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Diagnosing covert pied-piping

Sauerland and Heck (2003, S&H) show that Beck intervention effects occur within overtly pied-piped constituents. We present novel data showing that these intervention effects also affect covert pied-piping, contra Cable (2010). That is, when a focus intervener (Beck, 2006) is inside an in-situ *wh*-word's associated pied-piping constituent, it will block the interpretation of the *wh*-word, leading to ungrammaticality. We argue that these facts are best accounted for by (a) covert movement of *wh*-words for interpretation, with pied-piping through Cable's (2007, 2010) Q-theory of *wh*-movement, (b) interpretation of pied-piped constituents through focus alternatives (Horvath 2000, 2007; Krifka 2006; Cable 2007, 2010; a.o.), and (c) Beck's (2006) focus semantic account of intervention effects. We further argue that a careful look at such configurations leads to the conclusion that the size of overt pied-piping and covert pied-piping can differ—in particular, covert pied-piping in English does not allow P-stranding. Finally, we extend these findings to focus constructions and argue for a covert movement approach to in-situ focus interpretation (Krifka, 2006; Wagner, 2006).

Theoretical background: In Cable's (2007, 2010) Q-particle theory of *wh*-movement, a Q-particle (silent in English but overt in some languages) is adjoined to a particular *wh*-containing constituent, and "*wh*-movement" moves this QP. QPs containing more than just the *wh*-word lead to *pied-piping*. In English, in-situ *wh*-words in superiority-obeying questions merge with Q and covertly move to C (see also Pesetsky, 2000; Beck, 2006).

Previous work on intervention and pied-piping: S&H give German data showing that various interveners such as negative quantifiers cannot occur in an overtly pied-piped constituent (1). Cable (2010) presents the analogous contrast for English, reproduced in (2). (Interveners in **bold**, *wh*-words in *italics*.)

(1) Fritz möchte wissen [[✔ein /***kein** *wie* schnelles Motorrad] du fahren darfst]
     Fritz wants   know   a / no how fast   motorbike you drive   may
     'Fritz wants to know how fast a/*no motorbike you are allowed to drive.'

(2) [✔A/***no**/***few** picture(s) of *which* president] does Jim own ___?

S&H and Cable show that these intervention effects occur when an intervener is inside the pied-piped constituent (QP following Cable) and above the *wh*-word, schematized in (3). Intervention in this configuration is unexpected by Beck (2006), but is amenable to a similar focus-semantic explanation, since the pied-piped constituents are interpreted via focus-alternative computation within the QP (Cable, 2010; cf. Horvath, 2000, Krifka, 2006).

(3) * [$_{QP}$ Q … **INTERVENER** [… *wh* …]]$_i$ … t$_i$ …

Intervention in covert pied-piping: As the interpretation of in-situ *wh*-words can involve covert movement (Karttunen, 1977; a.o.), we would like to know (a) whether *covert* movement also triggers pied-piping and, if so, (b) whether the size of covert pied-piping is the same as overt pied-piping. The multiple *wh*-question in (4) provides some evidence:

(4) *Who*'s read ✔a/✔some/✔the/***no**/***few** book(s) from *which* library?

Note in particular that this is a superiority-obeying question and, in general, negation intervening between the complementizer and the in-situ *wh*-word is grammatical (5). Ungrammaticality arises precisely when the intervener is within the DP [D books from *which* library] that is a pied-piping constituent corresponding to *which*.

(5) ✔ *Who* has'**nt** read a/any/some/the book(s) from *which* library?

This contrast thus does not fall under Beck's (2006) analysis of intervention effects between C and an in-situ *wh*. It does, however, fall under the extension of Beck to intervention within QPs (schema in 3), assuming that covert movement also triggers pied-piping via Q-particles. *As Q's function is to mark the constituent that is targeted for movement, the contrast in (4) provides an argument for covert pied-piping in the interpretation of wh-in-situ.*

Diagnosing the size of overt and covert pied-piping: As noted by Huang (1982), PP-complements are easier to extract from within a DP than PP-adjuncts are (6–7).

