

Interpreting interrogatives as rhetorical questions[☆]

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Abstract

While an ordinary question seeks information or an answer from the hearer, a rhetorical question does not expect to elicit an answer. In general, a rhetorical question has the illocutionary force of an assertion of the opposite polarity from what is apparently asked. Under the rhetorical question reading, the *yes–no* questions *Did I tell you that writing a dissertation was easy?* and *Didn't I tell you that writing a dissertation was easy?* respectively assert *I didn't tell you that writing a dissertation was easy* and *I told you that writing a dissertation was easy*. I show that rhetorical questions and ordinary questions do not pattern alike with respect to various well-formedness conditions, such as negative polarity item licensing. I propose a way of deriving the interpretation of rhetorical questions and address why rhetorical questions have the interpretation of an assertion of the opposite polarity. I also argue that the representation over which various well-formedness conditions are stated is the output of a post-LF derivation which is determined via interaction with a sub-part of the interpretational component, namely pragmatics. I show that a compositional semantics for rhetorical questions is possible by directly mapping this post-LF representation onto the semantic interpretation. The approach pursued here has implications for the architecture of the grammar in general, and in particular for the nature of the interface between syntax and semantics/pragmatics. © 2002 Elsevier Science B.V. All rights reserved.

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1. Introduction

While an ordinary question seeks information or an answer from the hearer, a rhetorical question does not expect to elicit an answer. In general, a rhetorical question has the illocutionary force of an assertion of the opposite polarity from what is apparently asked (Sadock, 1971, 1974). That is, a rhetorical positive question has the illocutionary force of a negative assertion, and a rhetorical negative question has the illocutionary force of a positive assertion. Consider the questions in (1).

- (1) a. What has John ever done for Sam?
 b. What hasn't John done for Sam?

Under the rhetorical question reading, the *wh*-questions in (1) assert *John has done nothing for Sam* and *John has done everything for Sam*, respectively.¹

- (2) a. Did I tell you that writing a dissertation was easy?
 b. Didn't I tell you that writing a dissertation was easy?

Under the rhetorical question reading, the *yes–no* questions in (2) respectively assert *I didn't tell you that writing a dissertation was easy* and *I told you that writing a dissertation was easy*.

The main goals of this paper are (i) to show that rhetorical questions and ordinary questions do not pattern alike with respect to various well-formedness conditions, (ii) to address the question of why rhetorical questions are interpreted as an assertion of the opposite polarity from the surface form, given the semantics of questions in Groenendijk and Stokhof (1985), and (iii) to account for the formal properties of rhetorical questions. I will conclude that the interaction between the output of syntax (LF) and pragmatics derives an interpretational representation over which various well-formedness conditions are stated.

Sadock (1971, 1974) argues that a rhetorical question is semantically equivalent to an assertion of the opposite polarity from what is apparently asked, followed by a tag question with a falling intonation. Other studies on rhetorical questions include Linebarger (1987), Progovac (1993), Lee (1995), and Gutiérrez-Rexach (1997). They are mainly concerned with accounting for the licensing of negative polarity items (NPIs) in rhetorical questions. In this study, I add new observations with respect to the behavior of NPIs in rhetorical questions. But more importantly, I explain why rhetorical questions have the interpretation that they do. The NPI licensing facts will follow directly from the proposed analysis.

¹ In this paper, I limit the discussion of *wh*-questions to those with argument *wh*-phrases.

In §2, I show that rhetorical questions have the formal properties of assertions rather than of questions. I also show that NPI licensing in ordinary questions and rhetorical questions is not the same. In §3, I review some of the previous works on rhetorical questions: Sadock (1971, 1974), Progovac (1993) and Lee (1995). In §4, I briefly discuss the semantics of questions and semantics of *wh*-words that I am assuming. In §5, I address the question of why a rhetorical question has the illocutionary force of an assertion of the opposite polarity. In §6, I propose a way of deriving the interpretation of rhetorical questions compositionally. Based on the proposed system, I provide an account of formal properties of rhetorical questions including NPI licensing facts in §7. In particular, in §7.3 and §7.4, I provide further evidence for the proposed account from the interpretation of rhetorical questions containing a deontic modal and from the behavior of postverbal negative constituents in rhetorical questions in Italian, a negative concord language.

2. Formal properties of rhetorical questions

2.1. Rhetorical questions as assertions

Sadock (1971, 1974) provides tests to show that rhetorical *yes–no* questions are formally assertions and that they differ formally from information-seeking ordinary *yes–no* questions. As an introductory item, *after all* can occur with rhetorical *yes–no* questions, but not with ordinary *yes–no* questions. For instance, the question in (3) can only be interpreted as a rhetorical question.

(3) After all, do phonemes have anything to do with language?

A rhetorical *yes–no* question can be followed by a *yet*-clause, but an ordinary *yes–no* question cannot. Therefore, the question in (4) can only be interpreted as a rhetorical question.

(4) Do phonemes have anything to do with language? Yet people continue to believe in them.

Rhetorical *yes–no* questions do not allow phrases such as *by any chance*, which signal ordinary information-seeking questions. The question in (5) can only be an ordinary question.

(5) Does Arthur, by any chance, know anything about syntax?

Extending Sadock's tests to rhetorical *wh*-questions yields the same results as for rhetorical *yes–no* questions. The introductory item *after all* can occur with rhetorical *wh*-questions, but not with ordinary *wh*-questions. For instance, (6) can only be interpreted as a rhetorical question.

(6) After all, who helped Mary?

While rhetorical *wh*-questions can be followed by a *yet*-clause, ordinary *wh*-questions cannot. The question in (7) is felicitous only if it is interpreted as a rhetorical question.

(7) Who helped Mary? Yet she managed everything by herself.

The parenthetical *by any chance* can occur with ordinary *wh*-questions, but not with rhetorical *wh*-questions. The question in (8) can only be interpreted as an ordinary question, although it is a bit degraded for reasons which I do not understand yet.

(8) ? Who helped Mary, by any chance?

