Ellipsis Licensing in Sluicing: A QuD Account

Matthew Barros and Hadas Kotek

Yale University

{matthew.barros, hadas.kotek}@yale.edu

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Sluicing

Sluicing: clausal ellipsis in a Wh-question, leaving the Wh-phrase overt.

(1) Sally called someone, but I don't know who.

Some terminology:

- *Remnant*: any Wh-phrase left overt in sluicing.
- *Correlate*: (typically) an indefinite corresponding to the remnant.
- *Antecedent, sluice*.

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Multiple sluicing

Multiple sluicing: sluicing with more than one remnant.

(2) Some boy likes some girl, but I don't know which boy which girl.

(3) Some boy danced with some girl, BIDK which boy with which girl.

- Seen as degraded, but "real phenomenon" in English (Lasnik, 2014)
- In our own investigation, we find:
  - Many find (2)–(3) unimpeachable, others wholly reject them.
  - Variation in acceptance of $\langle DP, DP \rangle$ sluices (2) vs. $\langle DP, PP \rangle$ sluices (3).
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Multiple sluicing with quantified antecedents:

(4) a. Every boy likes some girl, BIDK which boy which girl.

b. * Some boy likes every girl, BIDK which boy which girl.

The puzzle:

- How can quantified antecedents license sluicing?
- What are the restrictions on sluicing with quantified antecedents, and what do they teach us about ellipsis licensing more generally?

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Roadmap

§1 Challenges to syntactic identity

§2 Proposal: a QuD account

§3 Implicature calculation and QuDs

§4 Conclusion

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§1 **Challenges to syntactic identity**

- Multiple sluicing in Russian
- Syntactic identity and “Super-QR”

§2 Proposal: a QuD account

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Multiple sluicing in Russian

Perhaps unsurprisingly (as a multiple *wh*-fronting language),
Russian allows multiple sluicing:

(5) a. Kto-to kogo-to videl, no ja ne znaju, kto kogo.
someone someone saw but I not know who whom
'Someone saw someone, but I don't know who whom.'
(Bailyn, 2012)

b. Každyj priglasil kogo-to na tanec, no ja ne pomnju,
everyone invited someone to dance but I not remember
kto kogo.
who whom
'Everyone invited someone to dance, but I don't remember
who invited whom to dance.' (Grebenyova, 2009)

Judgments appear much more robust than in English (Stjepanović 2003; Grebenyova 2009; Bailyn 2012; Scott 2012; Antonyuk 2015).

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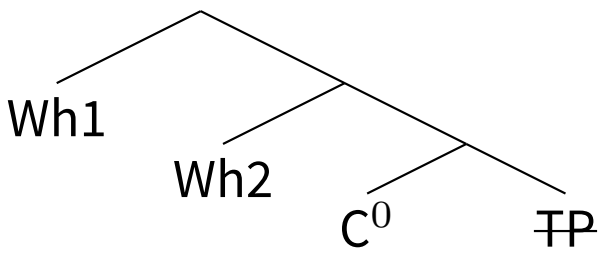
For concreteness, we'll assume a tucking-in (Richards, 1997) derivation, though what we say would be compatible with a (Rizzi, 1997) style articulated left periphery:

(6) **Tucking-in (left) and articulated (right) left peripheries:**

a.



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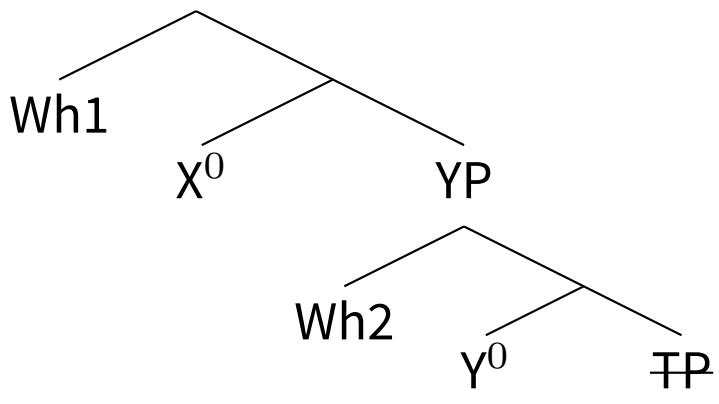

