# Sluicing and the Inquisitive Potential of Appositives

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**Abstract**

This paper investigates experimentally the generalizations made in AnderBois (2010, 2011, 2014) that a sluice may never take an appositive clause as its antecedent. We find that experimental participants rated sentences with sluice-antecedents in appositives as acceptable. We highlight two factors which influence the acceptability of appositive antecedents for sluices: whether the indefinite NP antecedent and the stranded *wh*-item include descriptive content (e.g., *a man*, *which man*), and whether the appositive clause engages with an issue raised in the preceding context. We argue that AnderBois's claim that appositive clauses are conventionally unable to antecede sluices is too restrictive and suggest that any theory of sluicing must allow appositive clauses to antecede sluices.

**Keywords:** ellipsis, sluicing, appositives, Inquisitive Semantics, experimental pragmatics

# 1 Introduction

On the basis of experimental data, this paper investigates the extent to which non-restrictive relative clauses (or appositive clauses) are able to license sluicing. We find that experimental participants allow sluices to take appositive clauses as antecedents contra the generalizations made by AnderBois (2010, 2011, 2014).

On the basis of these findings, we question AnderBois's arguments concerning the semantics of appositives. Under AnderBois's view, framed within the Inquisitive Semantics (IS) framework (Groenendijk and Roelofsen 2009, *inter alia*), a sentence may antecede a sluice only if it denotes a proposition which raises *issues* into the discourse context (in IS terminology: an inquisitive proposition). In IS, a proposition is inquisitive if it presents conversational participants with a choice between multiple alternative updates to their shared information state. As appositives are putatively unable to antecede sluices, AnderBois concludes that they conventionally denote non-inquisitive propositions. As we find that appositives are often able to antecede sluices, we argue that imposing a conventional rule limiting the inquisitive potential of appositive content is unwarranted.

The initial data-point under discussion comes from AnderBois (2010), who states that appositive clauses make bad antecedents for sluiced clauses. AnderBois gives the example and judgement in (1a), contrasted with a putatively acceptable example without an appositive clause in (1b).

(1) (a) #*Joe, who once killed a man in cold blood, doesn't even remember who.*

(b) *Joe once killed a man in cold blood and he doesn't even remember who.*

Under AnderBois's theory of sluicing, the sentential component of an interrogative clause is deleted if its semantic content matches a question currently active in the discourse. The contrast between (1a) and (1b) motivates AnderBois's definition of a conventional rule of interpretation for appositives. His rule has the effect of removing the potential of the appositive clause to raise a question into the discourse context and thereby removes its potential to antecede a sluice.

We ran an experiment testing the judgement in (1a) and found that participants did accept sluices which took an appositive clause as their antecedent. We further show results suggesting that a number of factors influence the acceptability of appositive antecedents to sluices. Firstly, our results suggest that where the indefinite NP antecedent (the correlate) and the stranded *wh*-item (the remnant) are both contentful (both contain lexical NPs), participants are more likely to accept sluices taking appositives as antecedents. Secondly, our results suggest that participants are more likely to accept sluices taking appositives as antecedents if the appositive engages with the preceding context. (2) provides an example which experimental participants rate as acceptable.

(2) **Context:** *Many confidential documents have gone missing.*
**Stimulus:** *My assistant, who was accused of losing an important paper, can't figure out which paper.*

We therefore argue that AnderBois's generalization that appositives are conventionally unable to antecede sluices is too strong. We suggest that if we assume that sluicing is a reliable diagnostic for determining whether a linguistic expression raises issues into the discourse context, appositive clauses must have the potential to raise such issues. We also make the general observation that any study concerning the grammaticality judgements of sentences containing sluices must reliably control for the lexical content of the correlate and remnant.

The structure of the paper is as follows. In Section 2, we outline contemporary approaches to sluicing including those which assume that sluices take their antecedent from a currently active issue (or question under discussion) in the discourse. In Section 3, we introduce contemporary theories of appositive content, specifically noting where they differ in their characterization of the issue-raising potential of appositive clauses. Section 4 describes our experiment and the results, showing that participants were willing to rate sentences where appositives antecede a sluice as acceptable. We discuss these results and how they bear on theories of appositive content. We suggest that the semantics of appositives must not conventionally block the appositive from raising issues into the discourse context. Section 5 concludes.

# 2 Sluicing and issues

Sluicing is a variety of ellipsis in which the sentential component of an interrogative clause is silent, stranding a *wh*-item (Ross 1969).

(3) (a) *At times it would appear that she is embracing somebody but it is never clear* ***who***.
(P. Whitehead, *Incomplete Projects: "Dora," Film Treatment*, 2011)

(b) *Lily could be a snob about a lot of things, but it wouldn't be smart to bet on* ***what***.
(A.D. Johnson, *Wicked City: A Zephyr Hollis Novel*, 2012)

(c) *The question seemed impolite. I can't explain exactly* ***why***.
(A. Tyler, *The Beginner's Goodbye: A Novel*, 2012)

Each example in (3) is interpreted as if there is a complete interrogative clause corresponding to the non-sluiced examples in (4). Throughout this paper, we refer to the interrogative clause which is interpreted at the site of the stranded *wh*-item as the *sluiced clause*. We refer to any linguistic expression from which the semantic content of the sluiced clause is derived as the *antecedent clause*. Any indefinite NP within the antecedent clause which triggers the sluice is the *correlate* while the *wh*-item stranded by the elision is the *remnant*.

(4) (a) *At times it would appear that she is embracing somebody but it is never clear who* [*it would appear that she is embracing*].

(b) *Lily could be a snob about a lot of things, but it wouldn't be smart to bet on what* [*Lily could be a snob about*].

(c) *The question seemed impolite. I can't explain exactly why* [*the question seemed impolite*].

Analyses of sluicing phenomena agree that its occurrence is licensed by some kind of redundancy of the sluiced clause. Analyses differ, however, in terms of their characterization of this redundancy. Following much work on the licensing of ellipsis (e.g., Sag and Hankamer 1984; Merchant 2001; Culicover and Jackendoff 2005; AnderBois 2011; Sag and Nykiel 2011), we characterize this redundancy in terms of meaning rather than syntactic form. The sentential component of an interrogative may be elided only when its semantic content is recoverable from the previous discourse (Ginzburg and Sag 2000; Culicover and Jackendoff 2005; AnderBois 2011; Ginzburg 2012).

## 2.1 Deletion and symmetric entailment

One particularly influential implementation of this idea comes from Merchant (2001). Like Ross (1969), Merchant characterizes sluicing as a deletion operation, rendering the IP constituent of an interrogative as silent. Merchant proposes that the deletion is licensed so long as particular entailment relations exist between the interrogative and preceding linguistic material.

For Merchant, sluicing may take place if the elided clause and an antecedent clause symmetrically entail each other (modulo existential closure). Illustrating with a simple example, in (5) the antecedent and elided clauses are in square brackets, labelled $\text{IP}_A$ and $\text{IP}_E$ respectively.

