Multiple Sluicing, Scope, and Superiority: Consequences for Ellipsis Identity

This paper defends a semantic identity account of ellipsis licensing. The argument will come from examples of multiple sluicing as discussed e.g. in Romero 1998; Lasnik 2014, focusing on data in Russian. We concentrate in particular on antecedents that contain two quantified statements and uncover a surprising asymmetry, where surface-scope antecedents can license a multiple sluice, but inverse-scope antecedents cannot. We argue that this finding is explained by semantic accounts of ellipsis licensing, where ellipsis is licensed when the sluice corresponds to an (implicit) Question under Discussion (cf. AnderBois, 2014; Barros, 2014; Weir, 2014). We show that QuDs cannot be computed based on the truth-conditional content of the antecedents alone; instead, they must be computed only after (scalar) implicatures have been calculated and added to the common ground, along with the context of utterance. We further discuss the commitments required of a syntactic LF-identity account of ellipsis licensing in order to account for multiple sluicing with quantified antecedents, and argue that accounts along these lines would run into serious trouble, making them practically untenable.

Keywords: sluicing, ellipsis licensing, pair-list readings, scope, parallelism.

1 Introduction

Sluicing is clausal ellipsis in a Wh-question, leaving just the Wh-phrase overt, as in (1a) (Ross 1969). We adopt the standard analysis in (1b), where sluicing involves Wh-movement followed by PF-deletion/non-pronunciation of TP (Merchant 2001 and many others). Following Merchant, we refer to Wh-phrases left overt in sluicing as *remnants*. Remnants typically correspond to some indefinite XP in the antecedent, the remnant's *correlate*. (In (1), the correlate is *someone*.)

(1) **A simple example of sluicing in English:**

    a. Sally called someone, but I don't know who.

    b. Sally called someone, but I don't know who [$_{TP}$ ~~Sally called~~ t].

Sluicing, alongside other ellipsis phenomena, is subject to an identity condition that must hold between the elided clause and some discourse-local linguistic antecedent (Hankamer and Sag 1976). Following Chung 2013; Barros 2014; Lipták 2015, there is no consensus position on how to state this identity condition. Proposals falls into three broad categories: purely semantic identity (e.g., Tancredi 1992; Romero 1998; Merchant 2001; Takahashi and Fox 2005; Barros 2014), purely syntactic/LF-identity approaches (e.g., Ross 1969; Fiengo and May 1994; Chung et al. 1995; Fox and Lasnik 2003; Thoms 2015), and hybrid approaches adopting a semantic condition alongside some degree of syntactic identity (e.g., Fox 1995, 1998, 1999; Rooth 1992a; Chung 2006, 2013; AnderBois 2011, 2014; Weir 2014).[1]

We contribute to the debate by examining *Multiple Sluicing* (Takahashi 1994), where more than one remnant survives ellipsis. In (2), we see examples of multiple sluicing in Russian and English.[2]

(2) **Multiple sluicing in Russian and English:**

    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)

---

[1]We set aside proposals that do not assume fully articulated (though unpronounced) clausal structure in sluicing (e.g., Lobeck 1995; Ginzburg and Sag 2000; Culicover and Jackendoff 2005; Barker 2014; Jacobson 2016 among others). See Merchant 2001, 2004, 2010; Vicente 2014, and many others following, for many empirical and conceptual arguments against such proposals. We additionally set aside "copying" proposals such as that in Chung et al. 1995, where the logical form of the antecedent TP is copied into an incomplete interrogative clause (missing TP in particular). (See Merchant 2001 for many compelling arguments against such an approach.)

[2]Under the Ross 1969/Merchant 2001-style conjecture that sluicing is derived via regular Wh-movement followed by TP deletion, one might expect multiple sluicing to only be attested in languages with multiple Wh-fronting. Perhaps surprisingly, multiple sluicing has been attested in a variety of languages, including Wh-in-situ languages (e.g., Japanese and Mandarin Chinese: Takahashi 1994; Nishigauchi 1998; Takahashi and Lin 2012), Single-Wh-fronting languages (e.g., English, German, Spanish, Portuguese, Norwegian, Italian: Lasnik 2014; Abels and Dayal 2016; Rodrigues et al. 2009), as well as (unsurprisingly) multiple Wh-fronting languages (e.g., Czech, Russian, Serbo-Croatian, Bulgarian, Polish, Hungarian: Grebenyova 2009; Scott 2012; Bailyn 2012; Stjepanović 2003; Richards 1997b; Lasnik 2014; Abels and Dayal 2016).

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

c. Some boy likes some girl, but I don't know which boy which girl.

Multiple sluicing is a particularly interesting domain of investigation as regards
the identity condition. First, we encounter examples like (2a) and (2c), where both
remnants have indefinites correlates. Hence, whatever issues affect syntactic iden-
tity in simple sluicing cases should carry over to these more complex cases, and
whatever solutions are proposed for the simple cases should apply here as well
(see e.g., Fox and Lasnik 2003, Chung et al. 1995 for some proposals). Interestingly,
we also observe examples like (2b), where one of the remnants (here, *kto*, 'who')
has a universally quantified NP as a correlate (*Každyj*, 'everyone'). Here it is not
at all clear how an antecedent with a universally quantified correlate can count as
syntactically or semantically identical to the sluiced multiple Wh-question.

Our goal in this paper is to highlight important challenges that multiple sluic-
ing raises for a certain class of extant accounts of ellipsis identity, namely, those
that require fairly strict syntactic identity between the antecedent clause and the
sluiced clause (e.g., Fox 1995, 1998, 1999; Fox and Lasnik 2003; Chung 2006; Thoms
2015). We illustrate how recent semantic approaches (AnderBois 2011; Barros 2014;
Weir 2014) — requiring equivalence between the sluiced question's meaning and a
Question under Discussion (or 'QuD' for short, Roberts 1996, 2012) associated with
the antecedent — can handle the facts.

We concentrate in this paper on data from Russian, a language in which multiple
sluicing is robustly attested (Stjepanović 2003; Grebenyova 2009; Bailyn 2012; Scott
2012; Antonyuk 2015). For convenience, we will occasionally make reference to
parallel English data, where a similar grammaticality judgment pattern obtains,
but where the judgments tend to be less robust.[3]

---

[3]Much of the literature on multiple sluicing claims it to be only marginally acceptable in English.
The most systematic investigation of the facts, to our knowledge, is found in Lasnik 2014, where the
results of an informal survey are reported, supporting the conclusion that multiple sluicing is a
"real phenomenon" in English. However, Lasnik 2014 reports pooled data, which may obscure
interspeaker variation. Our own informal investigations have identified two sorts of speakers: a

2 Challenges for Syntactic Identity

In this section we introduce the pattern of multiple sluicing with quantified antecedents that will be central to this paper. We begin by laying out preliminary assumptions about the derivation of sluicing in Russian, and proceed to discuss extant data in Grebenyova (2009) and her proposed analysis. We then present novel data to extend the paradigm and challenge Grebenyova's (2009) analysis, which is rooted in the tradition of syntactic identity. In section 3 we will turn to an account of the data in terms of semantic identity.

2.1 Syntactic Preliminaries

Movement of Wh-phrases is an obligatory step in the formation of Russian questions, although there is disagreement as to whether this is true Wh-movement, driven by interrogative features to [Spec,CP] (Scott 2012; Bailyn 2012), Focus fronting, or some combination thereof (Bošković 1998; Stepanov 1998; Grebenyova 2009). We will refrain from weighing in on the debate here, as our results would be compatible with either approach. We note, however, that under the standard assumption that the syntax of overt Wh-movement feeds TP-ellipsis in sluicing, the fact that multiple sluicing is available in Russian argues against approaches that take some or all of the Wh-phrases to be adjoined to TP (e.g., Rudin 1988; Stepanov 1998).[4]

We follow Scott 2012 in assuming a Richards 1997a style tucking-in analysis in [Spec,CP] for multiple Wh-phrases, as in (3a), though everything we say for such structures carries over to analyses which place each Wh-phrase in the specifier of a separate projection in a Rizzi 1997 style articulated left periphery, as in (3b):[5,6]
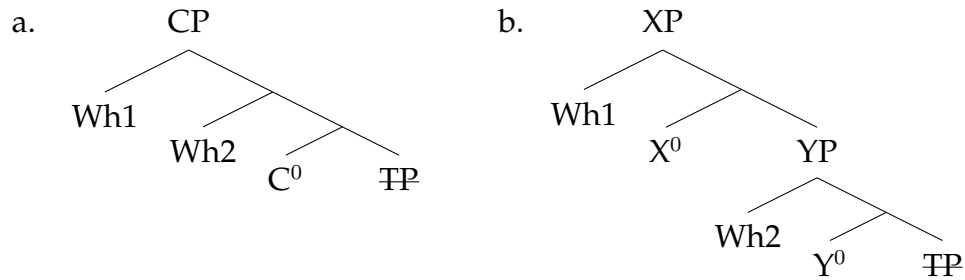
---

substantial number of speakers who find multiple sluicing unimpeachable, alongside others who find it marginal at best. Our discussion will therefore investigate multiple sluicing in the grammars of speakers for whom it is available as a productive questioning strategy, and concentrate more strongly on Russian, where these concerns do not arise. See also footnote 18 and §3.2.3.

[4]Strictly speaking, it is possible that a combination of analytical options are available in Russian as regards the landing sites of multiple fronted Wh-phrases. What will be important for our purposes is that, at least in sluicing — involving TP deletion — it must be the case that all Wh-phrases are outside the ellipsis site (i.e., above TP in the left periphery).

[5]Both structures are adopted as possibilities for Russian Wh-movement in Scott 2012, where superiority violations in multiple Wh-questions are derived via "hopping" of Wh2 over Wh1 in the multiply filled [Spec,CP] into [Spec,HOP] (High Operator Phrase) above CP. (In (3b), this would place Wh2 in [Spec,XP] (XP = HOP), leaving Wh1 in [Spec,YP] (YP = CP) in Scott's 2012 analysis.)

[6]Wh1 and Wh2 encode the relative order of the Wh-phrases, such that Wh1 is base generated in

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

a.
```
            CP
          /    \
        Wh1      \
           \      \
           Wh2     \
              \    / \
              C⁰  TP
```

b.
```
            XP
          /    \
        Wh1      \
           \      \
           X⁰      YP
                  /   \
                Wh2    \
                   \   / \
                   Y⁰  TP
```

$$a. \quad \begin{array}{c} CP \\ Wh1 \quad Wh2 \quad C^0 \quad \text{TP} \end{array}$$

2.2 Syntactic Identity and "Super Quantifier Raising"

We begin with a discussion of the syntactic identity account of Russian multiple sluicing in Grebenyova 2009. Examples (4a–c) illustrate cases of multiple sluicing with quantified antecedents. As Grebenyova notes, Russian multiple Wh-fronting is not subject to superiority; nonetheless, in sluicing contexts, superiority obeying multiple sluicing is available with a surface scope antecedent, whereas superiority violating multiple sluicing, corresponding to the inverse scope reading of the antecedent, is unavailable (4a–b). It is not the case that superiority violating orders are ruled out in multiple sluicing, however. Scrambling in the antecedent does allow for this word order (4c).

