

Ellipsis and the Question under Discussion: evidence from sluicing with nominal antecedents

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What is sluicing?

Definition: Sluicing is a form of **ellipsis** that targets **clauses** under interrogative wh-phrases.



- (2) Whenever there is a murder, the police will try to find out...
a. ...who did it.
b. # ...who.

Terminology:

- **Antecedent:** the linguistic constituent, canonically a clause, that provides the meaning of the elided material
- **Sluice:** a question with an elided clause that nonetheless receives a full question meaning
- **Elided material:** the part of the sluice meaning that is not expressed overtly

The big question: Under what conditions is sluicing acceptable?

IDENTITY theories of sluicing

(Merchant, 2001; Chung, 2006; 2013; Merchant, 2013; Rudin, 2018)

Central claim: Sluicing is acceptable only if the elided material is **identical** to some antecedent constituent in the linguistic context.

Identity theories predict (1) and (2):

- (1) is acceptable: elided material **identical** to antecedent clause.
- (2b) is unacceptable: elided material **not identical** to antecedent.

QUD theories of sluicing

(AnderBois, 2014; Barros, 2014)

Central claim: Sluicing is acceptable only if the sluice denotes a **Question under Discussion (QUD)** that is salient in the context.

Inquisitive Semantics approach to 'QUD availability':

- QUDs are made salient by "inquisitive elements" (existential quantifiers, indefinites, disjunctions, or conditionals) in the antecedent clause.
- In the absence of inquisitive elements, as in (1), the theory relies on "issue bridging" whereby a suitable QUD is inferred.

Roberts (1996/2012) approach to 'QUD availability':

- QUDs are inferred based on both **top-down** context constraints and **bottom-up** information from the target utterance.
- Bottom-up cues are reasonably well understood; top-down constraints remain largely mysterious.

Our approach: measure 'QUD availability' experimentally (Expt 2)

Strategy: 2 experiments

Test case: sluices with nominal antecedents

- (3) The only thing I can come up with is contamination, but I do not know what from. (Beecher, 2007)
- Antecedent NP: contamination

IDENTITY theories: Sluices with nominal antecedents are **categorically ungrammatical**.
QUD theories: Acceptability should track **QUD availability**

Expt 1: measure **acceptability** of 30 nominal-antecedent sluices.
Expt 2: measure **QUD availability** and test if it explains acceptability

Experiment 1

Goal: Test acceptability of sluices with **nominal antecedents**.

Stimuli: **30 sluices** with nominal antecedents, like the following:

- A: I can't see your parents in the audience. Did you not tell them about your performance today?
B: I did, but I forgot to tell them {when|where|what about|how long|why}.

Item protocol:

1. Engineer contexts to maximize acceptability of one case.
2. Generate 4 additional sluices in the same context by substituting different wh-phrases.
3. Cross contexts with sluices to generate **30 unique items**.

Design and participants: 63 native English Mechanical Turk users rated 6 experimental items (1 per context) along with 12 (un)acceptable fillers.