Finally, Sadock (1974: 126) shows that when a rhetorical *wh*-question is used as a parenthetical, it can be in the form of a nonrestrictive relative clause, as shown in (9a). But when an ordinary *wh*-question is used as a parenthetical, it cannot be reduced to a nonrestrictive relative clause, but must have the form of a conjunct. This is shown in (9b,c).

- (9) a. Symbolic logic, which who cares about anyway, is awfully tough.
 b. * Symbolic logic, which by the way who invented, isn't my cup of Postum.
 c. Symbolic logic – and by the way who invented it? – isn't my cup of Postum.

2.2. NPI licensing

Ordinary *yes–no* questions are known to license weak NPIs, such as *any* (Ladusaw, 1980; Linebarger, 1987; Provogac, 1993; Higginbotham, 1993).²

- (10) a. Did anybody visit John?
 b. Did John visit anyone?

However, ordinary *yes–no* questions do not license strong NPIs, such as *lift a finger* and *budge an inch*. *Yes–no* questions with strong NPIs can only have a rhetorical question reading.

- (11) a. Did John lift a finger to help Sam?
 b. Did John budge an inch when Sam was in trouble?

² Zwarts (1996) makes a distinction between weak and strong NPIs. Weak NPIs include *any* and *ever*. They can be licensed by any downward entailing operator, such as *few NP*, or *less than four NP*. Strong NPIs include *lift a finger*, *budge an inch*, etc. and can only be licensed by negative elements such as *no* or *not*.

For example, (11a) can only be interpreted as an assertion of the speaker's belief that John didn't lift a finger to help Sam.

As for NPI licensing in argument *wh*-questions, Han and Siegel (1997) point out that when the trace of the *wh*-phrase *c*-commands the weak NPI, both the ordinary question reading and the rhetorical question reading are available (as in (12)), whereas when this *c*-command relationship does not hold, only the rhetorical question reading is available (as in (13)).

- (12) a. Who_{*i*} *t_i* has ever been to Seoul?
 b. Who_{*i*} *t_i* said anything interesting at the seminar?
- (13) a. What_{*i*} has Sam ever contributed *t_i* to the project?
 b. What_{*i*} did anybody say *t_i* at the seminar?

For instance, (12a) can be interpreted either as a question about visitors to Seoul, or as an assertion of the speaker's belief that no one has been to Seoul. However, (13a) can only be interpreted as an assertion that Sam has not contributed anything to the project.

Just like ordinary *yes-no* questions, ordinary *wh*-questions do not license strong NPIs. *Wh*-questions with strong NPIs can only be interpreted as rhetorical questions.

- (14) a. Who lifted a finger to help Mary?
 b. Who budged an inch when you were in trouble?

(14a) can only be interpreted as an assertion that no one helped Mary.

While an ordinary negative question can contain a weak NPI, a rhetorical negative question cannot. The questions in (15) and (16) are good under the ordinary question reading. For example, (15a) can be a question that asks whether John visited anyone or not, and (16a) can be a question about visitors to Seoul. However, the questions in (15) and (16) do not have the rhetorical question reading. For example, (15a) cannot mean that John visited someone, and (16a) cannot mean that everybody has been to Seoul.

- (15) a. Didn't John visit anyone?
 b. Didn't anyone visit John?
- (16) a. Who hasn't ever been to Seoul?
 b. Who didn't say anything interesting at the seminar?

The fact that rhetorical negative questions do not license NPIs is quite surprising. This means that the negation that is present in the surface string of rhetorical negative questions does not function as the licenser of NPIs. It suggests that the NPI licensing condition applies at a more abstract level, where the representation of rhetorical negative questions does not contain a licenser for NPIs. I will return to this point in §7.

3. Previous studies of rhetorical questions

3.1. Sadock (1971, 1974)

Sadock (1971, 1974) is mainly concerned with rhetorical *yes–no* questions. He argues that they are semantically similar to tag questions with falling intonation and proposes that both types of questions share similar D-structures. For instance, for Sadock, the questions in (17) and in (18) have similar D-structures.

- (17) a. Syntax isn't easy, is it?
 b. Is syntax easy?
- (18) a. Syntax is easy, isn't it?
 b. Isn't syntax easy?

The polarity of the tag in tag questions corresponds to the polarity of the corresponding rhetorical questions. Moreover, the polarity of the body in tag questions corresponds to the polarity of the assertion expressed by the corresponding rhetorical questions.

Sadock proposes that the D-structure of a tag question is a conjunction of an assertive and an interrogative clause in that order. Furthermore, the D-structure of the corresponding rhetorical question is a conjunction of an interrogative clause and an assertive clause in that order. The D-structures of the questions in (17) and (18) are given in (19) and (20) respectively. Sadock uses a higher abstract performative to specify the illocutionary force.

- (19) a. [_S [_S Speaker-declare-Syntax isn't easy] [_S Speaker-ask-Is syntax easy]] (tag question)
 b. [_S [_S Speaker-ask-Is syntax easy] [_S Speaker-declare-Syntax isn't easy]] (rhetorical question)
- (20) a. [_S [_S Speaker-declare-Syntax is easy] [_S Speaker-ask-Isn't syntax easy]] (tag question)
 b. [_S [_S Speaker-ask-Isn't syntax easy] [_S Speaker-declare-Syntax is easy]] (rhetorical question)

In order to derive the correct surface string, Sadock claims that at S-structure, part of the second conjunct of a tag question, but all of the second conjunct of a rhetorical question undergoes deletion. But if the D-structures of both tag questions and rhetorical questions are conjunctions of an assertive and an interrogative clause and the only difference is the ordering of the conjuncts, the asymmetry in the deletion of second conjuncts is puzzling.

Moreover, Sadock would have to say that in rhetorical questions with a strong NPI, the NPI is licensed by the negation in the deleted assertive conjunct. For instance, given Sadock (1971, 1974), *give a damn* in (21a) is licensed by the negation in the second conjunct in (21b).