(4) **Superiority in Russian Sluicing: Correlates must match remnants:[7]**

a. Každyj priglasil kogo-to na tanec, no ja ne pomnju kto$_1$ kogo$_2$.
   everyone invited someone to dance, but I not remember who whom

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

---

a higher position than Wh2. The two schematic left peripheries in (3) are superiority-obeying.

Grebenyova 2009 adopts the LF identity analysis in Fox and Lasnik 2003, requiring structural parallelism between the elliptical clause and its antecedent, and that variables contained in the elliptical clause and its antecedent be bound from parallel positions (see Griffiths and Lipták 2014; Thoms 2015; Messick and Thoms 2016 for such an implementation of syntactic identity). Grebenyova also adopts the assumption that indefinites in antecedents contribute a variable bound by existential closure, following Kratzer 1998.[8,9]

For the unscrambled antecedent and the superiority obeying multiple sluice in (4a), Grebenyova 2009 provides the LFs in (5a–b). Here, variables are bound from parallel positions, meeting identity as defined above. The superiority violating sluice in (4b) has binders in different positions from the unscrambled antecedent in (4a), in violation of LF parallelism. The scrambled antecedent's LF in (4c) is only identical with superiority violating multiple sluicing, as illustrated in (6a–b).

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

   a. $\forall x \exists y$[x invited y to dance]   antecedent in (4a,b)

   b. $\text{who}_x \text{ whom}_y$[x invited y to dance] (Wh1 > Wh2)   sluice in (4a)

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

   a. $\forall y \exists x$[x invited y to dance]   antecedent in (4c)

   b. $\text{whom}_y \text{ who}_x$[x invited y to dance] (Wh2 > Wh1)   sluice in (4b,c)

Grebenyova's 2009 adoption of the proposal in Fox and Lasnik 2003 captures the unacceptability of superiority mismatches between remnants and correlates. Additionally, scrambled antecedents are also captured in her account, since the variable contributed by the indefinite subject in (6b) may be existentially bound in-situ.

However, closer consideration of the assumptions that we are forced to adopt in order to achieve parallelism in this way highlights some immediate problems.

---

[8] An additional assumption in Fox and Lasnik 2003, which we return to in the following section, is that Wh-movement under ellipsis takes place in one-fell-swoop. This is required under their approach in order to maintain parallelism between an antecedent without movement and the sluice which otherwise would contain intermediate copies, interrupting identity.

[9] Grebenyova 2009 differs slightly from Fox and Lasnik 2003 in implementation. In Fox and Lasnik 2003, existential quantification is over choice function variables, following Reinhart 1997, whereas Grebenyova 2009 uses individual variables, following Kratzer 1998. As far as we can tell, this difference will not matter here, so we keep to the implementation in Grebenyova 2009 for consistency.

Grebenyova 2009 assumes multiple sluicing in Russian places both Wh-phrases outside of the elided category, TP. In order to maintain that the quantifiers in the antecedent bind variables from a parallel position, it must be the case that the binders in the antecedent are themselves outside of TP as well. This would require exceptionally high QR of the universal subject in the antecedent to a position in the left periphery (Call this Super-QR).[10]

Likewise, $\exists$ closure of the variable contributed by the indefinite in the antecedent would need to be from outside TP.

(7) **Super-QR of 'everyone' in unscrambled antecedent satisfies parallelism**
$[_{CP}$ 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

While this latter assumption about the height of $\exists$ closure is rather innocuous, considering the capacity of indefinites to take exceptionally wide scope, the former assumption raises the question of what the motivation for the additional QR step for the universal quantifier might be.

There is, in fact, independent reason to think Super-QR should not be generable. Fox 1999 shows that QR is constrained by economy. When comparing two derivations, one with an extra QR step and one without, the more complex derivation is rejected if QR yields no interpretive consequence. Super-QR as needed to satisfy parallelism in multiple sluicing has this "semantically vacuous" character.

In Fox's 1999 proposal, inverse scope in the antecedent in (8) is ruled out by appeal to the interaction between Scope Economy and ellipsis parallelism.

(8) **Inverse scope ruled out by economy considerations:**
Some boy likes every teacher, and Mary does ~~like every teacher~~ too. (*$\forall > \exists$)

Fox 1999 takes the parallelism condition to be LF-identity between the sentence containing the elided constituent (E) (the right conjunct in (8)), and its antecedent (A). LF identity in Fox 1999 is sensitive to F-marking. Parallelism is met between A and E when A $\in$ F(E), where F(E) is a set of structured meanings corresponding to E's focus alternatives in the sense of Rooth 1992b. An inverse scope reading of A

---

[10]See Wurmbrand 2017 for a discussion of the locality of QR and some exceptions that allow for long-distance QR, especially in cases involving Antecedent Contained Deletion.

in (8) would require parallel QR of *every teacher* over *Mary* in E to meet LF-identity. However, since such QR yields no interpretive consequence in E, Scope Economy rules such a derivation out, in turn, forcing a surface scope reading for A. If Fox is correct, the Super-QR needed to meet LF identity in multiple sluicing should be ruled out, a point against LF-identity approaches.

Nonetheless, one may wonder whether the need to satisfy identity alone can count as a motivation for Scope Economy violating-QR. Fox (1999) does note that inverse scope appears to become available in examples like (9), where the antecedents in (8) are switched, so that it would seem, at first pass, that Scope Economy-respecting QR in an E clause may motivate Scope Economy-violating QR in an A clause.

(9) **Apparent violation of Scope Economy in A clause:**
[$_A$ Mary likes every teacher], and [$_E$ some boy does ~~like every teacher~~ too].
   a. LF of E clause $=$ [every teacher$_x$ some boy likes x]
   b. LF of A clause $=$ [every teacher$_x$ Mary likes x]

We might take Wh-movement in a multiple sluice, then, to be like QR in the E-clause in (9); the Wh-phrases independently raise to [Spec,CP], outscoping everything in the sentence. On analogy with apparent QR in the antecedent in (9), Super-QR of the universal in (4a) may be motivated to satisfy parallelism. However, Fox provides an account of data like (9) which preserves the conclusion that Scope Economy is never violated, despite appearances. In other words, it is not the case that Economy-respecting QR in an E clause may license Super-QR in its A clause, only to satisfy parallelism.

To capture the pattern in (9), Fox 1999 appeals to a mechanism whereby an alternative antecedent LF, call it A′, may be accommodated under certain conditions (met in (9)). First, Fox (1999) observes that the antecedent in (9) entails an LF that is in F(E) for (9), namely that in (10). (i.e. If Mary likes every teacher, then it is true for every teacher that some girl likes them.)

(10) **Accommodated antecedent in (9):**
[$_A$ 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])

Crucially, in A′, Scope Economy is respected, without needing to appeal to Super-QR in the actual antecedent itself. In other words, there is no provision in Fox's theory for Super-QR.[11]

To summarize, an important challenge for LF-identity lies in generating the acceptable cases with surface scope antecedents without appealing to Super-QR. Adopting Super-QR solely for the purposes of motivating parallelism in acceptable examples is conceptually unattractive because it lacks independent motivation and is therefore stipulative. If we reject Super-QR, however, LF-identity approaches like that in Fox and Lasnik 2003, Grebenyova 2009 run into trouble in ruling in sluices with quantifier correlates.[12]

Before concluding this section, some words are in order regarding interspeaker variation with respect to the structure and interpretation of multiple Wh-questions and the judgements reported in Grebenyova 2009. Grebenyova reports on a variety of Russian with the following properties: (a) it is a "surface scope" language, where inverse/covert scope taking operations are unavailable; (b) superiority violations are freely available in both matrix and embedded multiple Wh-questions; (c) multiple-Wh questions may only have "pair-list" answers, where each value for one Wh-term is paired with a corresponding value for the other.

In our investigations with L1 Russian speakers, we have not only found speakers of the variety reported in Grebenyova 2009, but also others. There is some dispute

---

[11]Note that even if Super-QR were possible in accommodated antecedents, there are additional constraints in place that block accommodation in our sluicing contexts. Super-QR is semantically vacuous by definition, so one could imagine that an antecedent like *Everyone invited someone to dance* may license the accommodation of its Super-QR'd LF *Everyone$_i$ t_i invited someone to dance*. In order for accommodation to take place, the E clause must contain *accommodation seeking material*, which Fox defines as deaccented material (i.e., non-ellided and non-F-marked) that lacks identical correlates in the antecedent. In (9), accommodation seeking material consists of the determiner *some* in the E clause. (F-marking is on *boy*, since if it were on the entire subject DP, there would be no accommodation trigger.) In multiple sluicing, there is no accommodation trigger, since everything but the F-marked remnants are elided. The notion that sluicing remnants are F-marked is explicitly adopted in Grebenyova 2009, where sluicing is movement to the specifier of a Focus projection in the left periphery. (See also Romero 1998 for an analysis of the distribution of F-marking on remnants in sluicing.)

[12]Examples like (i) below show that the problem extends beyond multiple sluicing, to any sluice with a quantified correlate.

(i) She has read most books, but we don't know EXACTLY which ones ~~she has read~~.
     (Romero 1998, example (51a), pg. 25)

in the literature as to whether it is a surface scope language (see e.g., Antonyuk 2015; Ionin and Luchkina 2015 for discussion). One of our consultants did, in fact, marginally accept inverse scope interpretations of sentences like (11).[13]

(11) **An inverse scope interpretation of a Russian sentence:**

? Kakoj-to malčik ljubit každuju devočku.
  Some   boy   likes every   girl

'For each girl, there is some boy that likes her.' $^\checkmark \forall > \exists$

This state of affairs allows us to strengthen our argument against super-QR, in the following way: One way Grebenyova's parallelism account may get around our criticism that scopal parallelism requires Super-QR is to assume that examples like (4a) instead involve string-vacuous overt scrambling of the universal subject to the left periphery. This would ensure scopal parallelism between the elided clause and its antecedent by appealing to an independently available operation (scrambling) in Russian, instead of the problematic Super-QR. If such a derivation were available, it would challenge our argumentation above.

