

# Conditional Questions as Matrix Questions with Syntactic Reconstruction

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## Abstract

Conditional Questions (CQs), structures such as *If it's raining, will Joanna leave?* pose a puzzle: they look like conditionals, but are interpreted like questions. Existing accounts in the literature all take the surface form of CQs at face value and treat them as matrix conditionals scoping over a question, and thus must employ sophisticated semantic machinery to produce a question meaning out of them (Isaacs and Rawlins 2008; Ciardelli et al. 2019). We develop and argue for an alternative theory on which CQs are, despite surface appearance, underlyingly matrix questions scoping over a conditional. The input to semantic interpretation is obtained as a result of syntactic reconstruction of the *if*-clause under the question—an independently needed mechanism. The theory does not necessitate any sophisticated semantics to handle CQs, and we show that it makes correct predictions with respect to diagnostics for reconstruction that surface-syntax accounts don't make. We also argue that the extra semantic machinery employed by previous accounts is harmful in being at risk of over-generating unattested structures, a problem avoided by our account which only makes use of conservative semantics for CQs.

**Keywords:** conditionals, questions, syntactic reconstruction

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# 1 Introduction

Consider the so-called Conditional Questions (henceforth CQs) in (1).

- (1) a. If it's raining, will Joanna leave?
- b. If it's raining, who will show up?

Impressionistically, what is going on in (1) is that a question in the consequent of the conditional is raised against the information specified by the antecedent of the conditional. In interpreting (1a), for instance, we raise the issue of whether Joanna will leave on the supposition that it is raining.

But how exactly do CQs compose to derive this meaning? The standard and conservative analysis of the conditional operator *if* is that it connects two declarative sentences, i.e., composes two propositions; therefore it is puzzling that here *if* is apparently able to connect a declarative sentence with an interrogative one.

Existing analyses in the literature (Velissaratou, 2000; Isaacs and Rawlins, 2008; Krifka, 2019; Bledin and Rawlins, 2019; Ciardelli et al., 2019), while varying sometimes radically from one another, all have one thing in common: they take the surface form at face value and presuppose a What-You-See-Is-What-You-Get syntax. Thus, they all must employ and justify some non-standard semantic machinery to allow the conditional operator to compose a proposition with a question meaning. We group those accounts under the heading ‘*if*>? approach’, and we state its gist in (2).

(2) *if*>? *approach*:

CQs are structures in which a question is embedded in the consequent of a conditional (*if* > ?). ‘*if*’ (or whichever is the operator that builds conditional constructions) can compose a proposition with a question meaning.

A prominent example of an *if*>? account is offered by Isaacs and Rawlins (2008). On their view, the interpretation of CQs proceeds in a two-step, dynamic process of

context update. Specifically, Isaacs and Rawlins (2008) propose, CQs are interpreted as follows: first, the global context of utterance is updated with the proposition in the conditional antecedent; then, the question in the consequent takes the newly created context as input, and outputs a partition of it into cells that correspond to exhaustive answers of the question (following the standard view that questions induce partitions of the context; Hamblin 1958; Groenendijk and Stokhof 1984). (1a), for instance, is semantically interpreted first by intersecting the global context with the set of worlds in which it's raining, and then the question partitions the new context to one cell in which Joanna leaves and one cell in which she doesn't.

A different *if*>? analysis is offered by Ciardelli (2016) and Ciardelli et al. (2019). They take the existence of CQs as support for the framework of Inquisitive Semantics, whose core is the hypothesis that declarative sentences and interrogative sentences have a like status in terms of both their semantic type and content (roughly, both describe a set of propositions). Glossing over the details, Ciardelli et al. (2019, §7.2.2) essentially stipulate that the conditional operator can be semantically lifted from its basic meaning as connecting two propositions to one that can operate on sets of propositions. With such lifting, the conditional operator can compose with a set of propositions—a question meaning—in the consequent.

The purpose of this paper to to develop and argue for a theory of CQs that rejects the *if*>? approach altogether. While we share the basic intuition described in the beginning of this section about the overall meaning of CQs and how they function in discourse, we will defend an analysis that cashes out that intuition with different assumptions about the syntax and compositional semantics. In short, we claim that CQs are matrix questions scoping over a conditional at Logical Form (LF). Our alternative account can be appropriately called ‘?>**if**’ approach, and its gist is summarized in the points in (3), which contrast with (2).

(3) **?>if Approach** (this paper)

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- (i) CQs are structures in which, despite surface appearance, a conditional is embedded under a question ( $? > if$ ); they are ordinary matrix questions.
- (ii) ‘if’ cannot connect a proposition with a question; it only ever connects a proposition with a proposition.

Our core proposal, which makes the claims in (3) possible, is that the conditional antecedent syntactically reconstructs into the scope of the question before semantic interpretation takes place (i.e., at LF). The underlying structure we propose for the CQs in (1) is virtually the same as in cases in which the *if*-clause appears in final position, and is schematically represented in (4).

(4) *Core proposal: the LFs of (1), schematically*

- a. Will [Joanna leave [if it’s raining]]?
- b. Who<sub>1</sub> will [<sub>1</sub> show up [if it’s raining]]?

