

THE SEMANTICS OF SLUICING: BEYOND TRUTH CONDITIONS

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Since Merchant 2001, it has been widely agreed that the licensing condition on sluicing is at least partially semantic in nature. This article argues that the semantics this condition operates on must include not only truth conditions, but also the ISSUES introduced by existential quantification and disjunction. In the account presented here, the special role these elements play in antecedents for sluicing derives from the deep semantic connections between these elements and questions. In addition to accounting for well-known facts about sluicing in a natural way, this article also analyzes novel facts such as the interaction of sluicing with appositives and double negation, and handles recalcitrant cases such as disjunctive antecedents. The account can readily be extended to so-called ‘sprouting’ cases where the crucial material in the antecedent is an implicit argument or is missing altogether.*

Keywords: sluicing, sprouting, inquisitivity, indefinites, disjunction, appositives, negation

1. INTRODUCTION. One of the central issues in the study of ellipsis, and of sluicing in particular, has been the question of what relationship has to hold between the ellipsis site itself and the antecedent material in the surrounding discourse. To take two basic examples (1–2), the question is what conditions the A(ntecedent) clause must meet in order to allow for the ellipsis of the E(lided) clause.

(1) [John ate something]_A, but I don’t know [what ~~John ate~~]_E.

(2) [John ate the taco]_A, but I don’t know [when ~~John ate the taco~~]_E.

Following Ross’s (1969) pioneering work, most authors have taken the condition to be syntactic isomorphy of one sort or another. More recently, Merchant (2001) has pointed out a number of problems for such theories, proposing instead that a semantic condition is needed. In particular, Merchant argues that sluicing is licensed if and only if the existential closures of the A and E clauses entail one another symmetrically.

Under this theory, then, the E clause will necessarily have existential truth conditions, due to the existential closure of the trace of the WH-word. In examples like 1—what Chung and colleagues (1995) dub ‘merger’—there is an overt indefinite (the ‘inner antecedent’) in the A clause: in this case, the indefinite *something*. In cases of so-called ‘sprouting’, like 2, the existential claim (in this case, that there is some time *t* such that John ate the taco at *t*) is taken to be entailed by the A clause alone. In essence, then, Merchant (2001) relies on there being indefinites in the A clause even in cases that are present in the semantics of the A clause, but not pronounced: that is to say, indefinite implicit arguments or at least entailments.

This article presents several kinds of data in English that pose a challenge to an account built on symmetric entailment both for merger cases and for sprouting. Rather than arguing against a semantic condition, however, it argues that the data are best captured under an analysis that shares its basic architecture with Merchant 2001 and Chung 2005,¹

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¹ Chung 2005 and other subsequent work has a hybrid approach in which a semantic condition is supplemented by some sort of morphosyntactic condition, but one that is less stringent than full-blown isomorphy. Such an approach is followed here, as seen in §5.

but makes use of a semantics that comprises not only truth-conditional information, but also ISSUES in the sense of inquisitive semantics (Groenendijk 2007, Groenendijk & Roelofsen 2009, and AnderBois 2012a, *inter alia*). The central intuition is that assertions not only contribute information, but also introduce issues that may be taken up in future discourse (similar to questions). Sluicing, I claim, is sensitive to both kinds of meaning, the result being that sluicing is licensed only in case the issue introduced by the question in the E clause is one that the A has already introduced (this is not quite true for certain cases of sprouting; see §5).

At the same time, then, this article constitutes, to my knowledge, the first direct empirical argument that the semantics of English assertions must comprise not just their truth conditions, but also their alternative-evoking or issue-raising capacity.² In particular, an assertion like 1 with an indefinite *something* is held to have a semantic representation that reflects not only its truth conditions but also the fact that it makes salient different alternatives (e.g. for 1, ‘that John ate tacos’, ‘that John ate soup’, etc.). Formally, this shift is captured by modeling the meanings of assertions as sets of proposed alternative propositions, rather than as simple propositions with no further structure. This approach is shown to allow for a deep understanding of the special role played by indefinites and disjunctions as inner antecedents, as well as for satisfying accounts of more problematic cases.

1.1. PROBLEMATIC MERGER DATA. For merger, the data that are problematic for a purely truth-conditional semantic condition come from cases where the truth-conditional equivalence of the A and E clauses is apparent, yet sluicing is infelicitous. The first such case to be discussed is sentences where an otherwise suitable inner antecedent, such as an overt indefinite, occurs within the scope of double negation, as in 3. Given the truth-conditional vacuity of double negation, such A clauses are predicted to license sluicing, just like minimally different sentences with no negation.

(3) #It’s not the case that Bill didn’t bring a dish, but I don’t know which (one).

The second problematic case for merger is sentences where an otherwise licit inner antecedent occurs inside of an appositive relative clause. As in the case of double negation, the appositive preserves truth conditions, yet sluicing is quite degraded.

(4) #The valiant knight, who defeated a masked enemy, still wonders who.

Given the truth-conditional vacuity of double negation and apposition, the question becomes the following: what distinguishes the illicit A clauses in 3–4 from licit ones like 1? The answer here builds on recent semantic insights from inquisitive semantics (Groenendijk 2007, Groenendijk & Roelofsen 2009, and AnderBois 2012a, *inter alia*), which holds that ordinary indefinites like *something* in 1_A introduce a set of alternatives into the composition and make two distinct semantic contributions related to this set.

The first is the truth-conditional INFORMATION that there exists some true alternative or other in this alternative set. For example, the indefinite in 1_A (given appropriate compositional principles to be discussed in §2) will produce a set of propositional alternatives of the form ‘John ate x ’. The informative component of the meaning of 1_A is that there is at least one true alternative in this set. The second meaning component—the INQUISITIVE component—is to make salient the issue of which alternative(s) in this set

² As discussed in §2 below, previous work in ‘Hamblin’ or ‘Alternative’ semantics has argued that indefinites (and disjunctions) evoke alternatives WITHIN the semantics of a sentence (e.g. Kratzer & Shimoyama 2002). What is new here, however, is the idea that such alternatives are truly part of the sentence’s top-level meaning.

hold. In other words, a sentence with a (widest-scope) ordinary indefinite like *something* in 1_A has the effect of introducing a POTENTIAL question under discussion (QUD) in the sense of Roberts 1996 (i.e. a question whose resolution represents a ‘safe’ next step in conversation, but whose resolution is not obliged). While the importance of QUDs to the analysis of sluicing has already been well established, most notably by Ginzburg and Sag (2001), the core idea of inquisitive semantics—the inquisitive nature of indefinites and disjunctions—is leveraged here to explain why it is these elements that play a privileged role in sluicing.

The central claim of this article is that the semantic condition on sluicing is crucially sensitive to this alternative-rich notion of semantic content. Since E clauses in sluicing are always interrogative, their meanings will necessarily be inquisitive ones (indeed, this is their only NEW contribution). Given the inquisitive contribution of the E clause, it follows that the only A clauses that can symmetrically entail an E clause are ones that are themselves inquisitive. The emergent generalization is stated in 5.

- (5) INNER ANTECEDENT GENERALIZATION: An expression α can serve as an inner antecedent for sluicing only if α makes an inquisitive contribution.

Since an ordinary indefinite like *something* in 1_A is, on this view, inquisitive, it is correctly predicted to be a possible inner antecedent. Similarly, since disjunctions have been argued to make an inquisitive contribution, the welcome prediction is made that disjunctions will also be licit inner antecedents, as in 6. As we see in §3.3 below, this is so even in cases where the disjunction is of entire clauses, cases that are problematic for accounts based on syntactic isomorphy (as noted in Chung et al. 1995). The inner antecedenthood of these two elements, then, is due to a particular semantic property they share with questions: their inquisitive potential.

- (6) [(Either) John or Mary left the door open] $_A$, and I want to find out [which (one) ~~left the door open~~] $_E$.

In contrast, the A clauses in 3–4 are argued to have a different semantics. While they each make the same informative contribution to the discourse that corresponding examples with a simple indefinite would, they lack the inquisitive potential that the indefinite contributes. For double negation as in 3, this follows straightforwardly from the way in which negation is naturally defined in inquisitive semantics. Since sentence meanings in inquisitive semantics are sets of alternatives, to negate a sentence is to reject each of these alternatives (i.e. to universally quantify over them). As Groenendijk and Roelofsen (2009) point out, this means that DOUBLE negation eliminates the inquisitive content of the sentence to which it applies. Section 4 below argues that independently observable properties of appositive relative clauses motivate a semantics where they too make a contribution to discourse that is inherently noninquisitive.

1.2. PROBLEMATIC SPROUTING DATA. For merger, the problematic cases introduced here are ones where the sluicing fails despite the presence of the appropriate truth-conditional information in the semantics of the A clause. For sprouting, essentially the opposite problem arises: cases where sluicing succeeds despite the absence of even the existential information (let alone the relevant inquisitive content). That is to say, the A clause—*Fred baked a cake*—entails the existence of a time at which the cake was baked, but not the existence of a helper. In contrast to well-behaved cases of sprouting like 7, examples like 8—first discussed in depth by Chung (2005)—are therefore problematic for an account based on symmetric entailment.

- (7) [Fred baked a cake] $_A$, but I don’t know [when ~~Fred baked a cake~~] $_E$.
 (8) [Fred baked a cake] $_A$, but I don’t know [with whose help ~~Fred baked a cake~~] $_E$.

There is a clear intuition that such examples rely on inference or accommodation of some sort. An approach that relies on ‘direct’ accommodation at the level of the discourse will, however, struggle to capture the fine-grained ways in which the linguistic form of the A clause itself still does impact the (in)felicity of such sluices. For example, Chung and colleagues (1995) (who in turn attribute the generalization to Chris Albert) observe that cases like 9, where there is an island present, do not allow sprouting. Furthermore, Romero (1998) observes that sprouting also is not possible in examples like 10a, where the nonelliptical counterpart—10b—is grammatical.³

(9) *That Tom will win is likely, but it’s not clear which race. (Chung et al. 2011)

(10) a. *Ramon is glad that Sally ate, but I don’t remember which dish.

b. I don’t remember which dish he is glad that Sally ate. (Romero 1998)

As in the problematic instances of merger from §1.1, a solution is proposed that makes crucial use of inquisitive content in the A clause. Like indefinites, existential quantification over the neo-Davidsonian event(uality) argument is proposed to be inquisitive. For an example like 7, then, the proposal is that 7_A both contributes the INFORMATION that there exists an event of Fred baking a cake and makes salient the ISSUE of which event it is. Sprouting is thus the result of an inferential process dubbed here ‘issue bridging’ (the term is intended to highlight the notional parallel with bridging definite descriptions). Sprouts like 7–8 are felicitous because the issue contributed by the E clause (e.g. What time was there an event of the appropriate type?) is sufficiently similar to that contributed by the A clause (e.g. Which event(s) are of the appropriate type?).

The felicity of 7–8, therefore, is crucially dependent on the issue contributed by the A clause. In the infelicitous sprouts in 9 and 10, by contrast, the A clauses are not inquisitive since another operator takes scope over the existential event quantification. Without an inquisitive A clause, there is no issue to compare with that of the E clause and sluicing will not be possible.

The remainder of the article proceeds as follows: the inquisitive semantics for both assertions and questions proposed in AnderBois 2012a (which in turn builds on work by Groenendijk and Roelofsen (2009) and others) is reviewed in §2, and then a novel semantic condition that builds on Merchant’s (2001) symmetric entailment condition, but makes use of the inquisitive semantics proposed in §2, is proposed in §3. The account is then shown to capture examples with disjunctive inner antecedents, as in 6, and the interaction with double negation, as in 3, in addition to more basic instances of merger. Section 4 shows that an independently motivated semantics for appositives correctly predicts the infelicity of 4 and a range of other facts regarding the interaction of appositives and ellipsis. Cases of sprouting with indefinite or existential implicit arguments—called DIRECT sprouting here—are shown in §5 to follow straightforwardly, given their independently observable semantics. Cases of indirect sprouting where no indefinite/existential argument is present (e.g. 8) are tackled in §6 as cases of issue bridging, and concluding remarks are given in §7.

2. INQUISITIVENESS IN QUESTIONS AND ASSERTIONS. The core intuition of this article was presented in the introduction: that sluicing makes crucial reference not just to truth-conditional information, but to a sentence’s inquisitive contribution. To do this, of

³ Lisa Matthewson (p.c.) suggests that judgments on 9 and 10a may exhibit more gradience than the judgments reported in previous literature (and repeated here) suggest. This question is left for future exploration since island-sensitivity is not central to the present article.

course, a semantics is needed that comprises both of these meaning components, that is, an INQUISITIVE semantics in the sense of Groenendijk and Roelofsen (2009) and others. Inquisitive semantics builds on the core insight of Hamblin (1973), who proposed that the denotation of a question is a set of alternative propositions, namely its possible answers.

For a WH-question, this alternative set is contributed by the WH-word—which denotes a set of individuals—and ‘expands’ by combining with other elements of the clause. The result, then, is that a WH-question has as its top-level meaning a set of alternative propositions. For example, a simple question like 11a would denote the set of alternatives of the form ‘Bill talked to x ’, where x is some person or other. More concretely, then, the meaning of 11a would be as in 11b, with the number of alternative propositions being determined by the contextual restriction on the WH-word (and in a technical sense, the model relative to which the sentence is evaluated).

- (11) a. Who did Bill talk to?
 b. {‘that Bill talked to Mary’, ‘that Bill talked to Al’, ‘that Bill talked to Jo’, ... }

Hamblin treats an assertion like 12a as differing fundamentally from a question in that it denotes a singleton set containing a single proposition: ‘that Bill talked to someone or other’, as in 12b. While for Hamblin, both assertions and questions are of the same type (sets of propositions, type *stt*), many subsequent works in this tradition, such as Lahiri 2002, have taken assertions to be of a different semantic type (a set of possible worlds, type *st*). This latter view, then, assigns to 12a a semantics like 12c, and therefore makes the meanings of questions and assertions look ever more different.