However, overt scrambling cannot be behind the inverse scope interpretation of (11) for those speakers who accept it. In (12), we show that such speakers also accept sluicing with examples like (11) as antecedents. Here, on a Grebenyova/Fox-and-Lasnik style account, we must appeal to super-QR of the universal correlate in the antecedent in order to scope at the same position as the corresponding Wh-remnant — in violation of Scope Economy.[14]

(12) **Multiple sluicing continuation is available for speakers who accept (11):**

? Kakuju devočku kakoj malčik?
  which girl   which boy

'Which girl does which boy like?'

---

[13]Thanks to xx for judgements (p.c.).

[14]In order to achieve the wide-scope universal interpretation of (11), it is only required that the universally quantified object scope over the subject. There are two standardly accepted ways to obtain this result: (a) subject lowering: the object adjoins to vP, scoping over the subject which is interpreted in [Spec,vP] at LF; (b) raising of the object: the object adjoins to TP, c-commanding the subject in [Spec,TP]. Neither option satisfies Fox-and-Lasnik 2003 style parallelism, requiring the universal to scope above TP.

On the other hand, for our consultants who do not accept inverse scope in (11), the sluice in (12) is categorically rejected with (11) as an antecedent.[15]

2.3 Additional challenges for syntactic identity

Fox and Lasnik 2003 highlight an immediate problem for LF-identity approaches to ellipsis licensing in the context of sluicing. Specifically, sluicing antecedents do not involve Wh-movement, yet sluiced Wh-questions do. Successive cyclic movement of the Wh-phrase on its way to Spec,CP through phase edges contained in the sluiced TP threaten to interrupt identity between the antecedent LF and the sluice. (We ignore subject movement from Spec,vP to Spec,TP below.)

(13) **With successive cyclic movement, antecedent and sluice are not parallel:**

    a.   [$_{\text{TP}}$ Jack   [$_{v\text{P}}$ saw someone]]

    b. [$_{\text{CP}}$ Who λy [$_{\text{TP}}$ ~~Jack~~ [$_{v\text{P}}$ t_y λx [$_{v\text{P}}$ ~~saw t_x~~   ]]]]

To compensate for this, in defense of an LF-identity account, Fox and Lasnik 2003 proposes Wh-movement under ellipsis takes place in one-fell-swoop (see also Messick and Thoms 2016 for a more recent implementation of this idea). The indefinite correlate introduces a variable that is bound in-situ by existential closure from a position in the antecedent parallel to the remnant.

One-fell swoop movement of the remnant, coupled with existential binding of the indefinite in-situ in the antecedent allows for LF identity to go through.

(14) **One fell swoop Wh-movement + existential closure allow LF identity:**

    a. [$_{\text{CP}}$ $\exists y$ [$_{\text{TP}}$ ~~Jack~~ [$_{v\text{P}}$ ~~saw y~~]]]

    b. [$_{\text{CP}}$ Who λy [$_{\text{TP}}$ ~~Jack~~ [$_{v\text{P}}$ ~~saw t_y~~]]]

---

[15]Grebenyova 2009 reports that (unsluiced) Russian multiple Wh-questions are immune to superiority effects across the board, though Scott 2012; Bailyn 2012 report that some speakers require superiority obeisance in embedded/indirect Wh-questions. As far as we can tell, this interspeaker variation will not matter for our purposes here (where it might, we explicitly control for such variation). An additional dimension of variation concerns the availability of multiple Wh-questions and multiple sluicing with or without a PL reading; Grebenyova 2009 claims that only PL multiple Wh-questions and multiple sluices are possible in Russian, whereas Scott 2012; Bailyn 2012; Antonyuk 2015 claim that single-pair multiple Wh-questions and multiple sluices are also possible. Here, we focus on PL interpretations for multiple questions/sluices.

While such an analysis may work for indefinite correlates, it runs into trouble with unambiguously quantificational correlates. We've already seen one problem illustrated in the preceding section for multiple sluicing. Specifically, universally quantified correlates must undergo Super-QR to a position parallel to the Wh-phrase in the sluice in order to ensure variables are bound from parallel positions.

The problem goes beyond multiple sluicing, to any sluice with an unambiguously quantified correlate.

(15) **Account cannot extend to cases of non-existential quantifiers:**
She's read most books, but I don't know exactly which ones ~~she's read~~.

Existential closure is unavailable for *most books* in (15). If *most books* is interpreted in-situ (perhaps via type-lifting, see e.g. Heim and Kratzer 1998), there will be a variable bound in the sluice, contributed by the Wh-trace. Antecedent and sluice will lack parallel binding configurations, and sluicing is incorrectly predicted to be impossible. On the other hand, one could posit short movement of *most books* to adjoin to the next highest propositional node (vP) in order to avoid a type mismatch in-situ. However, this will not remedy the problem, as there will now be distinct binding configurations between antecedent and sluice.

(16) **(Wrongly) predicted non-parallel antecedent and sluice with *most*:**
a. $[_{\text{TP}}$ She $[_{v\text{P}}$ most books λz $[_{v\text{P}}$ read t_z $]$ $]$ $]$
b. $[_{\text{CP}}$ which ones λy $[_{\text{TP}}$ ~~She~~ $[_{v\text{P}}$ ~~read t_y~~ $]$ $]$ $]$

Super-QR may perhaps again come to the rescue, allowing *most books* to violate Scope Economy and raise into the left periphery to a position parallel to the remnant. This would lead back to the objections raised in the previous section.

Without Super-QR, an additional challenge to LF/Syntactic identity approaches emerges. In particular, there is a lexical mismatch where *most books* in (16) lacks a correlate in the antecedent entirely, let alone one in a parallel structural position (since one-fell-swoop movement would not leave a trace of movement at the edge of vP). The latter issue could perhaps be addressed by jettisoning the notion that Wh-movement under ellipsis takes place in one-fell-swoop after all, but here we are still left with a lexical mismatch, where the quantified DP *most books* corresponds to a trace (or trace-converted copy, in Fox's (2002) sense) in the sluice.

(17) **Trace-theoretic representation with successive cyclic movement:**

a. $[_{TP}$ She $[_{vP}$ most books λz $[_{vP}$ read t_z $]]]$

b. $[_{CP}$ which books λx $[_{TP}$ She $[_{vP}$ t_x λy $[_{vP}$ read t_y $]]]]$

(18) **Copy-theoretic representation:**

a. $[_{TP}$ She $[_{vP}$ most books λz $[_{vP}$ read the books z $]]]$

b. $[_{CP}$ which books λx $[_{TP}$ She $[_{vP}$ the books x λy $[_{vP}$ read the books y $]]]]$

With trace conversion, at least, the mismatch reduces to one between the determiners (here, *most* in the antecedent, and *the* in its corresponding intermediate copy in the ellipsis site, although this problem would extend to the universally quantified subject correlates discussed in the previous section for multiple sluices). Super-QR could, once again, come to the rescue here. It would render the copy of *most books* at the left edge of vP a lower copy, allowing for determiner replacement to replace *most* with *the*. If such an operation is allowed, parallelism would be predicted.

(19) **Copy-theoretic representation with Super-QR:**

a. $[_{TP}$ *most books* λu $[_{TP}$ She $[_{vP}$ the books u λz $[_{vP}$ read the books z $]]]]$

b. $[_{CP}$ which books λx $[_{TP}$ She $[_{vP}$ the books x λy $[_{vP}$ read the books y $]]]]$

However, Super-QR is otherwise unmotivated, and so this would be a stipulative and confounded solution, for the reasons outlined in the preceding section.

As discussed in Merchant 2001, an additional challenge for LF-identity approaches comes from *contrast* sluicing, where the restrictions of correlates and their remnants are disjoint, with correlates and remnants bearing contrastive focus (in italics):

(20) **Contrast sluicing presents another challenge to LF-identity:**
I know which *puppy* you should adopt, but I haven't decided yet which *kitten* you should adopt.

Fox and Lasnik 2003 discusses such cases and offers trace-theoretic representations, which avoid the obvious challenge posed by the copy theory of movement for LF-identity, namely, that contrast sluices introduce mismatches in semantic content between the LF of the antecedent and sluice. A copy-theoretic representation of the antecedent and sluice in (20) is given below.

(21) **A copy-theoretic representation of (20) breaks parallelism:**

    a. which puppy λx you should the puppy x λy adopt the puppy y.

    b. which kitten λx ~~you should the kitten x λy adopt the kitten y~~

There are some ways around this issue that do not involve resorting to trace theoretic LFs, which would lead us back to the bad LFs in (16)–(17).

One could adopt, for instance, the assumption that the NP restrictions for the Wh-phrases in both clauses are subject to wholesale late merger (Takahashi and Hulsey 2009), only merged countercyclically to the head of the chain, so that lower chain links would lack the semantically conflicting content. However, such a move would be challenged by the observation that reconstruction to intermediate landing sites appears to be available under sluicing.[16] Consider (22) for instance, a contrast sluice in which the anaphor contained in the Wh-phrase must reconstruct to an intermediate position in Spec,CP of the embedded clause in order to satisfy condition A of the binding theory.

(22) **Reconstruction to intermediate landing sites is possible, challenging WLM:**
I know which *painting* of herself$_1$ Sally$_1$ said bill hated, but I don't know which *photo* of herself$_1$ ~~she$_1$ said he hated~~.

    a. wh pntg of herself λx Sally$_1$ said $\langle$the pntg of herself$_1$ $x\rangle$ Bill hated.

    b. wh photo of herself λx ~~She$_1$ said $\langle$the photo of herself$_1$ $x\rangle$ Bill hated.~~

Chung 2013 provides a suggestion which may help save syntactic/LF-identity approaches in the face of evidence such as that in (22). The suggestion in brief is that sluicing remnants, by virtue of being pronounced at the heads of their chains, render the content of lower copies irrelevant in the calculation of syntactic identity. This is a natural move, under the assumption that the identity condition is intuitively motivated by recoverability considerations, and the content of elided chain

---

[16]This is not necessarily a challenge to the notion that Wh-movement under ellipsis *may* take place in one fell swoop. That is, it is possible that successive cyclic movement under ellipsis is at least an option. Of course, given that we have evidence for successive cyclic movement under ellipsis in any case, it seems easier to believe, following Merchant 2001 that Wh-movement under ellipsis is "regular," and therefore successive cyclic as often as its non-elliptical counterpart (i.e., always). See Agüero-Bautista 2007 for independent argumentation in support of the claim that Wh-movement under sluicing is successive cyclic.

links is recoverable from the pronounced remnant at the head of the chain. Perhaps this assumption, in tandem with Super-QR in order to achieve parallel binding configurations, would be sufficient to save an LF identity account in the face of all these challenges. In the following section, however, we entertain an alternative approach—semantic identity—and show that it avoids these issues.