Multiple sluicing in Russian

A **superiority effect** in Russian Sluicing: Correlates must match remnants

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everyone invited someone to dance, but I not remember
kto$_1$ kogo$_2$.
who whom

b. * …no ja ne pomnju kogo$_2$ kto$_1$.
…but I not remember whom who
'Everyone invited someone to a dance, but I don't remember {who whom/ *whom who}.'

c. A: Každogo$_i$ kto-to priglasil t_i na tanec.
Everyone$_{ACC}$ someone$_{NOM}$ invited to dance

B: {Kogo kto?/*Kto kogo}
{whom who?/*who whom}

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Syntactic Identity

Grebenyova adopts the LF identity analysis in Fox and Lasnik (2003):

- Structural parallelism between elliptical clause and antecedent.
- Variables contained in elliptical clause and antecedent are bound from parallel positions.

(8) **LFs for unscrambled antecedent and superiority obeying sluice:**

a. $\forall x \exists y[\ x$ invited y to dance $]$ antecedent in (7a,b)

b. who$_x$ whom$_y$[x invited y to dance] (Wh1 $>$ Wh2) sluice in (7a)

(9) **LFs for scrambled antecedent and superiority violating sluice:**

a. $\forall y \exists x[\ x$ invited y to dance $]$ antecedent in (7c)

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Syntactic Identity

Seemingly good result:

- ✓ Unacceptability of superiority mismatches between remnants and correlates (7a vs 7b)
- ✓ Scrambling data (7c)

But… Grebenyova 2009, most other work:
All Wh-phrases in sluicing are outside of the elided category, TP.

For quantifiers in antecedent to bind variables from a parallel positions, they must be outside of TP as well.

☞ Requires exceptionally high QR of universal to left periphery.

Call this Super-QR.

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Syntactic Identity and Super-QR

Parallelism obtained via Super-QR, $\exists$-closure of indef from outside TP:

(10) $[_{CP}$ everyone$_x$ $\exists y$ $[_{TP_A}$ x invited y to dance $]\,]$ antecedent
$[_{CP}$ who$_x$ whom$_y$ $[_{TP_E}$ x invited y to dance $]\,]$ sluice

But, Super-QR ruled out by Scope Economy considerations (Fox, 2000).

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- High QR (above Mary) is ruled out in the sluice because it doesn't lead to a new scope relation compared to shorter QR (below Mary).
- Inverse scope in the antecedent is ruled out because of parallelism.

☞ QR can't be motivated by the need to license ellipsis alone!

☠ We need to have Super-QR for (7), and we need to not have it for (11).

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Summary

1. Super-QR is necessary for a syntactic identity story that can explain sluicing with quantified antecedents.
2. But at the same time it leads to problematic predictions — it should be ruled out by Scope Economy (Fox, 2000)
3. This leads us to abandon the syntactic approach in favor of a semantic one.

Roadmap

§1 Challenges to syntactic identity

§2 **Proposal: a QuD account**

- The basic idea
- The interpretation of pair-list questions
- Supporting evidence from English

§3 Implicature calculation and QuDs

§4 Conclusion

Proposal: Questions under Discussion

Questions under Discussion (QuDs): semantico-pragmatic objects — salient Q meanings in a discourse with interrogative force (Roberts, 2012).

- shape the information exchange, as interlocutors address the QuD.
- may be made salient implicitly or explicitly (e.g., by asking a direct Q).

QuD-equivalence approaches to sluicing appeal to the intuition that assertions with indefinites and disjunctions make certain QuDs salient.

- *Sally is dating someone* raises the question *who is Sally dating?*.
- *Sally is dating either Mary or Bill* raises the question *which of the two is Sally dating?*.

(12) **Indefinites and disjunctions serve as natural correlates:**

a. Sally is dating someone, bidk who ~~Sally is dating~~.

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- Congruence = equivalence (Roberts, 2012);
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We adopt a standard Hamblin/Karttunen semantics for questions, where they denote the set of possible answers to the question.

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Recall Grebenyova's motivation for her LF-identity account of Russian multiple sluicing:

- ☞ Russian multiple questions are insensitive to superiority, but remnants in sluiced Qs must match superiority of correlates (7a–b).