- (12) a. Bill talked to someone.
 b. {‘that Bill talked to someone or other’}
 c. ‘that Bill talked to someone or other’

While questions and assertions clearly are different in many ways, a number of recent works have pursued the intuition that these differences are not quite so stark as the traditional view above. In particular, it has been proposed that indefinites (Kratzer & Shimoyama 2002) and disjunctions (Alonso-Ovalle 2006) make the same alternative-rich contribution that Hamblin ascribes to WH-words. In this view, an indefinite like *someone* contributes the same set of individual alternatives as the corresponding WH-word, *who*. A disjunction similarly introduces a set of alternatives, with each disjunct spelling out a member of this set.

Although these authors do hold that indefinites and disjunctions themselves are more similar to WH-words, the view of the formal relationship between questions and assertions remains the same as in Hamblin 1973. The top-level semantics of an assertion like 12a still differs fundamentally from that of a question like 11a, differing either in the cardinality of the alternative set, 12b, or in the semantic type itself, 12c. In essence, then, these authors use question-like sets of alternatives as meanings for subparts of sentences, but arrive at the classical picture in 11–12 through the insertion of an existential closure operator (unpronounced in English) that quantifies over these alternatives.

The result is that pairs like 13a and 13b have identical meanings, even though the composition of the latter involves an alternative-evoking element, while the former presumably does not. In light of the asymmetry between these two sentences with respect to sluicing, seen in 14, this equivalence is an undesirable result.

- (13) a. It’s not the case that Bill talked to no one.
 b. Bill talked to someone.

- (14) a. #It's not the case that Bill talked to no one, but I don't know who.
 b. Bill talked to someone, but I don't know who.

Inquisitive semantics builds on the Kratzer & Shimoyama 2002-style alternative semantics by holding that not only do indefinites and disjunctions have an alternative-evoking semantics within sentential composition, but also that evoking question-like alternatives is an aspect of the sentence's top-level meaning and therefore its contribution to discourse. That is, while 13b has the same truth conditions as 13a, only the former additionally evokes the set of alternatives as the corresponding question did in 11.

In §2.1, the inquisitive semantics for first-order logic of AnderBois 2012a is presented in order to flesh out this picture for assertions. This semantics is extended in §2.2 to WH-questions, which have the same inquisitive content as corresponding sentences with indefinites, but are nonetheless distinguished by their being (necessarily) truth-conditionally uninformative.

2.1. INQUISITIVE SEMANTICS FOR FIRST-ORDER LOGIC. The inquisitive semantics for first-order logic of AnderBois 2012a, briefly reviewed in this section, itself builds on the inquisitive semantics for propositional logic of Groenendijk & Roelofsen 2009.⁴ As the preceding informal discussion suggests, the primary formal shift in inquisitive semantics is to treat the denotation of either an assertion or a question as a set of classical propositions, that is, a set of sets of possible worlds. For many formulas, including all atomic formulas, this set will simply be the singleton set containing the classical denotation.

- (15) Atomic formulas

$$\begin{aligned} \text{S1: } \llbracket R^n(\gamma_1, \dots, \gamma_n) \rrbracket^{\mathcal{M}, g, w} = \\ \text{ALT} \{ \alpha \subseteq W \mid \text{for all } w' \in \alpha : \langle \llbracket \gamma_1 \rrbracket^{\mathcal{M}, g, w'}, \dots, \llbracket \gamma_n \rrbracket^{\mathcal{M}, g, w'} \rangle \in \llbracket R^n \rrbracket^{\mathcal{M}, g, w'} \} \end{aligned}$$

Setting aside the contribution of ALT for a moment, the interpretive rule collects all of the sets of worlds where each world in that set is one where a given ordered tuple is a member of the given relation. For example, if we consider a toy model where *John left* is true only in worlds w_1 and w_2 , the definition will produce the set $\{\{w_1\}, \{w_2\}, \{w_1, w_2\}\}$ —the power set of classical denotation. The ALT operator, defined in 16, takes this set and eliminates any sets that are nonmaximal, creating true ALTERNATIVES rather than mere POSSIBILITIES (e.g. John and Bill leaving is not intuitively an ALTERNATIVE to John leaving). While this method is a bit cumbersome for atomic formulas, it is crucial when we turn to inquisitive expressions below (i.e. disjunctions and indefinites).

- (16) $\text{ALT} \mathcal{P} = \{ \alpha \in \mathcal{P} \mid \text{for no } \beta \in \mathcal{P}: \alpha \subset \beta \}$

For basic cases (when all subformulas are not inquisitive), conjunctions similarly produce the set containing the classical denotation, as in S2. Universal quantifiers, then, are defined in S3 essentially as conjunctions whose length is specified only by contextual restriction (and the domain of the model in a technical sense).

- (17) Conjunction

$$\text{S2: } \llbracket \phi \wedge \psi \rrbracket^{\mathcal{M}, g, w} = \text{ALT} \{ \alpha \subseteq W \mid \text{there is some } \beta \in \llbracket \phi \rrbracket^{\mathcal{M}, g, w} : \alpha \subseteq \beta \text{ and there is some } \gamma \in \llbracket \psi \rrbracket^{\mathcal{M}, g, w} : \alpha \subseteq \gamma \}$$

- (18) Universal quantifier

$$\text{S3: } \llbracket \forall u \phi \rrbracket^{\mathcal{M}, g, w} = \text{ALT} \{ \alpha \subseteq W \mid \text{for all } d \in \mathcal{D}_e : \text{there is some } \beta \in \llbracket \phi \rrbracket^{\mathcal{M}, g[u/d], w} : \alpha \subseteq \beta \}$$

⁴ For simplicity's sake, the discussion here is limited to models with finite domains. See Ciardelli 2009 for a somewhat more complicated inquisitive semantics for first-order logic that allows for models with infinite domains.

We have yet to see the impact of inquisitive semantics, since the elements considered thus far produce denotations that are singleton sets. Where its impact is seen is when we turn to consider disjunction and the existential quantifier. A disjunction introduces a nonsingleton set of alternatives into the computation, one per disjunct.

(19) Disjunction

S4: $\llbracket \varphi \vee \psi \rrbracket^{\mathcal{M},g,w} = \text{ALT} \{ \alpha \subseteq W \mid \text{there is some } \beta \in \llbracket \varphi \rrbracket^{\mathcal{M},g,w} : \alpha \subseteq \beta \text{ or there is some } \gamma \in \llbracket \psi \rrbracket^{\mathcal{M},g,w} : \alpha \subseteq \gamma \}$

Since these alternatives are located in the semantic interpretation of the metalanguage, rather than the metalanguage TRANSLATION, the formulas themselves appear unchanged. For this reason, it is helpful to have a pictorial representation of our inquisitive denotations, as in Figure 1. Here, we consider a toy model with four possible worlds ($w_{00}, w_{01}, w_{10}, w_{11}$), each represented by a circle, with the numbers inside the circle indicating the truth value of two propositions, p and q , in that world. A disjunction $\varphi \vee \psi$, then, denotes a set of two alternatives: the maximal set of worlds where φ is true and the maximal set of worlds where ψ is true.

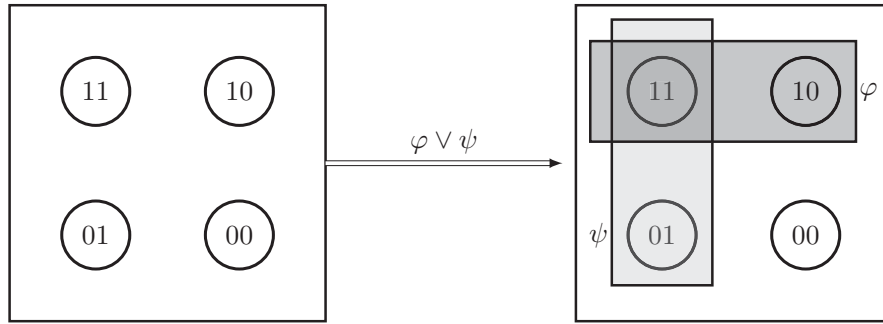


FIGURE 1. Disjunction.

Note that even though the definitions for conjunction/universal quantifier are entirely parallel to those for disjunction/existential quantifier, the former produces a singleton set of alternatives, as in Figure 2. That is, the sets of worlds where all of the atomic formulas in the conjunction are true will necessarily be in a subset-superset relationship. The ALT operator, then, will eliminate all of the nonmaximal ones, leaving only a single alternative (see Roelofsen 2013 for a far more detailed discussion of this asymmetry).

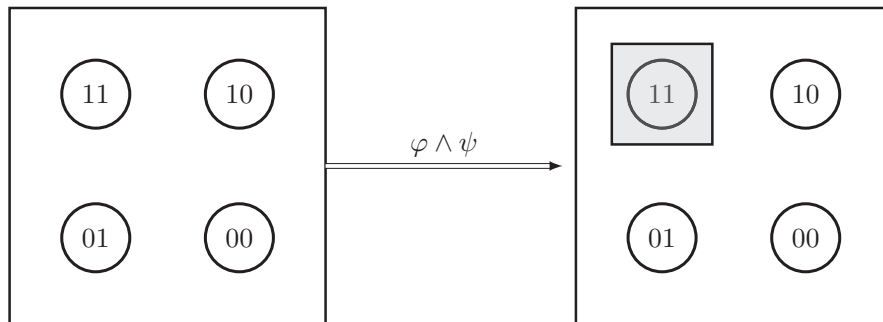


FIGURE 2. Conjunction.

Just as has been done for the universal quantifier, the existential quantifier is defined as a disjunction, with the number of disjuncts being specified contextually rather than linguistically. For a model with only two individuals, the denotation of the existential quantifier will thus be identical to that of a corresponding disjunction with two disjuncts.

(20) Existential quantifier

$$S5: \llbracket \forall u \varphi \rrbracket^{M,g,w} = \text{ALT} \{ \alpha \subseteq W \mid \text{there is some } d \in \mathcal{D}_e: \text{there is some } \beta \in \llbracket \varphi \rrbracket^{M,g[u/d],w} : \alpha \subseteq \beta \}$$

We have seen that formulas containing disjunctions and existential quantifiers introduce nonsingleton sets of alternatives into the semantic composition. Negation, then, is naturally seen as rejecting each of these alternatives. The interpretive rule S6 accomplishes this by universally quantifying over the alternatives in the denotation to which it applies. As we can see in Figure 3, the result of this is that the negation of any formula consists of a single alternative, whether the formula to which it applies contains a single alternative (e.g. atomic formulas, conjunction) or is inquisitive (e.g. disjunction). Note that collecting all of the alternatives that reject *SOME* alternative in φ would yield quite different truth conditions in cases where φ is inquisitive.

(21) Negation

$$S6: \llbracket \neg \varphi \rrbracket^{M,g,w} = \text{ALT} \{ \alpha \subseteq W \mid \text{for all } \beta \in \llbracket \varphi \rrbracket^{M,g,w}: \alpha \cap \beta = \emptyset \}$$

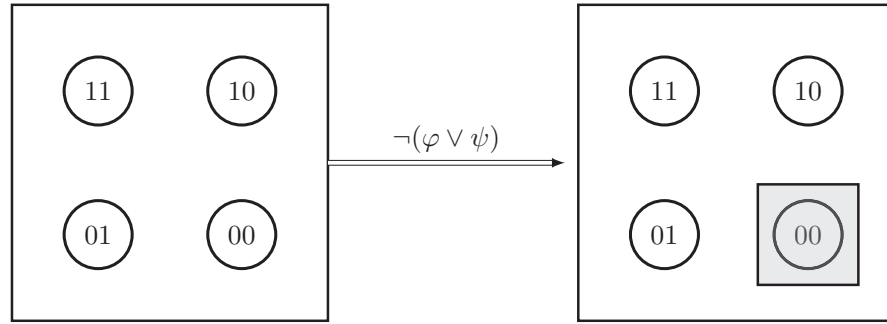


FIGURE 3. Negation.

2.2. QUESTIONS IN INQUISITIVE SEMANTICS. Thus far, disjunctions and existential quantifiers have been assigned a semantics that is far more question-like than is traditionally assumed. In §3 below, we see that it is this inquisitive contribution that is central to the inner antecedenthood of disjunctions and indefinites. First, however, we review two different approaches to question semantics that have been proposed in previous literature in inquisitive semantics. Common to both is the idea that questions differ from assertions in whether they provide truth-conditional INFORMATION, rather than differing in their inquisitivity itself.⁵

⁵ It is important to point out that the concern here is only with defining the two classes of formulas—questions and assertions—rather than providing a complete characterization of how questions behave in discourse, which is taken to be the domain of speech act theory. For example, in the semantics of Hamblin (1973), questions are sentences whose denotations are nonsingleton sets, while assertions have singleton sets as their denotations. For Groenendijk and Stokhof (1984), the difference is one of semantic types, with questions being of type *sst* and assertions of type *st*.

Where previous work in inquisitive semantics has differed is in what sort of uninformativity questions require: ABSOLUTE or RELATIVE to the sentence's presuppositions. The first option has been pursued by Groenendijk and Roelofsen (2009), who propose a question operator, Q_{op} , which takes the set of alternatives introduced by an inquisitive disjunction (or WH-word given our first-order extension) and adds in the elsewhere alternative: its negation. While it is not a partition (since the inquisitive alternatives introduced by the WH-word can overlap), this semantics is reminiscent of Groenendijk and Stokhof's (1984) in taking the question's alternatives to cover the entire logical space, with no presupposition present; see Figure 4.

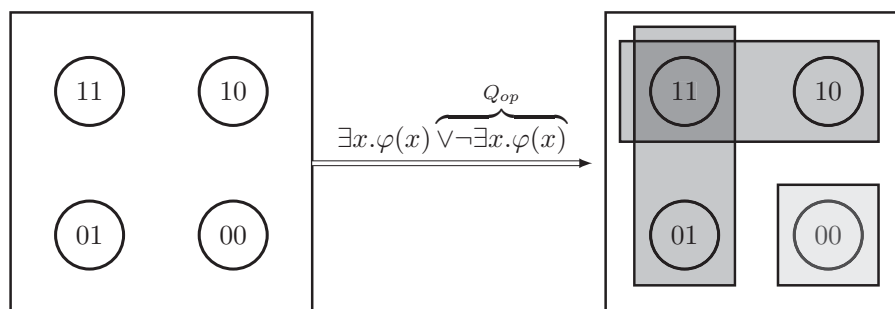


FIGURE 4. Groenendijk & Roelofsen 2009's semantics for a WH-question.