3   Semantic parallelism and PL multiple sluices

In this section, we entertain an alternative to syntactic identity, namely semantic identity. Semantic identity is not without its own challenges, which we highlight in the following discussion. Below, we show that Merchant's 2001 Truth-Conditional "e-GIVENness" approach is insufficient to account for our multiple sluicing data. In particular, e-GIVENness fails to let in multiple sluices with pair-list readings. Instead, we argue for semantic approaches to identity that reference the "Question under Discussion" (QuD, following Roberts 2012) in the calculation of identity, in keeping with much recent work (e.g., AnderBois 2011; Barros 2014; Weir 2014).

3.1   Truth conditional mutual entailment undergenerates

Merchant 2001 proposes an influential focus-theoretic implementation of semantic identity in ellipsis, given below.

(23)   **Focus Condition on Ellipsis (FCE, Merchant 2001)**

    a.   A constituent E can be deleted iff E is e-GIVEN.

    b.   An expression counts as e-GIVEN iff E has a salient antecedent A and, modulo $\exists$-type shifting,

       i.   A entails the Focus closure of E (written F-clo(E)), and

      ii.   E entails F-clo(A)

    c.   F-clo(α) is the result of replacing F-marked parts of α with $\exists$-bound variables.

Merchant treats traces of Wh-phrases in sluiced TPs as $\exists$-bound variables (see also Schwarzschild 1999). For a simple ('single') sluice like that in (24), F-clo(TP_E)

15

entails its antecedent TP_A, and F-clo(TP_A) entails TP_E, satisfying the FCE.[17]

(24) **Deriving simple sluicing using Merchant's FCE:**

[$_{TP_A}$ Someone left], but I don't know who [$_{TP_E}$ ~~t left~~].

TP_A = F-clo(TP_A) = $\exists x[\text{human}(x)\ \&\ \text{left}(x)]$

TP_E = F-clo(TP_E) = $\exists x[\text{human}(x)\ \&\ \text{left}(x)]$

Merchant's FCE straightforwardly accounts for single-pair multiple sluices, presented here in English:[18,19]

(25) **The FCE can account for single-pair multiple sluices:**

[$_{TP_A}$ Some boy likes some girl], BIDK which boy$_i$ which girl$_j$ [$_{TP_E}$ ~~t_i likes t_j~~].

TP_A = F-clo(TP_A) = $\exists x\exists y[\text{boy}(x)\ \&\ \text{girl}(y)\ \&\ \text{likes}(x,y)]$

TP_E = F-clo(TP_E) = $\exists x\exists y[\text{boy}(x)\ \&\ \text{girl}(y)\ \&\ \text{likes}(x,y)]$

However, the FCE undergenerates. Antecedent/sluice pairs in PL multiple sluices in Russian fail to be mutually entailing with their quantified antecedents. Consider (2b), repeated below in (26).

(26) **Antecedent, multiple sluice with PL reading aren't mutually entailing:**

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

'Everyone invited someone to dance, but I don't remember who invited whom to dance.' (Grebenyova 2009)

---

[17]In calculating F-clo(A/E), we assume the remnant's trace in TP_E contributes its restriction to $\exists$-clo(E)/F-clo(E). We stick to trace-theoretic representations for ease of exposition, but we assume the copy-theory throughout. We make this more explicit below.

[18] As mentioned above (see footnote 3), not all English speakers accept multiple sluicing to begin with. Among those who do, we find speakers for whom ⟨DP,DP⟩ remnants as in (25) are degraded, but ⟨DP,PP⟩ remnants as in (i) are much improved:

(i)   Some boy danced with some girl, but I don't know which boy with which girl.

Speculatively, we suggest that this issue stems from the similarity of the two DPs in (25) (cf Richards 1997b, as well as extensive discussions in the processing literature, e,g, Garraffa and Grillo 2008; Grillo 2008; Friedmann et al. 2009), but this is irrelevant to the purposes of this paper. We will concentrate on ⟨DP,DP⟩ cases in the text, and therefore only report judgments from speakers who find such examples acceptable.

[19]Henceforth, in English examples, we replace *but I don't know* with BIDK, and in Russian examples, *no ja ne znaju* with NJNZ.

16

(27) **The FCE incorrectly predicts PL multiple sluicing to be ruled out:**

    a. [$_{\text{TP}_\text{A}}$ Everyone invited someone to dance] ($\forall > \exists$)

       TP$_\text{A}$ = F-clo(TP$_\text{A}$) = $\forall x[\text{person}(x) \rightarrow \exists y[\text{person}(y) \,\&\, \text{invited-to-dance}(x, y)]]$

    b. …ʙɪᴅᴋ who$_i$ whom$_j$ [$_{\text{TP}_\text{E}}$ ~~t_i invited t_j to dance~~]

       TP$_\text{E}$ = F-clo(TP$_\text{E}$) = $\exists x \exists y[\text{person}(x) \,\&\, \text{person}(y) \,\&\, \text{invited-to-dance}(x, y)]$

The same holds true for any PL multiple sluice whenever the antecedent has a wide-scope universal; $\exists$-closure or Focus closure of Wh-traces in TP$_\text{E}$ inevitably lead to a failure of mutual entailment.

This adds to existing arguments against a characterization of the semantic identity condition on sluicing in terms of truth conditional mutual entailment. The general complaint in the literature about the FCE is that it *over*-generates ellipsis in certain contexts.[20] The argument presented in this section is that the FCE also *under*-generates when it comes to PL multiple sluices. In the next section, we entertain an alternative semantic condition that fares better.

3.2 QuD-equivalence

3.2.1 The basic idea

Following Roberts 2012, we take Questions under Discussion (QuDs) to be semantico-pragmatic objects—salient question meanings in a discourse with interrogative force. Their role in discourse is to shape the flow of information exchange, as interlocutors engage in the cooperative task of addressing the QuD. QuDs may be made salient implicitly, or explicitly (e.g., by asking a direct question).

QuD-equivalence approaches to sluicing identity appeal to the intuition that assertions with indefinites and disjunctions make certain corresponding QuDs salient (see AnderBois 2011, 2014). For instance, an assertion like *Sally is dating someone* intuitively raises the question *who is Sally dating?*. Likewise, *Sally is dating either Mary or Bill* raises the question *which of the two is Sally dating?*. Relevantly, assertions with indefinites and disjunctions make for natural sluicing antecedents, with the indefinite or disjunction serving as the remnant's correlate:

---

[20]See Hartman 2009 for discussion of FCE-overgeneration in VP ellipsis, AnderBois 2011, 2014; Barros 2014 for sluicing, and Weir 2014 for fragment answers.

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

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

    b. Sally is dating either Mary or Bill, BIDK which one ~~Sally is dating~~.

QuD-equivalence approaches require sluiced questions to be congruent to the QuD raised by the antecedent. Following Roberts 2012, congruence = equivalence, so that semantic identity is satisfied when $[\![\text{QuD}]\!] = [\![\text{Sluiced Q}]\!]$. For concreteness, we adopt a standard Hamblin/Karttunen semantics for questions, where they denote the set of possible answers to the question. A question like *Who is Sally dating?* in a model with just two individuals, Mary and Bill, would denote the set of propositions { that Sally is dating Mary, that Sally is dating Bill }.[21]

With this much in place, we return to the motivations behind Grebenyova's (2009) syntactic proposal. Grebenyova's observation was that, despite the fact that (for some speakers), Russian multiple Wh-questions are insensitive to superiority, remnants in sluiced multiple questions must match the superiority of their correlates in the antecedent ((4), repeated below in (29)).

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

    a. Každyj   priglasil kogo-to na tanec, no ja ne pomnju kto_1 kogo_2.
        everyone invited someone to dance, but I not remember who whom

    b.   * …no ja ne pomnju kogo_2 kto_1.
        …but I not remember whom who

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

    c. A: Každdogo_i kto-to   priglasil t_i na tanec.
       Everyone_{ACC} someone_{NOM} invited   to dance

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

In the preceding section we reviewed challenges to LF identity approaches to account for this pattern. Here, as an alternative, we capitalize on the established observation that hierarchical relations between Wh-phrases in multiple Wh-questions

---

[21]For simplicity we show extensional types here, although a more accurate description of the set would require it to be intensional. We use intensions only when they are relevant for our purposes, in section §3.2.4 below.

have consequences for the question meaning (Comorovski 1989; Dayal 1996, 2002; Fox 2012; Kotek 2014, a.o.). This fact allows for an alternative explanation for the Russian sluicing data and for parallel English data, couched in semantic identity (QuD-equivalence) and not subject to the pitfalls of syntactic identity.

In short, our claim, following QuD-equivalence approaches to sluicing identity, is that the antecedent in (29a) raises a distinct QuD from the sluiced question in (29b), ensuring the identity condition on sluicing is not met, correctly ruling sluices like that in (29b) out, given antecedents like that in (29a).

3.2.2   The interpretation of PL multiple questions, and QuD-equivalence

We review some crucial properties of pair-list multiple questions before illustrating how QuD-equivalence captures the facts in examples like (29). First, note that the multiple Wh-question in (30) has two readings: the single-pair reading, which asks for the identity of the relevant boy and the relevant girl in the *like* relation, and the pair-list reading, which asks for a list of boy-girl pairs in the *like* relation.

(30)   **Single-pair and pair-list answers to a multiple question:**
Which boy likes which girl?

a.   Mark likes Sarah.   single-pair

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

Multiple Wh-questions under a pair-list interpretation have two important presuppositions sensitive to the relative hierarchical prominence of the Wh-phrases in the structure (Comorovski 1989; Dayal 1996, 2002; Fox 2012; Kotek 2014, a.o.). These presuppositions are described in (31)–(32) below, and their salience is illustrated with examples from Fox 2012, designed to show that the questions are infelicitous in contexts that do not support the presuppositions.[22] (The same facts hold true for Russian, based on our language consultants.)

---

[22]See Kotek 2014 for a derivation of these presuppositions in an interrogative framework that is consistent with the assumptions we have made here.

(31) **The presuppositions of a pair-list multiple question:**
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.)

(32) 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.)

Following Fox 2012; Nicolae 2013; Kotek 2014, a.o. (cf Büring 2003; Roberts 2012), we assume that PL multiple questions denote a "family of questions" (a set of (sub-) questions). The presuppositions of the question illustrated above require that the entities that the higher Wh-phrase quantifies over are exhaustively paired in a 1-to-1 relation with entities quantified over by the lower Wh-phrase in a PL multiple question. In other words, it is required that the sub-questions be "sorted" by the restriction of the highest Wh-phrase in that question. We refer to this higher Wh-phrase as the "sorting key" for the question.

Under its PL interpretation, the question in (30) denotes a family of questions wherein each sub-question is a question about a particular boy—namely, which girl likes that boy—as illustrated in (33). Assuming a model with two boys, b_1, and b_2, and two girls, g_1 and g_2, this family of questions can be spelled out as in the second row of (33), assuming again that the meaning of a question is the set of possible answers to that question.