As we discuss later, the hypothesis that (some) sentence-initial *if*-clauses originate in a lower position, to which they can optionally reconstruct, has been argued for on independent grounds by Iatridou (1991) and Bhatt and Pancheva (2006), and is not a novelty designed specifically for our account of CQs (although it is one which we make crucial use of). Other than that, the analysis incorporates fairly standard assumptions about the interpretation of questions and conditionals, and does not require any special semantic machinery to deal with CQs. The proposal thus arguably enjoys theoretical parsimony.<sup>1</sup>

More importantly than theoretical parsimony, we provide empirical arguments to favor our  $? > if$  theory. For one, we will show that an account like ours that relies on

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<sup>1</sup>Kai von Fintel (unpublished class handout) also argues that CQs should receive a  $? > if$  account—what he calls a ‘questioned conditionals’ account—and he shows how all the semantic-pragmatic properties of CQs discussed by Isaacs and Rawlins 2008 still fall in place if the question is analyzed as taking scope over a conditional. Von Fintel points out that “under the questioned conditional account,  $it[=a \text{ question like (1a), THE AUTHORS}]$  must involve some kind of topicalization of the *if*-clause.” He however stops short of developing this idea formally and doesn’t provide empirical reasons to favor it over the Context Update approach. This paper fills this gap.

syntactic reconstruction makes correct predictions with respect to diagnostics for *if*-clause reconstruction, predictions which *if*>? accounts don't make. The diagnostics include scope interaction between *if*-clauses and attitude predicates, interaction with Binding Principle C, islands, and variable binding, and we show that CQs are sensitive to all of them. Second, we argue that keeping the semantic part of the theory standard doesn't over-generate some unattested structures when we consider parallel cases with disjunction and conjunction instead of a conditional—structures which *if*>? accounts are at risk of over-generating, if no other stipulations are made.

The paper is structured as follows. In section 2 we present the formal details of our ?>*if* theory, and we show how it delivers all the basic desiderata of a theory of CQs. In section 3 we review arguments, independent of CQs, for the existence of *if*-clause reconstruction, based on scope facts and general syntactic constraints on reconstruction (Binding Principle C, Islands and variable binding), and we crucially show that the distribution of CQs is constrained in the same way, supporting the reconstruction analysis. Finally, section 4 tries to show that semantic enrichments postulated by *if*>? analyses are not only rendered unnecessary by the syntactic reconstruction alternative, but also might be harmful when we turn from conditionals to conjunction and disjunction.

## 2 An ?>*if* analysis of Conditional Questions

### 2.1 Syntax and semantics

To repeat, in our view CQs like those in (1) are matrix questions scoping over an ordinary, propositional conditional, despite surface appearance. A syntactic derivation for the polar question in (1a) is given schematically in (5), and for the constituent question in (1b) is given schematically in (6). The *if*-clause, an adverbial, starts out

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somewhere inside TP and then moves up to adjoin to CP.<sup>2</sup> The base position of fronted elements is represented as a co-indexed  $t_i$ .

(5) *Derivation of (1a)* ‘if it rains, will Joanna leave?’

- a. Base structure:  $[_{\text{TP}} \text{Joanna will leave } [_{\text{ADVP}} \text{if it rains}]]$
- b. Head-movement:  $[_{\text{CP}} \text{will } [_{\text{TP}} \text{Joanna leave } [_{\text{ADVP}} \text{if it rains}]]]$
- c. Fronting:  $[_{\text{ADVP}} \text{if it rains}]_2 [_{\text{CP}} \text{will } [_{\text{TP}} \text{Joanna leave } t_2]]$

(6) *Derivation of (1b)* ‘if it rains, who will show up?’

- a. Base structure:  $[_{\text{TP}} \text{who will show up } [_{\text{ADVP}} \text{if it rains}]]$
- b. WH(+head)-movement:  $[_{\text{CP}} \text{who}_1 \text{will } [_{\text{TP}} t_1 \text{ show up } [_{\text{ADVP}} \text{if it rains}]]]$
- c. Fronting:  $[_{\text{ADVP}} \text{if it rains}]_2 [_{\text{CP}} \text{who}_1 \text{will } [_{\text{TP}} t_1 \text{ show up } t_2]]$

The structure after fronting feeds phonological form (PF). At LF, however, the *if*-clause reconstructs so the input to semantic interpretation is (5b)/(6b).

The rest of this section is devoted to spelling out more carefully the LF and semantic interpretation of these structures. We illustrate our theory using the constituent question case in (6b), but everything we say straightforwardly extends to the polar question case in (5b).

We adopt the Hamblin-Karttunen-Heim tradition, according to which the denotation of questions is a set of propositions which correspond to the set of its (possible) answers, together with a general recipe for using that set to induce a partition of the context (see Hamblin 1973; Karttunen 1977; Heim 1994; Guerzoni and Sharvit 2007; Klinedinst and Rothschild 2011; Cremers and Chemla 2016; Fox 2019). For our example (6b), the question denotation is the set of conditional propositions of the form *x will show up if it rains*—one proposition per (relevant) individual *x*. We use