- (21) a. Does John give a damn about syntax?
 b. [_S [_S Speaker-ask-Does John give a damn about syntax] [_S Speaker-declare-John doesn't give a damn about syntax]]

Assuming that strong NPIs are licensed if they are in the c-command domain of negation, NPI licensing in rhetorical questions ends up being a special case. That is, in the first conjunct of rhetorical questions, strong NPIs are licensed even though they are not c-commanded by the licensing negation. Even if we accept that NPI licensing in rhetorical questions is a special case, the prediction is that tag questions that have a negative tag should be able to license an NPI in the body as well. But this prediction is not borne out, as shown in (22a).

- (22) a. * John gives a damn about syntax, doesn't he?
 b. [_S [_S Speaker-declare-John gives a damn about syntax] [_S Speaker-ask-Doesn't John give a damn about syntax]]

If tag questions and rhetorical questions have similar D-structures and similar semantics, it remains unexplained why there should be this asymmetry in NPI licensing.

3.2. *Progovac (1993)*

Progovac (1993) is mainly concerned with accounting for NPI licensing in various types of constructions. She argues that NPIs are similar to anaphors in their need for licensing by a local antecedent and proposes an account of the licensing of polarity items that combines a modified version of the downward entailment approach of Ladusaw (1980) and the Binding Theory of Chomsky (1981), as extended in Aoun (1985, 1986) to include both A and A'-binding. She extends the proposed analysis to NPI licensing in rhetorical *wh*-questions.

The claim is that NPIs are subject to Principle A of the Binding Theory. A potential binder for NPIs is either the local negation or an empty polarity operator generated in [Spec, CP]. Further, only NPIs that undergo Quantifier Raising at LF can be licensed by the empty polarity operator. This means that while weak NPIs such as *ever* and *any* can be licensed by the empty polarity operator in [Spec, CP], strong NPIs such as *budge an inch* and *lift a finger*, which are not quantifiers, can only be licensed by local negation. In principle, the empty polarity operator (Op) is generated in [Spec, CP] of all clauses, but is filtered out in upward entailing clauses by the following filter.

- (23) *Op in an upward entailing clause

Thus, in (24a), local negation binds and licenses the NPI *anyone*. In (24b), an empty polarity operator is generated in [Spec, CP] of the complement clause. Since the complement clause of *forget* is not an upward entailing environment, the operator is not filtered out and is hence able to bind and license the NPI *anyone*. In (24c), the NPI *anything* does not have a binder and so is not licensed, i.e. there is no local

negation and the empty operator cannot be generated in the absence of a [Spec, CP] position.

- (24) a. John did not see anyone.
 b. Mary forgot that anyone visited her on Monday.
 c. * Mary forgot anything.

In (25a), the strong NPI *lift a finger* is licensed by local negation. But in (25b), since the strong NPI *lift a finger* cannot raise at LF, it is not licensed even though an empty polarity operator is present in [Spec, CP].

- (25) a. Sue did not lift a finger to help John.
 b. * Sue forgot that Mary lifted a finger to help John.

According to Progovac, *wh*-questions come out as upward entailing (adopting the definition of Karttunen (1977)). This is so because every true answer to (26b), which is of the form *x has a cat* entails a true answer to (26a), which is of the form *x has a pet*. But every true answer to (26a) does not entail a true answer to (26b). Thus, it is surprising that *wh*-questions license NPIs.

- (26) a. Who has a pet?
 b. Who has a cat?

Progovac proposes that *wh*-words are ambiguous between NPIs and true question words, based on the fact that in languages like Chinese and Serbo-Croatian, *wh*-words can serve as NPIs. She claims that in principle, a *wh*-question starts with both a *wh*-operator and an empty polarity operator in [Spec, CP]. When the question does not contain an NPI, the empty polarity operator is suppressed, and the *wh*-word is a true question word. The *wh*-operator binds and merges with the *wh*-word, and the question is interpreted as an ordinary information-seeking question. But when the question contains an NPI, it requires the empty polarity operator to license the NPI. In this case, the *wh*-operator is suppressed, and the *wh*-word is forced to be an NPI word. (28) demonstrates the interpretational process for the *wh*-question with an NPI in (27). The empty polarity operator binds and merges with the NPI *wh*-word, licensing the NPI *ever* as well, and the question is interpreted as a rhetorical question.

- (27) Who did Mary ever visit in Seoul?
 (28) a. [_{CP} WH-Op Polarity-Op who [_{C'} did Mary ever visit in Seoul?]]
 b. [_{CP} Polarity-Op who [_{C'} did Mary ever visit in Seoul?]]
 c. [_{CP} Polarity-Op anyone [_{C'} did Mary ever visit in Seoul?]]
 d. [_{CP} no one [_{C'} did Mary ever visit in Seoul?]]

Progovac assumes that the merger of the *wh*-word and the empty polarity operator in [Spec, CP] takes place prior to the application of the filtering process. Otherwise, the

empty polarity operator would be precluded from appearing in the clause in the first place.

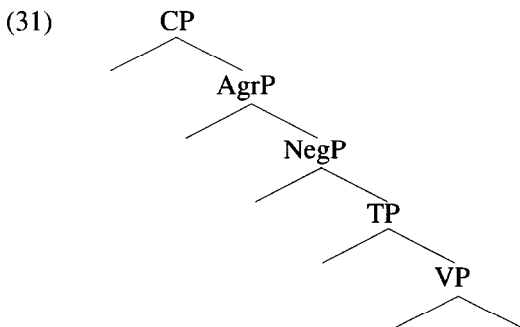
Progovac (1993) accounts for the rhetorical question reading of *wh*-questions with weak NPIs. But her system cannot account for the ordinary information-seeking reading that is available in some *wh*-questions with weak NPIs: she incorrectly predicts that all *wh*-questions with NPIs can only have rhetorical question reading. Furthermore, as observed in Horn and Lee (1995), her analysis incorrectly predicts that strong NPIs cannot occur in rhetorical questions, since they cannot undergo Quantifier Raising. Moreover, since it is the presence of an NPI that triggers the suppression of the *wh*-operator, Progovac incorrectly predicts that rhetorical *wh*-questions without NPIs cannot exist. A more general system that can account for the syntactic and semantic properties of rhetorical questions with or without NPIs would be preferable.

