Movement and alternatives don't mix: A new look at wh-*intervention effects*

Hadas Kotek

Yale University

hadas.kotek@yale.edu

NELS 47

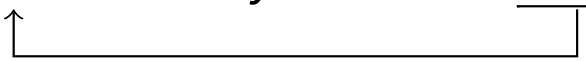
University of Massachusetts, Amherst

October 2016

Interpreting *wh*-in-situ

Wh-questions in English involve an **overt movement step**:

(1) *Who* did Mary introduce _____ to Sue?



In **multiple** *wh*-questions, only **one** *wh*-phrase moves overtly.

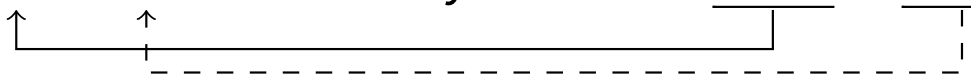
(2) *Who* did Mary introduce _____ to whom?

☞ **How are in-situ *wh*-phrases interpreted?**

Two approaches to *wh*-in-situ

The covert movement approach:
Wh-phrases **must move to C** by LF for interpretability (Karttunen, 1977, among others).

(3) LF: *Who whom* C did Mary introduce _____ to _____?



The in-situ approach:
Wh-phrases **are interpreted in their base-positions**, through focus-alternative computation (Hamblin, 1973; Rooth, 1985, 1992, a.o.).

(4) LF: *Who* C did Mary introduce _____ to *whom* ?

Wh-in-situ and intervention effects

☞ *Wh*-in-situ is sensitive to **intervention effects**.

(5) **Japanese: Intervention effects avoided through scrambling**

a. ✓ Hanako-ga [*nani-o*] yon-da-no?
Hanako-NOM what-ACC read-PAST-Q
'What did Hanako read?'

b. ?* **Dare-mo** [*nani-o*] yom-ana-katta-no?
no-one what-ACC read-NEG-PAST-Q

c. ✓ [*Nani-o*] **dare-mo** _____ yom-ana-katta-no?
what-ACC no-one read-NEG-PAST-Q
'What did no one read?' *data from Tomioka (2007)*

Wh-in-situ and intervention effects

Intervention effects affect regions of alternative computation but not (overt or covert) movement (Beck, 2006; Beck and Kim, 2006; Kotek, 2014a,b; Kotek and Erlewine, 2016)

(6) **The Beck (2006) intervention schema:**

a. * [$_{CP}$ C ... **intervener** ... *wh*]

b. ✓ [$_{CP}$ C ... *wh* **intervener** ... *t*]

Different theories of what interveners/intervention is about:

- **Focus** (Beck, 2006; Beck and Kim, 2006)
- **Quantification** (Beck, 1996; Mayr, 2014)
- **Topics** (Grohmann, 2006)
- **Prosody** (Tomioka, 2007)

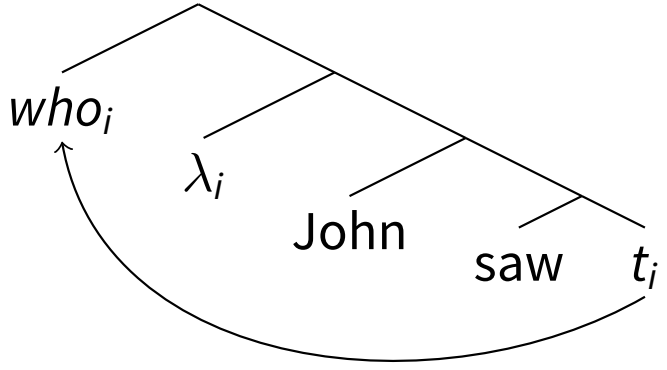
Proposal

(7) **The new intervention schema**

* C … λ … *wh*

Heim and Kratzer (1998): **a λ-binder is introduced below the landing site of movement**, abstracting over the trace.

(8) **Predicate Abstraction:**



Shan (2004, cf Rooth 1985, others): Predicate Abstraction is not well defined in region of alternative computation (in simple semantic models).

Movement can't target a region where focus alternatives are computed.

Proposal

(7) **The new intervention schema**

* C … λ … *wh*

☞ Predict **intervention in more places** than previously thought.

☞ Predict **more interveners** than previously thought.

Today: Both of these predictions are correct.

Roadmap

§1 **The state of the art**

§2 New patterns of intervention effects

§3 Superiority and intervention effects

§4 Some implications and conclusion

Background: intervention effects in English

Pesetsky (2000): **intervention correlates with superiority**

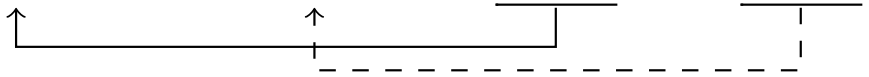
(9)	a.	*Which student* _____ read *which book*?	*obeying*
	b.	*Which book* did *which student* read _____?	*violating*
	c.	*Which student* **didn't** _____ read *which book*?	*obeying*
	d.	* *Which book* **didn't** *which student* read _____?	*violating*
		(cf *Which book* did *which student* **not** read _____?)	

Background: intervention effects in English

Syntax by Pesetsky (2000); **Semantics** by Beck (2006):

Superiority-obeying questions: *Wh*-in-situ covertly moves to C at LF.