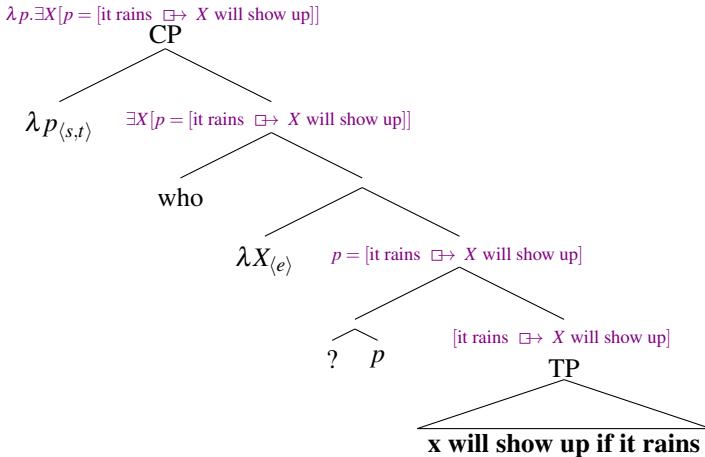
<sup>2</sup>We are being deliberately vague about where exactly the *if*-clause adverbial sits in the TP, because the choices don't matter for current purposes. We cannot rule out a parse where the *if*-clause originates TP-initially, higher than the subject. See more on this in footnote 11

standard technology to derive this compositionally, essentially a syntacticized version of Karttunen 1977, by adding some operators at LF and by treating wh-elements as existential quantifiers. Our LF is in (8), which enriches (6b) with  $\lambda$ -operators and with Karttunen's proto-question operator '?' (syntactically an interrogative head). The denotation of '?' and of *who* are given in (7), where the latter ranges over both atoms and pluralities (Dayal 1996 a.o.). '  $\square\rightarrow$ ' stands for the meaning of the conditional operator (see below). We ignore the contribution of tense.

(7) a.  $\llbracket ? \rrbracket = \lambda p. \lambda q. p = q$

b.  $\llbracket \text{who} \rrbracket = \lambda P_{(e,t)}. \exists X [X \text{ is an atomic or plural individual} \wedge P(X) = 1]$

(8) *LF of a CQ*



The resulting denotation of (8) (shown in (9a) in set notation) is equivalent to the set in (9b) of conditional propositions, as desired.

(9) a.  $\{p : \exists X [p = [\text{it rains } \square\rightarrow X \text{ will show up}]]\}$

b.  $\{\text{it rains } \square\rightarrow \text{Ann will show up},$   
 $\text{it rains } \square\rightarrow \text{Fred will show up},$   
 $\text{it rains } \square\rightarrow \text{Ana} \oplus \text{Fred will show up}, \dots\}$

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What about the meaning of  $\Box \rightarrow$ ? For us, any analysis of  $\Box \rightarrow$  will do as long as it validates the principle of Conditional Excluded Middle in (10), which is commonly thought to be intuitively valid (see below for why assuming CEM matters).

### (10) *Conditional Excluded Middle (CEM):*

$$\neg(p \Box \rightarrow q) \equiv p \Box \rightarrow \neg q$$

‘It’s not true that if it rains Ann will show up’  $\equiv$  if it rains Ann won’t show up’

One famous CEM-validating theory is the selection function analysis of Stalnaker (1968) in (11), according to which *if*-clauses refer to the most similar worlds to our own (the precise formulation of similarity does not matter). Thus, they are like singular definite descriptions of sorts.

### (11) *Stalnaker’s semantics:*

$\llbracket p \Box \rightarrow q \rrbracket = \lambda w. \llbracket q \rrbracket(w') = 1$ , where  $w'$  is the most similar world to  $w$  among those that make  $\llbracket p \rrbracket$  true.

Stalnaker’s semantics validates CEM as long as there is always exactly one most similar world to any  $w$ , as assumption that we take to be an added presupposition of  $\Box \rightarrow$  (thus, it is more accurate to say that (11) Strawson-validates CEM, in the sense of Strawson-entailment familiar from von Fintel 1999).<sup>3</sup> Adopting Stalnaker’s analysis, (9b) can be re-written as in (13).<sup>4</sup>

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<sup>3</sup>As an alternative to Stalnaker’s analysis we could opt for the Lewis-Schlenker hypothesis that *if*-clauses refer to a *plurality* of most-similar worlds (Lewis 1973; Schlenker 2004). That, together with a Homogeneity presupposition familiar from the literature on plural definites (von Fintel 1997), would (Strawson-)validate CEM as well.

<sup>4</sup>As for the polar conditional question in (5), the analysis is the same except for a choice point largely irrelevant to our main concern. Depending on one’s favorite theory of polar questions, their basic denotation could either be thought of as a doubleton set containing both the positive and the negative proposition in the question nucleus, giving us (12a); or it can be thought of as a singleton as in (12b), and the negative proposition being supplied indirectly through the partition function, see (15) below.

(12) a. {If it rains Joanna will leave, $\neg$ if it rains Joanna will leave}	(doubleton)
b. {If it rains Joanna will leave}	(singleton)

(13)  $\{\lambda w. \text{Ann shows up in the most similar rain world to } w,$   
 $\lambda w. \text{Fred shows up in the most similar rain world to } w,$   
 $\lambda w. \text{Ana} \oplus \text{Fred show up in the most similar rain world to } w, \dots\}$

## 2.2 Partition induced by Conditional Questions

Questions induce a partition of the context (Hamblin 1958, Groenendijk and Stokhof 1984 et seq.). A partition of a space of contextual possibilities  $C$  (a context set, in the sense of Stalnaker 1978) is a set of non-empty subsets (cells) of  $C$  that do not overlap with one another and whose union equals  $C$ . The question denotation in (13)—as is the general case in Karttunen-Heim framework—is a set of propositions which aren’t mutually-exclusive, so it does not constitute a partition by itself. But the partition can be retrieved from the denotation. This can be done by dividing the context into cells each of which contains the worlds that agree on the truth value of all the propositions in the question denotation. This is the job of the PART function defined in (15).<sup>5</sup>

(15) Let  $Q$  be a set of propositions (a question) and  $C$  a set of worlds (a context set).