The second option, from AnderBois 2012a, is to claim that questions have an existential presupposition and that the alternative set of the question is uninformative only relative to this presupposition. Returning to the inquisitive diagrams, we see in Figure 5 that this means that the presupposed input state is one where the negative alternative has already been eliminated. The result, then, is a top-level semantics for questions that is identical to that of Hamblin 1973.

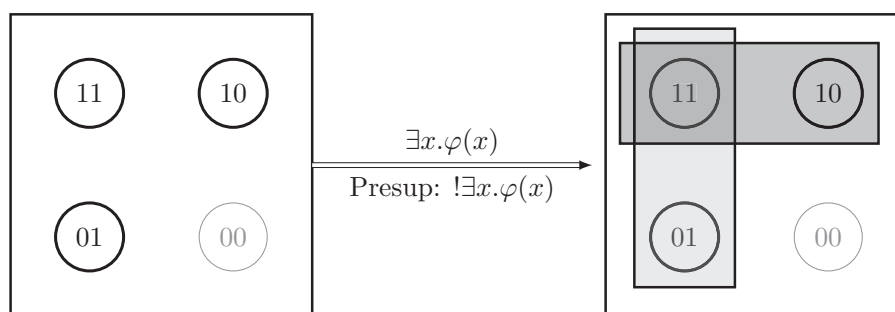


FIGURE 5. AnderBois 2012a's semantics for a WH-question.

In what follows, this second option is adopted, since it allows us to define entailment in independently motivated ways, by making use of so-called 'Strawson entailment' (von Fintel 1999 et seq.). Ultimately, there are, of course, empirical concerns beyond the scope of this article that will decide between a question semantics in the mold of Hamblin 1973 and one in the mold of Groenendijk & Stokhof 1984. Perhaps most notably, the long unresolved question of whether WH-questions in general contribute exis-

tential presuppositions bears on this decision. For our purposes, however, the decision is one of convenience, and determining the viability of a similar account using a question semantics along the lines of Fig. 4 is left to future work, though nothing obvious prevents such an account.

One technical aspect of the formula in the presupposition is the presence of the Groenendijk & Roelofsen 2009 ‘noninquisitive closure’ operator, indicated by the exclamation point. This operator, to be discussed further and formally defined in 41 below, takes a potentially inquisitive formula φ and returns only the informational component (i.e. a set containing the single alternative where any of the alternatives in φ are true). Since the purpose of a question is to introduce a new issue in discourse, it seems clear that the existential presupposition of a question ought not to include a prior QUD or anything of the sort, hence its inclusion in the presupposition.

3. SLUICING AND INQUISITIVE ENTAILMENT. With this semantic background in place, we turn now to a formulation of a semantic condition on sluicing: that the inquisitive semantic interpretations of the A and E clauses symmetrically entail one another. A brief review of previous accounts of sluicing is needed in order to properly situate the proposed account with respect to prior literature. Of particular interest is Merchant’s (2001) account, which is in many respects the most immediate predecessor to the current one. After this inquisitive entailment condition has been laid out, we return to two of the empirical observations with which we started: (i) the ability of disjunctions to serve as inner antecedents, and (ii) the inability of doubly negated indefinites to do so.

3.1. PREVIOUS APPROACHES TO SLUICING. One of the central reasons why sluicing (and ellipsis more generally) has been a topic of such great interest to researchers is the apparent mismatch between what is pronounced and what is interpreted. There are two central questions about this mismatch that an account of sluicing must address: (i) How does this mismatch arise?, and (ii) What condition(s) are this mismatch subject to? The arguments in this article are principally about the latter question, but a few brief words about the former are in order.

With respect to the first question, three kinds of approaches have been proposed in prior literature. The first approach claims that the perceived mismatch is not actually a mismatch after all (e.g. Culicover & Jackendoff 2005). That is, the bare *wh*-word or phrase simply has an anaphoric interpretation, much like a pronoun. Just as most theories no longer think of pronouns as resulting from a pronominalization transformation replacing a fully fleshed-out definite description, these authors argue that sluicing should be seen as the base generation of an anaphor (albeit of a special type), with no covert structure present in the syntax at any level.

In the absence of evidence to the contrary, such an account would seem to be preferable to one that posits covert syntax, since it relies only on independently motivated mechanisms of anaphora resolution. Much research in previous decades, however, has provided several potential kinds of counterevidence. Since the issue is largely orthogonal to our present concerns, the reader is referred to Merchant 2001 for detailed arguments, as well as to Chung 2005 and Chung et al. 2011 for more recent discussions of this issue.

The other two approaches both assume covert syntactic structure at some level of representation, differing in what this level is and where this structure comes from. One view, originally proposed by Ross (1969) and espoused more recently by Merchant (2001), holds that the E clause has a full clausal structure constructed in the normal way. That is, the surface syntax of the E clause is essentially the same as that of its nonelliptical coun-

terpart. While this structure is present in the surface structure, it is deleted at phonetic form (PF) under the appropriate conditions. This approach has therefore come to be known as PF-DELETION. The other view, developed by Chung and colleagues (1995) (and more recently defended in Fortin 2007 and Chung et al. 2011), holds that the surface syntax of the E clause matches what is pronounced, consisting of a WH-word (or phrase) and an empty TP. This empty TP is filled in at logical form (LF) via the ‘reuse’ or ‘copying’ of a TP from prior discourse, and is therefore termed LF-COPYING.

The central argument presented in this article is that the retrieval conditions on sluicing make crucial reference to inquisitive content in the A clause in the sense developed in §2. While this idea is implemented here in a way that makes use of covert structure, the main idea would seem to be equally implementable under a suitable structure-free approach.⁶ For the sake of concreteness, the analysis is formulated under a PF-deletion theory of ellipsis, leaving open the question of its compatibility with an LF-copying approach. The primary reason for this choice, however, is that it allows for a more direct comparison with Merchant 2001.

Here, the focus is on the isomorphy question: what conditions are imposed on the mismatch between what is pronounced and what is interpreted.⁷ Since the account here is couched in terms of PF-deletion, these are the conditions that this deletion process is subject to. The isomorphy conditions that are commonly posited fall into two major categories: (i) conditions on the syntactic/morphological/lexical FORM of the A and E clauses and (ii) conditions on their MEANINGS.

For example, in Ross’s (1969) seminal work, he argues that sluicing is subject to a single isomorphy condition between the A and E clauses: syntactic identity. In contrast to Ross, Merchant (2001) argues that sluicing is subject to only a semantic identity condition: that the focus closures of the A and E clauses symmetrically entail one another. Since Merchant 2001, the view that the isomorphy conditions on sluicing are at least partially semantic has come to be widely accepted (though not universally so). At the same time, however, there is mounting evidence that a purely semantic account might be too permissive, leading many recent authors (e.g. Chung (2005), van Craenenbroeck (2008), and Chung and colleagues (2011)) to conclude that the conditions must include both a semantic isomorphy condition AND some sort of form-based condition.⁸ Under a ‘hybrid’ approach of this sort, the possibility arises that the form-based condition can be far less stringent than full-blown syntactic isomorphy. For example, Chung (2005) argues that sluicing is subject to both a semantic condition and a lexical condition (all unpronounced words must have a pronounced counterpart in the A clause). When we turn to consider sprouting in §§5–6, an approach of exactly this sort is adopted.

In order to capture the data mentioned in the introduction, however, a semantic condition that references a richer semantics than the purely truth-conditional semantics assumed in Merchant’s (2001) account is argued for. Since the semantic isomorphy condition proposed builds on Merchant’s in its basic form, it is worth considering his condition in more detail before proceeding. Building on Schwarzschild’s (1999) ac-

⁶ Though see §4.2 for further discussion of the relationship between sluicing and other anaphoric processes such as pronominal reference.

⁷ In addition to the conditions on sluicing itself, there are conditions on deaccenting that must be met by focus parallelism domains that are (possibly) larger than the A and E clauses themselves. See Rooth 1992 and Fiengo & May 1994 for discussion of this condition in general and Romero 1998 for detailed discussion of its implications for sluicing.

⁸ Ginzburg & Sag 2001 may be considered a forerunner to this sort of hybrid approach, since a certain amount of syntax is in some sense built into the semantics.

count of deaccenting, Merchant argues that sluicing is subject to the condition in 22. That is, the A clause must entail the focus closure of the E clause and vice versa.⁹

- (22) Merchant's (2001) e-GIVENNESS condition: An IP α can be deleted only if α is e-GIVEN.
- (23) e-GIVENNESS: An expression E counts as e-GIVEN iff E has a salient antecedent A and, modulo existential type-shifting,
- A entails F-clo(E), and
 - E entails F-clo(A).

While Merchant's condition is a semantic one, one key point to make about it is that the reason indefinites are good inner antecedents in this account is nonetheless syntactic. Consider an example like 24. The condition in 22 holds that the crossed-out material in the E clause can be elided only if it symmetrically entails the A clause. Merchant would (uncontroversially) assign the A-clause a denotation with existential truth conditions. Where a decision has to be made is with respect to the trace of the WH-phrase. What semantics should the trace be given for the purposes of computing e-GIVENNESS? Merchant's answer, not surprisingly, is to give the trace an existentially quantified interpretation (the 'existential type-shifting' in 23), so that IP_E and IP_A have the same interpretation, and ellipsis is correctly predicted to be possible.

- (24) [[Marta lent something to Joe]_{IP}]_A,
and I want to find out [what_i [~~she lent *t_i* to Joe~~]_{IP}]_E.

While this correctly captures the fact that indefinites are licit inner antecedents, it does not provide a deep semantic explanation for WHY. It is not the semantics of interrogative E clauses itself that makes them sufficiently similar to A clauses with indefinites. Rather, it is the existential closure built into the symmetric entailment condition, coupled with the free variable contributed by the WH-trace. In the account to be developed below, the ability of indefinites to serve as inner antecedents arises because of the tight semantic connection between indefinites and WH-words themselves.

Although the focus is on English data in the present article, it is important to note that this connection between indefinite/existential semantics and sluicing is crosslinguistically widespread or perhaps universal (Merchant 2006, Merchant & Simpson 2012). For example, Potsdam (2007) applies this theory to Malagasy, a language where questions are argued to be formed from pseudoclefts. Beyond these differences in the forms of questions, we see that a variety of constructions in Malagasy—an existentially interpreted bare noun in 25a and an existential cleft in 25b—can provide the inner antecedent as long as they produce an existential semantics.

- (25) a. Nandoko zavatra i Bao fa manadino aho hoe inona.
paint thing Bao but forget I COMP what
'Bao painted something but I forget what.' (Potsdam 2007)
- b. Nisy olona nihomeny ka nanotany ianao hoe iza.
exist person laugh and ask you COMP who
'Someone laughed and you asked who.' (Potsdam 2007)

⁹ The focus-closure (F-clo) part of the definition is needed to handle two kinds of sluices that are not discussed here: ones where the WH-phrase contains *else*, as in (i), and so-called 'contrast' sluices like (ii), both examples from Merchant 2001. For exposition's sake, this is ignored in what follows, though something like it is surely needed to account for examples of this sort.

(i) Abby called BEN_F an idiot, but I don't know who else.

(ii) She has five CATS_F, but I don't know how many DOGS_F.

One further consequence of this aspect of Merchant's account worth noting is the ramifications it has for WH-in-situ languages. One of the great benefits of a semantic account of sluicing is that it can readily account for sluicing in languages where questions have quite different syntactic structures from in English. Since Merchant's (2001) approach for English relies on an existentially closed trace, this has meant that in order to analyze sluicing in WH-languages,¹⁰ covert movement of some sort must be appealed to (e.g. covert WH-movement). While the account offered here is consistent with a covert movement account of the syntax of such questions, it imposes no such restriction.

3.2. AN INQUISITIVE ENTAILMENT CONDITION ON SLUICING. As we saw in §2, given a Hamblin semantics for questions, the denotation of a question like *Who left?* and a corresponding assertion *Someone left* differ only in whether they impose a presupposition on the input state. They both propose the same output state, consisting of a set of alternative propositions of the form '*x left*' and with the worlds where no one left no longer candidates for the real world. That is, they not only contain the same truth-conditional INFORMATION, but also make the same INQUISITIVE contribution (i.e. raise the same ISSUE). The claim is that sluicing requires symmetric entailment over both kinds of semantic content, not just truth conditions. That is, for an interrogative E clause to be elided, its proposed output must have identical truth conditions AND inquisitive content as an A clause in prior discourse.

Formally, this is achieved by imposing a symmetric entailment condition similar to Merchant's (2001), but defining entailment over our inquisitive semantic denotations, as in 26, from Groenendijk & Roelofsen 2009. A formula ϕ entails another formula ψ iff every alternative in ϕ is a subset of some alternative in ψ . For formulas that denote singleton sets (e.g. those that are free of disjunctions and indefinites), this definition reduces to the standard notion of entailment. For elements that are inquisitive, the definition mirrors Groenendijk and Stokhof's (1984) entailment for questions, the difference being that the alternatives are allowed to overlap, and therefore do not necessarily form a PARTITION. It should be noted that while the condition is stated in terms of symmetric entailment, the interesting cases where this condition is not met are almost exclusively ones where the A clause fails to entail the E clause.

(26) ENTAILMENT: $\phi \models \psi$ iff $\forall \alpha \in \llbracket \phi \rrbracket, \alpha$ is such that $\exists \beta \in \llbracket \psi \rrbracket$ such that $\alpha \subseteq \beta$

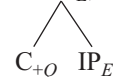
Crucially for our present purpose, this definition for entailment operates over only the proposed output states, ignoring the presupposed input or (equivalently) assuming that they are met. The notion of entailment required, then, is what von Stechow (1999), in his account of NPI (negative polarity item) licensing, has dubbed 'Stawson entailment'. The result is that entailment is essentially computed over the entire clause, including the WH-phrase, but ignoring the existential presupposition (which is attributed to a covert interrogative complementizer C_{+Q}).

Given this definition for entailment, the semantic condition on sluicing can be stated as in 27.¹¹

¹⁰ This is, of course, assuming that the constructions in question are in fact truly sluicing, rather than, say, clefts of some sort (as Gribanova 2013 argues for Uzbek).