(10) LF: *Which student which book* C _____ read _____ ?



Predict: no intervention

Superiority-violating questions:

Wh is truly LF-in-situ, interpreted via focus-alternatives computation.

(11) LF: *Which book* C did *which student* read _____ ?

Predict: intervention!

A note on judgments

Note: for many (perhaps all) speakers, intervention will be diagnosed by the loss of the pair-list reading of the question. A single-pair may survive.

(i) *Who* ate *what*?

a. Fred ate the beans. *single-pair*

b. Fred ate the beans, Mary ate the eggplant, and Sue ate the broccoli. *pair-list*

(This has been reported for superiority-violating questions in English and for German questions in footnotes in previous work (Beck, 2006; Pesetsky, 2000, cf also Beck 1996).)

Roadmap

§1 The state of the art

§2 **New patterns of intervention effects**

- Intervention with A-movement chains
- Intervention with traditional non-interveners

§3 Superiority and intervention effects

§4 Some implications and conclusion

The nature of interveners

The literature has several different ways of defining what interveners are (Beck, 1996, 2006; Grohmann, 2006; Tomioka, 2007; Haida, 2007; Mayr, 2014).

☞ Everyone agrees that **indefinites, bare plurals, existentials, and definite descriptions, do not act as interveners**.

However, they act as interveners if forced to take scope via movement.

A-movement and reconstruction

English subjects normally undergo A-movement from a *v*P-internal position to Spec,TP.

Q: Under the proposal I sketched here, why don't subjects always intervene?

A: Subjects are normally able to **reconstruct**, avoiding intervention.

Prediction: if reconstruction is blocked, we should observe intervention effects.

A-movement and reconstruction

Subjects of individual-level predicates must vacate *v*P (Diesing, 1992).
Hence, the subject can't reconstruct and we observe intervention:

(12) a. ✓ *Which* person are **counselors** available to discuss *which* issue with _____? *stage-level*

b. * *Which* person are **counselors** (λ) careful to discuss *which* issue with _____? *individual-level*

A-movement chains and binding

Reconstruction can also be prevented by **binding from the subject** into a pronoun or reflexive.

(13) Context: The lawyers seem to be likely to appeal different decisions to different courts.

a. ✓ *Which court* did **the lawyers** seem **to the reporters** to be likely to appeal *which decision* to _____?

a'. LF: *Which court* did __ seem **to the reporters** to be likely to **the lawyers** appeal *which decision* to _____?

b. * *Which court* did **the lawyers** (λ) seem **to each other** to be likely to appeal *which decision* to _____?

Summary

☞ **Intervention caused by traditional non-interveners...**

- Bare plurals
- Definite descriptions
- (Indefinites)
- (Existential quantifiers)

... when **reconstruction is blocked** or **movement is forced**.

☞ **Intervention happens whenever a λ-binder must be used in a region where focus-alternatives are also used.**

(14) **The new intervention schema**

* C ... λ ... *wh*

Roadmap

§1 The state of the art

§2 New patterns of intervention effects

§3 **Superiority and intervention effects**

- Intervention in superiority-obeying questions
- No intervention in superiority-violating questions

§4 Some implications and conclusion

Intervention effects in English

Recall: Superiority-obeying questions are not susceptible to intervention, but superiority-violating questions are.

☞ **Correlation can be broken in both directions**, in a way consistent with idea that **what matters is regions of alternative computation**.

Intervention in superiority-obeying questions

Intervention is avoided in superiority-obeying questions because *wh*-in-situ can covertly move above interveners.

Prediction: If covert movement is restricted, intervention happens when intervener occurs **above highest possible landing site of movement**.

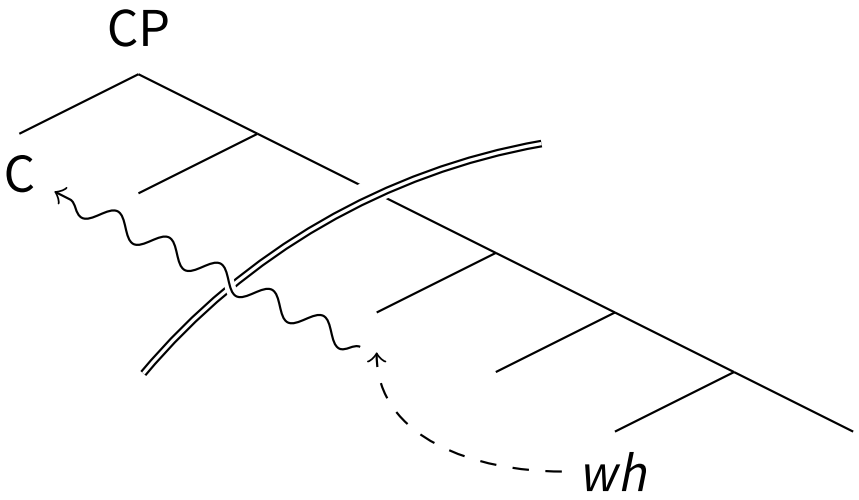
- *Wh* can move up to the barrier

☞ No intervention in region where movement happens

- *Wh* cannot move past barrier

☞ Intervention happens above the barrier, where focus alternatives must be used.

