1.1. Relative Clauses

We find pied-piping in the formation of relative clauses, which arguably requires syntactic machinery of the sort proposed by vS (*the book whose author I met*).

##### 3.1.2. Condition A/C<sup>5</sup>

- (5) How many books is Mary hoping to read this summer?  
 -What is the number  $n$ , such that Mary is hoping to read  $n$  many books?  
 -What is the number  $n$ , such that there are  $n$  many books and Mary is hoping to read those books?<sup>6</sup>

$$Q_1 = \{\lambda w. \forall w' \in H_{M,w} [M \text{ reads } n \text{ many books in } w'] : n \in \mathbb{N}\}$$

$$Q_2 = \{\lambda w. \exists X [|X| = n \ \& \ \text{Books}(X, w) \ \& \ \forall w' \in H_{M,w} [M \text{ reads in } w'] : n \in \mathbb{N}\}$$

Under vS's mechanism: two LFs; the pied-piped material can reconstruct even lower than what is needed to meet the constraint in (4).

The C/D system yields two LFs without any syntactic reconstruction.

- (6) **Semantic Reconstruction in a Charlow/Demirok system:**

$$LF_1: \lambda p [\exists \lambda Q_{s, \text{ett}} \text{ how ? } Q \text{ many books}]_1$$

$$? p \ \lambda w. Q_1(w). \lambda x. \text{ Mary is hoping to read } x$$

$$LF_2: \lambda p [\exists \lambda Q_{s, \text{ett}} \text{ how ? } Q \text{ many books}]_1$$

$$? p \ \text{ Mary is hoping } \lambda w \ Q_1(w) \ \lambda x. \text{ PRO to read } x$$

**Evidence for von Stechow's proposal:** Makes better predictions for Condition C and Condition A. See Heycock 1995, Romero 1997, Fox 1999, Fox and Nissenbaum 2004.

##### 3.1.3. Parasitic Gap Licensing<sup>7</sup>

**On the face of it, PG distribution argues against covert movement of the Pied-Piper**

- (7) a. This is the professor [whose<sub>2</sub> article]<sub>1</sub> you read t<sub>1</sub> after making a copy of pg<sub>1</sub>  
 b. \*This is the professor [whose<sub>2</sub> article]<sub>1</sub> you read t<sub>1</sub> after talking to pg<sub>2</sub> on the phone

<sup>5</sup> This challenge is acknowledged by Demirok though not addressed.

<sup>6</sup> As pointed out in von Fintel and Heim, there is actually a third reading here, which I will not discuss, though it is quite pertinent for the overall architecture..

<sup>7</sup> From joint work with Jon Nissenbaum (presented in WAFL 14).

- (8) a. [whose<sub>2</sub> article]<sub>1</sub> did you read t<sub>1</sub> after making a copy of pg<sub>1</sub>?  
 b. \* [whose<sub>2</sub> article]<sub>1</sub> did you read t<sub>1</sub> after talking to pg<sub>2</sub> on the phone?

**But...**

- (9) a. [Whose<sub>2</sub> article]<sub>1</sub> did you ask me to read t<sub>1</sub> after making myself a copy of pg<sub>1</sub>?  
 b. \*[Whose<sub>2</sub> article]<sub>1</sub> did you ask me to read t<sub>1</sub> after introducing myself to pg<sub>2</sub>?  
 (10) a. [Whose<sub>2</sub> article]<sub>1</sub> did you ask me to read t<sub>1</sub> after making yourself a copy of pg<sub>1</sub>?  
 b. [Whose<sub>2</sub> article]<sub>1</sub> you ask me to read t<sub>1</sub> after introducing yourself to pg<sub>2</sub>?