¹¹ As discussed above, this definition would have to be complicated with focus closure or something similar in order to account for contrast sluices and sluices with *else*. This complication is ignored in what follows, as it is orthogonal to our present concerns.

(27) SYMMETRIC ENTAILMENT CONDITION ON SLUICING: Given a structure CP_E ,



IP_E can be elided only if there is some salient antecedent CP_A such that:

- a. $CP_E \models CP_A$, and
- b. $CP_A \models CP_E$.

In addition to defining entailment over richer semantic objects, as discussed above, there are two further differences between this condition and Merchant's (2001) from 22. First, this definition makes explicit that the prospective E clause is a question, something that Merchant states but does not explicitly include in his definition. The more substantial difference (facilitated by the richer semantics adopted here) is that symmetric entailment can be defined over the entire clause INCLUDING the WH-phrase. Since WH-words always make an inquisitive contribution, the symmetric entailment condition therefore dictates that the A clause must also have a denotation that is inquisitive. The empirical generalization that thus follows from 27 is stated in 28.

(28) INNER ANTECEDENT GENERALIZATION: An expression α can serve as an inner antecedent for sluicing only if α makes an inquisitive contribution.

In contrast to this, Merchant's (2001) entailment condition is computed over the IP_E to be elided, and therefore disregards the WH-phrase itself. What matters for Merchant's account, then, is the relationship between the inner antecedent and the existentially closed trace, rather than the inner antecedent and the WH-phrase itself. The WH-phrase and the trace, of course, must also be related, since they form a single chain of ordinary A'-movement. Under the present approach, the intermediate step of existentially closing the trace becomes unnecessary; the WH-phrase itself already has suitably similar semantics to the inner antecedent, as we will see in detail shortly.

Applying this semantic condition to the data, we can first consider the most straightforward case, an example where there is a widest-scope overt indefinite in the A clause serving as inner antecedent, as in 29. The A clause *Someone left* will be assigned the metalanguage translation in 30a, whose inquisitive semantic interpretation is pictured in the left-hand side of Figure 6. That is, the denotation of the A clause here consists of a set of alternative propositions of the form 'x left'. The E clause will be assigned the metalanguage translation in 30b, whose output state is pictured in the right-hand side of Fig. 6. The interrogative E clause's denotation, then, differs from that of the A clause only in the input condition it presupposes (indicated by the grayed-out circle).

(29) [*Someone left*]_A, but I don't know [*who left*]_E.

(30) a. $29_A \rightsquigarrow \exists x.\text{leave}'(x)$

b. $29_E \rightsquigarrow \exists x.\text{leave}'(x)$ (Presupposes: $!\exists x.\text{leave}'(x)$)

Given these denotations, the symmetric entailment condition in 27 will be met and sluicing is predicted to be possible. Each alternative in CP_E is contained by one in CP_A (since they are the same alternatives), and the same holds in the opposite direction. The definition given here for entailment ignores the presupposition of the E clause, which is precisely what distinguishes the two clauses. Proper names and strong quantifiers are also straightforwardly predicted to similarly not be able to serve as inner antecedents, as in Chung and colleagues' (1995) examples in 31. The prospective A clauses in these examples have denotations that are not inquisitive in the way that indefinites are.

(31) a. ?*I know that Meg's attracted to Harry, but they don't know who.

b. *She said she had spoken to {everybody/most students}, but he wasn't sure who.

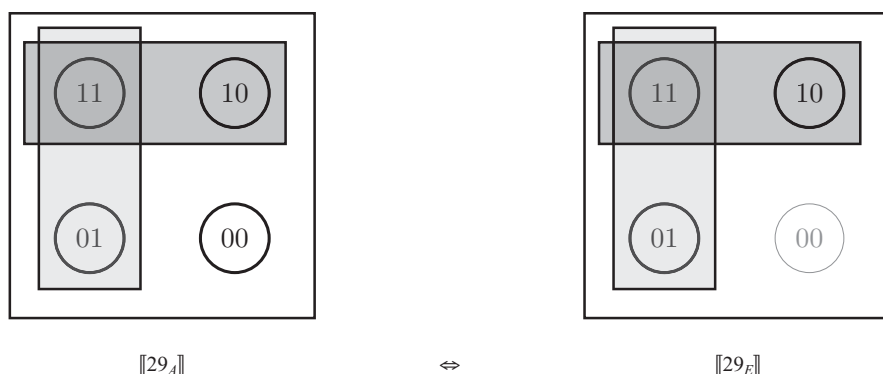


FIGURE 6. Inquisitive semantic interpretation of example 29.

The analysis here also straightforwardly handles cases of what Chung and colleagues (1995) call ‘inheritance of content’, such as Ross’s (1969) example in 32. Here, Chung and colleagues observe that the WH-word in the E clause, *who*, is restricted to individuals from Kankakee. Whereas accounts based on syntactic identity must posit some additional sluicing-specific mechanism to capture such data (the ‘merger’ operation from Chung et al. 1995 being the most well-known such mechanism), a semantic account like the present one can treat such data as more or less ordinary cases of contextual domain restriction of quantifiers. Since this approach is already discussed at some length in previous semantic/pragmatic accounts such as Romero 1998 and Merchant 2001, a more detailed discussion is omitted here (see AnderBois 2011:73–76 for a more extended discussion within the current framework).

- (32) [Ralph is going to invite someone from Kankakee to the party]_A, but they don’t know [who, he’s going to invite *t*, to the party]_E.

3.3. DISJUNCTIONS AND THE NATURE OF INNER ANTECEDENTS. Thus far, the fact that indefinites are licit inner antecedents for sluicing is derived from a symmetric entailment condition on sluicing in combination with an inquisitive semantics for indefinites. Since questions are always inquisitive (indeed, this is their sole contribution), symmetric entailment dictates that the antecedent clause not only must have the same informational content, but must also be inquisitive. This section shows that the account straightforwardly extends to capture the fact, first observed by Chung and colleagues (1995), that another inquisitive element—disjunction—can also readily serve as an inner antecedent for sluicing. Some basic examples are in 33.

- (33) a. [(Either) Ryan or Dexter will play center field]_A, but they haven’t announced [which (one) will play center field]_E.
 b. [Carlos (either) likes tofu or chicken]_A, and I’m going to find out [which (one) he likes]_E.
 c. [Troy gave the ball to (either) Todd or Ian]_A, but I don’t know [which (one) he gave the ball to]_E.

In each of the examples in 33, we can readily replace the disjunction with a suitable indefinite and the resulting sentence is felicitous with roughly the same meaning. This parallelism is, in a sense, unsurprising, given the long-noted semantic parallels between disjunctions and indefinites (e.g. Rooth & Partee 1982, Schlenker 2006).¹² Indeed,

¹² The only thing distinguishing these examples is the obligatory presence of the D-linked WH-word, *which*, which is taken here to be independently motivated by the presence of overt descriptive material in the

Chung and colleagues suggest an approach in passing (1995:268–69) that would treat such disjunctions as indefinites whose values are restricted to one of two individuals. It is not clear how literally this syntactic suggestion is intended, but regardless, it will struggle with examples like those in 34, where the disjunction is not of arguments, but of clauses or other constituents larger than DPs.

- (34) a. (Either) Freddie is baking a cake again or something is on fire, but I can't tell which (one).
 b. Russ is in the back or Ali is working alone, but I can't tell which (one).
 c. Estelle (either) walked in the park or took out the trash. If you wait, you'll find out which (one).

The examples in 34 demonstrate that the potential for disjunctions to serve as inner antecedents is not a peculiarity of argument disjunctions, but is a fact about disjunctions in general. Chung and colleagues' (1995) suggested tactic of assimilating disjunctions like 33 to indefinites does not seem readily generalizable to the data in 34. While clausal disjunctions are quite different from indefinites in their syntax, there is ample reason to think that there are deep semantic parallels, including their shared INQUISITIVITY.

Before an example is worked through in detail, one open question raised by the examples in 34 should be mentioned: the internal syntax of the E clause. In argument disjunctions, it seems clear what the internal syntactic structure should be, by analogy with corresponding examples where an indefinite serves as inner antecedent. For 34, however, it is less clear what the internal structure of the E clause is. A number of different paraphrases would seem to yield (roughly) the appropriate meaning. For example, the E clause in 34a could be *which (one) is happening*, *which (one) is true*, *which (one) it is*, among other possibilities. Example 34c has an additional paraphrase that is of particular note: *which (one) she did*. While this paraphrase does not immediately suggest a solution, it suggests that the problem posed by 34 is closely related to another well-known phenomenon from the literature on VP-ellipsis (VPE): that of so-called SPLIT ANTECEDENTS (Fiengo & May 1994, Elbourne 2008, among others), as in 35.

- (35) a. Bob wants to sail round the world and Alice wants to climb Kilimanjaro, but neither of them can, because money is too tight. (Webber 1978)
 b. Whenever Max uses the fax or Oscar uses the Xerox, I can't. (Fiengo & May 1994)

This larger issue is left for future work, since the choice between the different possible E clauses is largely orthogonal to our present concerns. As long as the WH-phrase plus the elided material has the same semantics as the A clause, ellipsis is predicted to be possible. The central difference between clausal disjunctive antecedents to sluicing and split antecedents for VPE—the fact that they arise only with disjunctions—follows straightforwardly from the account since only disjunctions have denotations that are inquisitive.

This caveat aside, the account developed above correctly predicts the felicity of sluicing with a disjunctive inner antecedent, as seen in 36. The interpretation of the A clause puts forth a set of two alternatives, as pictured in the left-hand side of Figure 7. The E clause, on the right-hand side, is also inquisitive, due to the WH-word. The contextual restriction of *which* limits the alternative set of the E clause to the same two alternatives made salient by the disjunctive inner antecedent. Since the A clause and

A clause. See Dayal & Schwarzschild 2010 for a detailed discussion of the connections between the material in the A clause and the use of *which* in general.

E clause denote the same set of alternatives, the symmetric entailment condition in 27 is met, and the sluice is predicted to be acceptable.

- (36) a. [(Either) John or Fred left]_A. Tell me [which (one) ~~left~~]_E.
 b. (i) $36_A \rightsquigarrow \text{leave}'(j) \vee \text{leave}'(f)$
 (ii) $36_E \rightsquigarrow \exists x.x \in \{j, f\} \wedge \text{leave}'(x)$
 (Presupposes: $\exists x.x \in \{j, f\} \wedge \text{leave}'(x)$)

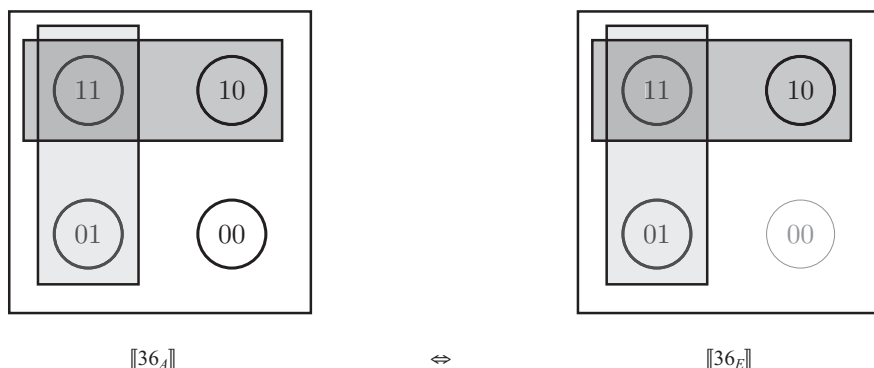


FIGURE 7. Inquisitive semantic interpretation of example 36.

One thing that this example makes quite clear is that it is the interpretation of the two clauses, in Fig. 7, that is crucial to the example's felicity. The metalanguage translations of the two clauses in 36b are quite different, yet sluicing succeeds due to the semantic parallels between the interpretations of disjunctions and indefinites. The clausal disjunctions in 34 illustrate this mismatch even more starkly. While this account is ultimately quite distinct from that suggested by Chung and colleagues (1995), there is nonetheless a shared intuition that the reason why disjunctions are licit inner antecedents stems from the parallelism between them and indefinites. Chung and colleagues suggest that this parallel might be cashed out syntactically, which is plausible for argument disjunctions, but less so for clausal disjunctions. Cashing out this parallel in the semantic interpretation itself captures the relevant data, but avoids having to posit an indefinite-like syntax for disjunctions.

3.4. DOUBLE NEGATION. The symmetric entailment condition developed here holds that A clauses for sluicing must have not only the same truth conditions as their corresponding E clauses, but also the same inquisitive potential. This richer semantic condition predicts that there should be potential A clauses that have existential truth conditions, yet fail to license sluicing. The first case of this sort examined here is that of doubly negated indefinites, which do not license sluicing, as seen in 37.

- (37) a. *[It's not the case that no one left]_A, but I don't know [who ~~left~~]_E.
 b. *[It's not the case that John didn't meet with a student]_A, but Fred still wonders [who ~~John met with~~]_E.

While the A clauses in such sentences are clearly pragmatically marked, it seems equally clear that they have the same truth conditions as their negation-less counterparts. Furthermore, in examples where the indefinite is provided by an ordinary indefinite, rather than *no one* or *anyone*, the sentence has the same potential for licensing

cross-sentential anaphora as a corresponding sentence with no negation, as seen in Krahmer and Muskens's (1995) example in 38.¹³

- (38) It is not true that John didn't bring an umbrella. It was purple, and it stood in the hallway.

Given these facts, then, it seems that double negation preserves truth conditions, but nonetheless has a semantic effect, namely eliminating the fine-grained inquisitive structure that the indefinite ordinarily possesses. This result follows quite directly from the way negation was defined in §2, repeated in 39. Negation closes off alternatives by quantifying over them universally. That is, while narrow-scope indefinites contribute alternatives in local composition, these alternatives are 'used up' by the higher operator, the result being that the whole sentence is not inquisitive.

- (39) $\llbracket \neg \phi \rrbracket^{\mathcal{M},g,w} = \text{ALT} \{ \alpha \subseteq W \mid \text{every } \beta \in \llbracket \phi \rrbracket^{\mathcal{M},g,w} \text{ is such that } \alpha \cap \beta = \emptyset \}$

This definition is empirically supported by the fact that an indefinite within the scope of negation, as in example 40 from Chung et al. 1995, does not license sluicing. The continuation with sluicing is possible, but indicates that the indefinite in the A clause takes wide scope over negation.