(15)



Intervention in superiority-obeying questions

Using binding to restrict covert movement: bindee cannot move out of the scope of a binder.

(16) **Baselines, with binder underlined:**

a. *Which daughter* showed Trump *which picture of herself*?

b. *Which daughter* showed Trump *which picture of himself*?

Adding an intervener:

(17) **Baselines, with binder underlined:**

a. ? *Which daughter* showed **only** Trump *which picture of herself*?

b. * *Which daughter* showed **only** Trump *which picture of himself*?

Intervention in superiority-obeying questions

Other ways to restrict covert *wh*-movement:

- focus association,
- NPI licensing,
- islands

☞ We observe intervention in superiority-obeying questions if we restrict covert *wh*-movement and force in-situ interpretation instead.

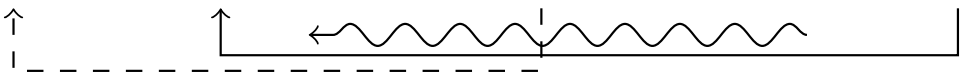
No intervention in superiority-violating questions

Recall the second half of the Pesetsky correlation: intervention happens in violating questions because *wh* is truly LF-in-situ.

Three ways of avoiding intervention in superiority-violating questions:

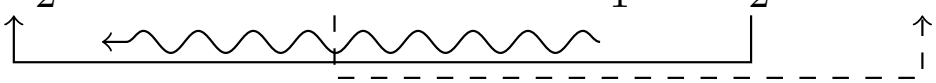
- Scope the intervener out of the question (Beck, 1996; Pesetsky, 2000):

(18) ✓ intervener wh_2 C ... **intervener** ... wh_1 ... t_2



- Reconstruct the intervener below *wh*-in-situ:

(19) ✓ wh_2 C ... **intervener** ... wh_1 ... t_2 intervener



- Give *wh* wide scope above the intervener through non-interrogative movement.

No intervention if *wh* scopes above intervener

Right-Node Raising can feed exceptional wide scope of a *wh* that is otherwise unavailable in questions (Bachrach and Katzir, 2009, a.o.):

(20) a. * *Which book* did John meet the man who wrote _____ ?

b. ✓ *Which book* did [John meet the man who wrote], and [Mary meet the man who published] _____?

No intervention when *wh* scopes above intervener

This exceptional wide scope in RNR is also able to escape intervention effects in superiority-violating questions:

(21) a. * *Which book* did **only Mary** allow *which student* to read _____?

b. ✓ *Which book* did [**only Mary** allow], and [**only Sue** prohibit], *which student* to read _____?

(See also Branan, ms.: data from extraposition, parasitic gap licensing)

Summary

☞ **No correlation between superiority and intervention.**
Instead, intervention correlates with movement possibilities for intervener and *wh*.

However, **the general intervention schema still applies:**

(22) **The intervention schema**

* C … λ … *wh*

☞ **Intervention happens in regions where focus-alternatives are computed** (Beck, 2006; Kotek, 2014a,b; Kotek and Erlewine, 2016), when it includes a **λ**-binder.

Roadmap

§1 The state of the art

§2 New patterns of intervention effects

§3 Superiority and intervention effects

§4 **Some implications and conclusion**

Modals

Modals are not interveners:

All known interveners, as well as the new ones shown here, quantify over individuals. Quantification over worlds does not lead to intervention.

(23) a. ✓ *Which abstract* **should** Mary assign _____ to *which reviewer*?

b. ✓ *Which reviewer* **should** Mary assign *which abstract* to _____?

(24) a. ✓ *Which paper* did Mary **have to** read _____ for *which class*?

b. ✓ *Which class* did Mary **have to** read *which paper* for _____?

(25) a. ✓ *Which abstract* were you **forced** to assign _____ to *which reviewer*?

b. ✓ *Which reviewer* were you **forced** to assign *which abstract* to _____?

Modals

Modals are not interveners:

(26) a. ✓ *Which paper* was it **necessary** for you to assign _____ to *which reviewer*?

b. ✓ *Which reviewer* was it **necessary** for you to assign *which paper* to _____?

(27) a. ✓ *Which paper* **may** Mary read _____ for *which class*?

b. ✓ *Which class* **may** Mary read *which paper* for _____?

(28) a. ✓ *Which paper* **must** Mary read _____ for *which class*?

b. ✓ *Which class* **must** Mary read *which paper* for _____?

☞ **Modality must be represented without the use of lambda binders,** e.g. though indices.

Successive cyclic movement

Notice that under this approach, intermediate landing sites of movement behave differently than the target position of movement.

☞ **Intermediate landing sites do not "count" for intervention.**

(29) *Which book* λ C did Mary think that [$_{CP}$ *t* (λ) *which kid* read *t*]?

LF: ✓ *Which book* **λ** C did Mary think that [$_{CP}$ *which kid* read ***t***]?