3.3. Lee (1995)

According to Lee (1995), argument rhetorical *wh*-questions cannot license subject position NPIs, whereas object position NPIs or verbal NPIs, such as *budge an inch*, are licit.

- (29) a. * Who did anyone see?
 b. * What did anyone buy?
 (30) a. Who said anything to you?
 b. Who budged an inch to help Bob?

Lee notes that the grammaticality of (29a,b) improves when the NPI *anyone* is focused. But she marks them ungrammatical assuming that focused forms are syntactically distinct from non-focused ones. She assumes a basic tree structure in which NegP appears above VP but below the surface subject position, in the spirit of Pollock (1989).



Lee argues that argument *wh*-phrases in rhetorical questions activate NegP by moving through its specifier on the way to [Spec, CP]. The activated NegP is then able to license NPIs that appear below it, but not ones above it. So object and verbal NPIs can be licensed, but subject NPIs cannot.

Lee's account makes a prediction with respect to *do*-support in rhetorical questions. The presence of an overt negation in declarative sentences triggers *do*-support in English, as in (32).

(32) John did not say anything.

If an account of *do*-support is adopted that appeals to PF adjacency requirement between the main verb and the inflection on INFL, as in Bobaljik (1995), then Lee correctly predicts that *do*-support should not be triggered in (33a) under the rhetorical question reading. This is because negation in rhetorical questions is covert, and so the inflection in INFL and the main verb are adjacent to each other at PF.

(33) a. Who said anything interesting at the seminar?
b. * Who did say anything interesting at the seminar?

However, if we adopt an account of *do*-support according to which *do*-support is required in negative declaratives because negation blocks LF verb movement to INFL, as in Chomsky (1991, 1993), then Lee (1995) wrongly predicts that the question in (33a) should trigger *do*-support under the rhetorical question reading. Since negation in rhetorical questions is structurally located in the same position as in negative declaratives, according to Lee, LF verb movement should be blocked in rhetorical questions as well and so *do*-support should be triggered.

Furthermore, Lee assumes that the examples in (29) are ungrammatical because the NPI has to be focused in order for them to have a rhetorical question reading. However, all rhetorical questions have to be uttered with a focus on some constituent or other. Hence, I believe that the examples in (29) are just as grammatical as those in (30). An adequate analysis should be able to account for the fact that argument *wh*-questions with subject NPIs can have a rhetorical question reading.

4. Semantics of questions and *wh*-words

4.1. Semantics of questions

Let us define, as in Groenendijk and Stokhof (1985), the denotation of a question as a function which partitions the set of all possible worlds. The partition represents the set of propositions which are possible answers, including the negative answer. That is, each block of the partition corresponds to the set of possible worlds in which one of the possible answers is true. For instance, the *yes-no* question *Does John drink?* returns the bipartition in (34).

(34) $\llbracket \text{Does John drink?} \rrbracket$

John drinks

John doesn't drink

One block of the partition represents the positive answer, and the other block represents the negative answer.

Assuming that the domain of universe contains three individuals *Mary*, *John* and *Bill*, the *wh*-question *Who drinks?* returns the partition in (35).

(35) $\llbracket \textit{Who drinks?} \rrbracket$

Everybody drinks
Mary, Bill drink
Mary, John drink
John, Bill drink
Mary drinks
Bill drinks
John drinks
Nobody drinks

Each block in the partition represents a possible answer, and one of them contains the true answer.

4.2. Semantics of *wh*-words

The semantics of questions in Groenendijk and Stokhof (1985) suggests an algebraic account of the possible values for *wh*-words, as in Szabolcsi and Zwarts (1993) and Gutiérrez-Rexach (1997). For instance, in (35), given that the domain of uni-verse contains three individuals *Mary*, *John* and *Bill*, the possible values for the *wh*-word *who* is the power set of the set containing the three individuals, including the empty set and the unit set.

(36) $\{\{Mary, Bill, John\}, \{Mary, Bill\}, \{Mary, John\}, \{John, Bill\}, \{Mary\}, \{Bill\}, \{John\}, \emptyset\}$

The power set in (36) is closed under intersection, union, and complement. That is, intersection, union and complement are defined for every element in the power set. This means that the result of intersection and union for any two elements in the power set and the result of the complement of any element in the power set are included in the power set. For instance, the intersection of $\{Mary, Bill, John\}$ and $\{Mary, Bill\}$ is $\{Mary, Bill\}$, the intersection of $\{Mary\}$ and $\{Bill\}$ is the empty set, the complement of $\{Bill\}$ is $\{Mary, John\}$, the union of $\{John\}$ and $\{Bill\}$ is $\{John, Bill\}$. This is exactly what the domain of a power set boolean algebra is like.

A power set boolean algebra is a six-tuple $\langle B, 1, 0, \cap, \cup, ' \rangle$, where B is the domain of the algebra, 0 and 1 are elements of B , corresponding to the empty set and the unit set respectively, \cap and \cup are binary functions corresponding to intersection and union, and $'$ is a unary function corresponding to the complement, and B is

closed under the three functions. 1 and 0 are also called the top element and the bottom element, respectively. Thus, we can say that a *wh*-word, such as *who* and *what*, is a variable that ranges over the domain of context which is structured as in a power set boolean algebra. I illustrate the power set boolean algebra whose domain is the power set of {Mary, Bill, John} in Fig. 1.³

Further, I assume that a *yes–no* question includes a covert *wh*-word that has the semantics of *whether*. This assumption is motivated by the obligatory presence of *whether* in indirect *yes–no* questions. Moreover, in some languages such as Yiddish, the word corresponding to *whether*, which is overt in indirect questions, is optionally overt in direct *yes–no* questions.