- $\text{PART}(Q, C)$ , the partition of  $C$  based on  $Q$ , =  

$$\{p \mid \exists w \in C [p = \{w' : w \sim_{Q,C} w'\}]\}$$
- $w \sim_{Q,C} w'$  iff  $w, w' \in C$  and  $\forall p \in Q [p(w) = p(w')]$

Assume that Ann and Fred are the only relevant individuals. Then given (15) the partition induced by (9) is the set of mutually-exclusive propositions in (16). Each cell intuitively corresponds to an exhaustive answer to the question.

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<sup>5</sup>For a proposal that links the contextual partition induced by  $Q$  to a process of pointwise-exhaustifying the contextual answers to  $Q$ , see Fox (2019).

(14)  $\text{PART}(Q, C) = \{[\text{EXH}(A, Q)]_C \mid A \in Q\}$ , where ‘ $\phi_C$ ’ is the intersection of  $\phi$  with the context set  $C$ , and  
 $\text{EXH}(A, Q) = \lambda w. A(w) \wedge \forall A' \in Q [A'(w) \rightarrow A \subseteq A']$  (Fox 2019)

10 *Conditional Questions*(16) *The contextual partition induced by (9)*

{ it rains  $\square \rightarrow$  show-up(Ann)  $\wedge$  show-up(Fred);  
 it rains  $\square \rightarrow$  show-up(Ann)  $\wedge$   $\neg$ show-up(Fred);  
 it rains  $\square \rightarrow$   $\neg$ show-up(Ann)  $\wedge$  show-up(Fred);  
 it rains  $\square \rightarrow$   $\neg$ show-up(Ann)  $\wedge$   $\neg$ show-up(Fred)<sup>6</sup> }

The second cell in (16), for instance, comprises exactly of those worlds in C which make the first proposition in (9b) true (i.e., *it rains*  $\square \rightarrow$  *Ann will show up*) and the second proposition there false (i.e.,  $\neg$ (*it rains*  $\square \rightarrow$  *Fred will show up*)). Given CEM,  $\neg$ (*it rains*  $\square \rightarrow$  *Fred will show up*) is equivalent to (*it rains*  $\square \rightarrow$   $\neg$ *Fred will show up*). So the overall result gives us the second cell.<sup>7</sup>

Partitions help us define answerhood conditions on questions (Groenendijk and Stokhof 1984). A direct answer to a question Q is appropriate only if it denotes a cell or a union of cells in the partition induced by Q. For our example, the good answer in (17a) indeed denotes the union of the first two cells in (16).<sup>8</sup> We assume that a fragment answer like (17b) is really just a shorthand for the conditional answer in (17a).

## (17) Q: If it's raining, who will show up?

- a. A: If it's raining, Ann will show up.
- b. A: Ann (will show up).

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<sup>6</sup>It is sometimes suggested that the ‘negative’ cell should not strictly speaking be part of the contextual partition induced by a Q. In that case the last member in (16) shouldn't be there. This can be explained if we assume following Dayal (1996) that questions impose a Maximality presupposition on the context, to the effect that one member of the question denotation must be true (and entail all other true ones). It also follows from Fox (2019)'s demand that every proposition in Q will identify through exhaustification some cell in the contextual partition induced by Q (cf. previous footnote). We can remain agnostic about the proper treatment of the negative cell.

<sup>7</sup>To see that the propositions in (16) are mutually exclusive, and thus that they make up cells, remember that Stalnaker's conditional checks for truth of the consequent in the single most similar antecedent-world (and recall we assume there is always one). Since the consequents in (16) are mutually exclusive, no world can make more than one of the propositions in (16) true. The cells are therefore disjoint.

<sup>8</sup>Or, if (17a) is appended with an exhaustivity operator (Fox 2007), it denotes just the first cell of (16).

## 2.3 Denial of the antecedent

Isaacs and Rawlins (2008) discuss the fact that denying the conditional antecedent seems to be a felicitous response to a CQ:

(18) Q: If it's raining, who will show up?

A: It won't rain.

The felicity of the response in (18) is a challenge given the answerhood condition mentioned above, since the denial of the antecedent is not a cell in the partition induced by the question (nor is it a union of cells).<sup>9</sup>

We adopt Isaacs and Rawlins (2008)'s own solution to the challenge: the denial of the antecedent amounts to a denial of a presupposition that the question carries. Indicative conditionals presuppose that the context set contain some antecedent worlds ( $p \rightarrow q$  uttered in  $C$  presupposes that there are  $p$ -worlds in  $C$ ); the question in (18) then presupposes that it might rain. The response by A objects to this presupposition, denying that the antecedent is contextually possible. From this perspective, denying the antecedent is no different from parallel cases in which some presupposition that a question carries is denied as a response. For instance in (19), the existence presupposition of the definite description is denied and the discourse sounds felicitous.

(19) Q: Did you go on the escalator here?

A: There is no escalator here.