Our proposal: Superiority in multiple Wh-questions has consequences for Q meaning (Comorovski 1989; Dayal 1996, 2002; Fox 2012; Kotek 2014, a.o.). Hence, the antecedent in (7a) raises a distinct QuD from the sluice in (7b); QuD-equivalence is not met.

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The interpretation of PL multiple questions

Multiple questions can have both single-pair and pair-list answers:

(13) Which boy likes which girl?

a. Mark likes Sarah. single-pair

b. Mark likes Sarah, and Bill likes Maria. pair-list

Under the PL interpretation, multiple questions have two presuppositions (Comorovski 1989; Dayal 1996, 2002; Fox 2012; Kotek 2014, a.o.).

(14) Exhaustivity: Every member of the higher Wh-phrase's restriction is paired with a member of the lower Wh-phrase's restriction.

(15) Uniqueness (functionhood): No member of the higher Wh-phrase's restriction may be paired with more than one member of the lower Wh-phrase's restriction.

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The interpretation of PL multiple questions

Recall our Russian examples (7a–b) and the scrambled (7c):

(16) **Superiority in Russian Sluicing: Correlates must match remnants**

Každyj priglasil kogo-to na tanec, no ja ne pomnju
everyone invited someone to dance, but I not remember

a. ✓ kto$_1$ kogo$_2$, b. *kogo$_2$ kto$_1$.
who whom whom who

'Everyone invited someone to a dance, BIDK {who whom/*whom who.}'

(17) A: Každogo$_i$ kto-to priglasil t_i na tanec.
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The interpretation of PL multiple questions

Superiority-obeying and violating questions have different meanings:

(18) **Sluice in (16a), *who whom (invited)*, sorted by *inviters*:**
{ which invitee did v_1 invite?, which invitee did v_2 invite? }
$\Leftrightarrow \{ \{ v_1 \text{ invited } i_1, v_1 \text{ invited } i_2 \}, \{ v_2 \text{ invited } i_1, v_2 \text{ invited } i_2 \} \}$
(= antecedent's QuD in (16a))

Generalization: the universally quantified correlate in the antecedent contributes the sorting key for the QuD.

(19) **Sluice in (16b), *whom who (invited)*, sorted by *invitees*:**
{ which inviter invited i_1?, which inviter invited i_2? }
$\Leftrightarrow \{ \{ v_1 \text{ invited } i_1, v_2 \text{ invited } i_1 \}, \{ v_1 \text{ invited } i_2, v_2 \text{ invited } i_2 \} \}$
(= Q meaning for sluice in (16b), $\neq$ antecedent's QuD in (16a))

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(19) **Sluice in (16b), *whom who (invited)*, sorted by *invitees*:**
{ which inviter invited i_1?, which inviter invited i_2? }
$\Leftrightarrow \{ \{ v_1 \text{ invited } i_1, v_2 \text{ invited } i_1 \}, \{ v_1 \text{ invited } i_2, v_2 \text{ invited } i_2 \} \}$
(= Q meaning for sluice in (16b), $\neq$ antecedent's QuD in (16a))

The interpretation of PL multiple questions

Superiority-obeying and violating questions have different meanings:

(18) **Sluice in (16a), *who whom (invited)*, sorted by *inviters*:**
{ which invitee did v_1 invite?, which invitee did v_2 invite? }
$\Leftrightarrow \{ \{ v_1 \text{ invited } i_1, v_1 \text{ invited } i_2 \}, \{ v_2 \text{ invited } i_1, v_2 \text{ invited } i_2 \} \}$
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Supporting evidence from English

Recall the English contrast:

(20) a. Every boy likes some girl, BIDK which boy which girl.

b. * Some boy likes every girl, BIDK which boy which girl.

Unlike Russian, English *does* allow inverse scope, yet sluicing with an inverse scope antecedent is not possible.

This is a sluicing-specific problem:

(21) Some boy likes every girl, BIDK which boy likes which girl.
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QuD-equivalence captures the acceptability of examples like (20a).

(22) **QuD and sluice meanings in (20a), sorted by *boys*:**
{ which girl does b_1 like?, which girl does b_2 like? }
$\Leftrightarrow \{ \{ b_1 \text{ likes } g_1, b_1 \text{ likes } g_2 \}, \{ b_2 \text{ likes } g_1, b_2 \text{ likes } g_2 \} \}$

In the antecedent, in English as in Russian, the universally quantified correlate in the antecedent contributes the sorting key for the QuD.