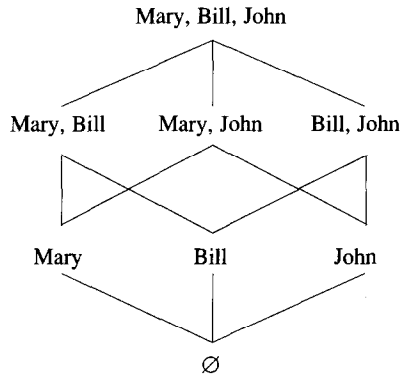


Fig. 1. Boolean algebraic structure.

- (37) a. John asked me whether Mary smokes.
b. * John asked me Mary smokes.

(38) Yiddish

- a. (Tsi) reykert Miryam?
whether smokes Miryam
'Does Miryam smoke?'
- b. Shmuel hot mikh gefregt, tsi Miryam reykert.
Shmuel has me asked whether Miryam smokes
'Shmuel asked me whether Miryam smokes.'

The semantics of *yes–no* questions in Groenendijk and Stokhof (1985) suggests that *whether* is a variable ranging over a domain with two elements: a positive polarity and a negative polarity. That is, the possible values for *whether* are either the positive or the negative polarity. If we think of the positive polarity as truth (1) and the negative polarity as falsity (0), then the set {0, 1} is closed under conjunction (\wedge),

³ See Keenan and Faltz (1985) for an application of boolean algebra to natural language semantics.

disjunction (\vee), and complement ($'$). This is exactly how the domain of a two algebra is like.

A two algebra is a six-tuple $\langle 2, 1, 0, \wedge, \vee, ' \rangle$, where 2 is $\{0, 1\}$, 1 (which is the top element) corresponds to truth, 0 (which is the bottom element) corresponds to falsity, \wedge and \vee are binary functions corresponding to conjunction and disjunction, respectively, and $'$ is a unary function that corresponds to complement. The domain of two algebra is closed under these functions, as shown in (39).

$$(39) \quad \begin{aligned} 1 \wedge 1 &= 1 \\ 1 \wedge 0 &= 0 \wedge 1 = 0 \wedge 0 = 0 \\ 1 \vee 1 &= 1 \vee 0 = 0 \vee 1 = 1 \\ 0 \vee 0 &= 0 \\ 1' &= 0 \\ 0' &= 1 \end{aligned}$$

Thus, we can say that *whether* is a variable that ranges over the domain that includes positive and negative polarity, which is structured as in a two algebra. I illustrate two algebra with Fig. 2.



Fig. 2. Two algebraic structure.

4.3. The source of negation in rhetorical questions

Given the semantics of *wh*-words in *wh*-questions assumed here, a *wh*-word is a variable that ranges over a domain of context which has the structure of a power set boolean algebra. Thus, the domain of a *wh*-word includes the empty set. Moreover, *whether* is a variable that ranges over a domain that includes a positive polarity and a negative polarity. The empty set (\emptyset in Fig. 1) and the negative polarity (0 in Fig. 2) contribute the model-theoretic equivalent of negation in the language. In particular, the empty set corresponds to negative quantifier and the negative polarity corresponds to sentential negation. More on this will be presented in §6.

5. An assertion of the opposite polarity

Recall that rhetorical questions are interpreted as assertions of the opposite polarity from what is apparently asked. I propose that the negation contributed by the semantics of *wh*-words is responsible for the polarity reversal in the interpretation of rhetorical questions. That is, the polarity reversal in the interpretation of rhetorical questions is the result of the principle in (40).

- (40) In rhetorical questions, *wh*-words denote the bottom element in their denotational domains.
- a. In rhetorical *yes–no* questions, *whether* denotes the negative polarity.
 - b. In rhetorical *wh*-questions, the *wh*-phrase denotes the empty set.

The question then is ‘Why?’ To put it differently, why shouldn’t the *wh*-phrase in rhetorical *wh*-questions always denote some non-empty set, and why shouldn’t *whether* in rhetorical *yes–no* questions always denote the positive polarity? In §5.1 and §5.2, I will argue that the pragmatic principle of informativeness forces *wh*-words in rhetorical questions to denote the bottom element of their denotational domains. In §6, I will then show how the interpretation of rhetorical questions can be derived compositionally by composing the denotation of the *wh*-word with the denotation of the rest of the question.

5.1. Yes–no questions

It turns out that ordinary questions also have polarity reversal effects in terms of the speaker’s expectations towards the answer. Ordinary negative *yes–no* questions implicate that the speaker expects a positive answer. For instance, (41a) is used when the speaker expects the hearer to agree that John finished the paper, or when the speaker believes that John finished the paper but the hearer does not seem to share this belief.

- (41) a. Didn’t John finish the paper?
 b. Speaker’s expectation: John finished the paper.

In general, a positive *yes–no* question has no implications as to the speaker’s expectations towards the answer. However, sometimes it implicates the speaker’s expectations towards the answer, in particular when the auxiliary verb is focused, and, when it does, it implicates that the speaker expects a negative answer.

- (42) a. DID John finish the paper?
 b. Speaker’s expectation: John didn’t finish the paper.

Assume that the speaker thought that John didn’t finish the paper. But he is not completely sure. In such a context, the speaker would utter (42a), rather than (41a).

If a positive proposition is followed by the conjunction *but* and a tag question, the tag question must be in the positive form, as in (43). If a negative proposition is followed by *but* and a tag question, the tag question must be in the negative form, as in (44). The conjunction *but* requires the second conjunct to contrast with the first conjunct. A positive tag question can be the second conjunct in (43a) because it expresses the speaker’s expectation towards the negative answer. A negative tag question can be the second conjunct in (44a) because it expresses the speaker’s expectation towards the positive answer. In both cases, the first conjunct contrasts with the second one.

- (43) a. John said that he finished the paper, but did he?
 b. # John said that he finished the paper, but didn't he?
- (44) a. John said that he didn't finish the paper, but didn't he?
 b. # John said that he didn't finish the paper, but did he?

A possible explanation for the polarity reversal effects as to the speaker's expectation towards the answer in *yes-no* questions may come from Gricean maxims (Grice, 1975). The speaker's expectation may be the result of an instantiation of the first part of the Gricean maxim of Quantity:

- (45) Make your contribution as informative as is required.