- (40) She didn't talk to one student; I wonder who.

It follows directly from this definition that double negation is no longer semantically vacuous. While it preserves truth conditions, it nonetheless has a semantic effect: eliminating the inquisitive component of the formula to which it applies. We can see this visually in Figure 8. The first negation (middle) looks at all of the alternatives of the indefinite (left) and returns the maximal alternative that does not overlap with any of them. The second negation looks at this necessarily singleton set and returns the maximal set with no overlap with that single alternative. The resulting set contains a single alternative comprising all of the worlds that were members of some alternative or other in $\llbracket \exists x.\phi(x) \rrbracket$. That is, double negation preserves the truth conditions of the formulas to which it applies, but eliminates its inquisitive potential. Indeed, Groenendijk and Roelofsen (2009) define a 'noninquisitive' closure operator, '!', in terms of double negation, as in 41.

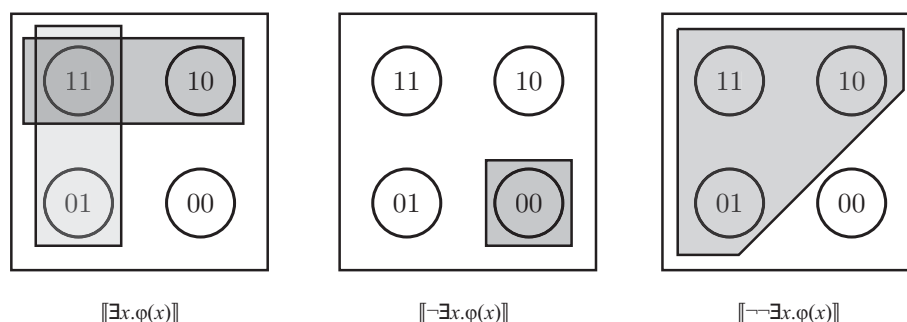


FIGURE 8. Double negation.

¹³ It is, of course, not impossible that the anaphora in such examples is somehow exceptional, not arising from ordinary means (e.g. via something more pragmatic). But it is not at all clear how to formulate such an account in a way that correctly predicts the asymmetry between 38 and other pragmatically similar examples such as Partee's famous marble example, in (i), and examples of negated negative quantifiers like (ii).

- (i) I lost ten marbles and found only nine of them. #It is probably under the sofa.
(ii) It's not the case that no student came to office hours. #He just left early.

$$(41) \llbracket !\varphi \rrbracket = \llbracket \neg\neg\varphi \rrbracket = \{ \{w' : \text{there is some } \alpha \in \llbracket \varphi \rrbracket \text{ such that } w' \in \alpha\} \}$$

Returning to our sluicing example, it is now clear why indefinites under double negation cannot serve as inner antecedents, as in 42, repeated from above. The A clause receives the interpretation schematized in the left-hand side of Figure 9, while the question is still, of course, inquisitive and has the proposed output state seen on the right-hand side. Since we are operating under a PF-deletion theory of ellipsis, only an E clause with no negation needs to be considered, since the doubly negated clause does not allow WH-extraction (the predictions of the LF-copying approach is discussed shortly).

(42) *[It's not the case that no one left]_A, but I don't know [who ~~left~~]_E.

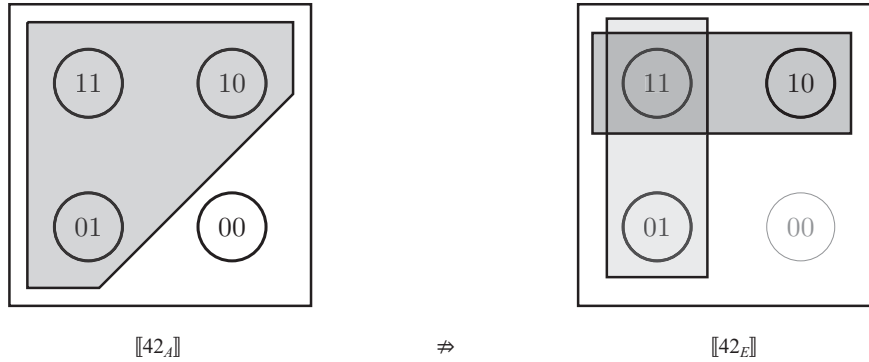


FIGURE 9. Inquisitive semantic interpretation of example 42.

Applying the symmetric entailment condition, then, we see that the E clause does entail the A clause. Each alternative in the E clause finds some alternative (the single alternative) in the denotation of the A clause that is a superset of it. In the other direction, however, the single alternative in the doubly negated A clause does not find any alternative in the E clause that contains it. Since symmetric entailment fails, double negation is correctly predicted to block sluicing.

The account thus correctly predicts the unacceptability of such examples because of the semantic (but non-truth-conditional) effect of double negation. At this point, the present account can be compared with previous ones, many of which struggle with such examples. While we have already seen several problems for such accounts above (and Merchant (2001) points out several more), accounts based on full-blown syntactic isomorphism get these examples right since the A clause with its double negation quite obviously has a different internal structure from the corresponding question with no negation.

An account based on symmetric entailment over a solely truth-conditional semantics, such as Merchant 2001, incorrectly predicts sluicing to be possible in such cases.¹⁴ The A clause has the same informational content as the existentially closed E clause and

¹⁴ A referee suggests that Merchant (2001) might account for such cases by claiming that only the embedded negated clause would count as a ‘salient antecedent’, with the unacceptability of the sluicing being due to the resulting negative island. Such an explanation, however, would rely crucially on an independently motivated notion of salience on which the singly negated clause counts as salient, but the innermost positive clause and the entire doubly negated clause do not. Beyond being unlikely from a theoretical perspective, in my opinion, this appears to be in direct conflict with the observation that singly negated indefinites do not license cross-sentential anaphora, assuming that the same notion of salience is relevant in ellipsis as in pronominal anaphora.

should therefore license sluicing in exactly the same way as the corresponding example with no negation. The more general conditions on deaccenting discussed by Romero (1998) will similarly predict that double negation will have no effect. For deaccenting, this prediction seems to be borne out: it seems that the underlined material in 43 can be destressed felicitously, as predicted by either the Roothian approach or Schwarzschildian GIVENNESS.

- (43) It's not the case that Bill didn't donate a book to the library, but I don't know which book he donated.

Despite this, the corresponding sluice is ill-formed, which shows us a rift between deaccenting and sluicing (and possibly ellipsis more generally; see §4.2, especially ex. 60). Deaccenting really is concerned with whether truth-conditional INFORMATION is given, as both Rooth (1992) and Schwarzschild (1999) argue. Sluicing, by contrast, is concerned primarily with INQUISITIVE content, that is, with retrieving an issue that the prior linguistic context has made salient. Ordinary indefinites are hybrid expressions, in that they make both an informational contribution and an inquisitive one. Double negation removes this latter contribution, and it is this richer notion of meaning to which sluicing is sensitive.

It is a bit more tricky to assess the predictions made by Chung and colleagues (1995) with regard to double negation. Their account relies on the copied IP containing a free variable that the question operator can bind, yielding the desired interpretation. On the one hand, since Heim's (1982) semantics for negation does not predict there to be a free variable, Chung and colleagues' (1995) account would appear to correctly rule out examples like 42. But on the other hand, Heim's account itself is aimed at capturing the anaphoric potential of such expressions, and therefore makes the wrong prediction with regard to doubly negated indefinites (as do nearly all other accounts; see Krahmer & Muskens 1995 for discussion). The potential for sluicing in the Chung et al. 1995 account is closely tied to the potential for cross-sentential anaphora, and double negation represents a case where the two diverge (§4 below shows that appositives provide another such case).

Focusing on the 'merger' subtype of sluicing, this section has proposed that sluicing is subject to a semantic condition: that the inquisitive semantic denotations of the A and E clauses symmetrically entail one another. Since E clauses in sluicing are always matrix or embedded questions, it follows from this that the A clause must not only have the same truth conditions (modulo the question's existential presupposition), but it must also have the same issue-evoking capacity. The so-called 'inner antecedent' is the element that provides this in the cases considered in this section. The semantics argued for, then, derives several observations about the nature of inner antecedents, including the felicity of disjunctions as inner antecedents and the infelicity of doubly negated indefinites. Examples of this sort have proven problematic for prior syntactic and truth-conditional semantic accounts, respectively. Moreover, we see in the next section that this account can be minimally extended to capture a novel body of facts that will prove problematic to both syntactic and truth-conditional semantic accounts: the interaction between sluicing and appositives.

4. ELLIPSIS AND APPPOSITION. The semantics developed for ordinary assertions above is more like that traditionally assumed for questions. So far, it has been claimed that it is this alternative-rich structure that allows sentences with indefinites and disjunctions to be sufficiently similar to questions to license sluicing. In this section, an environment that is claimed to lack this alternative-rich structure—appositive relative clauses—is

examined and a number of novel observations about sluicing are shown to follow from this idea. Central among these observations is that even overt indefinites inside relative appositive clauses are not licit inner antecedents for sluicing, as seen in 44.¹⁵

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

The section proceeds as follows: §4.1 provides independent motivation for treating appositives as having a semantics that is more like that of classical assertions than questions, devoid of the rich structure attributed to at-issue assertions, and §4.2 demonstrates that this semantics correctly predicts the attested interactions between sluicing and apposition.

4.1. APPositIVES AS CLASSICAL UPDATES. In recent literature, it has been widely agreed upon that the semantics of appositives is, in some way, different from that of at-issue assertions. That is, the semantics—broadly construed—of a sentence like 45a is not reducible to that of 45b plus some additional piece of semantics or pragmatics.

- (45) a. Mary, who is originally from Los Angeles, has a really good recipe for salsa.
b. Mary is from Los Angeles and she has a really good recipe for salsa.

Following Potts (2005), it has become common to think of the content of the appositive relative clause as being in some way *SEPARATE* from the rest of the sentence. While this result seems right at the level of propositional content, several recent works have shown that this separation does not extend to anaphora in general (Amaral et al. 2007, Nouwen 2007) or to ellipsis more specifically (AnderBois et al. 2013). For example, VPE can operate more or less freely across the at-issue/appositive boundary, as in 46.¹⁶ While ellipsis in general can freely cross the at-issue/appositive boundary, sluicing proves a surprising exception, as seen in 47.

- (46) Mary, who doesn't help her sister, told Jane to ~~help her sister~~ instead.
(47) *Joe, who once killed a man in cold blood, doesn't even remember who.

Since other anaphoric processes including VPE are possible, the infelicity of 47 cannot simply be attributed to the separation or extradimensionality of appositive content. Rather, it must be that the semantic contribution of appositive content is itself different from that of at-issue content in a way that derives this difference. To see how, the conception of ordinary at-issue assertions assumed above must first be fleshed out.

Inquisitive semantics treats assertions as being more question-like than is traditionally assumed. One of the central motivations for this is the idea that assertions, like questions, are *PROPOSALS* to update the common ground (see Groenendijk & Roelofsen 2009 for further discussion of this motivation). This conception is developed most explicitly by Farkas and Bruce (2010) in their account of particle responses to questions and assertions. Empirically, they argue for this view of at-issue content based in part on the fact that across languages, assertions often *ALLOW* for the responses that polar questions *EXPECT*, as seen for English in 48.

¹⁵ A referee suggests, in line with Vlachos 2011, that the observations in this section have parallels in the realm of restrictive relative clauses. But note that such facts are already expected for restrictive relative clauses under any account that captures the more general observation that inner antecedents must take wide scope relative to other operators (e.g. negation in 40). Appositives, however, quite famously exhibit obligatory wide scope/scopelessness and therefore require some other explanation.

¹⁶ While this is true in general, it is argued at the end of §4 that appositives do produce analogous effects within a particular subclass of VPE cases.

(48) Anne: Sam is home.

Ben: Yes./Yeah, he's home./No, he isn't home.

Appositives, however, do not intuitively PROPOSE updates to the common ground; they IMPOSE¹⁷ them. That is, while they also aim to enrich the common ground (i.e. provide new information), they are not readily subject to the same 'discourse negotiation' tactics as at-issue assertions (see AnderBois et al. 2013 for a more detailed discussion, and Murray 2010 for a similar approach to evidentials). For example, the response particles *yeah* and *no* in 49 do not seem to target the appositive content (whether Sonia left a jar open on the counter), but rather the main clause. Speaker B in 49 is most readily seen as confirming or rejecting A's claim that Sonia is a bad housemate, rather than the claim about the jar.

(49) A: Sonia, who left a jar open on the counter, is a terrible housemate.

a. B: Yeah.

b. B: No.

The observation that at-issue assertions, like questions, PROPOSE ways of updating the common ground fits naturally in inquisitive semantics, since both are modeled as being of the same semantic type, *stt*. To capture the idea that appositives IMPOSE rather PROPOSE, then, they ought to be of the same type as classical assertions—*st*—rather than questions. As we have seen, however, being of type *stt* is also the exact feature of the logic that allows for INQUISITIVITY. This is because inquisitiveness is due to the fact that a formula denotes a set consisting of multiple alternative sets of possible worlds. Since appositives are not proposals, it follows that they cannot be inquisitive; the two properties are inextricably linked.

In terms of compositional semantics, one way to capture this behavior is by making appositive content subject to a COMMA operator, as in 50. This operator takes an inquisitive proposition φ (i.e. a set of alternative sets of possible worlds) and returns a simple set of worlds where some alternative or other in $\llbracket \varphi \rrbracket$ holds. Equivalently, COMMA takes a set of alternatives and returns the single, unique maximal set of worlds in $\llbracket !\varphi \rrbracket$. For example, in 49, $\llbracket \varphi \rrbracket$ is a set of alternatives 'Sonia left the jar of mayo open on the counter', '... orange marmalade ...', and so forth, and $\llbracket \text{COMMA}(\varphi) \rrbracket$ would be the set of worlds—not the set of alternatives—where there is some jar or other that she left open on the counter.