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<sup>9</sup>To see this, observe that many pairs  $w, w'$  of non- $p$  worlds in  $C$  could disagree on the value of some proposition(s) in the set  $?(p \rightarrow q)$ , and that would make such  $w, w'$  belong to different cells in the partition. For our example, take  $w$  to be a non-rain world the most similar rain-world to which is such that both Ann and Fred show up, and take  $w'$  to be a non-rain world the most similar rain-world to which is such that Ann shows up but Fred doesn't. Then  $w$  and  $w'$ , even though they are both themselves non-rain worlds, will belong to different cells in the partition described in (16). And in both of those cells there can also be rain-worlds. So the partition determined by a CQ  $?(p \rightarrow q)$  will not generally contain a cell or union of cells that corresponds to  $\neg p$ .

## 2.4 Recap and lookahead

So far we developed an account of the basic facts about conditional questions which relies on reconstruction of the *if*-clause into the question nucleus at LF. This allows us to employ ordinary assumptions about semantic interpretation—a Karttunen-style semantics (with Partition pragmatics) for questions and a Stalnaker semantics for conditionals, without recruiting special machinery to deal with the specific phenomenon at hand. We wish to stress that our main points do not substantially rely on this or that detail that we spelled out for concreteness, and can probably be implemented with other approaches to the semantics of questions or conditionals. What's crucial is the hypothesis stated in (3): CQs have the LF of  $?>if$ , and *if* retains its simple analysis of connecting two propositions.

In the next section we turn to reviewing independent arguments for *if*-clause reconstruction based on scope facts and general syntactic constraints on reconstruction (Binding Principle C, Islands and variable binding); we then crucially show that the distribution of CQs is constrained in the way prescribed by the reconstruction analysis, supporting our main claim.

### 3 Arguments for syntactic reconstruction

### 3.1 Scope relative to attitude predicates

Iatridou (1991) and Bhatt and Pancheva (2006) discuss evidence in the declarative domain that some sentence-initial *if*-clauses originate lower than their surface position. The primary evidence is based on scope interaction between sentence-initial *if*-clauses and matrix attitude verbs, as exemplified in (20).

(20) a. If it rains, Mary believes that Bill will come. (Iatridou 1991:26)  
≈ ‘Mary believes that Bill will come if it rains’

- b. If Ed comes to the party, Mary is convinced that Joanna will leave early.  
 $\approx$ ‘Mary’s convinced that Joanna will leave early if Ed comes to the party’
- c. If Alfonso comes to the party, Mary knows that Joanna will leave.  
 $\approx$ ‘Mary knows that Joanna will leave if Alfonso comes to the party’

Sentence (20a) on its most salient reading describes the existence of Mary’s thought about a conditional, and not that the existence of her thought is conditioned on rain. This indicates that the *if*-clause is interpreted in the scope of *believe*.<sup>10</sup> The same goes for (20b)-(20c). We can account for these readings if the *if*-clause started out in the embedded clause and moved to its surface position. That would be the case if the structure of e.g. (20a) before movement looks like (21).<sup>11</sup>

(21) Mary believes [that Bill will come if it rains].

One may try to raise the possibility that the relevant reading is read off the surface syntax of (20), without reconstruction, using (yet-to-be-specified) semantic means. We show now that this alternative attempt arguably makes a wrong prediction. Specifically, it conflicts with established generalizations about presupposition satisfaction and projection.

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<sup>10</sup>The scope difference can be shown to be truth conditional. Focus on a mundane context in which (the conversational participants presuppose that) whether Mary’s belief state entails that Bill will come doesn’t depend on whether there is rain. In this context there exist worlds *w* where it rains and Mary does not have the belief in *w* that Bill will come. This makes the (*if* > *think*) reading of (20a) false in the context. But the sentence can intuitively still be true on the (*think* > *if*) reading.

<sup>11</sup>As Iatridou (1991) and Bhatt and Pancheva (2006) emphasize, sentences like in (20) are only evidence that the fronted *if*-clause has a source in the embedded clause, but they are silent on where exactly in the clause. In particular, they don’t decide on the question of whether the base position of the *if*-clause is clause-final as we represent in (21) or rather clause-initial in the embedded clause. For reasons of convenience only, we will always represent the pre-moved site of *if*-clauses as clause-final. This decision should not be taken to be of theoretical importance. In fact, reconstruction all the way to clause-final positions cannot be assumed to always be the only available option, because of data like (22) which shows the lack of clause-final reconstruction for the purpose of Principle C.

(22) a. If John<sub>i</sub> is home, he<sub>i</sub> is not alone.  
 b. \*He<sub>i</sub> is not alone if John<sub>i</sub> is at home.

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As mentioned earlier, indicative conditionals presuppose that the proposition expressed by the *if*-clause is contextually possible, i.e. that the context set contain antecedent worlds. This explains why (23) is odd, as this presupposition of the *if*-clause clashes with contextual knowledge:

(23) (Context: We know that Johanna is out of town so there is no way she will come to the party tonight.)

- a. #Alfonso will leave if Johanna comes to the party tonight.
- b. #If Johanna comes to the party tonight, Alfonso will leave.

In the scope of attitude predicates (*think, hope, want* etc.), presuppositional information is ‘filtered’ (Karttunen 1974; Heim 1992): it only poses constraints on the belief state of the attitude holder, not on the (global) context. This is why the presuppositions triggered by the definite description *her cello* in the second sentence in (24) do not cause a clash with the information specified in the first sentence.