Conclusion

- **The intervention generalization**: Movement cannot target a region where focus alternatives are computed

(30) **The intervention schema**

* C ... λ ... *wh*

- **A logical consequence of standard assumptions about structure building, interpretation**:
  - Movement as in e.g. Heim and Kratzer (1998)
  - Focus alternatives computation (Rooth, 1985, 1992)
  - Intensional semantics with simple types

  λ-abstraction not well-defined when computed over alternatives.
- **Previous responses to this problem:**
  - Shan (2004): Adopt a **variable-free semantics** without movement
  - Rooth (1985); Poesio (1996); Novel and Romero (2009): Use a **higher-typed 'superintensional' semantic system**

Conclusion

- **Today: Empirical evidence for the new intervention generalization**
- **Support for standard assumptions** (syntactic movement interpreted using λ-abstraction, focus alternatives, simple semantic types)
  - *Wh*-in-situ requires both covert movement and focus alternatives for its interpretation
  - … but abstraction and alternative computation cannot overlap

Thank you!

Thank you! Questions?

I would like to thank Martin Hackl, David Pesetsky, Danny Fox, Irene Heim, Michael Yoshitaka Erlewine, Bob Frank, audiences at GLOW 2015, the SIAS summer institute, MIT, McGill and Yale Universities, NSF Dissertation Improvement Grant #1251717, and the Mellon Foundation. All errors are mine.

References I

Bachrach, Asaf, and Roni Katzir. 2009. Right-node raising and delayed spellout. In *Interphases: Phase-theoretic investigations of linguistic interfaces*, ed. Kleanthes K. Grohmann. Oxford University Press.

Beck, Sigrid. 1996. Quantified structures as barriers for LF movement. *Natural Language Semantics* 4:1–56.

Beck, Sigrid. 2006. Intervention effects follow from focus interpretation. *Natural Language Semantics* 14:1–56.

Beck, Sigrid, and Shin-Sook Kim. 2006. Intervention effects in alternative questions. *Journal of Comparative German Linguistics* 9:165–208.

Cheng, Lisa Lai-Shen, and Hamida Demirdache. 2010. Trapped at the edge: On long-distance pair-list readings. *Lingua* 120:463–480.

Diesing, Molly. 1992. *Indefinites*. Cambridge, Mass.: MIT Press.

Drubig, Hans Bernhard. 1994. Island constraints and the syntactic nature of focus and association with focus. *Arbeitspapiere des Sonderforschungsbereichs 340: Sprachtheoretische Grundlagen der Computerlinguistik* 51.

References II

Erlewine, Michael Yoshitaka, and Hadas Kotek. 2014. Intervention in focus pied-piping. In *Proceedings of NELS 43*, ed. Hsin-Lun Huang, Ethan Poole, and Amanda Rysling, volume 1, 117–130. Amherst: GLSA.

Grohmann, Kleanthes K. 2006. Top issues in questions: Topics—topicalization—topicalizability. In *Wh-movement: Moving on*, ed. Lisa Lai-Shen Cheng and Norbert Corver. MIT Press.

Haida, Andreas. 2007. The indefiniteness and focusing of *wh*-words. Doctoral Dissertation, Humboldt University Berlin.

Hamblin, Charles. 1973. Questions in Montague English. *Foundations of Language* 10:41–53.

Heim, Irene, and Angelika Kratzer. 1998. *Semantics in generative grammar*. Blackwell.

Karttunen, Lauri. 1977. Syntax and semantics of questions. *Linguistics and Philosophy* 1:3–44.

Kennedy, Christopher. 1994. Argument contained ellipsis. Linguistics Research Center Report LRC-94-03, University of California, Santa Cruz.

References III

Kennedy, Christopher. 2004. Argument contained ellipsis revisited. Manuscript.

Kotek, Hadas. 2014a. Composing questions. Doctoral Dissertation, Massachusetts Institute of Technology.

Kotek, Hadas. 2014b. Intervention out of islands. In *Proceedings of NELS 44*, ed. Leland Kusmer and Jyoti Iyer, volume 1, 234—246. Amherst: GLSA.

Kotek, Hadas, and Michael Yoshitaka Erlewine. 2016. Covert pied-piping in English multiple *wh*-questions. *Linguistic Inquiry* 47.

Krifka, Manfred. 2006. Association with focus phrases. In *The architecture of focus*, 105–136. Mouton de Gruyter.

Mayr, Clemens. 2014. Intervention effects and additivity. *Journal of Semantics* 31:513–554.

Nissenbaum, Jon. 2000. Investigations of covert phrase movement. Doctoral Dissertation, Massachusetts Institute of Technology.

Novel, Marc, and Maribel Romero. 2009. Movement, variables, and Hamblin alternatives. In *Proceedings of Sinn und Bedeutung 14*.

Pesetsky, David. 2000. *Phrasal movement and its kin*. Cambridge, Mass.: MIT Press.

References IV

Poesio, Massimo. 1996. Semantic ambiguity and perceived ambiguity. In *Semantic ambiguity and underspecification*, ed. Kees van Deemter and Stanley Peters, chapter 8, 159–201. CSLI Publications.

Rooth, Mats. 1985. Association with focus. Doctoral Dissertation, University of Massachusetts, Amherst.

Rooth, Mats. 1992. A theory of focus interpretation. *Natural Language Semantics* 1:75–116.

Ross, John Robert. 1967. Constraints on variables in syntax. Doctoral Dissertation, Massachusetts Institute of Technology.