(6)   * [From *which* library] have you read [a book ___]?
(7)   ✓ [Of *which* president] have you met [a relative ___]?

Under the Cable Q-theory, these different options for pied-piping correspond to different positions that the Q-particle can adjoin to. (Note that the entire DPs "a book…" or "a relative…" in (6–7) are also possible pied-piping constituents.) (8–9) show possible attachment sites for the Q-particle for DPs as in examples (6–7).

(8)   (✓Q) D book (*Q) from (✓Q) *which* library
       ⇒ pied-piping options: ✓[D book from *which* l.], *[from *which* l.], ✓[*which* l.]
(9)   (✓Q) D relative (✓Q) of (✓Q) *which* president
       ⇒ pied-piping options: ✓[D relative of *which* p.], ✓[of *which* p.], ✓[*which* p.]

As the intervention effects observed in (4) occur when an intervener intervenes between a *wh*-word and its associated Q (schema in 3), the only possible position of Q in (4) must be on the largest possible pied-piping constituent, illustrated in (4').

(4')   * *Who*'s read [Q **no**/**few** book(s) from *which* library]?   **Intervention!**

If we modify (4) so that the in-situ *wh*-word is within a PP-complement (instead of a PP-adjunct), however, the multiple question with the intervener becomes grammatical (10).

(10)   ✓ *Who*'s met **no**/**few** relative(s) [Q of *which* president]?

This is because the Q can adjoin to the PP-complement [of *which* president], but not to the PP-adjunct [from *which* library] (8–9). As the intervener is entirely outside of the QP in (10), it does not trigger intervention. Thus the pattern of intervention effects in (4, 10) correlates with the options for pied-piping as determined through overt movement in (6–7).

Cable's theory predicts that Q may alternatively attach to the constituents [*which* library] or [*which* president] (8–9), as is possible in overt movement. However, if this were a possible option in covert movement, we would predict that the structure in (4'') is available, yielding no intervention effect in (4). Note that such movement of small QPs would leave a stranded preposition at LF. We argue that this effect is the emergence of the cross-linguistic constraint against preposition-stranding which is exceptionally violated in English overt movement.

(4'') * *Who*'s read **no**/**few** book(s) from [Q *which* l.]?   **Impossible LF: violates P-stranding**

Applications to in-situ focus: We extend these findings to focus constructions. Overt focus-movement, in the form of it-clefts in English, also triggers pied-piping. We observe intervention effects within these cleft pivots as well (11).

(11)   It's [✓a/✓the/✓some/***no**/***few** book(s) from [THAT]$_F$ library] that I've read ___.

Krifka (2006) argues that in-situ focus also involves covert movement with pied-piping. We thus predict intervention effects with the same sensitivity to complement/adjunct PPs observed in *wh*-in-situ. This prediction is borne out.

(12)   I've only$_i$ read [Q ✓a/✓the/✓some/***no**/***few** book(s) from [THIS]$_{F,i}$ library].
(13)   ✓ I've only$_i$ met **no** relatives [Q of [PRESIDENT OBAMA]$_{F,i}$].

This evidence thus further supports the covert movement analysis of focus interpretation, using the same syntactic mechanisms for pied-piping as in overt and covert *wh*-movement.

Selected references: Beck (2006). Intervention effects follow from focus interpretation. *NLS*. **Cable** (2010). *The Grammar of Q: Q-particles, wh-movement, and pied-piping*. **Horvath** (2000). Interfaces vs. the computational system in the syntax of focus. In *Interface strategies*. **Krifka** (2006). Association with focus phrases. In *The Architecture of Focus*. **Sauerland and Heck** (2003). LF-intervention effects in pied-piping. *NELS 33*.

[Of which city] did you witness the destruction ___.
[On which table] did you like [the books __].

Cable (2010) shows that intervention only occurs if the intervener is (a) inside the pied-piped constituent and c-commands the wh-word (%%%).

(1)   ✓[*Which* president] does Jim own [**no** pictures of ___]?
(2)   ✓[*Which* picture containing **no** presidents] does Jim own ___?