(23) **QuD meaning in (20b), sorted by *girls* ($\neq$ sluice in (20a,b)):**
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- ☞ The QuD-equivalence approach captures Grebenyova's paradigm.
  - The English data parallel the Russian data.

We achieve sensitivity to syntactic structure in a manner similar to LF/Syntactic identity approaches, without the pitfalls of those approaches.

Two issues remain:

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2. An account of the un-sluiced sentence (21)

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Roadmap

§1 Challenges to syntactic identity

§2 Proposal: a QuD account

§3 **Implicature calculation and QuDs**

- Context and accommodation in ellipsis licensing
- How and when QuDs are calculated

§4 Conclusion

Context and accommodation in ellipsis licensing

Speakers who accept multiple sluicing find (20b) degraded to varying degrees compared to (20a), with some reporting only a subtle contrast.

☞ QuD-equivalence does not predict variation, but ungrammaticality.

We appeal to accommodation: the QuD's meaning and the sluiced Q's meaning are manipulated in context in order to achieve semantic identity.

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We begin with the unsluiced (21), which is perfectly acceptable even to speakers who find sluicing in (20b) strongly unacceptable.

(21) ✓ Some boy likes every girl, BIDK which boy likes which girl.

(20b) * Some boy likes every girl, BIDK which boy ~~likes~~ which girl.

- The QuD made salient by the antecedent is sorted by *girls*.
- The continuation in (21) (and sluice in (20b)) is sorted by *boys*.

- What contexts are compatible with these antecedents and sluices?

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(24) **Contexts satisfying QuD's presuppositions in (21):**

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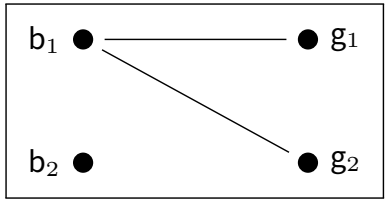

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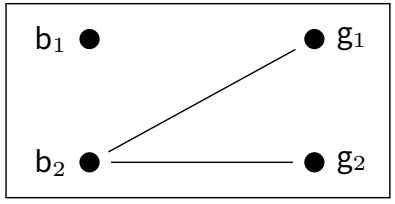

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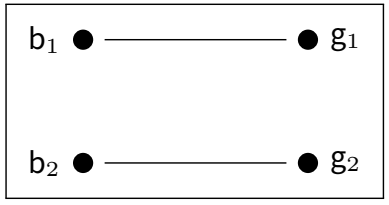

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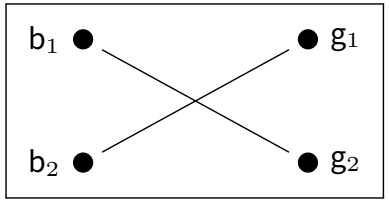

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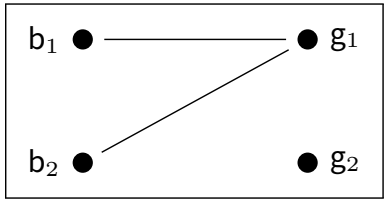

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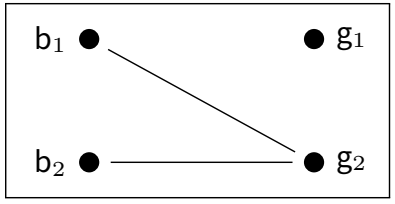

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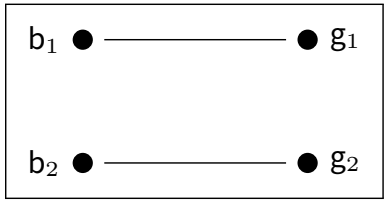

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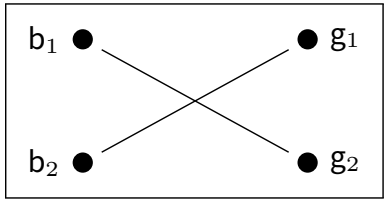

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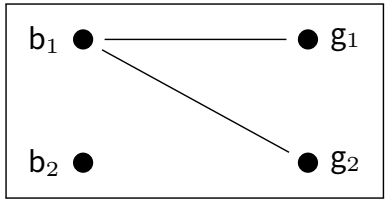