Shan, Chung-chieh. 2004. Binding alongside Hamblin alternatives calls for variable-free semantics. In *Proceedings of SALT 16*.

Tomioka, Satoshi. 2007. Pragmatics of LF intervention effects: Japanese and Korean interrogatives. *Journal of Pragmatics* 39:1570–1590.

Wagner, Michael. 2006. Association by movement: evidence from NPI-licensing. *Natural Language Semantics* 14:297–324.

Williams, Edwin. 1974. Rule ordering in grammar. Doctoral Dissertation, Massachusetts Institute of Technology.

The problem with lambda-abstraction

Adding Roothian alternatives to a Heim and Kratzer (1998) system:

(31) **A recursive definition for computing focus-semantic values:**

Terminal nodes (TN):

$$[\![\alpha_\tau]\!]^f = \begin{cases} \{[\![\alpha_\tau]\!]^o\} & \text{if } \alpha \text{ not F-marked} \\ \text{a subset of } D_\tau & \text{if } \alpha \text{ F-marked} \end{cases}$$

Pronouns and traces rule:

$$[\![\alpha_i]\!]^f = \begin{cases} g(i) & \text{if } \alpha \text{ not F-marked} \\ \{[\![\alpha_i]\!]^o\} & \text{if } \alpha \text{ F-marked} \end{cases}$$

Functional application (FA):

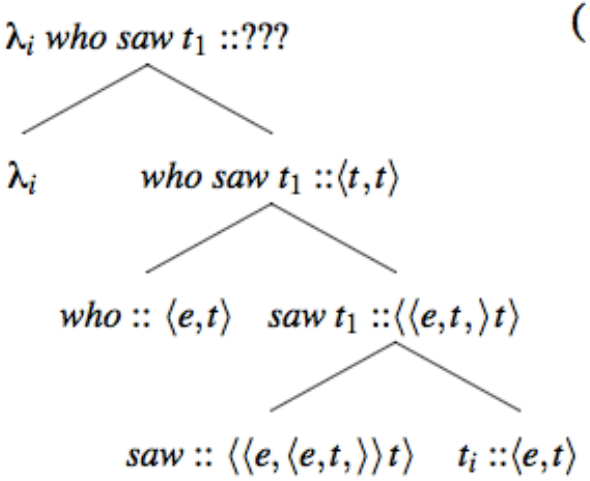
$$\left[\!\!\left[\begin{array}{c} \alpha_\tau \\ \diagup \quad \diagdown \\ \beta_{\langle\sigma,\tau\rangle} \quad \gamma_\sigma \end{array} \right]\!\!\right]^f =$$

$$\begin{cases} \{b(g) \mid b \in [\![\beta]\!]^f, g \in [\![\gamma]\!]^f\} & \text{if } \alpha \text{ not F-marked} \\ \text{a contextually-determined subset of } D_\tau & \text{if } \alpha \text{ F-marked} \end{cases}$$

The problem with lambda-abstraction

(from Novel and Romero (2009))

(18)



(19) a. $[\![t_i]\!]^{M,g} = \{g(i)\}$

b. $[\![saw]\!]^{M,g} = \{\lambda x.\lambda y.y \text{ saw } x\}$

c. $[\![saw\ t_i]\!]^{M,g} = \{\lambda y.y \text{ saw g(i)}\}$

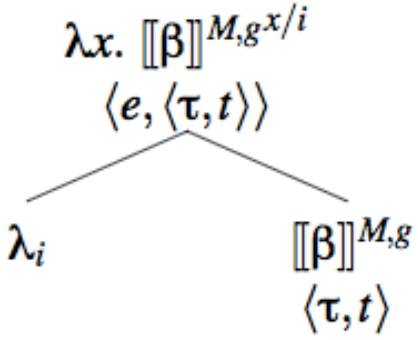
d. $[\![who]\!]^{M,g} = \{\text{Alice, Barbara, Caroll}\}$

e. $[\![who\ saw\ t_i]\!]^{M,g} =$
$\{\text{Alice saw } g(i), \text{Barbara saw } g(i), \text{Caroll saw } g(i)\}$

f. $[\![\lambda_i\ who\ saw\ t_i]\!]^{M,g} = ???$

The problem with lambda-abstraction

(20) The First Try: A Naive PA-Rule



We end up with a function into sets, type $\langle e, \langle \tau, t \rangle \rangle$. But a quantifier like *nobody* wants to compose with something of type $\langle \langle e, \tau \rangle, t \rangle$. We have a type-mismatch:

(21) $\lambda x.\ \{\text{Alice saw } g^{x/i}(i),\ \text{Barbara saw } g^{x/i}(i),\ \text{Caroll saw } g^{x/i}(i)\}$

(22) $[\![nobody]\!]^{M,g} = \{\lambda Q_{\langle e,t \rangle}.\neg\exists x[Q(x)]\}$

(23) $\{\lambda x.\ \text{Alice saw } g^{x/i}(i),\ \lambda x.\ \text{Barbara saw } g^{x/i}(i),\ \lambda x.\ \text{Caroll saw } g^{x/i}(i)\}$

The problem with lambda-abstraction

We can transpose our function into sets into a set of functions, as in (24). However, this over-generates. We now can have non-uniform functions in our set, contrary to fact.