(33) **Family of Qs for *Which boy likes which girl*? sorted by *boy*:**
$\llbracket(30)\rrbracket = \{$ which girl does b_1 like?, which girl does b_2 like? $\}$
$\Leftrightarrow \{\{b_1 \text{ likes } g_1, b_1 \text{ likes } g_2\}, \{b_2 \text{ likes } g_1, b_2 \text{ likes } g_2\}\}$.

With this background established, we can now turn our attention back to Grebenyova's 2009 paradigm, and ask ourselves which QuD the antecedent makes salient:

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

    a. Každyj   priglasil kogo-to na tanec, no ja ne pomnju kto_1 $kogo_2$.
      everyone invited someone to dance, but I not remember who whom

    b. * …no ja ne pomnju $kogo_2$ kto_1.
       …but I not remember whom who
       'Everyone invited someone to a dance, BIDK {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}

The surface scope antecedent in (29a) sets up a discourse where, for each inviter there is some invitee he or she invited. This raises a QuD asking for each inviter, which invitee he or she invited.[23] Such a QuD receives the family of questions denotation in (34) below. (We use a model with two inviters and two invitees: Inviters are v, and invitees are i.)

(34) **Family of questions meaning for the QuD in (29a) sorted by *inviters*:**
    { which invitee did v_1 invite?, which invitee did v_2 invite? }
    $\Leftrightarrow$ { { v_1 invited i_1, v_1 invited i_2 }, { v_2 invited i_1, v_2 invited i_2 } }

                                                              (= QuD for 29a)

This QuD matches that of the sluice in (29a), with the agent Wh-remnant (inviters) precedes (and, we assume, is more hierarchically prominent than) the patient Wh-remnant (invitees). However, the switched word order for remnants in

---

[23]Above we illustrated the Family of Questions denotation of multiple Wh-questions using D-linked Wh-phrases with distinct restrictions (i.e., boys and girls). Depending on the higher Wh-phrase in the question, there are consequences for the question's meaning in terms of the sorting key for the question. In Grebenyova's example, however, we are dealing with Wh-pronouns quantifying over humans, so that the NP restriction in question for both Wh-phrases is simply a restriction to humans. Nonetheless, we capitalize on the intuitive notion that humans are sorted in such questions — the higher Wh-phrase in a sentence like "Who invited whom?" is contextually restricted to inviters, and not invitees, allowing us to treat such multiple PL Wh-questions along the same lines as those with D-linked Wh-questions with explicit NP restrictions.

(29b) comes with a different question meaning for the sluiced question, given below in (35). Specifically, this question is sorted by *invitees*, not *inviters*, unlike in (29a). QuD-equivalence approaches therefore correctly rule out sluices like those in (29b) given antecedents like those in (29a).

(35) **Family of questions meaning for the sluice in (29b) sorted by *invitees*:**
   { which inviter invited i_1?, which inviter invited i_2? }
   $\Leftrightarrow$ { { v_1 invited i_1, v_2 invited i_1 }, { v_1 invited i_2, v_2 invited i_2 } }
   (= Q meaning for sluice in (29b), $\neq$ antecedent's QuD in (29a))

Finally, scrambling of the correlates in the antecedent, as in (29c), rearranges their position in the syntactic structure. We assume that such antecedents give rise to distinct QuDs from unscrambled ones, namely, ones where the sorting key corresponds to the scrambled, and hence hierarchically prominent argument. The QuD raised by the scrambled antecedent in (29c), then, is one sorted by invitees, with a meaning equivalent to the one we computed in (35) above. A sluice like that in (29a) is therefore correctly predicted to be unacceptable, since it would have the family of questions meaning in (34). On the other hand, a similarly scrambled, superiority violating sluice, like that in (29b), is predicted to go through, since both the antecedent's QuD and the sluice's meaning are identical.

The QuD-equivalence approach thus captures Grebenyova's paradigm. The interpretation of multiple Wh-questions is sensitive to syntactic hierarchy, which allows semantic identity approaches to achieve empirical coverage of syntactic patterns in multiple sluices in a manner similar to LF/Syntactic identity approaches, but without the pitfalls of LF-identity covered in the preceding section.

3.2.3 Supporting evidence from English

A similar paradigm to the one reported in Russian also exists in English, for those speakers who accept multiple sluicing. Much of the literature on multiple sluicing claims that it is only marginally acceptable in English (Takahashi 1994; Nishigauchi 1998; Hoyt and Teodorescu 2012; Merchant 2001; Takahashi and Lin 2012; Lasnik 2014). The most systematic investigation of the English facts, to our knowledge, is found is Lasnik 2014 (Appendix B), where the results of an informal judgement task experiment are reported, supporting the conclusion that multiple sluicing is a "real phenomenon" in English.

However, Lasnik 2014 reports pooled data, which may obscure interspeaker variation. In our own informal investigations, we have identified two sorts of L1 English speakers: a substantial number of speakers who find multiple sluicing in English unimpeachable (i.e., not just "marginally acceptable," but fully acceptable), alongside others who find it unacceptable to marginal at best.[24] For those speakers who have multiple sluicing as a productive strategy in English, there is a contrast in acceptability between examples like (36a) and (36b), where (36b) is reported as anywhere from mildly degraded to unacceptable in comparison to (36a).

(36) **English multiple sluicing paradigm:**

    a.   Every boy likes some girl, BIDK which boy which girl.

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

Unlike the variety of Russian reported in Grebenyova 2009, English readily allows inverse scope readings of quantified assertions. In (36a), a surface scope reading of the antecedent sets up a discourse where, for each boy, there is some girl he likes. Such a discourse intuitively makes salient a QuD asking for each boy, which girl he likes (a QuD sorted by boys). Such a QuD would have the same meaning as the sluiced multiple Wh-question under its pair-list reading (the relevant reading of the sluice in (36a)). QuD equivalence approaches would therefore capture

---

[24]Another dimension of variation exists amongst speakers who accept multiple sluicing in English, where ⟨DP,DP⟩ remnant pairs are unacceptable to some, and fully acceptable to others, see footnote 18 above. Here, we report judgements for those speakers who accept ⟨DP,DP⟩ multiple sluices. We will not speculate further about the microvariation found in English with respect to the acceptability of (sub-types of) multiple sluicing, surely an interesting area for future investigation.

the acceptability of the sluice in (36a). The family of questions meaning for both the QuD raised by the antecedent in (36a), and the corresponding sluice (with *which boy* hierarchically more prominent than *which girl*), is given below in (37) (assuming a toy model with two boys, b_1 and b_2, and two girls, g_1 and g_2). QuD equivalence approaches therefore capture the acceptability of examples like (36a).

(37) **QuD and sluice meanings in (36a):**
{ which girl does b_1 like?, which girl does b_2 like? }
$\Leftrightarrow \big\{ \{ b_1 \text{ likes } g_1, b_1 \text{ likes } g_2 \}, \{ b_2 \text{ likes } g_1, b_2 \text{ likes } g_2 \} \big\}$

A widest scope existential interpretation for either antecedent in (36) fails to set up a discourse that licenses a PL question (sluiced or unsluiced).[25] Under such an interpretation, both the sluice in (36b) and its unsluiced counterpart *Which boy likes which girl* are ruled out. However, like the surface scope reading of the antecedent in (36a), an inverse scope reading of the antecedent in (36b) sets up a discourse where there are pairs of boys and girls in the *like* relation, so that a PL question should be licensed asking for the identities of the pairings. Indeed, the unsluiced version of the multiple question in (36b) is (perhaps unsurprisingly) acceptable, so that whatever causes difficulties for sluicing in (36b) must be specific to sluicing:

(38) Some boy likes every girl, BIDK which boy likes which girl.
(A PL question asking for boy-girl pairs in the *like* relation.)

QuD-equivalence approaches to identity provide an account of these facts. Consider again how the antecedent in (36a) sets up the discourse, and the nature of the QuD it makes salient. In (36a), under a surface scope reading of the antecedent, we are left with a QuD sorted by boys, as in (37) in our toy model above. On the other hand, under the inverse scope reading of the antecedent in (36b), we are left with a discourse in which, for each girl, there is some boy that likes her, intuitively making salient a QuD asking for each girl, which boy it is that likes her. This is a QuD sorted by girls. The generalization is that the universally quantified correlate in the antecedent contributes the sorting key for the QuD.

---

[25]This would be an inverse scope reading for the antecedent in (36a), where there is some girl that all the boys like, and a surface scope reading for the antecedent in (36b), where there is some boy that likes all the girls.

(39) **QuD meaning in (36b): ($\neq$ sluice meaning in (36a, 36b, 37))**
    { which boy likes g_1?, which boy likes g_2? }
    $\Leftrightarrow \{ \{ b_1 \text{ likes } g_1, b_2 \text{ likes } g_1 \}, \{ b_1 \text{ likes } g_2, b_2 \text{ likes } g_2 \} \}$

Importantly, the sluice is the same in both (36a) and (36b), having the meaning in (37), which is not identical to (39) — the former questions are sorted by boys, and the latter by girls. Consequently, QuD-equivalence approaches correctly rule out multiple sluicing in (36b), while allowing sluicing to go through in (36a).

Additionally, since the identity condition is specific to sluicing, QuD-equivalence approaches correctly leave room for the acceptability of examples like (38) in the absence of sluicing.[26]

The challenges for LF-identity in accounting for the Russian patterns noted in Grebenyova 2009 apply in the case of the English examples in (36) just the same. In order for LF-identity to be met in English, both correlates in (36a) must scope outside of TP, so that variables bound by each correlate are bound from positions parallel to the Wh-remnants in the corresponding sluice. However, this runs afoul of Fox's 1999 Scope Economy constraint against "super-QP." QuD-equivalence approaches, on the other hand, avoid such issues, and capture the English facts just the same as the Russian ones.

LF-identity approaches, like the QuD approach entertained here, also promise to rule out examples like (36b), since the sluicing remnants are hierarchically ordered differently from their correlates in the antecedent's LF. Recall that in order to license a PL question at all in subsequent discourse, the antecedent in (36b) must have an inverse scope interpretation, with *every girl* scoping over *some boy*. The sluicing remnants, however, are hierarchically ordered differently.

It remains, however, puzzling for both the LF-identity approach and the QuD-equivalence approach that, at least for some speakers, the contrast in acceptability between (36a) and (36b) is very subtle. This fact will remain challenging for LF-identity accounts, but in the following section we show how such variation in the intensity of the unacceptability of (36b) finds an explanation in the QuD-equivalence approach.

---

[26]But see §3.2.4 and §3.3 for other conditions affecting the grammaticality of such examples.