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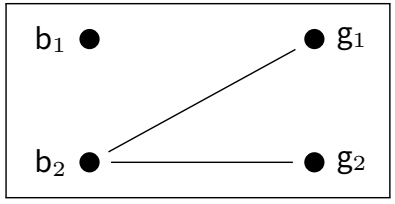

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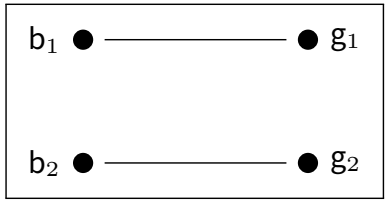

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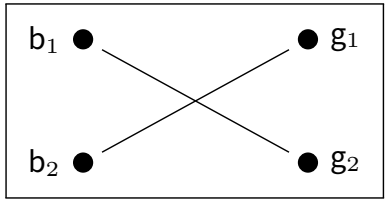

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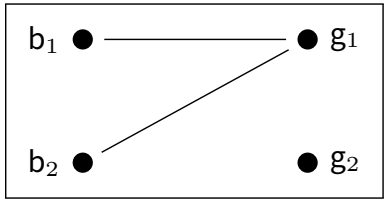

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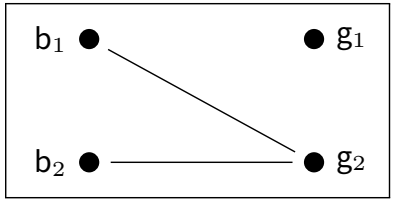

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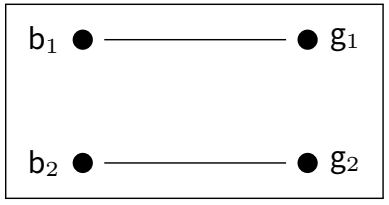

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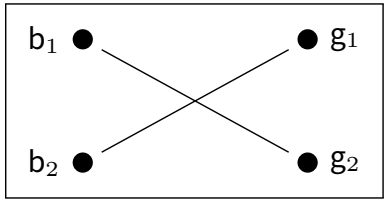

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Context and accommodation in ellipsis licensing

Only bijective contexts like (c) and (d) satisfy the presuppositions of both the QuD and the continuation.

Proposal: in the absence of sluicing, QuD-equivalence is irrelevant; speakers *accommodate* that only bijective contexts are possible, (21).

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Context and accommodation in ellipsis licensing

With sluicing (20b), even with accommodation, the meanings of the antecedent's QuD and the multiple Wh-question are distinct:

(26) a. $[\![$**QuD** (some boy likes every girl)$]\!] =$ $\neq$ **(26b)**
{ which boy likes g_1?, which boy likes g_2? }
$\Leftrightarrow \{ \{ b_1$ likes g_1, b_2 likes $g_1 \}, \{ b_1$ likes g_2, b_2 likes $g_2 \} \}$

b. $[\![$**which boy ~~likes~~ which girl?**$]\!] =$ $\neq$ **(26a)**
{ which girl does b_1 like?, which girl does b_2 like? }
$\Leftrightarrow \{ \{ b_1$ likes g_1, b_1 likes $g_2 \}, \{ b_2$ likes g_1, b_2 likes $g_2 \} \}$

Context and accommodation in ellipsis licensing

Proposal: Accommodation involves removing from consideration those contexts where the presuppositions of either question are not met.

This “pruning” will result in equivalence.

- But, costly and subject to speaker variation.
- Explaining the subtlety of judgments.

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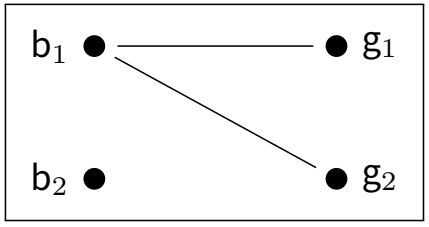
Context and accommodation in ellipsis licensing

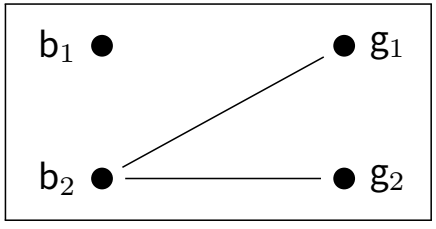
We illustrate with a more fine-grained representation for propositions, as sets of worlds.