(24) $\lambda Q_{\langle e,\langle \tau,t\rangle\rangle} \cdot \{ f_{\langle e,\tau\rangle} : \forall x_e . f(x) \in Q(x) \}$

(25) Uniform properties:

$$\left\{ \begin{bmatrix} x_1 \mapsto \text{Alice saw } x_1 \\ x_2 \mapsto \text{Alice saw } x_2 \\ x_3 \mapsto \text{Alice saw } x_3 \end{bmatrix} \begin{bmatrix} x_1 \mapsto \text{Barbara saw } x_1 \\ x_2 \mapsto \text{Barbara saw } x_2 \\ x_3 \mapsto \text{Barbara saw } x_3 \end{bmatrix} \begin{bmatrix} x_1 \mapsto \text{Caroll saw } x_1 \\ x_2 \mapsto \text{Caroll saw } x_2 \\ x_3 \mapsto \text{Caroll saw } x_3 \end{bmatrix} \right\}$$

(26) Non-uniform properties:

$$\left\{ \begin{bmatrix} x_1 \mapsto \text{Alice saw } x_1 \\ x_2 \mapsto \text{Caroll saw } x_2 \\ x_3 \mapsto \text{Barbara saw } x_3 \end{bmatrix} \begin{bmatrix} x_1 \mapsto \text{Alice saw } x_1 \\ x_2 \mapsto \text{Barbara saw } x_2 \\ x_3 \mapsto \text{Caroll saw } x_3 \end{bmatrix} \begin{bmatrix} x_1 \mapsto \text{Caroll saw } x_1 \\ x_2 \mapsto \text{Barbara saw } x_2 \\ x_3 \mapsto \text{Alice saw } x_3 \end{bmatrix} \right\}$$

Open questions

☞ **Why does adverb *only* intervene?**

- Association with focus possible without movement (Rooth, 1985, a.o.)
- Explained if there is covert focus movement (Drubig, 1994; Krifka, 2006; Wagner, 2006; Erlewine and Kotek, 2014)
- Or if Beck (2006) is correct for at least some cases of intervention

☞ **Why does sentential negation intervene?**

- Perhaps sentential negation moves and introduces a λ-binder
- Intervention via head-movement?
- Or we may need the Beck (2006) story again

Successive cyclic movement

Prediction: if there is no λ-binders in intermediate landing sites of movement, parasitic gaps should not be licensed (Nissenbaum, 2000).

(32) **baselines:**

a. ✓ *Which apple enthusiast* bought *which watch* [before *pg* talking to his wife]?

b. ✓ *Which apple enthusiast* bought *which watch* [before actually *pg* trying on *pg*]?

c. * *Which apple enthusiast* bought *which watch* [before the newspaper reviewed *pg*]?

(33) **Test cases:**

a. * *Which watch* did *which apple enthusiast* buy [before the newspaper reviewed *pg*]?

b. * *Which watch* does the log say that *which customer* bought [before the newspaper reviewed *pg*]?

Turning non-interveners into interveners

Argument contained ellipsis (ACE) (Kennedy, 1994, 2004) requires movement for its interpretation.

(34) a. The woman who said she would △ bought the tuna.

b. The woman who said she would ~~buy the tuna~~

[*t* did buy the tuna].

NB: Definite descriptions like *the woman* can otherwise be interpreted without movement.

Non-interveners and Argument Contained Ellipsis

(35) **Baselines (*obeying* and *violating*):**

a. ✓ *Which boy* did you tell **someone** to introduce _____ to *which girl*?

b. ✓ *Which girl* did you tell **someone** to introduce *which boy* to _____?

(36) **More elaborate baselines:**

a. ✓ *Which boy* did you tell [**someone** who (really) shouldn't be here] to introduce _____ to *which girl*?

b. ✓ *Which girl* did you tell [**someone** who (really) shouldn't be here] to introduce *which boy* to _____?

(37) **ACE test case:**

a. ✓ *Which boy* did you tell [**someone** who (really) shouldn't △] to introduce _____ to *which girl*?

b. * *Which girl* did you tell [**someone** who (really) shouldn't △] to introduce *which boy* to _____?

Non-interveners and Argument Contained Ellipsis

(38) **This happens with other traditional non-interveners as well:**

a. ✓ *Which boy* did you tell [**{the, a, some} man** who (really) shouldn't be here] to introduce _____ to *which girl*?

b. ✓ *Which girl* did you tell [**{the, a, some} man** who (really) shouldn't be here] to introduce *which boy* to _____?

(39) a. ✓ *Which boy* did you tell [**{the, a, some} man** who (really) shouldn't △] to introduce _____ to *which girl*?

b. * *Which girl* did you tell [**{the, a, some} man** who (really) shouldn't △] to introduce *which boy* to _____?

☞ **ACE forces covert movement of an otherwise in-situ element.**

As a result, we observe intervention effects in superiority-violating Qs.

No intervention if intervener scopes out of the question

(40) *Which newspaper* did **everyone** write to _____ about *which book*?

a. Wide-scope answering pattern:
Bill wrote to the New York Times about book X,
Mary wrote to the Boston Globe about book Y, and
Tom wrote to the Maquoketa Sentinel about book Z.

b. Narrow-scope answering pattern:
Everyone wrote to the New York Times about book X,
everyone wrote to the Boston Globe about book Y, and
everyone wrote to the Maquoketa Sentinel about book Z.