I take the notion of 'informativeness' to be relative to the individual's degree of belief in a certain proposition p in a given context c . The idea of assigning a degree of belief for p is adopted from various probabilistic ways of modeling epistemic states (e.g., Bayesian models for degrees of beliefs,⁴ see Gärdenfors, 1988: 36). Such models take into account individuals' beliefs that are partial in the sense that they are neither accepted nor rejected. If a speaker believes that it is very likely that p holds in c , the most informative proposition in c is $\neg p$. For instance, assume that you believe that it is very likely that it is raining and someone says to you *It is raining* (q). Then q is not adding much to what you already know. But if someone says to you *It is not raining* (q') and you believe him to be truthful, then you have to change your beliefs about the weather. The claim is that q' is more informative than q because you have to change your beliefs if you accept q' . I speculate that when a speaker is formulating a question to find out whether p or $\neg p$, s/he formulates the question in the form of the proposition that would be the most informative if it turned out to be true. This means that if a question has the form $\neg p?$, the speaker believes that $\neg p$ is the most informative proposition if it turned out to be true. This in turn means that in such a context, the speaker believes that it is likely that p holds. In other words, the likelihood that a speaker will use a negative question $\neg p?$ is equal to the speaker's assessment of the probability of p .

Before I go on to explain how the pragmatics of *yes-no* questions relate to the polarity reversal effects of rhetorical *yes-no* questions, let me point out that a rhetorical question has an intonational contour of an assertion. Unlike an ordinary question, which has a rising intonation, a rhetorical question has a falling intonation, just like a declarative sentence expressing an assertion. I claim that the intonational contour serves as a cue for the rhetorical question function. Using the intonation contour as a cue for a certain illocutionary force is not restricted to the domain of questions. For instance, a declarative sentence with a rising intonation expresses question force rather than assertive force. Thus, assuming that falling intonation contour in a question is an indication of assertive force seems reasonable.

⁴ Each proposition has associated with it a probabilistic belief function $b: P \rightarrow [0,1]$, where P is the set of propositions and $[0,1]$ is the real interval between 0 and 1.

I do not know why a question can be used to express an assertion. But let us take this fact as given, just as we take as given the fact that a declarative can be used to express a question.

The question then is how we compute that a rhetorical *yes-no* question expresses an assertion of the opposite polarity. My answer to this question depends on the semantics and pragmatics of *yes-no* questions. According to the semantics of *yes-no* questions, the denotation of a *yes-no* question $p?$ is a function which partitions the set of all possible worlds into two blocks, where one block represents the positive answer p and the other block represents the negative answer $\neg p$. Further, according to the pragmatics of *yes-no* questions, given a *yes-no* question $p?$, the speaker believes that the proposition of the opposite polarity $\neg p$ is likely to be true. The semantics of *yes-no* questions makes available either p or $\neg p$ as the assertion expressed by a rhetorical *yes-no* question $p?$. Among the two choices, the negative answer is the one that is consistent with the pragmatics of *yes-no* questions. Thus, the negative answer is selected as the assertion expressed by the rhetorical *yes-no* question. In effect, rhetorical *yes-no* questions implicate the speaker's expectation towards the answer in the strongest possible form. That is, given a rhetorical *yes-no* question $p?$, the speaker's assessment of the probability of $\neg p$ is 1, and so the speaker's expectation towards the negative answer is asserted as the speaker's belief. Crucially, the negative answer ($\neg p$) corresponds to the proposition in which *whether* denotes the negative polarity.⁵

5.2. Wh-questions

Ordinary *wh*-questions also have implications in terms of speaker's expectations towards the answer. Ordinary negative *wh*-questions implicate that the speaker expects that the set of individuals who satisfy the question is smaller than the set of individuals who do not satisfy the question.

- (46) a. Who didn't finish the paper?
 b. Speaker's expectation: Most people finished the paper.

⁵ There are some apparent rhetorical positive *yes-no* questions that do not express the negative assertion. The question in (ib) and the rhetorical *yes-no* question in (ic) can mean the same thing: namely, the Pope is indeed Catholic. However, the usage of these questions is different. As can be seen by the following discourse segments, the two questions cannot be used interchangeably. While (ib) can be an answer to the ordinary question in (ia), (ic) cannot. Moreover, while (iib) can be an appropriate reply to (iia), (iic) cannot.

- (i) a. A: Is Clinton a liberal?
 b. B: Is the Pope Catholic?
 c. # B: Isn't the Pope Catholic?
 (ii) a. A: The Pope has not been acting like himself lately.
 b. B: No matter what, isn't the Pope Catholic?
 c. # B: No matter what, is the Pope Catholic?

The question in (ib), although without negation, expresses a positive assertion. While the analysis given here predicts that such cases must have negation (as in (ic)), the above examples show that the positive assertion of (ib) is distinct from the one in (ic) and must be dealt with exceptionally.

In general, a positive *wh*-question has no implications as to the speaker's expectations with respect to the answer. However, sometimes, in particular when the main verb is focused, it has the implication that the speaker expects that the set of individuals who satisfy the question is smaller than the set of individuals who do not satisfy the question.

- (47) a. Who FINISHed the paper?
 b. Speaker's expectation: Most people did not finish the paper.

Assume that the speaker believes that most people didn't finish the paper, and wants to know who indeed finished the paper. In such a context, the speaker would utter (47a), rather than (46a).