(24) Bill is mistaken to think that Mary owns a cello. He furthermore thinks that she wants to sell her cello. (after Heim 1992)

The reconstruction analysis then predicts that fronted *if*-clauses that are interpreted in the scope of attitude predicates will similarly not impose constraints on the global context, but only on the belief state of the attitude holder. This is borne out, as (25a) and crucially (25b) both sound coherent.

(25) (Context same as (23))

- a. Bill mistakenly thinks that Johanna might come to the party tonight. Furthermore, he thinks that Alfonso will leave if she comes.
- b. Bill mistakenly thinks that Johanna might come to the party tonight. Furthermore, if she comes he thinks that Alfonso will leave.<sup>12</sup>

The fact that the existence presupposition triggered by the *if*-clause in (25b) is filtered under the attitude indicates that the *if*-clause must be allowed to fully take scope under the attitude verb, as predicted by the reconstruction analysis. But if the *if*-clause in (25b) was interpreted where it surfaces, we would wrongly predict presupposition failure. We conclude that the inverse scope of a sentence like (20a) is not a scope illusion.

We thus have an argument for syntactic reconstruction of *if*-clauses independently of CQs. On our analysis, it is this operation that underlies both the the scope interaction with attitude verbs and our  $?>if$  syntax for CQs. The question in (26) is an example that combines both: it is a CQ in which the *if*-clause reconstructs under an attitude predicate. And (27b) shows that the same filtering facts extend to CQs.

(26) If Johanna comes to the party, who does Bill think will leave? (*think*  $>$  *if*)

(27) a. A- Bill is mistaken to think that Johanna might come to the party tonight.

B- Yeah I know. But does he think that Alfonso will leave if she comes?

b. A- Bill wrongly thinks that Johanna might come to the party tonight.

B- Yeah I know. But if she comes does he think that Alfonso will leave?

The rest of this section discusses three separate diagnostics for *if*-clause reconstruction, following [Iatridou \(1991\)](#) and [Bhatt and Pancheva \(2006\)](#): Islands, Principle C, and variable binding. In each such case, we will show that the distribution of CQs are sensitive to the same diagnostics, further supporting our proposal.

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<sup>12</sup>We note that (25b) becomes odd or at least very degraded if the second sentence is uttered in isolation. Against the context in (23), the sentence *if Johanna comes Bill thinks that Alfonso will leave* sounds like a presupposition failure. But this is also true of (25a), so it is not about the surface position *per se* of the *if*-clause. Rather, it could be attributed to the idea, going back to Karttunen and to [Heim \(1992\)](#), that presuppositions in the scope of attitude verbs tend to be globally accommodated as a default unless the speaker explicitly signals that the attitude holder's presuppositions do not coincide with theirs. That tendency is apparently so strong that it can cause a clash with contextual knowledge, a clash which is prevented by the explicit addition of the first sentence in (25a)-(25b).

### 3.2 Islands

Island considerations can provide support for the hypothesis that the relationship between a fronted *if*-clause and an embedded clause it modifies involves syntactic reconstruction. Bhatt and Pancheva (2006) show that island configurations indeed seem to restrict the scope of *if*-clauses, as exemplified in (28) with Complex NP island and WH-island.

(28) *Island effects*

- a. #If Alfonso comes to the party, Mary expressed the concern that Joanna will cause trouble. (Complex NP island)
- b. #If it rains, Mary wonders whether Bill will come. (WH-island; Bhatt and Pancheva 2006)

This further suggests that cases like (20) involve syntactic movement of the *if*-clause from a low position, to which it reconstructs—but not when an island condition is violated.

We observe that CQs are similarly constrained by islands, which lends support to our claim that CQs involve syntactic reconstruction:

(29) a. \*If John comes to the party, did Mary express the concern that Ann will come too? (with *concern*>*if*)

b. \*If John comes to the party, does Mary wonder whether Ann will come? (with *wonder*>*if*)

### 3.3 Principle C

Inverse scope of *if*-clauses is sensitive to Binding Principle C effects, see (30).

(30) *Principle C effects*

- a. \* $\text{He}_i$  thinks that Ann will come visit if  $\text{John}_i$  is sick.
- b. \*If  $\text{John}_i$  gets sick,  $\text{he}_i$  thinks that Ann will come visit. (with  $\text{think} > \text{if}$ )  
(Bhatt and Pancheva 2006)
- c. (?) If  $\text{he}_i$  gets sick,  $\text{John}_i$  thinks that Ann will come visit. (with  $\text{think} > \text{if}$ )

(30b) under the indicated reading is bad because after reconstruction of the *if*-clause to its original position, the proper name is c-commanded by the co-indexed pronoun, exactly like in (30a).<sup>13</sup>

Here too, we see that CQs induce the same Principle C effects, see (31). This furnishes another indication that CQs involve reconstruction.

(31) \*If John<sub>i</sub> comes to the party, does he<sub>i</sub> think that Alfonso will come too?  
(with  $\text{think} > \text{if}$ )

### 3.4 Variable binding

Bhatt and Pancheva (2006) observe that a pronoun in a sentence-initial *if*-clause can be bound by a quantifier in the main clause:

(32) If  $\text{her}_1$  child is late from school, every  $\text{mother}_1$  is upset.