(41) *Which book* did **everyone** write to *which newspaper* about _____?
Only has answer pattern a, but not b. (Pesetsky, 2000)

☞ *Every* must **scope out of the question** in superiority-violating questions, to avoid intervention.

Wh-in-situ and intervention effects in German

Intervention avoided by scoping out the intervener: German

(42) **Intervention above *wh*-in-situ, rescued by covert movement**

Wen hat **jeder Junge** *wann* beobachtet?
who has every boy when observed

Only one reading attested:

a. ‘For every boy, who did he observe when?’ ∀ > *who*

b. * ‘Who is such that every boy observed him when?’ *who* > ∀

Intervention in superiority-obeying questions

NPIs are licensed in downward entailing contexts:

(43) a. Mary *(**didn't**) read any books.

b. *Which* boy {**didn't** give, *gave} *which* girl any flowers?

Prediction: NPI inside a *wh*-phrase can't move out of the scope of negation. Negation is an intervener. **Expect intervention effects.**

(44) a. ✓ *Which* boy **didn't** read *which* book about some president?

b. * *Which* boy **didn't** read *which* book about any president?

Movement and intervention effects: Focus association

A focused item cannot move out of the scope of its associated operator:

(45) a. * Mary$_F$, John **only** likes _____.
Intended: 'As for Mary, John only likes her$_F$ (he doesn't like anyone else).'

b. ✓ John **only** likes Mary$_F$.

(46) a. * *Who*$_F$ do you **only** like _____?
Intended: Who *x* is such that you like only *x*?

b. ✓ You **only** like *who*$_F$?

Movement and intervention effects: Focus association

Prediction: Focus inside a *wh*-phrase can't move out of the scope of ***only***. ***Only*** is an intervener. **Expect intervention effects.**

(47) a. Baseline: I can tell you [*which* student read *which* book].

b. Context: The students in the class were supposed to read one book *and* one article about syntax. However, everyone got confused and read one book *or* one article. I've been reading everyone's squibs. I've finished all the ones about books, so:

* I can tell you [*which* student **only** read *which* book$_F$ (about syntax)].

Multiple questions with islands

Baseline: Multiple *wh*-questions with islands are grammatical.

(48) Context: The linguists at the conference are very picky about attending the conference dinner. However, each of them adores one philosopher and will certainly attend the dinner if that philosopher is invited. What I want to know is:

Q: *Which* linguist will come [if we invite *which* philosopher]?

A: ✓ Pair-list answer:
Chomsky will come if we invite Quine,
Kayne will come if we invite Lewis,
Labov will come if we invite Russell, ...

(based on Cheng and Demirdache 2010, citing Tancredi (p.c.))

Multiple questions with islands

Add interveners: here, ***only***.

(49) Context: The linguists at the conference are looking forward to the conference dinner. However, each of them dislikes all but one philosopher and will attend the dinner just in case that philosopher alone is invited. What I want to know is:

Q: *Which* linguist will come [if we **only** invite *which* philosopher]?

A: ✓ Pair-list answer:
Chomsky will come if we only invite Quine,
Kayne will come if we only invite Lewis,
Labov will come if we only invite Russell, ...

☞ Intervener **inside** the island is **grammatical**.

Multiple questions with islands

Add interveners: here, ***only***.

(50) Context: The linguists at the conference don't really want to attend the conference dinner. However, each of them adores one philosopher and has said that they will come just in case that philosopher is invited. What I want to know is:

Q: *Which* linguist will **only** come [if we invite *which* philosopher]?

A: * Pair-list answer:
Chomsky will only come if we invite Quine,
Kayne will only come if we invite Lewis,
Labov will only come if we invite Russell, ...

☞ Intervener **above** the island causes an **intervention effect**.

Intervention with CNPC

Movement is sensitive to **syntactic islands** (Ross, 1967).

Prediction: No intervention inside the island, as the *wh* can move around the intervener, but **intervention predicted outside of the island**.

Baseline: Multiple *wh*-questions with islands are grammatical.

(51) Context: The linguists at the conference are very suspicious of rumors. However, each of them believed the rumor that we invited one philosopher to the conference party. What I want to know is:

Q: *Which* ling. believed the rumor [that we invited *which* phil.]?

A: ✓ Pair-list answer:
Chomsky believed the rumor that we invited Quine,
Kayne believed the rumor that we invited Lewis,
Labov believed the rumor that we invited Russell, ...

Intervention with CNPC

Add interveners: here, sentential negation.

(52) Context: The linguists at the conference are very suspicious of rumors. However, each of them believed the rumor that we failed to invite one philosopher to the conference party. What I want to know is:

Q: *Which* ling. believed the rumor [that we **didn't** invite *which* phil.]?

A: ✓ Pair-list answer:
Chomsky believed the rumor that we didn't invite Quine,
Kayne believed the rumor that we didn't invite Lewis,
Labov believed the rumor that we didn't invite Russell, ...

☞ Intervener **inside** the island is **grammatical**.

Intervention with CNPC

Add interveners: here, sentential negation.