A *wh*-question $Whx[Px]?$ contributes an open proposition Px . For instance, the *wh*-question in (46a) contributes the open proposition x *didn't finish the paper*. In a context where most people finished the paper, the probability of an arbitrary person in the domain of context to be included in the WITNESS SET of the open proposition is low. The witness set of an open proposition is the set of individuals that satisfies that proposition. If we assume that the probability of an arbitrary individual in the domain of context to be included in the witness set of the given open proposition to be inversely proportional to the informativeness of that proposition, then we can provide a similar explanation regarding the speaker's expectation in *wh*-questions in terms of informativeness as for *yes-no* questions. For instance, if the speaker believes that most people in the domain of context finished the paper, then the probability of an arbitrary person in the domain of context to be included in the witness set of the open proposition x *finished the paper* is high, and so the informativeness of the open proposition is low. However, given the same context, the probability of an arbitrary person in the domain of context to be included in the witness set of x *did not finish the paper* is low, and so the informativeness of this open proposition is high. The intuition behind this assumption is that in a situation where the speaker already believes that most people finished the paper, the information that some individual x did not finish the paper is more informative than the information that some individual x finished the paper. Thus, just as in *yes-no* questions, when a speaker is formulating a *wh*-question, s/he formulates the question with an open proposition that is most informative. This means that if a *wh*-question is in the form of $Whx[\neg Px]?$, then the speaker's assessment of the probability of an arbitrary individual being included in the witness set of $\neg Px$ is low. This in turn means that the speaker believes that most individuals in the domain of context satisfies Px . In other words, the likelihood that a speaker will use a negative *wh*-question $Whx[\neg Px]?$ is equal to the speaker's assessment of the probability of an arbitrary individual being included in the witness set of Px .

Returning to rhetorical *wh*-questions, assuming that the intonational contour serves as a cue that a *wh*-question is a rhetorical question that expresses an assertion, the question I ask is how we compute that a rhetorical *wh*-question expresses an assertion in which the value of the *wh*-phrase is the empty set and not some other set. In principle, the semantics of *wh*-questions makes available all the possible answers

as the assertion expressed by a rhetorical *wh*-question, where the possible answers differ with respect to the possible values for the *wh*-phrase. According to the pragmatics of *wh*-questions, given a *wh*-question $Whx[Px]?$, the speaker believes that the probability of an arbitrary individual being included in the witness set of Px is low. Among the choices of propositions presented by the semantics of *wh*-questions, the proposition that is consistent with the pragmatics of *wh*-questions will be selected as the one being asserted by the rhetorical *wh*-question. Thus, the proposition in which the value of the *wh*-phrase denotes the unit set will not be selected because it implies that there is the highest probability of an arbitrary individual in the domain of context to be included in the witness set, namely 1. On the other hand, propositions in which the *wh*-phrase denotes one of the smaller sets can be selected because these propositions are consistent with the pragmatics of *wh*-questions. Among these propositions, the proposition in which the value of the *wh*-phrase denotes the empty set, the bottom element of a boolean algebra, is selected because it corresponds to the lowest probability of an arbitrary individual being included in the witness set, namely zero.⁶

6. Deriving the denotation

Now that I have addressed the question why rhetorical questions are interpreted as assertions of the opposite polarity by motivating why *wh*-words in rhetorical questions denote the bottom element of their denotational domains, I propose a way of deriving their denotations compositionally.

6.1. Rhetorical *yes–no* questions

I have assumed that *yes–no* questions have a covert *wh*-word that corresponds to *whether* in [Spec, CP], just like ordinary *wh*-words in *wh*-questions. In ordinary *yes–no* questions, *whether* is a variable ranging over negative and positive polarity. These are structured as a two algebra as was illustrated in Fig. 2, where the top element corresponds to the positive polarity and the bottom element corresponds to the negative polarity. I propose that in rhetorical *yes–no* questions, the two algebra essentially collapses to the bottom element, and so *whether* effectively denotes the negative polarity. The reason why the two algebra structure collapses to the bottom element and not the top element is motivated by the pragmatic principle of informativeness

⁶ There are some rhetorical *wh*-questions whose *wh*-phrase does not denote an empty set.

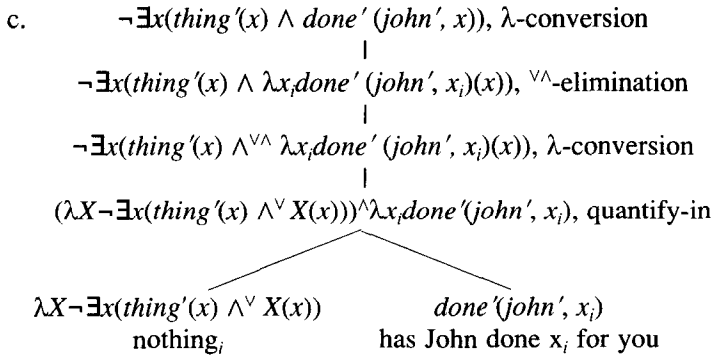
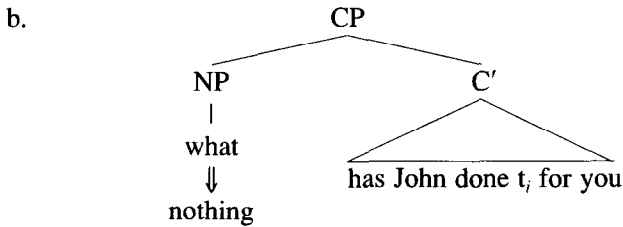
(i) Who fed you and gave you a proper education? (A mother to her son)

Under the rhetorical question reading, the *wh*-phrase in (i) denotes a singleton set, and the question denotes a specific answer: namely, *I fed you and gave you a proper education*. A possible explanation could come from the nature of the discourse context. That is, the discourse context in which such a type of rhetorical question can be used has an existential presupposition, e.g. *someone fed you and gave you a proper education*. Thus, the *wh*-phrase can no longer denote an empty set, and the smallest possible set it can denote is a singleton set. With this kind of extension in mind, I restrict the discussion to rhetorical *wh*-questions whose *wh*-phrase denotes an empty set.

1. I propose that in interpreting rhetorical *wh*-questions, the boolean algebra collapses to the bottom element, motivated by the pragmatic principle of informativeness as discussed in §5.2. The *wh*-phrase thus ends up denoting the bottom element, which is isomorphic to a negative quantifier. That is, the LF output of a rhetorical *wh*-question interacts with the pragmatics, and undergoes a post-LF derivation where the *wh*-phrase maps onto a negative quantifier, which takes scope over the entire sentence.