(32) can be paraphrased as ‘every  $\text{mother}_1$  is upset if  $\text{her}_1$  child is late from school’. That  $\text{her}_1$  can be bound suggests that the *if*-clauses reconstructs under *every mother* at LF.<sup>14</sup>

Observe now that a pronoun in a fronted *if*-clause can be bound by a lower operator in the case of CQs as well. In (33), a pronoun is bound by the wh-phrase:

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<sup>13</sup>Remember from footnote 11 that the diagnostics for *if*-clause reconstruction do not decide on the exact position of the *if*-clause in the clause where it is interpreted. Therefore for this Principle C diagnostics to be used, it is crucial that the co-indexed c-commanding element,  $\text{he}_i$  in (30b), is in a higher clause than the intended position of the *if*-clause, which is made sure by focusing on the  $\text{think} > \text{if}$  reading of (30b).

<sup>14</sup>It would be problematic to claim that the reverse scope is a result of QR of *every mother* instead, because that would be a Weak Crossover violation.

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(33) a. If her<sub>1</sub> child is late from school, which mother<sub>1</sub> gets upset?  
     ≈‘Which mother<sub>1</sub> gets upset if her<sub>1</sub> child is late from school?’

    b. If a relative of hers<sub>1</sub> dies, which actress<sub>1</sub> will inherit a fortune?  
     ≈‘Which actress<sub>1</sub> will inherit a fortune if a relative of hers<sub>1</sub> dies?’

### 3.5 Summary

We have argued for a  $?>if$  theory of CQs (repeated from (3)):

(34)  **$?>if$  Approach**

- (i) CQs are structures in which, despite surface appearance, a conditional is embedded under a question ( $? > if$ ); they are ordinary matrix questions.
- (ii) ‘if’ cannot connect a proposition with a question; it only ever connects a proposition with a proposition.

The engine of the account is the hypothesis that *if*-clauses can undergo syntactic reconstruction; This hypothesis predicts correctly a host of correlations with known diagnostics for syntactic reconstruction.

By contrast, recall the spirit of *if* $>?$  accounts, repeated below from (2):

(35) ***if* $>?$  approach:**

CQs are structures in which a question is embedded in the consequent of a conditional (*if*  $> ?$ ). ‘if’ (or whichever is the operator that builds conditional constructions) can compose a proposition with a question meaning.

Since *if* $>?$  accounts hold that the surface syntax is the input to semantic interpretation, they do not predict the reconstructions effects we observe.

Given the existence of syntactic reconstruction, as we showed, CQs can be handled with standard semantics, rendering the extra machinery employed by *if* $>?$  accounts unnecessary, or at least unmotivated by the phenomenon of CQs—whatever

the exact nature of that machinery is, as we briefly reviewed in section 1 (Inquisitive Lifting in Ciardelli et al. 2019; Dynamic Context Update in Isaacs and Rawlins 2008).

The next section is an attempt to argue that the semantic stipulations made by *if*>? accounts doesn't only fail to predict the interaction with reconstruction diagnostics, but also harmful in other ways, unless some other stipulations are added to the theory.

## 4 No parallel ‘conjunctional/disjunctional questions’

Consider the ungrammaticality of the following conjunctions and disjunctions:

(36) a. \* It's (both) raining and who will show up?  
 b. \* It's (either) not raining or who will show up?

Sentences (36) point to the impossibility of *and* and *or* to compose a proposition with a question. But if, as *if*>? accounts hold, grammar allows *if* to compose a proposition with a question, why doesn't it allow the same for *and* and *or*?<sup>15</sup> *if*>? analyses must somehow block the semantic machinery that works for CQs from applying here too.

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<sup>15</sup>Sometimes *and* and *or* do seem to be able to connect a declarative proposition and a question, as in (37).

(37) a. John left town, and after all, why wouldn't he? (Lasersohn, 2024)  
 b. John is wrong, or is he not? (a reviewer, p.c.)

But these examples could be analyzed as containing two separate root sentences (orthography could be misleading), where *and* and *or* are in fact sentence-initial, discourse-level particles. We control against that possibility in (36) with the addition of *both* and *either*, which are known to mark the (sentence-internal) scope of conjunction and disjunction respectively (Larson 1985). If we add *both* to (37a) and *either* to (37b), the examples become bad. Sentence-initial uses of *and* are abundant and well-documented, see Dorgeloh (2004); Bell (2007). Such uses of *or* are also common, but we are not aware of their mention in the literature, except for a short passage in Szabolcsi 2015:165. Since cases like (37) are outside the scope of this paper, we do not investigate them in any depth. But we point out that sentence-initial *and* (though not *or*) can precede a question only if the question is rhetorical. To wit, the sequence: *John left town. And did he get a new job?*, at least if uttered by one speaker, is bad if the question is genuinely answer-seeking (whereas removing *and* allows the question to be interpreted so). Indeed, the question in (37a) can only have rhetorical force.

To be a bit more concrete, recall from the introduction the *if*>? account of Isaacs and Rawlins (2008). They devise a two-step dynamic procedure where CQs are interpreted as follows: first, the context is updated with proposition in the antecedent, and then the question in the consequent partitions that newly-created context. That theory, however, now requires further stipulations, whose nature are not clear to us, to block the same mechanism from applying in the case of conjunction/disjunction. After all, in dynamic frameworks *and* and *or* have update semantics just like *if* (Heim 1983). This is not to say that this specific challenge is detrimental to Isaacs and Rawlins 2008's analysis (as opposed perhaps to the one from reconstruction effects), as they could enrich their system with some constraints on the update function of certain operators. But it does cast further doubt that the mechanism they employ is on the right track.