(50) $\llbracket \text{COMMA}(\varphi) \rrbracket = \{w \mid \text{there is some } \alpha \in \llbracket \varphi \rrbracket \text{ such that } w \in \alpha\}$

A full account of appositives is beyond the scope of the present work, as it requires a semantic account of HOW these two kinds of content update the common ground (though see AnderBois et al. 2013). What matters for our present purposes is what structures these updates consist of; the operator in 50 accomplishes exactly this.

4.2. SLUICING AND APPositIVES. Returning to sluicing, we see that unlike other ellipsis processes, it cannot freely cross the appositive/at-issue boundary. More specifically, sluicing is fairly unacceptable whenever the would-be A clause occurs in an appositive relative clause, as in 51–53. As the (b) examples show, this restriction does not seem to be due to some independent source; it is the ellipsis itself that is ill-formed. Furthermore, since we have already seen in 46 that VPE can find its antecedent VP inside an appositive, these sluicing data cannot be due to discourse parallelism constraints on ellipsis of the sort discussed by Hardt and Romero (2004), Frazier and Clifton (2006), and others that affect both VPE and sluicing. Similarly, it cannot be due to more general

¹⁷ Thanks to Floris Roelofsen for suggesting this term.

conditions on deaccenting discussed by Romero (1998) and others, since VPE is generally taken to be subject to these conditions as well.

- (51) a. #?Joe, who once killed a man in cold blood, doesn't even remember who.
 b. Joe, who once killed a man in cold blood, doesn't even remember who he killed.
- (52) a. #?The valiant knight, who defeated a masked enemy, still wonders who.
 b. The valiant knight, who defeated a masked enemy, still wonders who he killed.
- (53) a. #?Amy, who coined a new word last night, forgot what/which.
 b. Amy, who coined a new word last night, forgot what/which word she coined.

At this point, a word of caution is in order about the acceptability of sluicing with appositives. The examples in this article were collected using the traditional methodology of introspection by a native-speaker linguist and informal corroboration of the data with fellow native-speaker linguists of various dialects of English, audiences in various public forums, and to a lesser extent naive native speakers. Using this method, there is a clear consensus that the (a) examples in 51–53 (as well as 60 below) are at least somewhat degraded.

While such examples sound at least somewhat odd, it is important to note that it is relatively easy to figure out what the sentences were intended to have meant after the fact (especially when encountered in written form). While these sentences may or may not be as categorically bad as the semantics here would predict, all speakers I have consulted agree that they are significantly worse than corresponding nonelliptical controls or truncated clefts (e.g. ... *still wonders who it was*). This asymmetry is all the more striking since, outside of appositives, there is a strong preference in the opposite direction: that is, the full clausal or truncated cleft versions are frequently dispreferred. Determining the processing and other factors that produce such variability and how to extend the present analysis to account for the fine-grained variations in judgments is left to future work.

Finally, we see the same contrast present in examples where the clause containing the indefinite is embedded within the appositive, as in 54. Such examples are important because the prospective A and E clauses in them are identical in every respect: lexically, syntactically, and truth-conditionally. They differ only in that the A clause occurs inside an appositive relative clause, yet sluicing is not possible. Such examples highlight that the infelicity of the above examples cannot be straightforwardly attributed to some aspect of the connection between the relative pronoun and the matrix subject.¹⁸

- (54) Elizabeth, who thinks that Joe murdered a man in cold blood, wants to find out who #(it was).

In §4.1, a semantics of appositives as purely informational updates imposed on the common ground was motivated. This was achieved in the logic by positing a semantics for comma intonation that collapses all of the alternatives in the formula to which it applies into a single classical proposition (i.e. a single piece of information). Since the antecedent clause, as it has entered the common ground, does not possess inquisitive alternatives, it cannot entail the inquisitive E clause.¹⁹ Since symmetric entailment fails, sluicing is correctly predicted to be infelicitous, as demonstrated for 53 in 56–57.

¹⁸ Thanks to a referee for discussion relating to this point.

¹⁹ In a technical sense, entailment as defined in 26 is not even defined for appositive contents since they are of different types ($\langle s, t \rangle$ instead of $\langle st, t \rangle$). This can be fixed if entailment is defined for elements of type $\langle s, t \rangle$ in terms of the entailment properties of the singleton sets containing them.

- (55) *Joe_A [who once killed a man in cold blood]_A doesn't even remember [who ~~he killed in cold blood~~]_E.
- (56) a. $\llbracket 55_A \rrbracket = \text{COMMA}(\exists x.\text{kill}'(\text{Joe}, x))$
 b. $\llbracket 55_E \rrbracket = \text{At-issue: } \exists x.\text{kill}'(\text{Joe}, x)$ Presupposes: $!\exists x.\text{kill}'(\text{Joe}, x)$
- (57) $\text{COMMA}(\exists x.\text{kill}'(\text{Joe}, x)) \not\Rightarrow \exists x.\text{kill}'(\text{Joe}, x)$

One thing that these examples make clear is that the proposed semantic condition on sluicing is truly a condition on the anaphoric RETRIEVAL of the issue introduced by the inner antecedent. To determine whether the E clause can be elided, one must examine the representation of prior conversation and try to find a suitable antecedent that entails it symmetrically in the discourse record. In the case of appositives, the appositive provides a prior clause with the same lexical items, syntax, and truth-conditional semantics, yet sluicing is not possible since that clause—as it has entered into the discourse record—has been subjected to the comma operator. That is, the symmetric entailment condition proposed is not a calculation that operates over abstract formal objects such as logical forms, but is a way of formalizing the conditions on the anaphoric retrieval of the issue from the A clause.²⁰

Since it is a condition on the anaphoric retrieval of the A clause, the restriction on sluicing across the appositive/at-issue boundary is predicted to be an asymmetric one. Since issues WITHIN the scope of a COMMA operator do not exhibit any special behavior (e.g. there are embedded questions within appositives), sluicing with an at-issue A clause and an appositive E clause is expected to be equally well formed as when no appositive is involved. This is exactly what we find in examples like 58.

- (58) [Someone left the door open]_A. Jamie, who wants to find out who [~~left the door open~~]_E, is interrogating the likely culprits.

Given this, it is therefore perhaps tempting to simply attribute these observations to a more general condition already present in Merchant's (2001) semantic condition in 21: that the A clause be SALIENT in prior discourse. That is, one might think that being inside an appositive is simply a particular way that a clause can fail to be sufficiently SALIENT. But this cannot be since Merchant's condition is explicitly stated to hold of both sluicing and VPE, which, we have seen, can indeed find its antecedent material inside an appositive.

While antecedents for VPE can occur inside appositives, however, there is reason to believe that the material retrieved in these cases is not in fact inquisitive.²¹ That is, the elided VP in a sentence like 59a is interpreted as 59b rather than 59c, as the inquisitive entailment condition would predict. While a more detailed investigation is left to future work (see also AnderBois 2011:90–92), one observation supporting this conclusion is the inability of indefinites INSIDE elided VPs of this sort to serve as inner antecedents or further sluicing, as in 60.

- (59) a. John, who met with a student yesterday, convinced Jane to __ too.
 b. $\llbracket 59a_E \rrbracket = \lambda y.!\exists x.\text{meet-with}'(y, x)$ \Leftarrow predicted
 c. $\llbracket 59a_E \rrbracket = \lambda y.\exists x.\text{meet-with}'(y, x)$ \Leftarrow not predicted
- (60) #?John, who met with a student yesterday, convinced Jane to __ too, but she can't remember who [~~she met with yesterday~~].

²⁰ Admittedly, this aspect of the theory would be more clearly seen if the present account were embedded in an update semantics for appositive and at-issue content (e.g. AnderBois et al. 2013).

²¹ Thanks to Jeroen van Craenenbroeck for insightful discussion on this point.

To sum up, we see that the appositive data highlight the sense in which ellipsis is truly an ANAPHORIC PROCESS. An account that simply compares the logical form of the antecedent and elided clauses abstractly, whether syntactically or semantically, would be unable to account for such facts. The content of the A clause itself is not what determines the infelicity of these examples. Rather, it is the fact that their material entered the conversational record via an appositive (i.e. subject to the COMMA operator) that derives their infelicity. Furthermore, these facts demonstrate an asymmetry between issues and pronominal anaphora in indefinites. Whereas indefinites inside appositives still serve as antecedents for subsequent anaphoric reference, they cannot serve as inner antecedents for sluicing. Given this, even an account referring to symmetric entailment over dynamic semantic representations will not be able to account for these facts.

5. DIRECT SPROUTING. Thus far, sluicing has been proposed to be subject to a symmetric entailment condition over inquisitive semantic representations. Since the elided clause in sluicing is always a question, this condition predicts that the antecedent clause in sluicing will always have an inquisitive interpretation. Previous sections have considered the class of sluices where the inquisitiveness of the A clause is provided by an overt indefinite or disjunction, what Chung and colleagues (1995) dub ‘merger’. The following two sections turn to cases where no such inquisitive element is overtly present (i.e. pronounced) in the A-clause, what Chung and colleagues term ‘sprouting’.²² As seen in the examples in 61, the WH-phrases in sprouting can correspond either to an implicit argument of the main predicate (61a,b) or to an adjunct (61c,d).

- (61) a. [Alexis was reading]_A, but [what ~~Alexis was reading~~]_E isn’t clear.
 b. [Craig is jealous]_A, but I don’t know [who of ~~Craig is jealous~~]_E.
 c. [Francisco finished the book]_A, but I’m not sure [when ~~Francisco finished the book~~]_E.
 d. [Seth arrived]_A, but I don’t know [who with ~~Seth arrived~~]_E.

At first blush, such examples appear to be counterexamples to the inquisitive entailment condition that has been proposed. What is argued in what follows is that such cases are not counterexamples at all, but rather are instances where the semantic representation of the A clause contains covert existential quantification over individuals, neo-Davidsonian events, or other suitable semantic objects. Just as overt indefinites have been claimed to be inquisitive, so too these cases of covert existential quantification.

One of the challenges posed by sprouting is the fact that prepositional material such as *of* in 61b cannot be elided even though English in general allows preposition stranding (i.e. there is a nonelliptical form *I don’t know who Craig is jealous of* where only the WH-word is fronted). To account for this observation, I follow Chung (2005) in taking the semantic condition on sluicing to be supplemented by the lexical requirement in 62.²³ The condition in 62 ensures that no morpheme can be elided that was not present in the A clause. There are various other ways to formulate this generalization; see Merchant 2007.

²² For Chung and colleagues (1995), these two terms do double duty, referring not only to the two descriptive classes defined in the main text, but also to a particular analysis of these. For Chung and colleagues, examples of sprouting arise from a specific LF-augmentation procedure of the same name. In general, my use of these two terms is intended as a descriptive one, not presupposing any particular analysis. Indeed, I argue below that some instances of sprouting are best analyzed in a way more akin to merger than sprouting.

²³ The moniker ‘no new morphemes’ is due to Merchant (2007).

- (62) NO NEW MORPHEMES: Every lexical item in the numeration of the sluice that ends up (only) in the elided IP must be identical to an item in the numeration of the antecedent CP.

Within this basic framework, the goal is to argue that examples like those in 61 can be successfully accounted for by a modified version of the symmetric entailment condition from 27. Central to the analysis is the idea that once we take seriously the claim that existentially interpreted implicit arguments are present in the semantics, many cases of sprouting follow quite naturally. For example, if an example like 61a is assigned a translation as in 63, sluicing is predicted to be possible just as it is with an overt indefinite.

- (63) 'Alexis was reading.' $\rightsquigarrow \exists x.\text{read}'(A, x)$

For certain adjuncts, however, it is clearly untenable to claim that the interpretation of the A clause contains an existential quantifier DIRECTLY corresponding to the WH-phrase of the E clause. For example, assigning the A clause in 61d a translation such as 64 clearly produces truth conditions that are too strong; 61d_A does not entail that Seth had a companion. There is no implicit companion argument of any sort in the meaning of a sentence like *Seth arrived*. The sentence's meaning does not preclude this possibility, of course, but this has no bearing on the semantic representation of the sentence.

- (64) 'Seth arrived.' $\rightsquigarrow \exists x.\text{arrive-with}'(S, x)$

Instead, the inquisitive element in 61d_A is argued to be something more general: existential quantification of a neo-Davidsonian event argument. The felicity of examples like 61d (and possibly 61c) is the result of an accommodation process that can be called 'issue bridging'. The idea is that the existence of the issue corresponding to a specific argument of the event introduced by the E clause can be accommodated based on the more general issue previously raised by the inquisitive existential quantification in the A clause. The proposed accommodation process is similar to what we find in bridging definite descriptions, where a discourse referent can be accommodated by 'bridging' from one previously present in the discourse (e.g. *A bus went by and the driver waved*).

Following this discussion, sprouting can be divided into two different subclasses, depending on whether there is an inner antecedent that corresponds DIRECTLY with the WH-phrase. Cases of sprouting where there is such an inner antecedent present semantically are termed DIRECT sprouting and cases with no such element INDIRECT sprouting.²⁴

- (65) Two kinds of sprouting
- a. DIRECT: The A clause contains a semantically represented inner antecedent equivalent to the WH-phrase.
 - b. INDIRECT: The A clause does not contain a semantically represented inner antecedent equivalent to the WH-phrase.

The remainder of §5 extends the account of merger to direct sprouting, and §6 presents the analysis of indirect sprouting.

5.1. THE TYPOLOGY OF IMPLICIT ARGUMENTS. Before we proceed to direct sprouting, some assumptions about the semantics of implicit arguments are first made clear. While it is universally agreed upon that implicit arguments are understood at some level of in-

²⁴ While the terms 'direct' and 'indirect' are used here to refer to instances of sprouting, the terms could equally be applied to all instances of sluicing, including merger cases. Since merger involves an overt indefinite or disjunction in the A clause, such cases will necessarily be classified as 'direct' sluicing. The direct/indirect distinction is therefore the semantic analog of Chung et al. 1995's syntactically/phonologically defined merger/sprouting distinction.

terpretation, the details of how this happens is the subject of widespread disagreement in the semantic literature.