(5) [$_{IP_A}$ *Kim likes somebody*] *but I don't know who* [$_{IP_E}$ ~~*Kim likes*~~].

The condition under which the deletion may take place is fundamentally semantic, stated below.

(6) A clause $\text{IP}_E$ may be elided iff:

(a) $\text{IP}_E$ has a salient antecedent $\text{IP}_A$, and modulo $\exists$-type shifting,

(b) the F-closure of $\text{IP}_E$ is entailed by $\text{IP}_A$, and

(c) the F-closure of $\text{IP}_A$ is entailed by $\text{IP}_E$.

F-closure is an operation which replaces the focus marked constituents in a clause with existentially bound variables. Assuming that the indefinite correlate *somebody* in (5) is focus marked, and that F-closure serves to existentially bind *wh*-traces, the F-closures of $\text{IP}_A$ and $\text{IP}_E$ are shown in (7). As the F-closures of $\text{IP}_A$ and $\text{IP}_E$ are equivalent, the symmetric entailment condition on ellipsis in (6) is satisfied, and sluicing may take place.

(7) (a) $\text{F-CLO}(\text{IP}_A) = \exists x.\text{Kim likes } x$

(b) $\text{F-CLO}(\text{IP}_E) = \exists x.\text{Kim likes } x$

AnderBois (2010, 2011) points out that Merchant's theory of truth-conditional entailment wrongly predicts the acceptability of the following data.

(8) (a) *[*It's not the case that no one left*] *but I don't know who* [~~t *left*~~]

(b) **It's not the case that John didn't meet with a student, but Fred still wonders who* [~~*John met with* t~~].

(c) *A: The cake was eaten.*
*B: *Who* [~~t *ate it*~~]*?*

(AnderBois 2010a: 2)

AnderBois claims that Merchant's theory predicts that any antecedent clauses with existential truth conditions should license sluicing. Why then do double negation (8a-b) and passivization (8c) block sluicing? To remedy the symmetric entailment account, AnderBois strengthens the symmetric entailment condition in (6) by stating that the symmetric entailment should not only include truth-conditional entailment, but the two clauses should also raise the same *issues* into the discourse. Under this account, he claims that doubly negated clauses and clauses with passivization raise non-identical issues to the would-be elided clauses.

## 2.2 The Inquisitive account

AnderBois states that sluicing requires mutual truth-conditional entailment between the two clauses, and semantic isomorphy between any *issues* raised by the clauses. This statement adopts central assumptions within Inquisitive Semantics (IS) about the structure of discourse and the semantic types of propositions. The relevant assumptions are briefly enumerated here.

In IS, an *issue* is a request for information made by a speaker to the conversational participants. In making this request, the speaker asks the participants to reduce their mutual knowledge to a smaller space of alternatives. Both declarative and interrogative sentences in IS may raise issues into the discourse context.

The information state shared by the conversational participants is represented by a set of possible worlds. The act of raising and resolving an issue has the effect of enhancing the information state by reducing it to a smaller set of possible worlds. A proposition is represented as a downward closed set of the possible enhancements of the information state that the proposition can make. The semantic type of a proposition is therefore a set of sets of possible worlds.

Given that propositions are a higher type (of type $\langle st,t\rangle$) than in traditional frameworks, the ways in which two propositions may be semantically isomorphic is expanded. Two propositions $A$

and $B$ may be *truth-conditionally* equivalent if they exclude or falsify the same set of worlds, that is, $\bigcup[\![A]\!] = \bigcup[\![B]\!]$. However, despite being truth-conditionally equivalent, $A$ and $B$ may or may not raise the same issues into the discourse context.

AnderBois's condition on sluicing is identical to Merchant's in (6), except that AnderBois's definition of entailment is couched within the IS system. As in Merchant (2001), a clause may be elided just in case the F-closure of that clause and the F-closure of a salient antecedent clauses symmetrically entail each other. However, they must entail each other in terms of both their truth-conditional content and the issues they raise into the discourse context. AnderBois proposes the definition of entailment in (9). A proposition $A$ may only entail a proposition $B$ if every set of worlds (a classical proposition) in $A$ is a subset of a possibility in $B$. The definition is therefore sensitive to the internal structure of $A$ and $B$. It is also crucial to note that AnderBois assumes that both $A$ and $B$ must be expressed linguistically and thus categorizes sluicing as a variety of surface anaphora (as in Hankamer and Sag (1976), but contra Ginzburg and Sag (2000)).

(9) **Entailment** (AnderBois 2010: 7): $A$ entails $B$ iff $\forall p \in [\![A]\!] : \exists q \in [\![B]\!] : p \subseteq q$

The proposal relies on a key distinction made in IS concerning their typology of propositions. In IS, a proposition may be *inquisitive* or *non-inquisitive*. An IS proposition is *inquisitive* just in case it does not contain one member possibility which includes all other member possibilities — there is no single maximal possibility.

(10) **Inquisitive** (Ciardelli et al. 2012: 9): A proposition $A$ is *inquisitive* iff $\bigcup[\![A]\!] \notin [\![A]\!]$

A proposition with widest scope existential quantification is inherently inquisitive in this system. Existential quantification invites the conversational participants to resolve the identity of the bound variable by raising an alternative proposition for each contextually relevant individual. Consider a simple example below where an existentially quantified sentence is interpreted relative to a model with three relevant individuals.

(11) $[\![\exists x.\text{leave}(x)]\!]^M = \{[\![\text{John leaves}]\!]^M, [\![\text{Mary leaves}]\!]^M, [\![\text{Sue leaves}]\!]^M\}$

As there is no one possibility which is entailed by all the other possibilities, the proposition is inquisitive. It is helpful to now work through an example of sluicing.

(12) *Someone$_F$ leaves but I don't know who* [t *leaves*]. (assume *someone* is F-marked)
*[$\exists x$.leave(x)] but I don't know who [$\exists x$.leave(x)]*
(replace F-marked constituents and *wh*-traces with existentially bound variables)

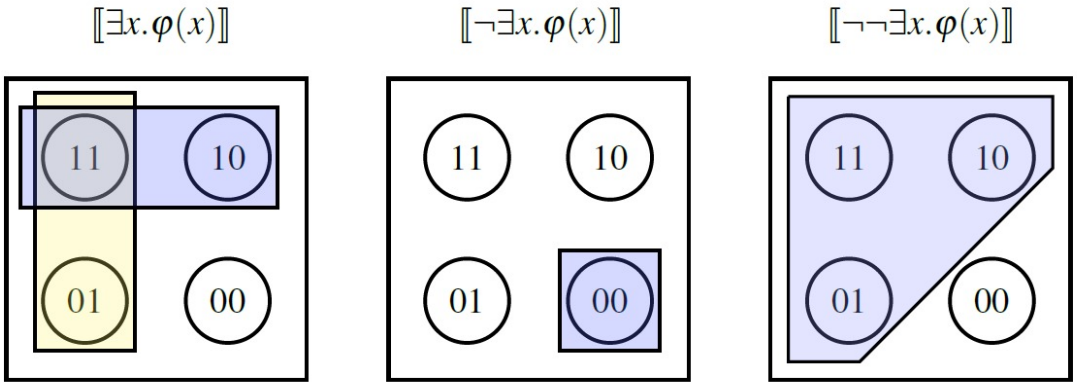
As the bracketed clauses entail each other in terms of their truth-conditional and issue-raising content (both being interpreted relative to $M$ as in (11)), sluicing is licensed. Now consider the case of double negation.