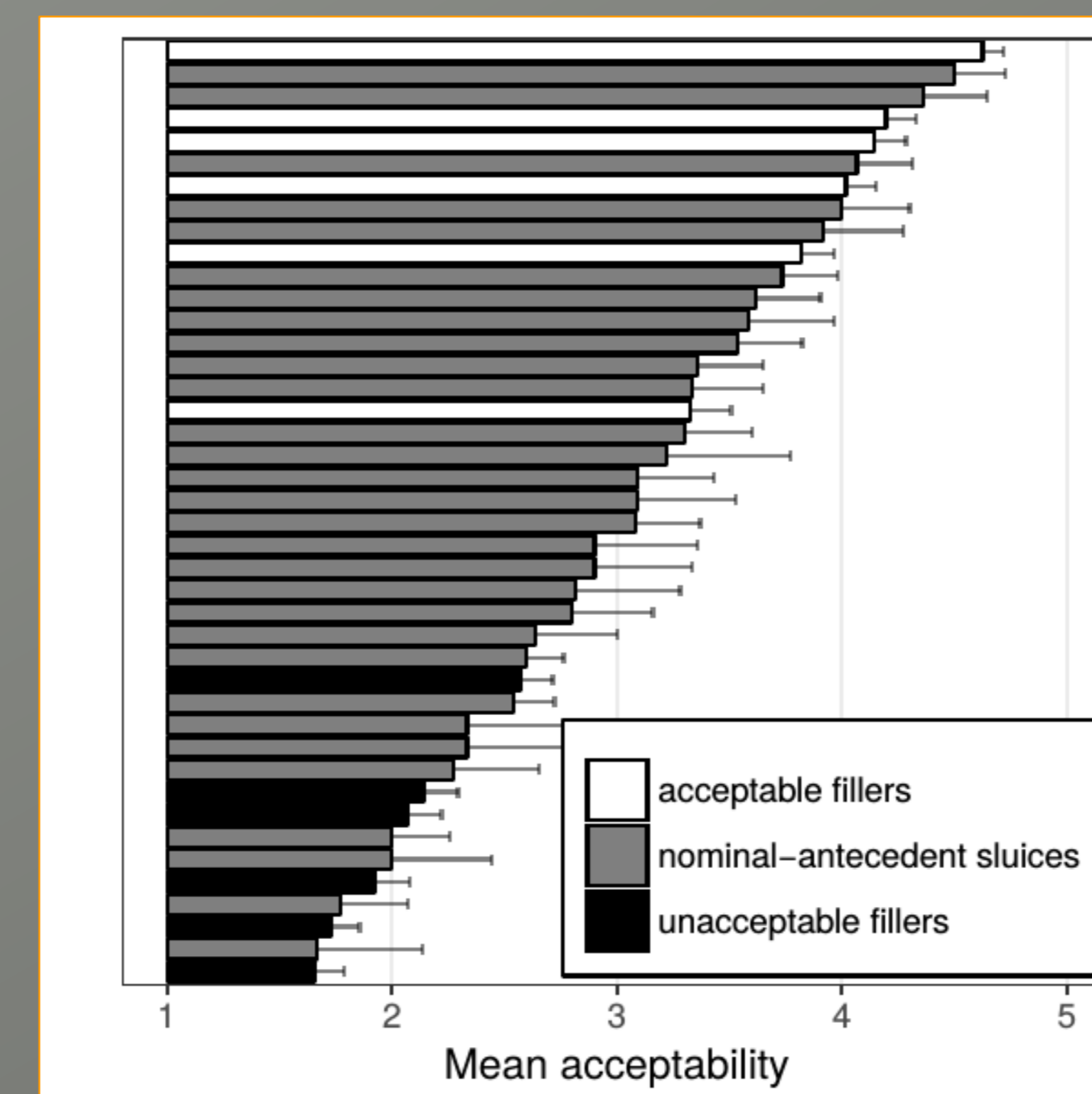


Figure 1. Acceptability (x) of nominal-antecedent sluices (gray) along with acceptable (white) and unacceptable (black) fillers. Each bar represents a single item.

Filler items:

We included 12 (un)acceptable fillers (2:1 ratio), sampled from the literature and exemplified below:

- Acceptable: Mr. Henderson ate either a hamburger or a hotdog, but I don't know which one.
Unacceptable: The boy was visibly happy, but it wasn't clear what.

Experiment 2

Goal: Estimate QUD availability for items from Expt 1.

Strategy: Present participants with the full contexts of the sluices from Expt 1 and ask them to predict the upcoming embedded question.

Stimuli:

- A: I can't see your parents in the audience. Did you not tell them about your performance today?
B: I did, but I forgot to tell them...
...when it was going to start.
...where I was performing.
...what it was about.
...how long it would last.
...why they should be in the audience.

The meaning of sluices is based on naive participants' paraphrases provided in a separate experiment.

Task: Forced-choice passage continuation ("select the continuation that appears most likely to you")

Results: The result of this forced-choice passage completion task is a (proper) probability distribution over continuations (questions) given contexts. These probabilities indicate the (relative) predictability of each sluice meaning given its context.

Some nominal-antecedent sluices are impeccable. Many of them pattern with acceptable fillers (white bars), all of which are cases the literature treats as "grammatical."

Some nominal-antecedent sluices are terrible. Many of them pattern with unacceptable fillers, i.e. cases that the literature agrees are "ungrammatical."

Highly variable: As a group, nominal-antecedent sluices span the entire range of possible acceptability ratings.

QUD availability explains acceptability. QUD availability explains some of the variance in acceptability, whereby more predictable questions are more acceptable when sluiced.