On the one extreme, Recanati (2007) argues that the implicit arguments like those in 66 arise pragmatically, not being represented either semantically or syntactically. On the other extreme, Landau (2010) has recently argued that many sorts of implicit arguments are always present in the syntax, differing from their overt counterparts only in being featurally deficient and unpronounced. While they express uncertainty about exactly what this would mean, Bhatt and Pancheva's (2006) survey article reaches a similar conclusion, claiming that (many) implicit arguments are 'syntactically active but not syntactically projected'.²⁵ In between these extremes are accounts such as Condoravdi & Gawron 1996, which take implicit arguments to be present in the semantics, but make no commitments about their status in the syntax.

- (66) a. Jacques finally noticed. (state of affairs)
 b. Alexis was reading. (theme)
 c. Bill is jealous. (stimulus)

In contrast to the lack of consensus in the literature on implicit arguments, the literature on sluicing has (often tacitly) taken the position that implicit arguments are absent from the syntax. For example, Merchant (2001) simply treats 66b as involving an intransitive verb without any sort of syntactic argument (though as far as I can tell, this syntax is in no way crucial to the account). No particular position is taken on the issues of whether and how such arguments are represented in the syntax in what follows, since it is their semantics that matters in the present account.

The clearest piece of evidence that implicit arguments must be present in semantic representations is the need to distinguish between different semantic subtypes of implicit arguments. The most long-standing distinction in this vein is one, first proposed by Fillmore (1969), between INDEFINITE and DEFINITE implicit arguments (alternately termed 'existential' and 'anaphoric'). Here, we see that implicit arguments of these two sorts exhibit the same behavior as their overt counterparts with respect to two diagnostics: (i) the ability to license sluicing, and (ii) whether they establish a novel discourse referent or are coreferential with some prior discourse referent. See Fillmore 1969 et seq. for further indications regarding the (in)definiteness of these implicit arguments (e.g. uniqueness, felicity in out-of-the-blue contexts, bound-variable readings for definites).

(67) Sluicing

- a. Fido was eating, but I don't know what. ⇐ Indefinite does license sluicing.
 b. #Alexis noticed, but I don't know what. ⇐ Definite does not.

(68) Novelty condition

- a. A: What happened to my sandwich?
 B: #Fido ate. ⇐ Indefinite cannot refer to prior dref.
 b. A: John is really tall.
 B: I noticed. ⇐ Definite must refer to prior dref.

However, AnderBois 2012b shows that these same diagnostics reveal a third class of apparent implicit arguments that are FLEXIBLE with respect to these two properties. For example, the implicit stimulus of the predicative adjective *jealous* can serve as the inner

²⁵ There is a wider range of other syntactic approaches than the present discussion would suggest (see Bhatt & Pancheva 2006 for a recent survey). The differences between them are not important for our purposes, however, since this account of sluicing relies mainly on semantic identity.

(74) [John ate_A, but I don't know [what ~~John ate~~]_E.

(75) a. $74_A \rightsquigarrow \exists x.\text{eat}'(J, x)$

b. $74_E \rightsquigarrow \exists x.\text{eat}'(J, x)$

(Presupposes: $\neg \exists x.\text{eat}'(J, x)$)

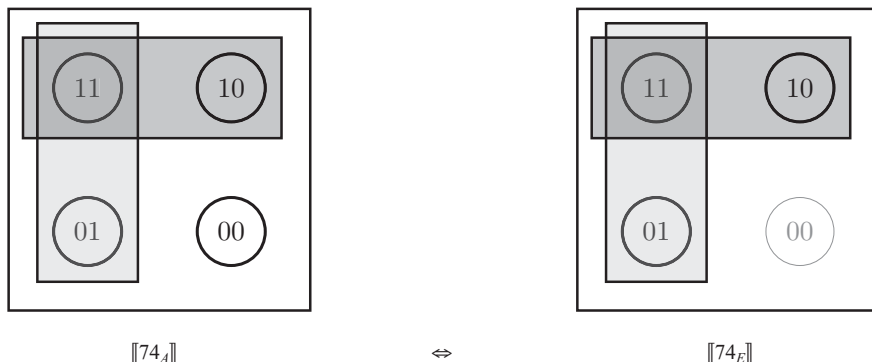


FIGURE 10. Inquisitive semantic interpretation of example 74.

Another indefinite implicit argument that is handled straightforwardly under this approach is the implicit agent of English passives, as in 76. Unlike the corresponding inchoative in the would-be A clause of 77, the passive entails the existence of a causer/agent. As such, the A and E clauses receive translations as in 78 that include an (inquisitive) existential quantifier. Given these translations, the symmetric entailment condition in 27 is met, and sluicing is predicted to be possible. The nonomissibility of the preposition *by* in 76 is again attributed to the ‘no new morphemes’ constraint, as confirmed by the contrast with the long passive in 79, since *by* is present in the A clause in this example as well.

(76) [The boat was sunk]_A, but Fred wasn't sure [who by ~~the boat was sunk~~]_E.

(77) *The boat sunk, but Fred wasn't sure who by.

(78) a. $76_A \rightsquigarrow \exists x.\text{sink}'(x, \text{the boat})$

b. $76_E \rightsquigarrow \exists x.\text{sink}'(x, \text{the boat})$ (Presupposes: $\neg \exists x.\text{sink}'(x, \text{the boat})$)

(78) [The boat was sunk by someone]_A, but Fred wasn't sure [who ~~the boat was sunk by~~]_E.

While the account proposed here assimilates direct sprouting to merger cases, it also readily provides an explanation for the central asymmetry between the two: sensitivity to intervening operators including islands. One of the properties of the merger subtype of sluicing that has attracted the most attention in previous literature (dating back to Ross 1969) is its lack of sensitivity to syntactic islands. For example, sluicing is possible in an example like 80, even though the nonelliptical version of the E clause, 81, is not possible (see Merchant 2001 for examples from a variety of islands and detailed discussion).

(80) That Tom will win a (certain) race is likely, but it's not clear which race.

(81) *It's not clear [which race]_i that Tom will win *t_i* is likely.

While this ‘island-amnestying’ effect holds in cases of merger, it has been observed by Chung and colleagues (1995) (who in turn attribute the observation to unpublished work by Chris Albert) that no such effect arises in corresponding examples of sprouting, as seen by the ungrammaticality of their example in 82.

(82) *That Tom will win is likely, but it's not clear which race.

Chung and colleagues (1995) and many subsequent authors have pursued the intuition that the source of the ungrammaticality of 82 is the same as that of 81. In particular, the idea is that the relationship between the WH-phrase and the trace in sprouting is similar (or perhaps identical) to the A'-movement that takes place in overt WH-movement. In contrast, merger cases are argued to involve unselective binding rather than movement and therefore are expected to be island-insensitive. This approach, then, makes the prediction that sprouting should be subject to exactly the same constraints as overt A'-movement. While it is true that sprouting is subject to all of the constraints that overt A'-movement is, Romero (1998) and later Merchant (2001) show that it is in fact subject to a more stringent condition. Evidence for this comes from minimal pairs, like those in 83–84, where there is some intervening element that blocks sprouting, as in the (a) examples, but allows overt A'-movement, as in the (b) examples.

- (83) a. *Ramon is glad that Sally ate, but I don't remember which dish.
 b. I don't remember which dish he is glad that Sally ate. (Romero 1998)
- (84) a. *A nurse is rarely on duty—guess when!
 b. When is a nurse rarely on duty? (Merchant 2001)

Looking at the whole body of data from 80–84, Romero (1998) identifies the unifying pattern: sluicing is possible if and only if the existential in the A clause—whether overt or not—takes widest scope, as the WH-phrase does in the E clause. That is, the island-escaping example in 80 is possible only under a wide-scope reading for the indefinite *a race*. She argues that the asymmetry between 80 and 82 can therefore be attributed to independently observed scopal properties of overt and implicit arguments (Merchant (2001) makes essentially the same case). In particular, it has been independently observed that implicit existential arguments always take narrow scope relative to all other operators (e.g. Fodor & Fodor 1980, Lasnik 1997). In contrast, overt indefinites have been known since at least Farkas 1981 to have the property of being able to take wide scope outside of syntactic islands, that is, 'exceptional wide scope'.

In terms of the present account, then, this means that A clauses containing overt indefinites will have a reading (the wide-scope reading) that will be assigned an inquisitive denotation, even when the indefinite occurs inside an island. The fact that sluicing with overt indefinites as inner antecedents is island-insensitive is directly tied to the exceptional wide scope of overt indefinites more generally. Implicit existential arguments do not exhibit exceptional wide scope (in fact, quite the opposite), and, correspondingly, sluicing with implicit inner antecedents is possible only when no such operator intervenes.

Since overt disjunctions show the same sort of exceptional wide scope (Schlenker 2006 and references therein), sluicing with an overt disjunction as inner antecedent is predicted straightforwardly to also be island-insensitive. This prediction is borne out in 85, parallel to 80.

- (85) That Tom will win (either) the downhill or the slalom is likely, but it's not clear which.

Beyond islands, this account captures one further parallel between merger cases and direct sprouting: so-called 'inheritance of content'. In §3.2, we saw examples like 32, repeated in 86, where overt material in the A clause contextually restricts the interpretation of the E clause despite not being present (or absent via some independently attested process). While implicit arguments do not have overt restrictor material, their interpretation is nonetheless more restricted than that of their overt counterparts, as has been known since Fillmore 1969. For example, Allerton (1975) claims that the indefinite im-

implicit argument of the verb *drink* ‘normally suggests an object beverage that is [+ALCOHOLIC]’, whereas the range of possible overt arguments is not restricted in this way. When an indefinite implicit argument provides the inner antecedent for sluicing, we similarly find that this content restricts the interpretation of the E clause in 87: that is, Alejandro’s mom wants to find out what kind of alcohol he drank.

- (86) [Ralph is going to invite someone from Kankakee to the party]_A, but they don’t know [who_i ~~he’s going to invite *t_i* to the party~~]_E.
 (87) Alejandro drank at the party, and his mom wants to find out what.

In this section, we have seen that once we take the independently motivated position that implicit arguments should be represented (at least) in the semantics, some instances of sprouting (dubbed ‘direct’ sprouting) can be given essentially the same analysis as corresponding examples with overt indefinites. In the following section, we turn to the remaining cases of sprouting, dubbed ‘indirect’ sprouting.

6. INDIRECT SPROUTING. In §5, it was argued that A clauses with existentially interpreted implicit arguments—direct sprouting—are possible inner antecedents for the same reason that their overt counterparts are. While this strategy is possible for some cases of sprouting, it falls short for other cases such as 88, where there is no existential quantification directly corresponding to the WH-phrase. In addition to these cases where the existential information is not entailed at all, there are the instances of flexible implicit arguments discussed in §5.1, where the existential information is a lexical or metaphysical entailment, as in 89.

- (88) a. [Seth arrived]_A, but I don’t know [who with ~~Seth arrived~~]_E.
 b. [John baked a cake]_A, but we’re all wondering [with whose help ~~John baked a cake~~]_E.
 c. [Mary learned French]_A, but I don’t know [who for ~~she learned French~~]_E.
 (89) a. [They’re jealous]_A, but it’s unclear [of who]_E. (Chung 2005)
 b. [They were firing]_A, but [at what]_E was unclear. (Chung et al. 2011)
 c. [John has been nominated]_A, but he still hasn’t found out [for which award]_E.

In both sorts of cases, I claim, there is no inquisitive element such as an existential quantifier that directly corresponds to the WH-phrase.²⁷ While it is true that no inquisitive element DIRECTLY corresponds to the WH-phrase in these examples, this section argues that the A clause in indirect sprouting nonetheless does contain an inquisitive element: the existential quantification of a neo-Davidsonian event argument. The sluices in 88–89, then, are the result of an accommodation process of sorts, which is termed here *ISSUE BRIDGING*. The term is intended to highlight the analogy with bridging in the realm of definite descriptions, as exemplified by the definite *the driver* in 90.

- (90) A bus went by. The driver had on sunglasses.

Issue bridging must be constrained in order to correctly rule out the accommodation of the various illicit sluices we have seen in previous sections. In §6.1, the extension of inquisitive existential quantification beyond the domain of individuals is spelled out and motivated. In §6.2, three ways in which the analysis from previous sections con-

²⁷ It should be noted that there are a number of cases for which either an indefinite implicit argument (with a contextual domain restriction) or a flexible implicit argument seems *prima facie* plausible. Many of these cases arise in domains that can be subdivided with varying degrees of granularity (e.g. times and places). Under the former analysis, such cases would be treated as direct sprouting, and under the latter as indirect sprouting. Such cases are set aside here, though see AnderBois 2011 for further discussion.

strains issue bridging are examined. First, the ‘sprouted’ WH-phrases must be ‘licensed’ by the material in the A clause since the E clause is, by hypothesis, a fully articulated clause underlyingly. Second, the entire WH-phrase including prepositions must be overtly present due to the ‘no new morphemes’ constraint. Third, just as bridging requires a prior discourse referent, issue bridging still requires a prior issue, in the form of the INQUISITIVE A clause. Collectively, these constraints ensure that issue bridging: (i) only occurs with WH-phrases that do not have counterparts in the A clause (adjuncts and flexible implicit arguments), and (ii) is subject to the same operator/island intervention effects as sprouting with implicit arguments.

6.1. INQUISITIVE EXISTENTIAL QUANTIFICATION BEYOND INDIVIDUALS. In §2, a compositional semantics was presented where indefinites not only include the truth-conditional information that there is some entity satisfying a given predicate, but also raise the issue of which entity or entities do so. Therefore, a sentence containing a wide-scope indefinite (or disjunction) makes a hybrid contribution to discourse: it provides information (ideally) aimed at resolving old issues and simultaneously pushes the discourse forward by highlighting new issues for elaboration. This subsection extends this idea to other kinds of existential quantification, particularly that of an event/state argument, proposing that they too make a similar hybrid contribution.

Before existential event quantification is tackled, recall how the interpretation of indefinites came about for a basic example like 91a. First, this formula was translated into our metalanguage with the formula in 91b. Second, the metalanguage interpretation of this formula consists of a set of alternative possibilities schematized in 91c. In terms of information, the sentence is considered true iff there is at least one alternative in 91c that contains the world of evaluation. In addition to this truth-conditional information, 91a also introduces the issue of which alternative(s) in 91c hold as a potential future issue for discussion.