(53) Context: The linguists at the conference are very gullible and believe lots of rumors. However, each of them is suspicious of one rumor about a phil. that we supposedly invited to the conference party. What I want to know:

Q: *Which* ling. **didn't** believe the rumor [that we invited *which* phil.]?

A: * Pair-list answer:
Chomsky didn't believe the rumor that we invited Quine,
Kayne didn't believe the rumor that we invited Lewis,
Labov didn't believe the rumor that we invited Russell, ...

☞ Intervener **above** the island causes an **intervention effect**.

Intervention is about in-situ computation

(54) **Williams' generalization (Williams, 1974, ch. 4):**
When an adjunct β is extraposed from a "source NP" α, the scope of α is at least as high as the attachment site of β (the extraposition site).

(Informally: extraposition extends the scope of α at least as high as β)

Intervention is about in-situ computation

Prediction: No intervention effect if we are able to extrapose the island high, above the intervener.

(55) **Extraposition allows exceptional wide scope for in-situ *wh*:**

a. ✓ *Which* linguist believed the rumor [that we **didn't** invite *which* philosopher]?

b. * *Which* linguist **didn't** believe the rumor [that we invited *which* philosopher]?

c. ? *Which* linguist **didn't** believe the rumor yesterday [that we invited *which* philosopher]?

Intervention with non-bridge verbs

(56) **Non-bridge verbs are also an island for extraction:**

a. * *Which* linguist **didn't** shout [that we invited *which* phil.]?

b. *Which* linguist shouted [that we **didn't** invite *which* phil.]?

Intervention with three *whs*

(57) **Questions w/three *wh* exhibit intervention *above* but not *inside* island:**

a. * *Which* linguist **didn't** believe the rumor [that *which* student invited *which* philosopher]?

b. *Which* ling. believed the rumor [that *which* student **didn't** invite *which* philosopher]?

Intervention with three *whs*

If two *wh*-phrases occur outside the island with the intervener and one is inside the island, we get a pair-list reading with a third triplet held constant:

(58) **Questions with three *wh*: pair-list reading for *whs* above island**
Which linguist **didn't** tell *which* philosopher about the rumor [that *which* student had won a dissertation prize]?

Intervener inside island causes intervention in German

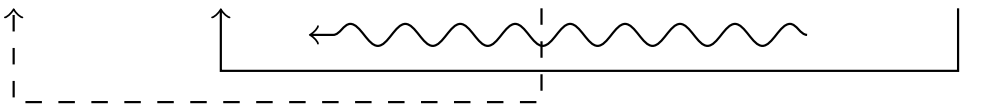
(59) ✓ *Welcher* Philosoph wird sich aergern wenn wir *welchen*
which philosopher will self be upset if we which
Linguisten einladen?
linguist invite
'Which philosopher will be offended if we invite which linguist?'

(60) * *Welcher* Philosoph wird sich aergern wenn **niemand** *welchen*
which philosopher will self be upset if no one which
Linguisten einlaedt?
linguist invite
'Which philosopher will be offended if no one invites which linguist?'

No intervention if intervener scopes out of question

Prediction: Intervention can be avoided if the intervener is able to scope out of the question, so that it is no longer in the way.

(61) ✓ **intervener** wh_2 C ... intervener ... wh_1 ... t_2



☞ This is a property of universal quantifiers.

No intervention if intervener scopes out of question

(62) Tell me *which book* **each kid** will try to persuade *which adult* to read _____. (Pesetsky, 2000)

Only one reading attested:

a. ‘For each kid, which adult will she try to persuade to read which book?’ ∀ > *book-adult pairs*

b. * ‘What book-adult pairs are s.t. each kid will try to persuade the adult to read the book?’ *book-adult pairs* > ∀

☞ **Floating the quantifier fixes its scope**, preventing it from moving out of the way of the in-situ *wh*, leading to intervention.

(63) * Tell me *which book* the kids will **each** λ try to persuade *which adult* to read _____. (Pesetsky, 2000)

No intervention if intervener reconstructs below *wh*

Prediction: Intervention can be avoided if the intervener is able toreconstruct below the in-situ *wh*.

(64) Context: The first-year students took several classes this past semester, taught by different professors. Each professor thought that the students particularly enjoyed one topic that she taught. Tell me,

✓ *Which topic* did it seem to *which professor* that **all** of the students enjoyed _____? *baseline*

✓ *Which topic* did **all** of the students seem to *which professor* to have enjoyed _____? *reconstructed reading possible*

* *Which topic* did the students **all** (λ) seem to *which professor* to have enjoyed _____? *reconstructed reading blocked*

✓ *Which topic* did the students seem to *which professor* to have **all** enjoyed _____? *reconstructed reading possible*

Wh-in-situ and intervention effects in German

(??) **German: intervention above *wh*-in-situ, rescued by scrambling**

a. ✓ *Wer* hat Luise [*wo*] angetroffen?
who has Luise where met
'Who met Luise where'?

b. ?? *Wer* hat **niemanden** [*wo*] angetroffen?
who has no-one where met

c. ✓ *Wer* hat [*wo*] **niemanden** _____ angetroffen?
scrambling
who has where no-one met
'Who met no one where'? *data from Beck (1996)*