(13) *[It's not the case that no one leaves] but I don't know who* [t *leaves*].[1]
*[$\neg\neg\exists x$.leave(x)] but I don't know who [$\exists x$.leave(x)]*
(replace *wh*-traces with existentially bound variables)

[1] AnderBois is unclear about the F-marking in the double negated clause. We assume that he intends there to be no F-marking in the antecedent clause.

In terms of truth-conditional content, the bracketed clauses are equivalent — they falsify the same set of worlds. However, under the IS framework, the two clauses differ in their inquisitive content. In order to see this, it is helpful to represent the negation operation pictorially (image from AnderBois 2010: 10).

(14)




The negation of a proposition $\phi$ is interpreted as the maximal set of worlds which are falsified by $\phi$. Adding a second negation has the effect of creating a single maximal set of all worlds compatible with $\phi$. Recall that a proposition is only inquisitive if it does not include a single maximal possibility. As double negation has the effect of adding a single maximal possibility, double negation always has the effect of destroying the inquisitive potential of any proposition. The bracketed clauses in (13) differ in terms of their inquisitive potential and fail to entail each other under the definition in (9) and the sluice therefore does not go through.

AnderBois extends this analysis to passives. The passive version of the verb existentially binds the agent argument with a non-inquisitive existential quantifier. The IS logic provides the doubly negated existential in (14) as a way of formalising the intuition that the implicit agent of a passive is a non-inquisitive indefinite. AnderBois therefore analyses the semantics of the passive as the binding of the agent argument of a transitive with an existential quantifier scoping under double negation. This provides a unified account as to why neither the passive sentences below nor the doubly negated sentences in (13) may antecede a sluice. The passive antecedent clause in (15) is semantically non-identical to the active elided clause and fails the entailment condition in (9).

(15) *The cake was eaten but I don't know who ate the cake.*
[*The cake was eaten*] *but I don't know who* [t *ate the cake*][2]
[¬¬∃*x.ate.the.cake(x)*] *but I don't know who* [∃*x.ate.the.cake(x)*]
(replace *wh*-traces with existentially bound variables)

Expanding the view of semantic isomorphism and stipulating particular semantics for negation and passives, AnderBois provides an analysis of sluicing which accounts for some troubling data for Merchant's analysis. The next section of this paper deals with his generalization that appositive clause are likewise unable to license sluices and his proposed semantics for appositive clauses.

[2]Again we assume that AnderBois intends there to be no F-marking in the passive antecedent clause.

# 3 Appositive content

Emerging from AnderBois's analysis is the notion that sluicing may provide a diagnostic for whether a clause denotes an inquisitive or non-inquisitive proposition. The proposal states that if an antecedent clause and an elided clause are truth-conditionally equivalent but sluicing fails, the two clauses must raise different issues — for example, if the antecedent clause is non-inquisitive.

Given his intuitions about the contrast in (1), repeated below, AnderBois surmises that appositive clauses are non-inquisitive and therefore are unable to raise issues.

(16) (a) #*Joe, who once killed a man in cold blood, doesn't even remember who.*

(b) *Joe once killed a man in cold blood and he doesn't even remember who.*

His formalization of this intuition comes in the form of a conventional rule by which appositives are interpreted. Under this analysis, an appositive clause is interpreted under the scope of an operator (termed COMMA). This operator has the function of type lowering a set of sets of worlds, returning a set of worlds (AnderBois 2010: 14). Note that AnderBois's COMMA operator differs from the COMMA operator in Potts (2005), which has no type-lowering effect on the appositive meaning.

(17) $[\![\text{COMMA}(\phi)]\!] = \{w \mid \exists p \in [\![\phi]\!] : w \in p\}$

Sluicing fails due to the non-identical inquisitive structure of the antecedent appositive clause and the elided clause.

(18) *Joe, who once killed a man*$_F$ *in cold blood, doesn't even remember who* [*he once killed* t *in cold blood*]. (assume *a man* is F-marked)
*Joe*$_i$, [COMMA(∃*x.Joe once killed x in cold blood)*], *doesn't even remember who* [∃*x.Joe once killed x in cold blood*].
(replace F-marked constituents and *wh*-traces with existentially bound variables)

The two bracketed sentences have different inquisitive structures. In fact, the semantic types are different. Under the COMMA operator, the appositive clause is a classical proposition. It is not a proposition in the sense of Inquisitive Semantics (it is not a downward closed set of enhancements of the information state). The elided clause on the other hand is an inquisitive proposition, raising alternatives into the discourse context. As the single possibility denoted by the appositive clause does not entail any possibility denoted by the would-be elided clause, sluicing is not possible.

AnderBois's analysis makes a strong claim about the discourse potential of appositive clauses by stating that they are conventionally unable to raise issues into the discourse context. AnderBois, Brasoveanu, and Henderson (2011) (henceforth ABH) expands this point of view. ABH propose a conventional distinction between main clause content and appositive content. Main clause content is a *proposal* to update the common ground, while appositive content is *imposed* on the common ground. Conversational participants are not invited to negotiate the adoption of appositive content into the common ground.

The putative inability of a sluiced clause to take its antecedent across an appositive clause boundary is surprising, considering the wealth of semantic operations which are able to take place between an appositive clause and its main clause syntactic host. Potts (2005), Nouwen (2007)

and Amaral et al. (2007) show that presupposition and anaphora may operate across an appositive boundary. Some examples from ABH illustrate this. In (19), the presupposition triggered by *either* is satisfied by the appositive clause. In (20) and (21), pronominal anaphora and VP-ellipsis respectively, take their antecedents from within an appositive.

(19) **Presupposition**:
*John, who wouldn't talk to Mary, wouldn't talk to Susan* ***either****.*

(20) **Pronominal Anaphora**:
*John, who had been kissed by Mary, kissed* ***her*** *too.*

(21) **VP-Ellipsis**:
*So Lalonde, who was the one person who could deliver Trudeau,* ***did****.*

It would be surprising then if sluicing were an exception, that is – an operation unable to cross the appositive boundary. The following corpus examples (from COCA) seem to show that sluicing can, in fact, take an appositive clause as an antecedent.

(22) (a) *[I]f she hadn't married Ivor, her future husband would have been a distantly related Chandler cousin, perhaps Beau Chandler,* ***who was a cousin twice or three times removed****. She could never remember* ***which****.* (R. Dean, *Palace Circle*, 2011)

(b) *Now, my mother's uncle being quite the ingenious chap - he buries the trunk again and heads up to the main office,* ***where he proceeds to purchase a cemetery plot****. Guess* ***which one****?* (from the film *Chasing Amy*)

ABH do point out evidence for treating sentence final appositives and sentence medial appositives as semantically distinct. They suggest that sentence final appositives are interpreted more like true conjunction to the main clause and therefore should show the requisite semantic properties of a conjoined clause. If this is correct, we may be able to explain away the examples in (22) by virtue of the fact that they are sentence final appositives and therefore may be interpreted as inquisitive.