3.2.4 (Inverse) Scope and Superiority in Russian and English

As mentioned in the preceding section, some English speakers who accept multiple sluicing find examples like (36b), with an inverse scope reading of the antecedent, degraded to varying degrees in comparison to examples like (36a), with some reporting only a subtle contrast. The QuD-equivalence approach we defend here as it stands does not lead us to expect such variation. If sluicing is only licensed when the sluice and the QuD are identical in meaning, then we should expect examples like (36b) to be categorically unacceptable, since the antecedent's QuD and the sluice have distinct sorting keys.

To account for this pattern, we appeal to accommodation. We assume that the QuD's meaning and the sluiced question's meaning can be manipulated in context in order to achieve semantic identity. We assume this accommodation process is costly, which is behind the more or less degraded status of examples like (36b).
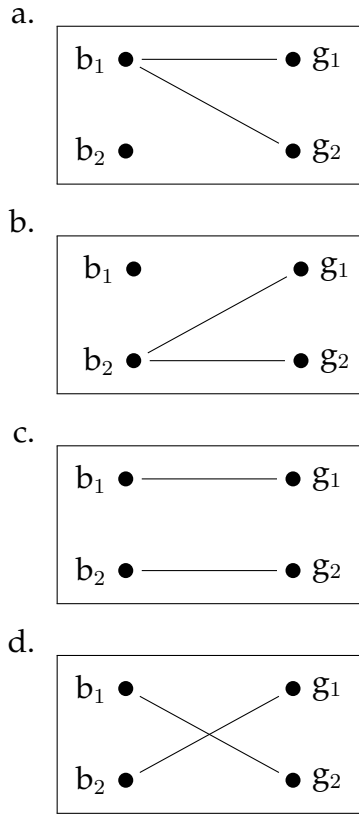
We start by examining examples like (38), repeated below, which is the unsluiced version of (36b), and is perfectly acceptable even to speakers who find sluicing in (36b) strongly unacceptable. Our claim about the QuD that the antecedent in (36b) makes salient is that the universally quantified correlate *every girl* supplies the QuD's sorting key, whereas the sorting key for the multiple Wh-question is supplied by the more prominent Wh-phrase *which boy*. These assumptions raise the question of what sorts of contexts may satisfy the distinct presuppositions of the QuD on the one hand, and the explicit multiple Wh-question on the other.

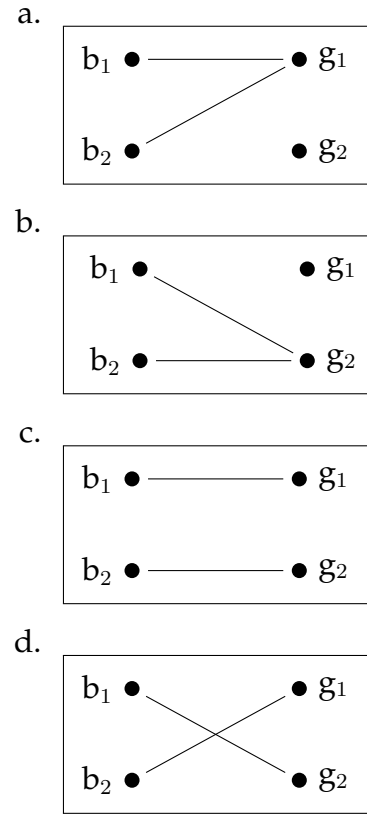(38)   Some boy likes every girl, but I don't know which boy likes which girl.

The QuD presupposes that the set of girls in context is exhaustively mapped injectively into the set of boys. In such a context, there may be boys that are unmapped-to (that is, boys who are not in the *like* relation with any girl).

On the other hand, the explicit multiple question presupposes that the set of boys is exhaustively mapped injectively into the set of girls. In such a context, there may be *girls* that are unmapped-to, (that is, girls who are not in the *like* relation with any boy). The following graphs illustrate the possible contexts that satisfy each question's presuppositions as regards the *like* relation.

(40) **Contexts satisfying QuD's presuppositions in (38):**

a.

b_1 — g_1
b_2 — g_2 (line from b_1 to g_2)

b.

b_1 — g_1
b_2 — g_2 (line from b_2 to g_1)

c.

b_1 — g_1
b_2 — g_2

d.

b_1 — g_1
b_2 — g_2 (crossing lines)

(41) **Contexts satisfying multiple-Q's presuppositions in (38):**

a.

b_1 — g_1
b_2 — g_2 (line from b_2 to g_1)

b.

b_1 — g_1
b_2 — g_2 (line from b_1 to g_2)

c.

b_1 — g_1
b_2 — g_2

d.

b_1 — g_1
b_2 — g_2 (crossing lines)

Only contexts like (c) and (d), in which boys are mapped surjectively onto girls and vice versa (i.e. a bijection), satisfy the presuppositions of both the QuD and the multiple Wh-question. This is unlike cases where the QuD and multiple question are identical, such as in (36a). In (36a), any of the contexts in (41) would satisfy both questions' presuppositions (but not (40a), or (40b)).

Of course, even in contexts like (c) and (d), the QuD's meaning and the multiple Wh-question's meaning (repeated below in (42)) are distinct. Under the QuD-equivalence approach, sluicing should be impossible, predicting perhaps stronger unacceptability for examples like (36b).

(42)   a.   ⟦**which boy likes which girl?**⟧ = $\neq$ **(42b)**
         { which girl does b_1 like?, which girl does b_2 like? }
         $\Leftrightarrow \big\{$ { b_1 likes g_1, b_1 likes g_2 }, { b_2 likes g_1, b_2 likes g_2 } $\big\}$

27

b. $\llbracket \textbf{QuD} \rrbracket =$ $\neq$ **(42a)**

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

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

To account for this, we assume that equivalence may nonetheless be achieved via an accommodation process, predicting that sluicing may go through in examples like (36b), but that this process is costly (militating against full acceptability). We assume accommodation in these cases involves removing from consideration those worlds or situations where the presuppositions of either question are not met. This pruning of worlds from consideration will then have consequences for the alternative propositions in each question's meaning, resulting in equivalence.

To illustrate how this works, we adopt a more fine-grained representation below for propositions, specifically as sets of worlds. We flesh out our toy model with a set of worlds, each instantiating a distinct possible *like* relation. It will be sufficient for our purposes to consider only the worlds or situations we have already entertained in (40) and (41) above, giving us the six possible (sets of) worlds below (w1–w6).[27]

(43)
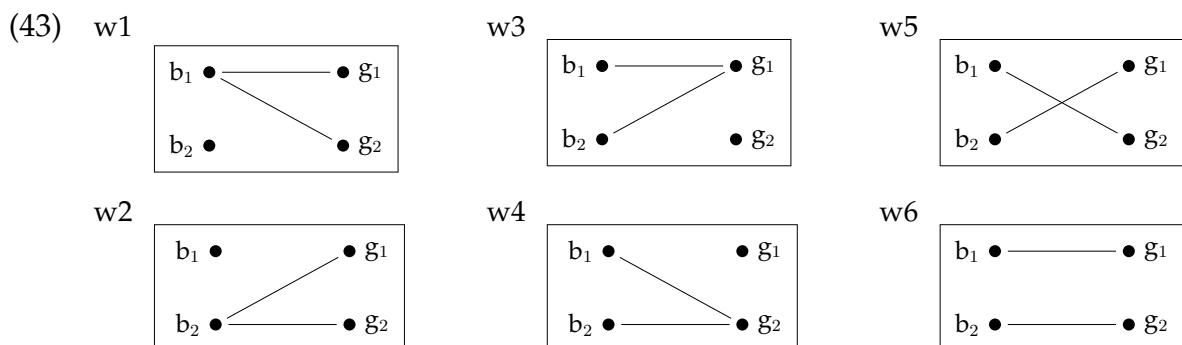
The question meanings in (42) are repeated below, but with propositions represented as distinct sets of worlds on the third line. Accommodation is represented as "pruning" those worlds in which the presuppositions of either question are not met, resulting in the removal worlds 1–4 from consideration, and yielding the sets of alternatives in (45). As the reader can verify, this renders the meanings of the QuD and multiple question identical.

---

[27]We set aside worlds where neither question's presuppositions are met (for instance worlds where the *like* relation is empty, or consists of only one pair). We also leave out imaginable pairings irrelevant to the interpretations of the examples under consideration here (involving e.g., mappings from boys to boys, girls to girls, or of individuals to themselves.)

(44) **Unpruned QuD and multiple question meanings: equivalence not met**

    a. ⟦which boy likes which girl?⟧ = $\neq$ (44b)

       { 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 } }

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

    b. ⟦QuD⟧ = $\neq$ (44a)

       { 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 } }

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

(45) **Pruned QuD and multiple question meanings: equivalence met**

    a. ⟦which boy likes which girl?⟧ =   = (45b)

       { 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 } }

       $\Leftrightarrow$ { { { w6 }, { w5 } }, { { w5 }, { w6 } } }

    b. ⟦QuD⟧ =   = (45a)

       { 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 } }

       $\Leftrightarrow$ { { { w6 }, { w5 } }, { { w5 }, { w6 } } }

In other words, after accommodation/pruning, both the QuD and the multiple Wh-question are reduced to a question about which of the bijective worlds, w5 or w6, instantiates the state of affairs in the actual world. Provided accommodation is successful, QuD-equivalence is satisfied, allowing sluicing to go through in examples like (36b), although with more work than in cases like (36a).[28]

Finally, one might wonder whether the problem with (36b) in English can be fixed by switching the order of remnants. It is possible to violate superiority in multiple Wh-questions with D-linked Wh-phrases in English, as in (46b) (Pesetsky 2000). If this were possible, *which girl* would act as the sorting key for the multiple

---

[28]The availability of this sort of accommodation raises the question why it should not be available for the sorts of data discussed in Grebenyova 2009. We might expect to see variation amongst Russian speakers with respect to the relative unacceptability of examples like (29b) just as we see for examples like (36b) in English. We have nothing to say about this crosslinguistic difference here, though it is possible that further collection of relevant Russian data would uncover just such inter-speaker variation, a possibility we leave aside for future work.

sluice, which would then have the same meaning as the QuD which is keyed on girls in (36b). However, as (46a) shows, superiority may not be violated in multiple sluicing in English.

(46) **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.

There are independent factors preventing superiority violations in English multiple sluicing. In short, superiority violating multiple questions like that in (46b) do not involve the evacuation of both Wh-phrases from TP (Pesetsky 2000). Instead, only the object moves to Spec,CP, over the subject, which remains in Spec,TP. As a result, *which boy* is trapped inside the ellipsis site, and is predicted to be elided along with TP. In other words, there is no possible derivation that can yield the sentence in (46a). See Abels and Dayal 2016 for recent discussion of superiority violations in English multiple sluicing.