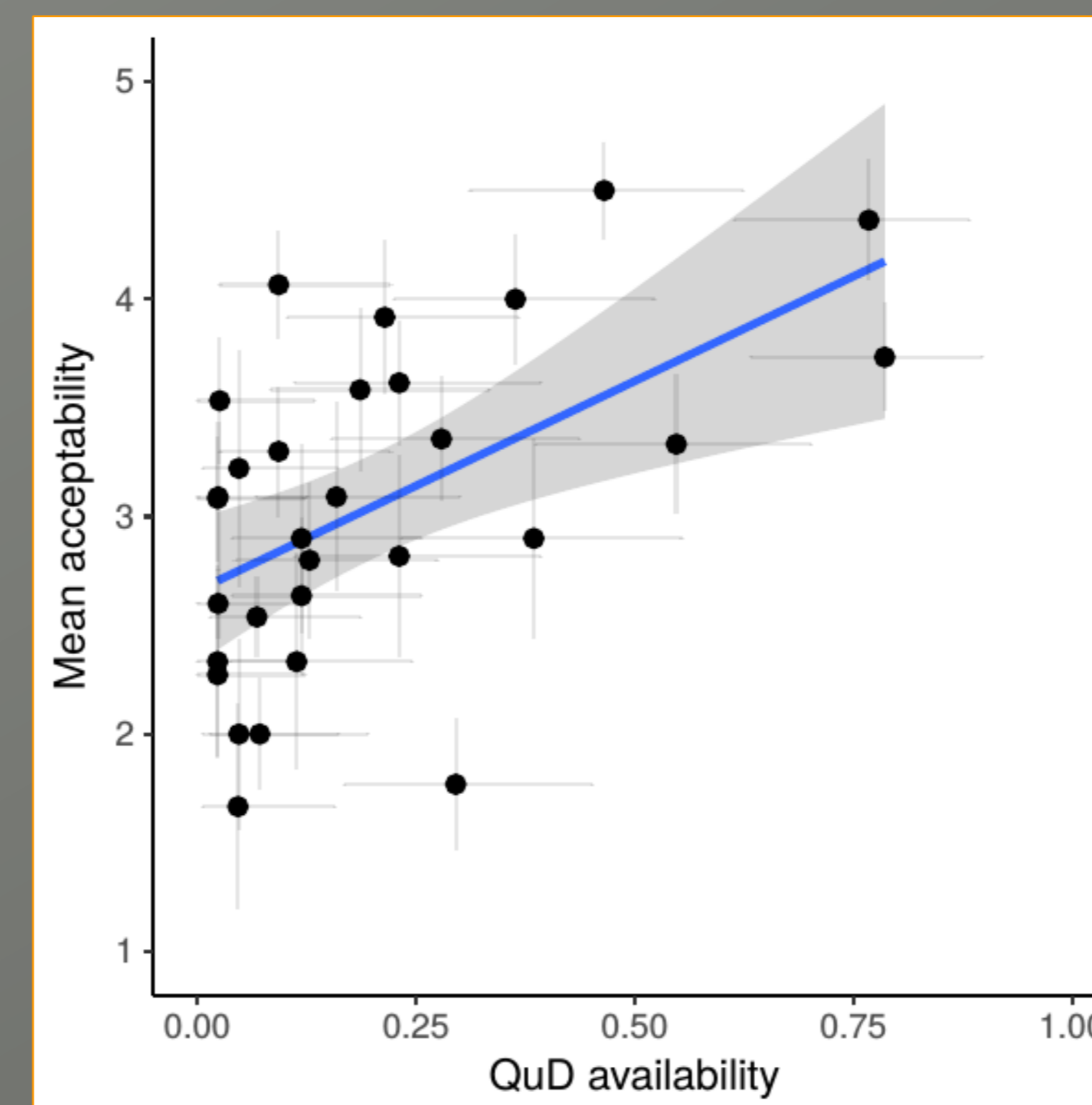


Figure 2. Acceptability (y) as a function of item-by-item 'QUD availability' measured in Expt 2 (x). Acceptability of sluicing significantly increases as a function of QUD availability ($\beta = 1.826, p = 0.037$).

Conclusion

We set out to compare to classes of theories of sluicing: those that require **identity** between elided material and its antecedent; and those that require the sluiced question to be a salient **QUD**.

Our results **favor QUD theories** over Identity theories:

- 1) We found a tremendous amount of **variability** in the acceptability of sluices with nominal antecedents, with some cases achieving **peak acceptability** (Expt 1).
- 2) Some (but not all) of the variance in acceptability can be explained in terms of '**QUD availability**' (Expt 2).

Is a salient QUD sufficient?

Unlikely:

- 1) Our experimental measure of QUD availability explains *some* of the variance in acceptability, but a lot of residual variance remains unexplained (see Figure 2).
- 2) There are well-known cases of unacceptable sluicing that are challenging for QUD-only models, like (4):

- (4) a. Joe was murdered but we don't know by who(m).
b. Joe was murdered by someone but we don't know who.
c. # Joe was murdered but we don't know who.

Chung (2006) captures this pattern in her **No New Words constraint** that aligns well with Identity theories and has since been adopted even by QUD theorists (AnderBois, 2014). However, that generalization runs into trouble elsewhere, including the nominal-antecedent sluices we examined here, which involve numerous "New Words."

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Acknowledgements

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