In fact, we failed to find corpus evidence of a sluiced clause taking its antecedent from within a sentence-medial appositive. Our central experimental question is whether such cases of sluicing are truly impossible (as opposed to merely hard to find). We ran an experiment, asking participants to judge sentences where sluiced clauses take their antecedents from sentence medial appositive clauses. The following section introduces our results, showing that participants rated these kinds of sentences as acceptable.

# 4 Experimental evidence

We conducted two experiments testing the validity of AnderBois's generalization that appositive clauses may not antecede a sluiced clause. In the first experiment, we tested the hypothesis that informativity of the indefinite correlate and the *wh*-remnant influences the acceptability of sluices with appositive antecedents. In the second experiment, we focussed on the impact of the context. Our results suggest that once both factors are controlled for, sluices with appositive antecedents become acceptable, favoring the view that appositives can antecede sluices and can be inquisitive over the hypothesis that they may not antecede a sluiced clause and are conventionally non-inquisitive.

## 4.1 Experiment 1

In the first experiment, we presented complex sentences with embedded interrogatives to participants and varied whether they involved sluicing or not. We compare the results of sentences containing sluices to their minimal counterparts without sluices. Where the sluiced version has a significantly lower acceptability rating than its non-sluiced counterpart, we can reliably interpret the drop in acceptability as induced by the sluice.

Our results show that participants accept sluices with appositive antecedents. Furthermore, they strongly suggest that informativity of the indefinite correlate and the *wh*-remnant affects the acceptability of sluices. In particular, we show that where the *wh*-remnant and indefinite correlate mismatch in terms of their informativity, the sluice is significantly less acceptable than where the *wh*-remnant and correlate match in terms of their informativity.

### 4.1.1 Materials and method

Participants were asked to rate each sentence they were presented with on a Likert scale from 1 to 7 based on their intuitions about the acceptability of the sentence, 1 being *completely unacceptable* and 7 being *completely acceptable*.

Each participant was presented with 19 sentences. Out of the 19 sentences, 2 sentences contained a passive and an embedded interrogative, 2 sentences contained a double negative and an embedded interrogative, and 6 sentences contained an appositive and an embedded interrogative. The remaining 9 sentences were acceptable and unacceptable fillers.

In the case of the passive sentences, participants randomly saw either a version with a conjoined sluiced clause or a conjoined unelided interrogative clause. For example, participants randomly saw either (23a) or (23b). This between-subject design ensured that no participant saw both members of the minimal pair.

(23) (a) *One of our windows was broken yesterday but I don't know who broke it.*

(b) *One of our windows was broken yesterday but I don't know who.*

A similar scheme was used for the double negatives. Participants randomly saw either a sluiced interrogative clause or an unsluiced interrogative clause, exemplified below. We only tested double negatives where a sentence negated by the *-n't* morpheme is embedded under *it's not the case that*. We kept the informativity of the stranded *wh*-item constant, always of the form *which NP* and always matching the informativity of the indefinite correlate.

(24) (a) *It's not the case that William won't go to a party tomorrow and I need to find out which party he will go to.*

(b) *It's not the case that William won't go to a party tomorrow and I need to find out which party.*

The stimuli containing appositive clauses were a little more complex considering that we varied the informativity of the *wh*-items and indefinite correlates. Our decision to test this variable stems from recent research (Dayal and Schwarzschild (2010), Barros (2013)) which claims that sluicing is degraded when the indefinite correlate and the *wh*-remnant mismatch in terms of their

informativity. For example, a sluice is degraded if a contentful indefinite correlate is paired with a non-contentful *wh*-remnant. (25a) and (25b) should rate higher than (25c).[3]

(25) (a) *I spoke with a police officer but I can't remember which police officer.*

(b) *I spoke with someone but I can't remember who.*

(c) *I spoke with a police officer but I can't remember who.*

We therefore considered three conditions: correlate and *wh*-remnant match and are contentful (e.g., 25a), correlate and *wh*-remnant match and are non-contentful (e.g., 25b), and correlate and *wh*-remnant mismatch (25c). This condition was cross-tabulated with elision or non-elision of the interrogative clause giving six possible variants of sentences containing an appositive and embedded interrogative. The following example illustrates the six experimental conditions. Participants randomly saw one of these six variants.

(26) (a) *My cousin Joni, who spent the night with a Beatle in 1962, can't remember which Beatle.*

(b) *My cousin Joni, who spent the night with someone in 1962, can't remember who.*

(c) *My cousin Joni, who spent the night with a Beatle in 1962, can't remember who.*

(d) *My cousin Joni, who spent the night with a Beatle in 1962, can't remember which Beatle she spent the night with.*

(e) *My cousin Joni, who spent the night with someone in 1962, can't remember who she spent the night with.*

(f) *My cousin Joni, who spent the night with a Beatle in 1962, can't remember who she spent the night with.*

Each participant rated six questions containing appositives. Each of the six questions had different lexical content. The entire stimulus set is listed in the appendix.

### 4.1.2 Participants

142 participants were recruited via Facebook and Mechanical Turk. Mechanical Turk participants were compensated monetarily. All the participants self-identified as native speakers of English.

### 4.1.3 Distribution of responses

Participants demonstrated the use of the full judgment scale. Acceptable fillers received an average rating of 5.5 (*somewhat/very acceptable*) and unacceptable fillers received an average rating of 2.2 (*very unacceptable*).

[3] Barros (2013) in fact claims that animate correlate-remnant pairs are exempt from this effect, though in some cases the remnant *wh*-item must be modified by *exactly*. Our results contradict this exemption. We do see a significant degradation induced by mismatching the correlate-remnant pair.

Sentences with double negation rated badly regardless of whether the embedded interrogative was present or not. Both doubly negated sentences with no sluicing and sentences with double negation and sluicing received mean ratings comparable to the ratings of unacceptable fillers.

In contrast, sluicing markedly reduces the acceptability of sentences with passives. Sentences with a passive and no sluicing received a mean rating comparable to the average rating of acceptable fillers, while sentences with a passive and sluicing received a mean rating comparable to the rating of unacceptable fillers.

Crucially, sentences with an appositive clause and no sluicing receive a mean rating comparable to the rating of acceptable fillers, while the rating of sentences with an appositive and sluicing differs categorically from the rating of unacceptable fillers. The findings are summarized in Figure 1.