3.3　How QuDs are computed

Above, we appealed to intuitions about the QuDs that antecedents raise based on their contribution to the discourse. In (36a), the antecedent sets up a discourse where for each boy, there is some girl he likes, raising a QuD asking which *girl* that is, whereas in (36b), the antecedent sets up a discourse where for each girl, there is some boy that likes her, raising a QuD asking which *boy* that is. However, an important question we must now address is where our intuitions about this particular characterization of the antecedent's meaning, and the corresponding QuD it raises, come from. We will see that the implicatures of the antecedent play a crucial role in determining the QuD.

Consider the following puzzle: both of the antecedents in (36) may be true in a context where the uniqueness presupposition of the QuD that is needed in order to license sluicing is not met. For concreteness, take the antecedent in (36a), *every boy likes some girl*. This sentence may be true in a context where one or more of the boys likes more than one girl, including, for example, the context in (47a). This context

entails the antecedent in (47b), but nonetheless the sluiced continuation in (47b) is unacceptable in that context. (Our native Russian speaking consultants report the same intuition in Russian.)

(47)   **Antecedent of (36a) true without Uniqueness (sluicing unacceptable):**
   a.   Context: Every boy likes two girls.
   b.   # Every boy likes some girl, ʙɪᴅᴋ which boy which girl.

Crucially, the sluiced question's uniqueness presupposition requires that for every boy, there is exactly one girl that he likes. However, the context in (47a) explicitly contradicts this presupposition, thus blocking the QuD *which boy likes which girl?* from being accessible for licensing the sluiced continuation in (47b). Note that this context *does* allow multiple sluicing—as well as a non-sluiced continuation—but only when each boy is mapped to a *group* of two girls:

(48)   **Grammatical multiple sluicing based on (47a):**
   a.   Every boy likes two girls, ʙɪᴅᴋ which boy (likes) which (two) girls.
   b.   Každyj malčik ljubit dvuh devoček, no ja ne znaju kakoj malčik
        Every boy   likes two   girls   but I   not know which boy
        kakih (dvuh) devoček
        which (two)   girls

Similar considerations also apply to the antecedent in (36b). This antecedent, *Some boy likes every girl*, may be true in a context where for each girl, there is *exactly* one boy that likes her. But it may also be true when more than one boy likes a given girl. Nonetheless, the intuitive QuD for the antecedent in (36b) is *for each girl, which boy likes her?*, requiring a context where exactly one boy likes each girl.

The question, therefore, is how to ensure that the right QuD is raised by the antecedent, and how to prevent the wrong QuD from being raised. In order to answer this question, we will appeal below to the calculation of scalar implicatures.

Consider first the antecedent *Every boy likes some girl* for the sluice in (36a). We propose that the singular *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, as we illustrated in (33) above, licenses the sluice in (36a). For concreteness, we might assume

that this strengthened meaning is the result of a silent ᴇxʜ operator which operates on the antecedent (Groenendijk and Stokhof, 1984; Sauerland, 2001; Spector, 2007; Fox, 2007, 2009; Chierchia et al., 2012, a.o.), although nothing hinges on this assumption.[29] If this exhaustification process is obligatory whenever possible, this would block potential QuDs such as *Which boy likes which girls?* from being accessible.

Indeed, as is predicted from this proposal, the example below with a sluice that would be licensed by such a QuD is unacceptable.

(49)   **Unacceptable sluice with a non-exhaustified QuD:**

   a.   * Every boy likes some girl, ʙɪᴅᴋ which boy which girl or which girls.

   b.   * Every boy likes some girl, ʙɪᴅᴋ which boy which girls.

   c.   * Každyj malčik ljubit kakuju-to devočku, no ja ne znaju kakoj
        Every boy   likes some   girl,   but I not know which
        malčik kakuju devočku ili kakih devoček.
        boy   which girl   or which girls

   d.   * Každyj malčik ljubit kakuju-to devočku, no ja ne znaju kakoj
        Every boy   likes some   girl,   but I not know which
        malčik kakih devoček
        boy   which girls

Similar considerations would lead us to propose that the context in (47), *Every boy likes two girls*, gives rise to an implicature *Every boy likes exactly two girls*. This, in turn, blocks QuDs like *Which boy likes which girl?*, which presupposes that each boy likes exactly one girl, explaining the unacceptability of (47b). Instead, the QuD raised by this antecedent is *Which boy likes which two girls?*, licensing the sluicing we observed in (48).[30]

It is also possible to explicitly suspend the implicature not using context, as we have done in (47), but by changing the antecedent to block exhaustification. In such cases, as we would expect, a sluiced continuation that is based on an exhaustified QuD is unacceptable.

---

[29]Alternatively, the implicature may be calculated via appeal to (neo-)Gricean reasoning.

[30]Note that in the sluiced part of (48), "two" is optional. This appears to follow from a general preference of many speakers to avoid repetition and redundancy in sluicing when possible.

(50) **Non-exhaustified antecedent unacceptable with multiple sluice:**

    a.   * Every boy likes one or more girls, ʙɪᴅᴋ which boy which girl.

    b.   * Kazhdyj malčik ljubit odnu ili bolše devoček, no ja ne znaju kakoj
         Every   boy   likes one   or more girls   but I not know which
         malčik kakuju devočku.
         boy   which girl

Importantly, exhaustification of the antecedent must be possible independently of sluicing in order to satisfy the uniqueness presupposition of the multiple question. Examples such as (36a) are also acceptable in the absence of sluicing but only in a context in which every boy likes *exactly one* girl. In a context in which it is explicitly known that some boys may like more than one girl, the antecedent cannot be interpreted exhaustively and the presuppositions of the multiple question cannot be met.

(51) **Scalar implicature also calculated in the absence of sluicing:**
Every boy likes some girl, ʙɪᴅᴋ which boy likes which girl.
<u>Felicitous</u> in a context in which each boy likes exactly one girl.
<u>Infelicitous</u> in a context in which some boys like more than one girl.

To summarize, we argue that both the semantics *and* the pragmatic implicatures of the antecedent are important for the purposes of determining the QuD that the antecedent makes salient, and for determining QuD-equivalence in ellipsis licensing. Within the QuD-equivalence approach to sluicing that we are pursuing here, QuDs are crucially computed after the antecedent's contribution to the common ground of the discourse has been computed—taking into consideration any (scalar) implicatures that the antecedent gives rise to. Antecedents that set up discourses that fail to satisfy the presuppositions of the multiple question lead to infelicity. However, the sluicing cases carry an extra requirement that is not imposed on non-elliptical sentences—that the sluice be identical to a QuD raised by an antecedent. As we have shown, this explains the English and Russian patterns discussed above. It is unclear how an LF-identity approach may countenance these facts.

4 Conclusion

We have shown that antecedents with quantified correlates raise many challenges for syntactic/LF-identity approaches. The mechanism of Super-QR was entertained as a possible solution, but ran into various issues as discussed in §2, including the lack of any independent motivation for such an operation. Additionally, Super-QR would run afoul of Fox's (1999) Scope Economy, incorrectly predicting that QR may be motivated solely to satisfy LF-parallelism for ellipsis licensing.[31]

As regards semantic approaches, we have shown that Merchant's (2001) influential Focus Condition on Ellipsis is unable to account for the data we have been occupied with in this paper. In particular, this condition undergenerates in that it does not predict any PL sluices with quantified antecedents to be possible. These results add to existing arguments in the literature that show that Merchant's FCE also overgenerates certain cases. As a result, we argued that a characterization of the semantic identity condition on sluicing in terms of truth conditional mutual entailment is untenable.

Instead, we argued in favor of QuD-equivalence approaches, under which the sluiced question must be equivalent to a QuD raised by the antecedent, in line with other recent work on sluicing (cf. AnderBois, 2014; Barros, 2014; Weir, 2014). However, we have shown that additional assumptions must be in set in place in order to correctly predict the data patterns discussed above.

QuDs cannot be computed based on the truth-conditional content of the antecedents alone. Instead, the QuD must be computed at a stage at which (scalar) implicatures have already been calculated and added to the common ground. Likewise, the context of utterance must also be taken into account. This is in line with Roberts' 1996/2012 intended understanding of QuDs as semantico-pragmatic objects, shaped by e.g., speaker intentions/non-linguistic goals, world knowledge, the common ground and context set at the time of utterance, etc. We leave open a more

---

[31]It is worth noting that our results here do not argue against hybrid identity approaches that adopt QuD-equivalence alongside a sufficiently "limited" syntactic identity condition. (See Chung 2013; Barros 2014; Lipták 2015 for discussion of how this might be achieved, and AnderBois 2011; Weir 2014 for specific implementations.) Such proposals have the benefit of not requiring wholesale syntactic or LF identity between elided phrase markers and their antecedents, avoiding many of the pitfalls we discuss for such approaches here.

precise formulation of how QuDs should be calculated for future work.[32]

References

Abels, Klaus, and Veneeta Dayal. 2016. On the syntax of multiple sluicing. Paper presented at NELS 47, UMass Amherst.

Agüero-Bautista, Calixto. 2007. Diagnosing cyclicity in sluicing. *Linguistic Inquiry* 38:413–443.

AnderBois, Scott. 2011. Issues and alternatives. Doctoral Dissertation, UC Santa Cruz.

AnderBois, Scott. 2014. The semantics of sluicing: Beyond truth conditions. *Language* 90:887—926.

Antonyuk, Svitlana. 2015. Quantifier scope and scope freezing in Russian. Doctoral Dissertation, Stony Brook University.

Bailyn, Frederick. 2012. *The syntax of Russian*. Cambridge Syntax Guides. Cambridge.

Barker, Chris. 2014. Scopability and sluicing. *Linguistics and Philosophy* 36:187—223.

Barros, Matthew. 2014. Sluicing and identity in ellipsis. Doctoral Dissertation, Rutgers University.

Bošković, Željko. 1998. Multiple wh-fronting and economy of derivation. In *Proceedings of West Coast Conference on Formal Linguistics 16*. Stanford, CA: Stanford University.

Büring, Daniel. 2003. On D-Trees, Beans, and B-Accents. *Linguistics and Philosophy* 26:511–545.

Chierchia, Gennaro, Danny Fox, and Benjamin Spector. 2012. The grammatical view of scalar implicatures and the relationship between semantics and pragmatics. In *Semantics: An International Handbook of Natural Language Meaning*, ed. Claudia Maienborn, Klaus von Heusinger, and Paul Portner, volume 3, 2297–2332. Berlin: Mouton de Gruyter.

---

[32]We note, however, that our findings cast doubt on the feasibility of mechanical algorithms for the calculation of QuDs such as the ones proposed in Büring 2003 or Barros 2014. These findings also cast doubt on the inquisitive semantics approach in AnderBois 2014, all else being equal. All these approaches fail to predict that any multiply quantified statement should license a PL multiple sluice.