(27)

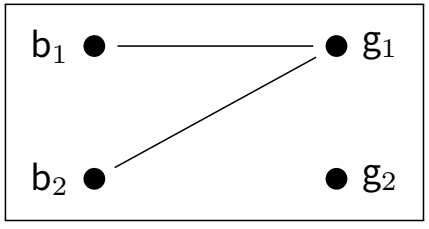
w1



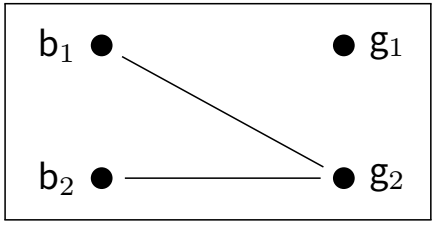
w2



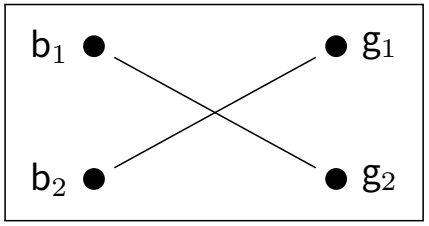
w3



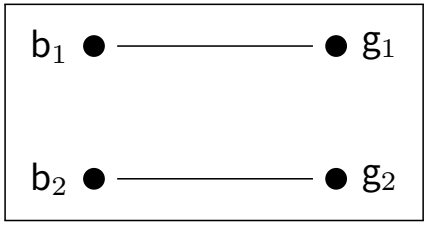
w4



w5



w6



Only w5 and w6 will survive pruning.

Context and accommodation in ellipsis licensing

(28) **Unpruned QuD and multiple Q meanings: equivalence not met**

a. $[\![\text{QuD}]\!] =$ $\neq$ (28b)

{ which boy likes g_1?, which boy likes g_2? }

$\Leftrightarrow \{ \{ b_1 \text{ likes } g_1, b_2 \text{ likes } g_1 \}, \{ b_1 \text{ likes } g_2, b_2 \text{ likes } g_2 \} \}$

$\Leftrightarrow \Big\{ \big\{\{w1,w3,w6\}, \{w2,w3,w5\}\big\}, \big\{\{w1,w4,w5\}, \{w2,w4,w6\}\big\} \Big\}$

b. $[\![\text{which boy likes which girl?}]\!] =$ $\neq$ (28a)

{ which girl does b_1 like?, which girl does b_2 like? }

$\Leftrightarrow \{ \{ b_1 \text{ likes } g_1, b_1 \text{ likes } g_2 \}, \{ b_2 \text{ likes } g_1, b_2 \text{ likes } g_2 \} \}$

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Context and accommodation in ellipsis licensing

(29) **Pruned QuD and multiple Q meanings: equivalence met**

a. $[\![\text{QuD}]\!] =$ $= (29b)$

{ which boy likes g_1?, which boy likes g_2? }

$\Leftrightarrow \left\{ \{ b_1 \text{ likes } g_1, b_2 \text{ likes } g_1 \}, \{ b_1 \text{ likes } g_2, b_2 \text{ likes } g_2 \} \right\}$

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b. $[\![\text{which boy likes which girl?}]\!] =$ $= (29a)$

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How and when QuDs are calculated

We've seen that context matters in the computation of the QuD.

Next we'll show that the implicatures of the antecedent also play a crucial role in determining the QuD.

How and when QuDs are calculated

Puzzle: The antecedent of (20a) may be true in a context where the uniqueness ps of the QuD needed to license sluicing is not met.

(30) Context: Every boy likes two girls.

a. Every boy likes some girl — true under $\forall > \exists$

b. # Every boy likes some girl, BIDK which boy which girl.

The sluiced question's uniqueness presupposition requires that for every boy, there is *exactly one* girl that he likes.

The context explicitly contradicts this presupposition, thus blocking the QuD *which boy likes which girl?*, needed to license the sluice in (30b).

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How and when QuDs are calculated

Proposal: the sg *some girl* gives rise to an implicature of *exactly one girl*.

This, in turn, gives rise to the QuD *Which boy likes which girl?*, which licenses the sluice in (20a).

This strengthened meaning is the result of a silent EXH operator operating on the antecedent
(Sauerland, 2001; Spector, 2007; Fox, 2007, 2009; Chierchia et al., 2012, a.o.).