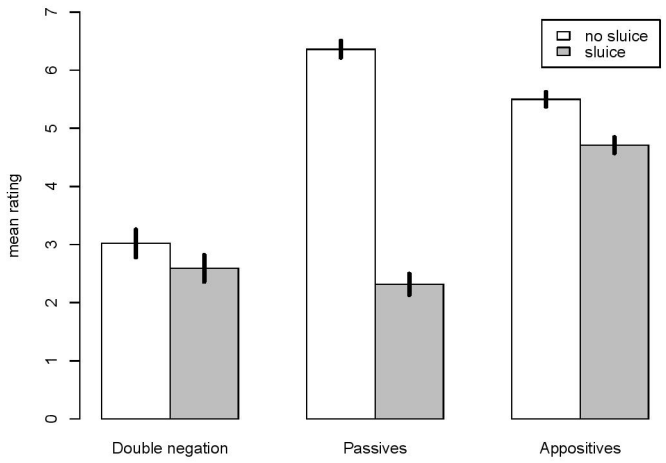



Figure 1: Ratings on the acceptability scale {1 (completely unnatural), 7 (totally natural)} by antecedent type. From left to right, the bars represent 142, 141, 140, 143, 433, and 418 judgments. The error bars stand for 95% confidence intervals.

In the case of double negation, there is no significant difference between the examples with sluices and examples without sluices. Participants tended to rate sentences with double negation low on the acceptability scale regardless of whether the doubly negated clause anteceded a sluice or not. Therefore, we are unable to make a claim that sluicing significantly degrades acceptability when anaphoric to a doubly negated clause. The unacceptability that AnderBois reports could be attributable to the general unnaturalness of doubly negated clauses.

In the case of passives and appositives, stimuli which involve sluicing score significantly lower (Wilcoxon rank-sum test, $\alpha = 0.99, p < 0.0001$) than their counterparts with no sluicing. These results appear to support AnderBois's hypothesis that both passives and appositives are illicit sluicing antecedents.

However, we assert that AnderBois does not predict the large variation in acceptability amongst his putatively unacceptable sentences. Appositive clauses are much better antecedents for sluices (with a mean rating of 4.71) than doubly negated clauses (mean rating of 2.59) or clauses with

passives (mean rating of 2.32).

We further assert that once the informativity of the *wh*-item and indefinite correlate are properly controlled, appositive antecedents for sluices become more acceptable and we see the variance between the sluiced and non-sluiced counterparts shrink to become insignificant.

### 4.1.4 Informativity effects on appositive antecedents for sluices

In Figure 2, we only show the mean ratings of complex sentences with appositive clauses and embedded interrogatives. Sentences with passives and double negation are not included. Each bar in Figure 2 represents a condition exemplified in (26). Harmonic versions with both the correlate and the remnant being contentful or non-contentful are presented adjacent to their disharmonic counterpart. Figure 2 clearly demonstrates that cases where the indefinite correlate and the *wh*-remnant are both contentful are not significantly degraded where the embedded interrogative clause is sluiced. This is a clear contradiction of AnderBois's claim regarding appositive antecedents for sluicing, which predicts that sluicing the embedded interrogative should significantly reduce acceptability.

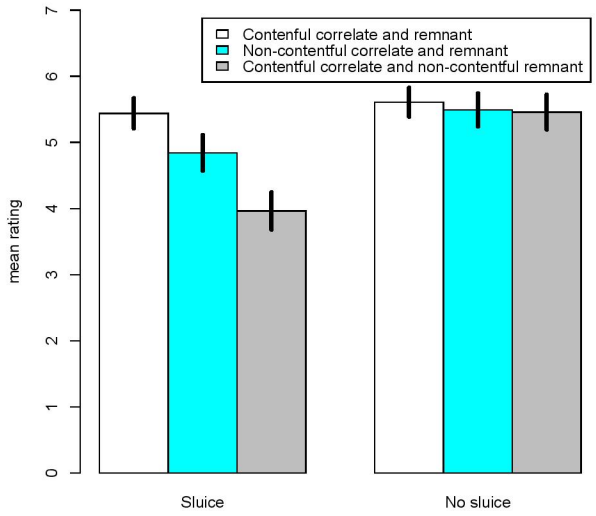



Figure 2: Informativity (dis)harmony in the correlate–*wh*-remnant pairs. From left to right, the bars represent 143, 139, 136, 167, 142, and 124 judgments. The error bars stand for 95% confidence intervals.

The difference in ratings of sluiced and non-sluiced versions of examples where both the correlate and the remnant are contentful is insignificant (Wilcoxon rank-sum test, $\alpha = 0.99, p = 0.16$). The difference in ratings of the non-contentful correlate-remnant pairs in sluiced and non-sluiced examples is significant (Wilcoxon rank-sum test, $\alpha = 0.99, p = 0.0003$). In the cases of correlate-remnant disharmony, the difference between the sluiced and non-sluiced sentences is highly significant (Wilcoxon rank-sum test, $\alpha = 0.99, p < 0.0001$).

Furthermore, sluiced sentences where both the correlate and the remnant agree on the level of informativity receive a significantly higher rating than the sluiced sentences with mismatching correlates and remnants (Wilcoxon rank-sum test, $\alpha = 0.99, p < 0.0001$).

These results show that mismatching the informativity of the correlate and remnant *wh*-item significantly degrades sluicing. Therefore, these results must be controlled if we are to accurately judge whether appositive antecedents for sluices are acceptable or not. In cases where we controlled for the informativity effects, participants did not rate appositive sluice-antecedents as significantly less acceptable than their counterparts without sluices.

## 4.2 Experiment 2

The second experiment was designed to determine whether the acceptability of having an appositive antecedent for a sluice was influenced by a preceding context. The setup was similar to the first experiment except that each stimulus sentence was presented to the participant following a "context-setting" sentence. Again, we compare the results of sentences containing sluices to their minimal counterparts without sluices.

Our results for this experiment are less robust, but do show that participants are more willing to accept an appositive clause as an antecedent for a sluice if the appositive clause engages with the preceding context. We therefore suggest the contextual relevance of the appositive clause as a possible factor influencing its ability to antecede a sluice, and that controlling for this effect (alongside controlling for the informativity of the *wh*-item) further improves the acceptability of appositive sluice-antecedents.

### 4.2.1 Materials and method

Each stimulus consisted of two sentences: a context sentence (labelled CONTEXT) and a target sentence (labelled TARGET). Participants were asked to rate each target sentence on a Likert scale from 1 (*completely unacceptable*) to 7 (*completely acceptable*).

The design of the experiment was inter-subject with counterbalanced lists. Each participant saw 18 stimuli, consisting of 16 acceptable and unacceptable fillers (including stimuli for unrelated experiments) and 2 experimental items. All experimental items contained a sentence-medial appositive clause and an embedded interrogative anaphorically linked with an indefinite inside the appositive clause. We varied whether the preceding context engaged with the appositive clause or not, and we varied whether the embedded interrogative was sluiced or not. The cross-product of these two variables gave us four kinds of stimuli. Participants only saw one of four types of stimuli. The four types are exemplified in (27). Note that we did not vary the informativity of the *wh*-item and correlate.