Chung, Sandra. 2006. Sluicing and the lexicon: The point of no return. In *BLS 31: general session and parasession on prosodic variation and change*, ed. Cover and Kim, 73–91.

Chung, Sandra. 2013. Syntactic identity in sluicing: How much and why. *Linguistic Inquiry* 44:1–44.

Chung, Sandra, William Ladusaw, and James McCloskey. 1995. Sluicing and logical form. *Natural Language Semantics* 3:239–282.

Comorovski, Ileana. 1989. Discourse and the syntax of multiple constituent questions. Doctoral Dissertation, Cornell University.

Culicover, Peter, and Ray Jackendoff. 2005. *Simpler syntax*. Oxford: Oxford University Press.

Dayal, Veneeta. 1996. *Locality in wh quantification: Questions and relative clauses in hindi*. Kluwer Academic Publishers.

Dayal, Veneeta. 2002. Sinle-pair vs. multiple pair answers: Wh-in-situ and scope. *Linguistic Inquiry* 33:512—520.

Fiengo, Robert, and Robert May. 1994. *Indices and identity*. Cambridge, Massachusetts: MIT Press.

Fox, Daniel. 1998. Economy and semantic interpretation - a study of scope and variable binding. Doctoral Dissertation, Massachusetts Institute of Technology.

Fox, Danny. 1995. Economy and scope. *Natural Language Semantics* 3:283–341.

Fox, Danny. 1999. Focus, parallelism and accommodation. In *Proceedings of SALT 9*, ed. Tanya Matthews and Devon Strolovitch, 70–90. Ithaca, NY: Cornell University: CLC Publications.

Fox, Danny. 2002. Antecedent contained deletion and the copy theory of movement. *Linguistic Inquiry* 33:63–96.

Fox, Danny. 2007. Free choice disjunction and the theory of scalar implicatures. In *Presupposition and implicature in compositional semantics*, ed. Uli Sauerland and Penka Stateva, 71–120. Palgrave Macmillan.

Fox, Danny. 2009. Too many alternatives: Density, symmetry, and other predicaments. In *Proceedings of Semantics and Linguistic Theory 17*, ed. Tova Friedman and Edward Gibson, 89–111. Ithaca, NY: Cornell Linguistics Circle.

Fox, Danny. 2012. More on questions. Class notes, MIT seminar.

Fox, Danny, and Howard Lasnik. 2003. Successive cyclic movement and island repair: the difference between sluicing and VP-ellipsis. *Linguistic Inquiry* 34:143–154.

Friedmann, Naama, Adriana Belletti, and Luigi Rizzi. 2009. Relativized relatives: types of intervention in the acquisition of A-bar dependencies. *Lingua* 119:67–88.

Garraffa, M., and Nino Grillo. 2008. Canonicity effects as grammatical phenomena. *Journal of Neurolinguistics* 21:177–197.

Ginzburg, Jonathan, and Ivan Sag. 2000. *Interrogative investigations: The form, meaning and use of english interrogatives*. CLSI publications.

Grebenyova, Lydia. 2009. Sluicing and multiple wh-fronting. In *Proceedings of GLOW in Asia 5*, ed. Nguyen Chi Duy Khuong and Richa Samar Sinha, 219–242. New Delhi: Central Institute of Indian Languages.

Griffiths, James, and Anikó Lipták. 2014. Contrast and island sensitivity in fragments. *Syntax* 17:189—234.

Grillo, Nino. 2008. Generalized minimality. Doctoral Dissertation, Institute of Linguistics OTS, Utrecht.

Groenendijk, Jeroen, and Martin Stokhof. 1984. Studies on the semantics of questions and the pragmatics of answers. Doctoral Dissertation, University of Amsterdam.

Hamblin, C. L. 1973. Questions in montague english. *Foundations of Language* 10:41–53.

Hankamer, Jorge, and Ivan Sag. 1976. Deep and surface anaphora. *Linguistic Inquiry* 7:391–428.

Hartman, Jeremy. 2009. When e-GIVENness over-predicts identity. Handout presented at the Fourth Brussels Conference on Generative Linguistics (BCGL 4), Ellipsis Workshop. Hogeschool-Universiteit Brussel.

Heim, Irene, and Angelika Kratzer. 1998. *Semantics in Generative Grammar*. Blackwell Publishing.

Hoyt, Frederick, and Alexandra Teodorescu. 2012. How many kinds of sluicing and why? single and multiple sluicing in Romanian, English, and Japanese. In *Sluicing: crosslinguistic perspectives*, ed. Jason Merchant and Andrew Simpson, 83—103. Oxford: Oxford University Press.

Ionin, Tania, and Tatiana Luchkina. 2015. One reading for every word order: Revisiting russian scope. In *Proceedings of the 32nd West Coast Conference on Formal Linguistics*, 21–30. Somerville, MA: Cascadilla Proceedings Project.

Jacobson, Pauline. 2016. The short answer: Implications for direct compositionality. *Language* 92:331—375.

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

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

Kratzer, Angelika. 1998. Scope or pseudoscope? are there wide scope indefinites? In *Events in grammar*, 163–196. Kluwer.

Lasnik, Howard. 2014. Multiple sluicing in English? *Syntax* 17:1–20.

Lipták, Anikó. 2015. Identity in ellipsis: An introduction. *Lingua* 166:155–171.

Lobeck, Anne. 1995. *Ellipsis: Functional heads, licensing and identification*. New York: Oxford University Press.

Merchant, Jason. 2001. *The syntax of silence: Sluicing, islands, and the theory of ellipsis*. Oxford: Oxford University Press.

Merchant, Jason. 2004. Fragments and ellipsis. *Linguistics and Philosophy* 27:661—738.

Merchant, Jason. 2010. Three kinds of ellipsis. In *Context-dependence, perspective, and relativity*, ed. Francois Recanati, 141—192. Berlin: Walter de Gruyter.

Messick, Troy, and Gary Thoms. 2016. Ellipsis, economy and the (non)uniformity of traces. *Linguistic Inquiry* 47:306–332.

Nicolae, Andreea. 2013. Any questions? Doctoral Dissertation, Harvard.

Nishigauchi, Taisuke. 1998. Multiple sluicing in japanese and the functional nature of wh-phrases. *Journal of East Asian Linguistics* 7:121—152.

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

Reinhart, Tanya. 1997. Quantifer-scope: How labor is divided between qr and choice functions. *Linguistics and Philosophy* 20:335–397.

Richards, Norvin. 1997a. In full pursuit of the unspeakable. In *Proceedings of NELS 28*. GLS Publications.

Richards, Norvin. 1997b. What moves where when in which language? Doctoral

Dissertation, MIT.

Rizzi, Luigi. 1997. The fine structure of the left periphery. In *Elements of grammar*, ed. L. Haegeman, 281–337. Kluwer.

Roberts, Craige. 1996. *Information structure: Towards an integrated theory of formal pragmatics*, volume 49 of *OSU Working Papers in Linguistics*. OSU: The Ohio State University Department of Linguistics.

Roberts, Craige. 2012. Information structure in discourse: towards an integrated formal theory of pragmatics. *Semantics and Pragmatics* 5:1–69.

Rodrigues, Cilene, Andrew Nevins, and Luis Vicente. 2009. Cleaving the interactions between sluicing and preposition stranding. In *Romance languages and linguistic theory*, ed. L Wetzels and J. van der Weijer, 175–198. John Benjamins.

Romero, Maribel. 1998. Focus and reconstruction effects in wh-phrases. Doctoral Dissertation, University of Massachusetts Amherst.

Rooth, Mats. 1992a. Ellipsis redundancy and reduction redundancy. In *Proceedings of the Stuttgart ellipsis workshop, Arbeitspapiere des Sonderforschungsbereichs 340*, ed. S. Berman and A. Hestvik.

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

Ross, John. 1969. Guess who? In *Papers from the 5th regional meeting of the Chicago Linguistic Society*, ed. R. Binnick, A. Davison, G. Green, and J. Morgan, 252–286. Chicago: Chicago Linguistic Society.

Rudin, Catherine. 1988. On multiple questions and multiple wh-fronting. *Natural Language and Linguistic Theory* 6:445–501.

Sauerland, Uli. 2001. On the computation of conversational implicatures. In *Proceedings of SALT 11*, ed. Rachel Hastings, Brendan Jackson, and Zsofia Zvolenszky, 388–403. Ithaca, NY: Cornell Linguistics Circle.

Schwarzschild, Roger. 1999. GIVENness, AvoidF, and other constraints on the placement of accent. *Natural Language Semantics* 7:141–177.

Scott, Tatiana. 2012. Whoever doesn't HOP must be superior: The Russian left periphery and the emergence of superiority. Doctoral Dissertation, Stony Brook University.

Spector, Benjamin. 2007. Aspects of the pragmatics of plural morphology: On

higher-order implicatures. In *Presupposition and implicature in compositional semantics*, ed. Uli Sauerland and Penka Stateva, 243–281. Palgrave Macmillan.

Stepanov, Arthur. 1998. On wh-fronting in Russian. In *Proceedings of the 30ᵗʰ Meeting of the North Eastern Linguistic Society*.

Stjepanović, Sandra. 2003. Multiple wh-fronting in serbo-croatian matrix questions and the matrix sluicing construction. In *Multiple wh-fronting*, ed. Cedric Boeckx and Kleanthes Grohmann. Amsterdam: John Benjamins.

Takahashi, Daiko. 1994. Sluicing in Japanese. *Journal of East Asian Linguistics* 3:265–300.

Takahashi, Daiko, and Sichao Lin. 2012. Two notes on multiple sluicing in Chinese and Japanese. *Nanzan Linguistics* 8:128—145.

Takahashi, Shoichi, and Danny Fox. 2005. MaxElide and the re-binding problem. In *Proceedings of SALT 15*, ed. Effi Georgala and Jonathan Howell, 223–240.

Takahashi, Shoichi, and Sarah Hulsey. 2009. Wholesale late merger: Beyond the A/A′ distinction. *Linguistic Inquiry* 40:387–426.

Tancredi, Christopher. 1992. Deletion, deaccenting, and presupposition. Doctoral Dissertation, MIT, Cambridge, MA.

Thoms, Gary. 2015. Lexical mismatches in ellipsis and the identity condition. *Lingua* 166:260–293.

Vicente, Luis. 2014. Sluicing and its subtypes. Ms. University of Potsdam.

Weir, Andrew. 2014. Fragments and clausal ellipsis. Doctoral Dissertation, University of Massachusetts Amherst.

Wurmbrand, Susi. 2017. The cost of raising quantifiers. Manuscript.