If exhaustification is obligatory whenever possible, this would block potential QuDs such as *Which boy likes which girls?* from being accessible.

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How and when QuDs are calculated

As is predicted from this proposal, sluices that would be licensed by non-exhaustified QuDs are ruled out:

(31) a. * Every boy likes some girl, BIDK which boy which girls.

b. * Every boy likes some girl, BIDK which boy which girl or which girls.

How and when QuDs are calculated

Note, exhaustification of antecedent takes place independently of sluicing:

(32) Every boy likes some girl, BIDK which boy likes which girl.
Felicitous in a context in which each boy likes exactly one girl.
Infelicitous in a context in which some boys like more than one girl.

☞ **The truth conditions, the context, and the scalar implicatures associated with the antecedent all matter for QuD equivalence!**

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Roadmap

Conclusion

- The availability of multiple sluices with quantified antecedents is surprising and unexpected.

☞ **Both the semantics *and* the pragmatic implicatures of the antecedent matter** for the purposes of ellipsis licensing.

- Within **QuD-equivalence**, QuDs are computed after antecedent's contribution to CG has been computed — taking into account any (scalar) implicatures antecedent gives rise to.
- This explains a complex set of judgments in Russian and English, and contributes to our understanding of ellipsis licensing more generally.

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☞ **Both the semantics *and* the pragmatic implicatures of the antecedent matter** for the purposes of ellipsis licensing.

- Within **QuD-equivalence**, QuDs are computed after antecedent's contribution to CG has been computed — taking into account any (scalar) implicatures antecedent gives rise to.
- This explains a complex set of judgments in Russian and English, and contributes to our understanding of ellipsis licensing more generally.

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Thank you!

Thank you! Questions?

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Scope economy and Super-QR

(33) **Apparent violation of Scope Economy in A clause:**
[$_A$ Mary likes every teacher], and [$_E$ some boy does ~~like every teacher~~ too]. ($^{\checkmark}\forall > \exists$, $^{\checkmark}\exists > \forall$)

a. LF of E clause = [every teacher$_x$ some boy likes x]

b. LF of A clause = [every teacher$_x$ Mary likes x]

Fox deals with this through a mechanism that crucially does not involve long-distance QR: E is parallel to an alternative antecedent LF, call it A′, which may be accommodated under certain conditions (met in (33)).

(34) **Accommodated antecedent in (33):**
[$_A$ Mary likes every teacher] $\models$ [$_{A'}$ every teacher$_x$ some girl likes x]
A′ $\in$ F([$_E$ every teacher$_x$ some [boy]$_F$ likes x])

(where F(E) is a set of structured meanings corresponding to E's focus alternatives in the sense of Rooth 1992.)

The interpretation of PL multiple questions

Under the PL interpretation, multiple questions have two presuppositions (Comorovski 1989; Dayal 1996, 2002; Fox 2012; Kotek 2014, a.o.).

(35) Exhaustivity: Every member of the higher Wh-phrase's restriction is paired with a member of the lower Wh-phrase's restriction.

a. Guess which one of these 3 kids will sit on which of these 4 chairs.
(Good with a single-pair answer and with a pair-list answer.)

b. Guess which one of these 4 kids will sit on which of these 3 chairs.
(Only good with a single-pair answer.)

(36) Uniqueness (functionhood): No member of the higher Wh-phrase's restriction may be paired with more than one member of the lower Wh-phrase's restriction.

a. I wonder which one of the 3 boys will do which one of the 3 chores.

b. # I wonder which one of the 3 boys will do which one of the 4 chores.
(Suggests that the boys will not do all of the chores.)

Superiority violations in English multiple sluicing

Could the problem with (20b) in English can be fixed by switching the order of remnants?

Superiority violations are generally possible (Pesetsky, 2000). However:

(37) **No superiority violations in English multiple sluicing:**
Some boy likes every girl,

a. * …but I don't know which girl which boy.

b. …but I don't know which girl which boy likes.

Superiority violations are ruled out in sluicing because only the (overtly) moved Wh evacuates TP, the other one remains in-situ (Pesetsky 2000), hence it is trapped and expected to be deleted.

See Abels and Dayal 2016 for recent discussion of superiority violations in English multiple sluicing.