By contrast, (36) is not a problem for our account. It is simply impossible to generate these structures, if connectives can never connect a declarative with a question—be it by *if*, *and* or *or*. Note that it is also impossible to generate them through movement of the first con/disjunct from inside the question nucleus; such a movement is ruled out as a violation of the Coordinate Structure Constraint (Ross 1967).

## 5 Conclusion

In studying a phenomenon at the syntax-semantics interface, it is sometimes beneficial to take syntax more seriously than what appears on the surface, as that allows us to simplify the semantic component, and if on the right track it could make correct predictions about interaction with other components of grammar and for diagnostics for structure. In this paper we made this case for Conditional Questions like (1). We argued that syntactic reconstruction of the *if*-clause under the question is all

we need for an adequate analysis using conservative semantics, and it makes correct predictions for scope and for diagnostics for reconstruction.

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## References

Bell, D.M. 2007. Sentence-initial and and but in academic writing. *Pragmatics. Quarterly Publication of the International Pragmatics Association (IPrA)* 17(2): 183–201 .

Bhatt, R. and R. Pancheva. 2006. Conditionals. *The Blackwell companion to syntax*: 638–687 .

Bledin, J. and K. Rawlins. 2019. What ifs. *Semantics and Pragmatics* 12: 14–1 .

Ciardelli, I. 2016. Lifting conditionals to inquisitive semantics. In *Semantics and Linguistic Theory*, pp. 732–752.

Ciardelli, I., J. Groenendijk, and F. Roelofsen. 2019. *Inquisitive Semantics*. Oxford University Press.

Cremers, A. and E. Chemla. 2016. A psycholinguistic study of the exhaustive readings of embedded questions. *Journal of Semantics* 33(1): 49–85 .

Dayal, V. 1996. *Locality in Wh-Quantification: Questions and Relative Clauses in Hindi*. Dordrecht: Kluwer Academic Press.

Dorgeloh, H. 2004. Conjunction in sentence and discourse: sentence-initial and and discourse structure. *Journal of Pragmatics* 36(10): 1761–1779 .

von Fintel, K. 1997. Bare plurals, bare conditionals, and only. *Journal of Semantics* 14(1): 1–56 .

von Fintel, K. 1999. Npi licensing, strawson entailment, and context dependency. *Journal of Semantics* 16(2): 97–148 .

Fox, D. 2007. Free choice and the theory of scalar implicatures, *Presupposition and implicature in compositional semantics*, 71–120. Springer.

Fox, D. 2019. Partition by exhaustification: Comments on dayal 1996 .

Groenendijk, J.A.G. and M.J.B. Stokhof 1984. *Studies on the Semantics of Questions and the Pragmatics of Answers*. Ph. D. thesis, Univ. Amsterdam.

Guerzoni, E. and Y. Sharvit. 2007. A question of strength: on npis in interrogative clauses. *Linguistics and Philosophy* 30: 361–391 .

Hamblin, C.L. 1958. Questions. *Australasian Journal of Philosophy* 36(3): 159–168. <https://doi.org/10.1080/00048405885200211> .

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

Heim, I. 1983. On the projection problem for presuppositions. *Formal semantics—the essential readings*: 249–260 .

Heim, I. 1992. Presupposition projection and the semantics of attitude verbs. *Journal of Semantics* 9: 183–221 .

Heim, I. 1994. Interrogative semantics and karttunen’s semantics for know. In *Proceedings of IATL*, Volume 1, pp. 128–144.

Iatridou, S. 1991. *Topics in conditionals*. Ph. D. thesis, Massachusetts Institute of Technology.

Isaacs, J. and K. Rawlins. 2008. Conditional questions. *Journal of Semantics* 25(3): 269–319 .

Karttunen, L. 1974. Presupposition and linguistic context .

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

Klinedinst, N. and D. Rothschild. 2011. Exhaustivity in questions with non-factives. *Semantics and Pragmatics* 4(2): 1–23 .

Krifka, M. 2019. Indicative and subjunctive conditionals in commitment spaces. In *Proceedings of the 22nd Amsterdam Colloquium*, pp. 248–258.

Larson, R.K. 1985. On the syntax of disjunction scope. *Natural Language & Linguistic Theory* 3(2): 217–264 .

Lasersohn, P. 2024. Coordination of Unmatched Clause Types and Dynamic Look-Ahead. Unpublished draft.

Lewis, D. 1973. *Counterfactuals*. Oxford: Blackwell.

Ross, J. 1967. *Constraints on Variables in Syntax*. Ph. D. thesis, Massachusetts Institute of Technology.

Schlenker, P. 2004. Conditionals as definite descriptions. *Research on Language and Computation* 2(3): 417–462. <https://doi.org/10.1007/s11168-004-0908-2> .

Stalnaker, R.C. 1968. A theory of conditionals, *Iffs: Conditionals, belief, decision, chance and time*, 41–55. Springer.

Stalnaker, R.C. 1978. Assertion, *Pragmatics*, 315–332. Brill.

Szabolcsi, A. 2015. What do quantifier particles do? *Linguistics and Philosophy* 38: 159–204 .

Velissaratou, S. 2000. Conditional questions and which-interrogatives. Master’s thesis, University of Amsterdam.