- (91) a. Someone left.
 b. $\exists x.\text{leave}'(x)$
 c. $\left\{ \begin{array}{l} \text{John left} \\ \text{Maribel left} \\ \text{Alexis left} \\ \text{Ignacio left} \\ \dots \end{array} \right\}$

For events, the same procedure is repeated, differing only in the ontological domain being operated over. Ignoring tense, a simple sentence like 92a is assigned a metalanguage translation as in 92b. Interpreting the existential event quantification in the same way gives us the semantic interpretation in 92c.

- (92) a. John won.
 b. $\exists e.\text{win}'(e) \wedge \text{AGENT}(J, e)$
 c. $\left\{ \begin{array}{l} e_1 \text{ is an event of John winning} \\ e_2 \text{ is an event of John winning} \\ e_3 \text{ is an event of John winning} \\ e_4 \text{ is an event of John winning} \\ \dots \end{array} \right\}$

In terms of information, the sentence is therefore true if and only if at least one of the alternative possibilities is true in the world of evaluation. If a suitable semantics for tense is added in, this gives us exactly the truth conditions we expect for the sentence. How-

ever, it also makes an inquisitive contribution, putting forth the issue of which events are in fact events that consist of John winning.

On the face of it, this is a somewhat strange issue to imagine, in part because there is no overt corresponding question of the form *Which event(s) is one of John winning?* in the way that the issue raised by 91a can be straightforwardly paraphrased as *Who left?*. But this strangeness merely points to what we already knew: that while we take events to be, in some sense, objects in the real world, they are a quite different sort of ‘object’ from individuals. It is not natural to individuate events in the same way as we do physical entities such as people and things (much as it is not natural to do in the case of possible worlds). While it is not so natural to individuate events, it is quite natural to SORT them along a given dimension. That is, while it is somewhat odd to imagine asking a question about ‘which event’, it is quite easy to imagine asking questions that target particular classes of events, whether by time, location, or some other contextually salient property.

Issue bridging, then, involves making just such a leap: from the general issue of ‘Which event?’ introduced by the inquisitive existential quantification in the A clause to the adjunct WH-question that sorts the space of events along a particular argument of the event and asks the question ‘Which class of events?’. Consider, for example, the case of sprouting from a flexible implicit argument as in 93.

(93) [John won]_A, but I don’t know [which contest]_E.

Here, the A clause will have the semantic contribution sketched in 92b,c, raising the issue of which event(s) in fact are events of John winning. We can visualize this as in Table 1, where each row represents a different event and the columns describe properties of those events. For the purposes of illustration, a model is assumed with only eight events differing only in two parameters: time and the contest won. The existential quantification of 93_A puts on the table the issue of which row(s) contain events of John winning.

EVENT	TIME	CONTEST
e ₁	t ₁	c ₁
e ₂	t ₂	c ₁
e ₃	t ₁	c ₂
e ₄	t ₂	c ₂
e ₅	t ₁	c ₃
e ₆	t ₂	c ₃
e ₇	t ₁	c ₄
e ₈	t ₂	c ₄

TABLE 1. Possible events of John winning.

The E clause in 93, by contrast, presents a closely related issue, but one that is slightly more coarse-grained. Instead of asking the question of which row contains an event of John winning, it sorts the space of events along a particular dimension (the contest) and asks which chunk contains one of John winning (e.g. is there an event of John winning c₁, a c₂ event, etc.). This can be visualized by the divisions in Table 2.

Indirect sprouting, then, consists of an A clause that presents a general issue (‘Which event?’), thereby facilitating further discussion of the details of the event described. The E clause presents a more coarse-grained issue corresponding to this larger issue and can therefore be accommodated as being sufficiently similar to the A issue. That is, indirect sprouting is expected to be licit to the extent that world knowledge and context support the inference that the alternatives in A (which differ in which event serves as witness for the existential in Table 1) differ along the dimension specified by the WH-phrase in the

EVENT	TIME	CONTEST
e ₁	t ₁	c ₁
e ₂	t ₂	c ₁
e ₃	t ₁	c ₂
e ₄	t ₂	c ₂
e ₅	t ₁	c ₃
e ₆	t ₂	c ₃
e ₇	t ₁	c ₄
e ₈	t ₂	c ₄

TABLE 2. Possible events of John winning, sorted by contest.

E clause, as specified in 94. While a more detailed exploration of the parallels with bridging definites is left to future work, this principle is regarded as a specific instance of these more general inferential processes.

- (94) COVARIATION CONDITION: Indirect sprouting is felicitous to the extent that the context allows for the inference that the alternatives in the A clause covary with the alternatives in the E clause.

This principle predicts that indirect sprouting is context-sensitive in a way that merger and direct sprouting are not. And indeed, this seems to be the case. The clearest indication of this are cases where the discourse context provides a prior discourse referent for a flexible implicit argument, as in 95. Here, the context is such that the events in question are only ones where my having won the lottery is clearly indicated as the stimulus of John's jealousy. Therefore, the covariation condition is not met, and 95 is predicted to be infelicitous.

- (95) #I just won the lottery. John is jealous, but I don't know who/what of.

For adjuncts like 96, this condition means that the existential presupposition of the question in the E clause must be met or accommodated in order for sluicing to be felicitous. If the information that John rode on a bike at all is not present, say if John generally takes the bus, then clearly the events of John getting to the party will not covary with bikes. Beyond this, the prediction is that the sentence's felicity will be tied to the plausibility in context of a variety of different bikes John may have taken. For example, 96 is expected to be better in a context where John's bike is known to be broken than if it is known to be working (since presumably he would then use his own bike in most such events then).

- (96) John got to the party, but we don't know on whose bike.

While more extensive empirical investigation is left to future work, the covariation condition seems reasonable and captures the data we have seen here. One aspect of the account of indirect sprouting that is worth emphasizing here is that while the account relies on accommodation, it is the covariation of the A and E issues that must be accommodated, not simply the E issue itself. As is seen in the remainder of this section, this approach avoids the pitfalls faced by unconstrained accommodation.

6.2. CONSTRAINTS ON ISSUE BRIDGING. That sprouting would involve accommodation, especially in some of the cases of adjuncts, is not a new idea. However, as Chung (2005) discusses, unconstrained accommodation runs the risk of being too permissive, allowing any arbitrary issue to be accommodated. Chung points out examples like 97 as being problematic for an account that makes use of free or unconstrained accommodation. The examples in 98–100 present further cases that would seem to be problematic for free accommodation.

(97) #He finished the project, but we don't know whose help. (Chung 2005)

(98) #The ship sunk. Guess who (by).

(99) #Tony sent Mo a picture that he painted, but it's not clear with what.
(Chung et al. 1995)

(100) #No nurse was on duty, but we don't know when. (Merchant 2001)

The account developed in previous sections for sluicing with overt and implicit inner antecedents, however, naturally constrains issue bridging in ways that rule out such examples. There are three independently motivated aspects of the analysis that serve to constrain issue bridging.

- (101) Three constraints on issue bridging
- a. No new morphemes
 - b. The overt E clause must be grammatical.
 - c. The A clause must be inquisitive.

First, in order to account for the obligatory presence of prepositions introducing implicit arguments, following Chung (2005), it has been assumed that the elided material cannot contain any morphemes that are not previously present in the A clause. This correctly predicts that any prepositional material is obligatorily present in cases like 102–103, just as it was for semantically represented implicit arguments.

- (102) a. #He finished the project, but we don't know whose help.
b. He finished the project, but we don't know with whose help.
- (103) a. #John got to the party, but we don't know whose bike.
b. John got to the party, but we don't know on whose bike.

Second, the account proposed here is based on the PF-deletion of a fully articulated E clause. One consequence of this is that the fully formed E clause itself must be possible in the first place (island amelioration being the notable exception, as discussed in detail by Merchant (2001)). Given this, examples like 104 are expected to be ill-formed since the E clause is itself not possible. Not only must the E clause itself be well formed, but the combination of the A clause and the fully formed E clause must be well formed. This constraint rules out examples like 105 where the E clause is itself is well formed, but is infelicitous following the A clause (for reasons that are poorly understood).

- (104) a. #She knew French, but I don't know for whom.
b. #John was tall, but I don't know on what occasions.
c. #They noticed the painting, but I don't know for how long.
d. #The ship sunk. Guess who (by).
- (105) a. #John noticed, but I don't know what.
b. #The cake was tasty, but I don't know for who.

Finally, the accommodation process proposed is a BRIDGING process, not the direct accommodation of a question or issue under discussion. Accommodation in indirect sprouting is located in the SIMILARITY RELATION between the E clause's question and the issue introduced by the A clause. As such, the A clause still must be inquisitive in order for this to be possible. Like the existential quantification found in implicit arguments, existential quantification over events is also known to have narrow scope relative to other operators (e.g. Landman 2000), including negation. Given this, sprouting of this sort is predicted to pattern with direct sprouting in being sensitive to strong islands, as in 106, as well other intervening operators such as negation, as in 107. This also correctly predicts the impossibility of adjunct sprouting in cases of double negation, as in 108.

(106) #Tony sent Mo a picture that he painted, but it's not clear with what.

(Chung et al. 1995)

(107) #No nurse was on duty, but we don't know when.

(Merchant 2001)

(108) #It's not the case that John didn't leave. Guess when!

In this section, an analysis of INDIRECT sprouting has been proposed, that is, sprouting where there is no inner antecedent directly corresponding to the WH-phrase. In particular, the analysis holds that such cases involve anaphoric retrieval of an issue introduced by the inquisitive existential quantification of the event argument plus an accommodation process, issue bridging.

At this point, then, it is worth considering the relationship between issue bridging and ordinary bridging and therefore the place of sluicing within the typology of anaphoric processes more generally. While they do not consider ellipsis, one distinction that has been made by Beaver and Zeevat (2007) is between anaphoric processes that readily allow for accommodation (albeit with certain restrictions) and those that do not. Some examples of the first category, seen in 109, are the presuppositions of change-of-state verbs like *stop* and of factive verbs such as *realize*. The second category, according to Beaver and Zeevat, includes pronouns, short definite descriptions, and certain lexical presuppositions such those contributed by *too* and *another*.

(109) a. It will *stop* raining.

b. Mary *realizes* it is raining.

(110) a. *He* is very cute.

b. *The* driver waved at me.

c. John is having dinner in New York *too*.

d. *Another* man came in.

This distinction, Beaver and Zeevat (2007) argue, can be boiled down to the precise nature of the material to be accommodated. Specifically, they claim that the anaphoric material sought in 109 is limited to propositions or facts about the world, while those in 110 are 'intrinsically concerned with the discourse record itself'. While they leave many of the details for future work, they attribute the asymmetry in accommodation between the two cases to a general principle such as 111.

(111) THE DISCOURSE RECORD PRINCIPLE: Presuppositions about what is in the discourse record may not be accommodated.

Sluicing, therefore, belongs to the second category; sluicing in general is clearly about the discourse record. Like pronouns and the presuppositions of *too* and *another*, sluicing requires a linguistic antecedent and does not allow for the relevant material to be accommodated if no such material is found, as in Hankamer and Sag's (1976) example in 112. In essence, this claim is not particularly new, being more or less a restatement of Hankamer and Sag's claim that sluicing requires an overt linguistic antecedent (i.e. is a type of 'surface anaphora', in their terms).

(112) [Scenario: Hankamer produces a gun, points it offstage, and fires, whereupon a scream is heard.]

Sag: #Jesus, I wonder who.

The present account offers two insights regarding the status of sluicing within this broader picture. First, the account gives us a clear indication of why sluicing must be intrinsically concerned with the discourse record. The material to be retrieved is not a mere proposition or fact, but rather is itself an intrinsically discourse-related entity, an ISSUE (much the same can be said for pronouns vis-à-vis discourse referents). Second, the account of sprouting in this section has provided an explanation of a class of appar-

ent counterexamples: indirect sprouting. Consider again an instance of sprouting such as 102b, repeated in 113.

(113) He finished the project, but we don't know with whose help.

Since the issue in the E clause has no direct inner antecedent in the A clause, indirect sprouting appears to involve the accommodation of an issue with no antecedent in the prior discourse record. This section, however, has argued that such examples do indeed involve the retrieval of an issue from the previous discourse record: the issue introduced by existential event quantification. To arrive at the specific issue in the E clause requires some inference in the form of issue bridging, but it also requires the existence of the issue in the previous discourse record from which to bridge. In this way, the account allows us to maintain the idea that sluicing is a type of surface anaphora, intrinsically concerned with the discourse record, yet still capture examples like 113.

7. CONCLUSION. In this article, it has been proposed that the semantic condition on sluicing in English must be sensitive not just to the truth-conditional information of the two clauses, but also to their inquisitive content. Since the E clause to be elided in sluicing is always a question, it then follows that the antecedent A clause must have a denotation that is inquisitive. On the empirical side, this theory allowed two kinds of otherwise recalcitrant examples to be accounted for. First, we saw certain cases of merger where truth-conditional equivalence is met, yet sluicing is not felicitous. Second, cases of sprouting where truth-conditional equivalence was not met, yet sluicing was possible, were able to be accounted for. On the theoretical side, the account offers a SEMANTIC insight into what aspects of indefinites and disjunctions make them good inner antecedents for sluicing. Indefinites and disjunctions evoke the same kind of alternatives as questions do, and it is this deep connection that explains their role in sluicing.

In addition to improving our understanding of sluicing and ellipsis, the article has significant ramifications for inquisitive semantics itself. The data and analysis presented here constitute the first direct empirical argument that an inquisitive semantics is needed for assertions themselves, at least in English. Previous work has made the empirical case for an inquisitive semantics based principally on the compositional role of disjunctions and indefinites in questions across languages (e.g. AnderBois 2012a, Pruitt & Roelofsen 2012). Under the account of sluicing proposed here, sluicing emerges as a way of diagnosing inquisitive content in assertions and providing empirical support for the richer notion of semantic content central to inquisitive semantics. Finally, given the apparent ubiquity of sluicing crosslinguistically (discussed in §3.1) and the role of disjunctions and indefinites as inner antecedents, there is every reason to believe that similar arguments can be made for other languages and therefore that an issue-rich semantics is warranted for natural language more generally.

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