(27) (a) **Context**: *My relatives have had occasional brushes with fame.*
**Target**: *My cousin Joni, who spent the night with a Beatle in 1962, can't remember which Beatle (she spent the night with).*

(b) **Context**: *My relatives all enjoy live music to some extent.*
**Target**: *My cousin Joni, who spent the night with a Beatle in 1962, can't remember which Beatle (she spent the night with).*

In (27a) the context sentence engages with the appositive clause in the target sentence. The propositional content of the appositive *my cousin Joni spent the night with a Beatle in 1962* elaborates on the contextual statement that *my relatives have had occasional brushes with fame*. In

(27b), the context does not directly engage the content of the appositive clause: the two propositions *My relatives all enjoy live music to some extent* and *My cousin Joni spent the night with a Beatle in 1962* do not address the same issue. However they are not unrelated to the extent that they constitute an incoherent discourse; enjoying live music in some sense facilitates the reference to a Beatle in the appositive clause. As in the first experiment, we devised six scenarios with distinct lexical items and prepared tables like (27) for each scenario. The full list of stimuli is given in the appendix.

### 4.2.2 Participants

366 participants were recruited via Mechanical Turk and were compensated monetarily. All the participants self-identified as native speakers of English.

### 4.2.3 Analysis of results

Participants demonstrated the use of the full judgment scale. The acceptable fillers average at 5.3 *somewhat natural* and the unacceptable fillers average at 2.5 *very/somewhat unnatural*.

Sentences where the appositive clause engages the context and antecedes a sluice (as in 27a) received a mean rating of 4.84. Sentences where the appositive clause does not engage the context, and the interrogative is sluiced (as in 27b) received a mean rating of 4.38. Crucially, both ratings are not comparable to the ratings of the unacceptable fillers and approach the ratings of the acceptable fillers. The findings are summarized in Figure 3.

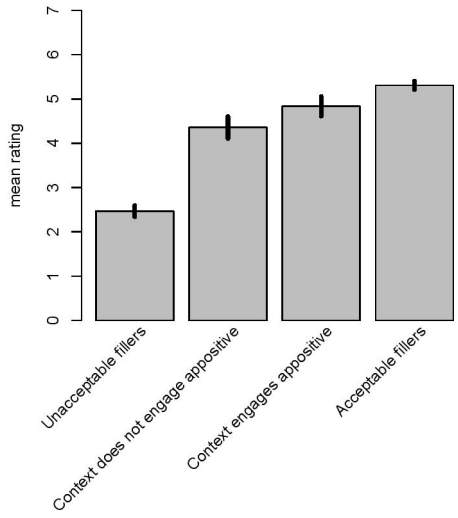



Figure 3: The context influence on the acceptance of sluices with appositive antecedents. The bar for unacceptable fillers represents 757 judgments, the bars for experimental conditions represent 182 judgments each, the bar for acceptable fillers represents 937 judgments. The error bars stand for 95% confidence intervals.

The results demonstrate that appositive antecedents for sluices which engage with the preceding context are rated as significantly more acceptable than appositive antecedents for sluices which

do not engage with the preceding context (Wilcoxon rank-sum test, $\alpha = 0.99$, $p = 0.01$ for the sluiced cases). As there is a positive influence of the context, we suggest that the potential of an appositive clause to antecede a sluice is not something that is categorically ruled out as AnderBois might suggest. Instead, it seems that numerous factors are at play influencing whether participants rate appositive sluice-antecedents as acceptable or not, one factor being the contextual relevance of the appositive clause. We tentatively suggest that these results generally favor an approach where the contextual salience of a clause is a crucial factor in determining whether the clause is an acceptable sluice-antecedent or not, such as the MAX-QUD approach posited in Ginzburg and Sag (2000) (discussed in Section 4.3).

Overall, the results of the second experiment are less robust than the results of our first experiment. This might be due to the general complexity of the experiments that involve discourse coherence manipulations. Nevertheless, the second experiment provides the crucial data for the evaluation of the claim that appositives are conventionally unable to antecede a sluice, undermining the hypothesis that appositives are conventionally non-inquisitive and cannot raise issues into the discourse context.

## 4.3 Discussion

Our results show that participants rate appositive antecedents to sluices as acceptable. The acceptability is improved if the indefinite correlate and remnant *wh*-item match in terms of their informativity, and if the appositive clause engages with the preceding context. These results are not predicted by the generalization made by AnderBois (2010, 2011, 2014) which states that appositive clauses categorically may not antecede sluices.

This generalization stems from the hypothesis that appositive clauses and main clauses have different semantic types. They update the discourse context in fundamentally different ways. Main clause assertions denote sets of sets of worlds, while appositive clauses denote mere sets of worlds.

Our results show that participants accept appositive clauses as antecedents to sluices. There are multiple ways this finding could bear on the generalizations made by AnderBois. One option is that AnderBois's type distinction between appositive content and main clause content may or may not be justified, but his characterization of sluicing as a type of surface anaphora is incorrect. In cases where participants accept appositive antecedents for sluices, they are pragmatically inferring the presence of an extant issue in the discourse which licenses the sluice, despite the conventional inability of appositive clauses to raise such an issue.

This kind of characterization of sluicing has much in common with the analysis given in Ginzburg and Sag (2000). Their analysis is framed in terms of a theory of Questions Under Discussion (QUDs) and as such shares with AnderBois the general idea that sluicing is licensed by some kind of anaphoric link to a question previously raised in the discourse context. Ginzburg and Sag posit a constructional rule whereby a sluiced clause is given a semantic value matching the currently extant Maximal-Question-Under-Discussion (MAX-QUD). The semantic content of MAX-QUD is constantly updated as the dialogue progresses by both linguistic and non-linguistic material. They therefore allow for the possibility that a sluice can take its semantic content from the non-linguistic context, as evidenced by the examples below. The Ginzburg and Sag (2000) account therefore places sluicing as a kind of deep anaphora, contra Hankamer and Sag (1976).

(28) (a) [Milling around on first day of conference, participants ignorant of location of talks go up to harried organizer:] *Hey, could you tell us which room so we can go in and wait for things to start?*

(b) [In an elevator] *What floor?*

(Ginzburg and Sag 2000: 298)

Conversational participants constantly make inferences about the content of the MAX-QUD. When a participant encounters a sluice which appears to take its antecedent from an appositive clause, they are able to make an inference that the speaker intends the MAX-QUD to be raised by the appositive clause, thereby licensing the sluice. Given the increased flexibility of a QUD model of sluicing, where participants can infer that a QUD takes its semantic content from an appositive clause, we expect participants to accept appositive antecedents to sluices. Under this view, where all kinds of linguistic and non-linguistic material may update the MAX-QUD, it is inconsequential whether or not an appositive clause is unable to be interpreted as a question-like semantic object.

An alternative interpretation of our experimental results is that we should depart from the view that appositive clauses and main clauses are interpreted as different semantic types. In AnderBois's model, a main clause is able to denote a set of sets of worlds, while an appositive clause simply denotes a set of worlds. This is the root of their supposed differing behavior with respect to sluicing. As our results show that appositives can demonstrate similar behavior to main clauses with respect to sluicing, we find little evidence to support the view that appositives are conventionally prevented from raising the same kinds of issues as main clauses. We have more flexibility with regards to the kinds of clauses which may enter into anaphoric relations, including sluicing, by assuming that an appositive clause is able to raise issues and does not differ in type from the main clause.