**Any phrase that dominates a *wh*P (within Spec, ?) can sometimes license a parasitic gap.**

- (11) a. The person [[whose<sub>3</sub> car's]<sub>2</sub> front seat]<sub>1</sub> you<sub>8</sub>  
 [[t<sub>8</sub> asked me<sub>7</sub> PRO<sub>7</sub> to t<sub>7</sub> clean t<sub>1</sub>]  
 [after PRO<sub>8</sub> remembering yourself<sub>8</sub> spilling coffee on pg<sub>1</sub>]]  
 b. The person [[whose<sub>3</sub> car's]<sub>2</sub> front seat]<sub>1</sub> you<sub>8</sub>  
 [[t<sub>8</sub> asked me<sub>7</sub> PRO<sub>7</sub> to t<sub>7</sub> clean t<sub>1</sub>]  
 [after PRO<sub>8</sub> imagining yourself<sub>8</sub> driving pg<sub>2</sub>]]  
 c. The person [[whose<sub>3</sub> car's]<sub>2</sub> front seat]<sub>1</sub> you<sub>8</sub>  
 [[t<sub>8</sub> asked me<sub>7</sub> PRO<sub>7</sub> to t<sub>7</sub> clean t<sub>1</sub>]  
 [after PRO<sub>8</sub> introducing yourself<sub>8</sub> to pg<sub>3</sub>]]

Other constituents within the pied-piped constituent cannot license pg.

- (12) a. The person [[whose<sub>2</sub> book] (about Mary<sub>3</sub>)<sub>1</sub> you<sub>8</sub>  
 [[t<sub>8</sub> asked me<sub>7</sub> PRO<sub>7</sub> to t<sub>7</sub> read t<sub>1</sub>]  
 [before PRO<sub>8</sub> getting me<sub>8</sub> to talk about pg<sub>1</sub>]]  
 b. The person [[whose<sub>2</sub> book] (about Mary<sub>3</sub>)<sub>1</sub> you<sub>8</sub>  
 [[t<sub>8</sub> asked me<sub>7</sub> PRO<sub>7</sub> to t<sub>7</sub> read t<sub>1</sub>]  
 [before PRO<sub>8</sub> getting me<sub>8</sub> to talk to pg<sub>2</sub>]]  
 c. \*The person [[whose<sub>2</sub> book] about Mary<sub>3</sub>]<sub>1</sub> you<sub>8</sub>  
 [[t<sub>8</sub> asked me<sub>7</sub> PRO<sub>7</sub> to t<sub>7</sub> read t<sub>1</sub>]  
 [before PRO<sub>8</sub> getting me<sub>8</sub> to talk to pg<sub>3</sub>]]

### 3.2. Overgeneration

As Filipe pointed out after class, C/D overgenerates.

- (13) Who knows [what Mary bought t]  
 \*LF  
 $\lambda p$  who<sub>1</sub> XP<sub>2</sub> [ ? p t<sub>1</sub> knows t<sub>2</sub> ]

Where XP =  $\exists \lambda p$  what<sub>3</sub> ? p Mary bought t<sub>3</sub>

This is essentially Dayal's analysis of partial *wh*-movement.

Likewise, Patrick taught us how Dayal deals with the “*wh*-triangle”. But this also overgenerates. Specifically, we get the right meaning only if we ensure that we form nested dependencies in the embedded question and that we introduce  $\exists$  above the covertly moved phrase.

The only reply I could think of: there are two varieties of  $\exists$ , one selected by  $\exists$  and the other not. The one selected by  $\exists$  cannot trigger/attract overt *wh* movement.

**Major empirical problem:** in languages like Bulgarian, Baker ambiguities are resolved the way Baker said they are rather than the way Dayal said.

#### 4. Return to vS

Which of the assumptions advocated by C/D should be rejected?

- Type-flexible  $\exists$  allows (by Karttunen’s procedure) for the generation not only sets of propositions, but also sets of objects of other types.
- Such objects can be turned into complex existential QPs if combined with  $\exists$ , a covert type flexible existential quantifier.
- These complex existential QPs can move (like *wh-phrases*) and be specifiers of  $\exists$ , thereby forming new sets of objects of other types.
- vS’s problem is resolved if we limit type-flexibility and allow  $\exists$  to take only intensional arguments (and make certain syntactic assumptions that we will go over).

If we need to block non-*wh*-related elements from appearing in Spec  $\exists$ . (as I suggested), the simplest thing to do would be to claim that, (even if it exists)  $\exists$  doesn’t have +*wh* features and  $\exists P$  cannot occupy Spec,  $\exists$ .

Only *wh*Ps can occupy Spec,  $\exists$  and other phrases must reconstruct, hence solving vS’s problem under a scope theory of intensionality. Perhaps, the C/E/D mechanism is nevertheless needed to account for third readings (see note 1).