# 5 Conclusion

This paper experimentally evaluates the generalizations made in AnderBois (2010). We find that contra AnderBois, participants are willing to accept a sluice which takes as its antecedent a non-restrictive relative clause (an appositive clause). We found that acceptability of these kinds of sluices improved when we controlled for two factors: the informativity of the remnant *wh*-item and the contextual relevance of the appositive clause. In addition to challenging the general observations in AnderBois (2010), we further emphasize the importance of controlling for extrinsic effects such as the informativity of the *wh*-item and contextual salience when making claims about the acceptability of particular kinds of sluice-antecedents.

We intend this paper to contribute to a larger discussion of factors specific to discourse structure which influence the acceptability of sluices. We contribute to a general class of theories which assume that sluices take their semantic value from an active question in the discourse. The key goal is therefore to determine what class of linguistic expressions is capable of raising such questions. Our experimental results show that appositive clauses fall into that class.

## Acknowledgements

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## Appendix

**Experiment 1 Stimuli**
Key: *stimuli_name*: Stimuli.

1. *filler_good_1*: Your butler is close to retirement and he loves to tango.
2. *filler_good_2*: The prime minister, who is often very indecisive, decided to pass the bill on Thursday.
3. *filler_good_3*: Sue loves to build canoes, so she moved to the beach and loves it there.
4. *filler_good_4*: My mother, who often watches game shows in the evening, missed the last episode and she was quite upset.
5. *filler_good_5*: The rugby player couldn't find his manager so he decided to call his manager.
6. *filler_good_6*: The fastest rowing team, who won the last championship, has decided to pull out of the finals.
7. *filler_bad_1*: My professor Harold just found out, in order to a student was cheating.
8. *filler_bad_2*: My sister Camilla might have forgotten the scarf and she teaches Chemistry and she left a scarf at my house.
9. *filler_bad_3*: Anita is about to since she forgot to leave a tip.
10. *filler_bad_4*: Erik herds reindeer but he couldn't possibly guess which one.
11. *neg_sluice_scene1*: It's not the case that I didn't meet with a student yesterday, but I've forgotten which student.
12. *neg_nosluice_scene1*: It's not the case that I didn't meet with a student yesterday, but I've forgotten which student I met.
13. *neg_sluice_scene2*: It's not the case that William won't go to a party tomorrow and I need to find out which party.
14. *neg_nosluice_scene2*: It's not the case that William won't go to a party tomorrow and I need to find out which party he will go to.
15. *pass_sluice_scene1*: One of our windows was broken yesterday, but I don't know who.
16. *pass_nosluice_scene1*: One of our windows was broken yesterday, but I don't know who broke it.
17. *pass_sluice_scene1*: I want these results to be calculated tonoght, but I haven't decided who.
18. *pass_nosluice_scene2*: I want these results to be calculated tonight, but I haven't decided who will calculate them.
19. *app_match.inf_sluice_scene1*: My cousin Joni, who spent the night with a Beatle in 1962, can't remember which Beatle.
20. *app_match.noninf_sluice_scene1*: My cousin Joni, who spent the night with someone in 1962, can't remember who.
21. *app_mismatch_sluice_scene1*: My cousin Joni, who spent the night with a Beatle in 1962, can't remember who.

22. *app_match.inf_nosluice_scene1*: My cousin Joni, who spent the night with a Beatle in 1962, can't remember which Beatle she spent the night with.
23. *app_match.noninf_nosluice_scene1*: My cousin Joni, who spent the night with someone in 1962, can't remember who she spent the night with.
24. *app_mismatch_nosluice_scene1*: My cousin Joni, who spent the night with a Beatle in 1962, can't remember who she spent the night with.
25. *app_match.inf_sluice_scene2*: Joe, who once killed a man in cold blood, doesn't even remember which man.
26. *app_match.noninf_sluice_scene2*: Joe, who once killed someone in cold blood, doesn't even remember who.
27. *app_mismatch_sluice_scene2*: Joe, who once killed a man in cold blood, doesn't even remember who.
28. *app_match.inf_nosluice_scene2*: Joe, who once killed a man in cold blood, doesn't even remember which man he killed.
29. *app_match.noninf_nosluice_scene2*: Joe, who once killed someone in cold blood, doesn't even remember who he killed.
30. *app_mismatch_nosluice_scene2*: Joe, who once killed a man in cold blood, doesn't even remember who he killed.
31. *app_match.inf_sluice_scene3*: My brother Steve, who says he read an interesting book last week, can't remember which book.
32. *app_match.noninf_sluice_scene3*: My brother Steve, who says he read something interesting last week, can't remember what.
33. *app_mismatch_sluice_scene3*: My brother Steve, who says he read an interesting book last week, can't remember what.
34. *app_match.inf_nosluice_scene3*: My brother Steve, who says he read an interesting book last week, can't remember which book he read.
35. *app_match.noninf_nosluice_scene3*: My brother Steve, who says he read something interesting last week, can't remember what he read.
36. *app_mismatch_nosluice_scene3*: My brother Steve, who says he read an interesting book last week, can't remember what he read.
37. *app_match.inf_sluice_scene4*: My assistant, who was accused of losing an important paper, can't figure out which paper.
38. *app_match.noninf_sluice_scene4*: My assistant, who was accused of losing something important, can't figure out what.
39. *app_mismatch_sluice_scene4*: My assistant, who was accused of losing an important paper, can't figure out what.
40. *app_match.inf_nosluice_scene4*: My assistant, who was accused of losing an important paper, can't figure out which paper she was accused of losing.
41. *app_match.noninf_nosluice_scene4*: My assistant, who was accused of losing something important, can't figure out what she was accused of losing.
42. *app_mismatch_nosluice_scene4*: My assistant, who was accused of losing an important paper, can't figure out what she was accused of losing.
43. *app_match.inf_sluice_scene5*: The president, who needed to approve a clean-energy plan, couldn't decide on which clean-energy plan.
44. *app_match.noninf_sluice_scene5*: The president, who needed to approve something, couldn't

decide on what.

45. *app_mismatch_sluice_scene5*: The president, who needed to approve a clean-energy plan, couldn't decide on what.
46. *app_match.inf_nosluice_scene5*: The president, who needed to approve a clean-energy plan, couldn't decide on which clean-energy plan to approve.
47. *app_match.noninf_nosluice_scene5*: The president, who needed to approve something, couldn't decide on what to approve.
48. *app_mismatch_nosluice_scene5*: The president, who needed to approve a clean-energy plan, couldn't decide on what to approve.
49. *app_scene6_sluice_match.inf*: Kobe Bryant, who just donated money to a charity event, isn't sure about which event.
50. *app_scene6_sluice_match.noninf*: Kobe Bryant, who just donated money to something, isn't sure about what.
51. *app_scene6_sluice_mismatch*: Kobe Bryant, who just donated money to a charity event, isn't sure about what.
52. *app_scene6_nosluice_match.inf*: Kobe Bryant, who just donated money to a charity event, isn't sure about which event to donate to.
53. *app_scene6_nosluice_match.noninf*: Kobe Bryant, who just donated money to something, isn't sure about what to donate to.
54. *app_scene6_nosluice_mismatch*: Kobe Bryant, who just donated money to a charity event, isn't sure about what to donate to.

**Experiment 2 Stimuli**

Key: *stimuli_name*: Stimuli.

1. *scene1_cont.match*
   CONTEXT: My relatives have had occasional brushes with fame.
   TARGET: My cousin Joni, who spent the night with a Beatle in 1962, can't remember which Beatle.
2. *scene1_cont.mismatch*
   CONTEXT: My relatives all enjoy live music to some extent.
   TARGET: My cousin Joni, who spent the night with a Beatle in 1962, can't remember which Beatle.
3. *scene2_cont.match*
   CONTEXT: Some people have no conscience whatsoever.
   TARGET: Joe, who once killed a man in cold blood, doesn't even remember which man.
4. *scene2_cont.mismatch*
   CONTEXT: Some people are better off behind bars.
   TARGET: Joe, who once killed a man in cold blood, doesn't even remember which man.
5. *scene3_cont.match*
   CONTEXT: Some members of my family are experts in literature.
   TARGET: My brother Steve, who says he read an interesting book last week, can't remember which book.
6. *scene3_cont.mismatch*
   CONTEXT: Some members of my family are experts in the kitchen.

TARGET: My brother Steve, who says he read an interesting book last week, can't remember which book.

7. *scene4_cont.match*
   CONTEXT: Many confidential documents have gone missing.
   TARGET: My assistant, who was accused of losing an important paper, can't figure out which paper.
8. *scene4_cont.mismatch*
   CONTEXT: Many staff members are in danger of being sacked.
   TARGET: My assistant, who was accused of losing an important paper, can't figure out which paper.
9. *scene5_cont.match*
   CONTEXT: The company was in the process of overhauling its environmental policy.
   TARGET: The president, who needed to approve a clean-energy plan, couldn't decide on which plan.
10. *scene5_cont.mismatch*
    CONTEXT: The company has recently come under close scrutiny from investors.
    TARGET: The president, who needed to approve a clean-energy plan, couldn't decide on which plan.
11. *scene6_cont.match*
    CONTEXT: When athletes become celebrities, they are often required to support a lot of good causes.
    TARGET: Kobe Bryant, who just donated money to a charity event, isn't sure about which event.
12. *scene6_cont.mismatch*
    CONTEXT: When athletes become celebrities, they are often required to travel frequently.
    TARGET: Kobe Bryant, who just donated money to a charity event, isn't sure about which event.
13. *filler_good_1*
    CONTEXT: Elderly people often find creative ways to exercise.
    TARGET: Your butler is close to retirement and he loves to tango.
14. *filler_good_2*
    CONTEXT: It seems like the new laws about censorship are on everyone's mind.
    TARGET: The prime minister, who is often very indecisive, decided to pass the bill on Thursday.
15. *filler_good_3*
    CONTEXT: My sisters have all made big life changes in the past year.
    TARGET: Sue loves to build canoes, so she moved to the beach and loves it there.
16. *filler_good_4*
    CONTEXT: Wheel of Fortune has become such an exciting TV show recently.
    TARGET: My mother, who often watches game shows in the evening, missed the last episode and she was quite upset.
17. *filler_good_5*
    CONTEXT: The Olympic Games this year have been full of surprises.
    TARGET: The fastest rowing team, who won the last championship, has decided to pull out of the finals.

18. *filler_bad_1*
    CONTEXT: A complaint has just been made to the student affairs officer.
    TARGET: My professor Harold just found out, in order to a student was cheating.
19. *filler_bad_2*
    CONTEXT: I recently had family over for Christmas.
    TARGET: My sister Camilla might have forgotten the scarf and she teaches Chemistry and she left a scarf at my house.
20. *filler_bad_3*
    CONTEXT: Sometimes I don't know what my friends are thinking!
    TARGET: Anita is about to since she forgot to leave a tip.
21. *filler_bad_4*
    CONTEXT: Career mobility is difficult in rural areas.
    TARGET: Erik herds reindeer but he couldn't possibly guess which one.

# References


Amaral, P., C. Roberts, and E. A. Smith (2007). Review of the logic of conventional implicatures by Chris Potts. *Linguistics and Philosophy 30*(6), 707–749.

AnderBois, S. (2010). Sluicing as anaphora to issues. In N. Li and D. Lutz (Eds.), *Proceedings of SALT XX*, pp. 451–470.

AnderBois, S. (2011). *Issues and alternatives*. Ph. D. thesis, University of California, Santa Cruz.

AnderBois, S. (2014). The semantics of sluicing: Beyond truth-conditions. Ms., Brown University. http://sites.clps.brown.edu/anderbois/files/2013/12/AnderBois_Language_Sluicing2.pdf.

AnderBois, S., A. Brasoveanu, and R. Henderson (2011). Crossing the appositive/at-issue meaning boundary. In *Proceedings of SALT*, Volume 20, pp. 328–346.

Barros, M. (2013). Harmonic sluicing. Presentation at Semantics and Linguistic Theory 23.

Ciardelli, I., J. A. Groenendijk, and F. Roelofsen (2012). Inquisitive Semantics: NASSLLI 2012 lecture notes. Ms. University of Bordeaux and University of Amsterdam.

Culicover, P. W. and R. Jackendoff (2005). *Simpler Syntax*. Oxford University Press Oxford.

Dayal, V. and R. Schwarzschild (2010). Definite inner antecedents and wh-correlates in sluices. *Rutgers Working Papers in Linguistics 3*, 92–114.

Ginzburg, J. (2012). *The Interactive Stance*. OUP Oxford.

Ginzburg, J. and I. A. Sag (2000). *Interrogative Investigations*. CSLI Publications Stanford.

Hankamer, J. and I. Sag (1976). Deep and surface anaphora. *Linguistic inquiry 7*(3), 391–428.

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

Nouwen, R. (2007). On appositives and dynamic binding. *Research on Language and Computation 5*(1), 87–102.

Potts, C. (2005). *The Logic of Conventional Implicatures*. Oxford Studies in Theoretical Linguistics. Oxford: Oxford University Press.

Ross, J. R. (1969). Guess who? In *Proceedings from the 5th Meeting of the Chicago Linguistics Society*, pp. 252–286. University of Chicago.

Sag, I. A. and J. Hankamer (1984). Toward a theory of anaphoric processing. *Linguistics and Philosophy 7*(3), 325–345.

Sag, I. A. and J. Nykiel (2011). Remarks on sluicing. In S. Müller (Ed.), *Proceedings of the HPSG11 Conference. CSLI Publications*.