For instance, in (50a), the *wh*-phrase is mapped onto a negative quantifier as the result of a post-LF derivation, as illustrated in (50b). The output of this post-LF derivation maps onto semantic interpretation, as represented in (50c), by mapping *what* to the intensional logical translation of *nothing*, and quantifying this into the translation of *has John done x_i for you* (in the way that the quantifying-in function in Montague’s (1973) PTQ model works). This correctly derives the negative assertion interpretation for the question in (50a).

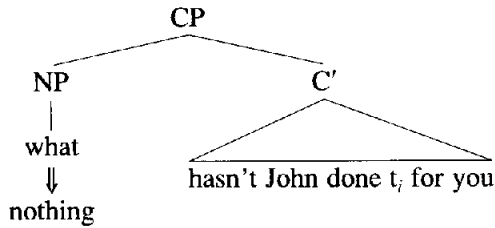
(50) a. What has John done for you?



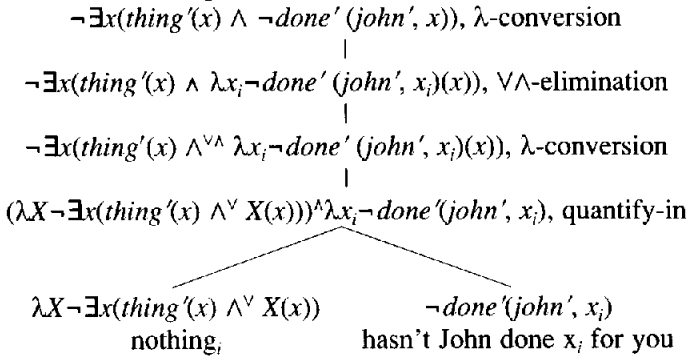
In (51a), the *wh*-phrase maps onto a negative quantifier, as the result of a post-LF derivation, as in (51b). The negative quantifier and the propositional content of the question each contribute a negation, as represented in (51c). The two negations cancel out each other, and the question is given the correct interpretation as a positive assertion, as represented in (51d).

(51) a. What hasn't John done for you?

b.



c.

d. $\forall x[\text{thing}'(x) \rightarrow \text{done}'(\text{john}', x)]$

6.3. Difference between rhetorical and ordinary questions

Under the proposed approach, the difference between ordinary questions and rhetorical questions boils down to the range of possible values for the *wh*-element. For ordinary *yes-no* questions, the possible values for *whether* range over the positive polarity and the negative polarity, and so the question returns a bipartition where one block represents the positive answer and the other block represents the negative answer, as discussed in §4.1. On the other hand, for rhetorical *yes-no* questions, there is only one possible value for *whether* to range over, namely the negative polarity. This in effect means that rhetorical *yes-no* questions return a partition with a single block representing the negative answer, hence resulting in the same denotation as the corresponding negative assertion.

Similarly, for ordinary *wh*-questions, the possible values for the *wh*-phrase range over a powerset of a set of individuals structured as a boolean algebra. The question thus returns a partition where each block represents a possible answer, which corresponds to an element in the powerset. However, for rhetorical *wh*-questions, the *wh*-phrase ranges over only one possible value, namely the bottom element, which corresponds to the negative quantifier. And so the question returns a partition with a single block, the denotation of which is equivalent to an assertion.

7. Accounting for the formal properties of rhetorical questions

I can account for the properties of rhetorical questions discussed in §2 if the well-formedness conditions apply at a level where *wh*-words have been mapped onto negation for *yes–no* questions and negative quantifiers for *wh*-questions. The representation at this level is not LF, which is the output of syntax, but more abstract than that. It is the output of further post-LF derivation via interaction with at least a sub part of the interpretational component, namely pragmatics. An analysis in a similar vein is found in Linebarger (1980, 1987) in the domain of NPI licensing in general. Bhatt (1998) also reaches a similar conclusion in the domain of rhetorical adjunct *wh*-questions. Heycock and Kroch (1999) argue that the connectedness effects of specificational pseudoclefts can be explained if well-formedness conditions such as binding and NPI licensing are stated over a partially interpreted post-LF representation. They argue that this representation is derived via an operation which is a part of information packaging instructions to a hearer on how to store the propositional content of the pseudocleft sentence in the discourse model (see Prince (1981) and Vallduví (1990) on information packaging in discourse).

7.1. Rhetorical questions as assertions

The proposed analysis explains why rhetorical questions have the formal properties of assertions. At the level in which the well-formedness conditions apply, the value of *whether* for rhetorical *yes–no* questions and the value of the *wh*-phrase for rhetorical *wh*-questions are determined. At this level, rhetorical questions are not questions anymore. Rather, they are assertions.

7.2. NPI licensing

Under the proposed analysis, NPI licensing in rhetorical questions can be accounted for. NPI licensing applies to the representation in which the *wh*-phrase is mapped onto negation. Thus, NPIs are licensed only if this representation contains a licensing negation. In other words, NPIs are licensed if rhetorical questions are interpreted as a negative assertion, but not if they are interpreted as a positive assertion.

7.2.1. Rhetorical *yes–no* questions

Both strong and weak NPIs are licensed in rhetorical positive *yes–no* questions. Under the rhetorical question reading, both (52a) and (53a) are interpreted as negative assertions.

- (52) a. Did John visit anyone?
- b. ¬[John visited anyone]
- (53) a. Did John lift a finger to help you?
- b. ¬[John lifted a finger to help you]

The interpretation of (52a) and (53a) can be represented as in (52b) and (53b), respectively. The weak NPI *anyone* in (52a) and the strong NPI *lift a finger* in (53a) are licensed because they both end up in the scope of negation in the derived representations for the rhetorical questions.

NPIs are not licensed in rhetorical negative *yes–no* questions (the asterisk on (54a) applies only to the rhetorical question reading).

- (54) a. * Didn't John visit anyone?
 b. $\neg[\neg(\text{John visited anyone})]$
 c. * John visited anyone

Under the rhetorical question reading, (54a) is interpreted as a positive assertion because the two negations contributed by *whether* and the propositional content of the question cancel out each other. The interpretation of (54a) can be represented as in (54c). But this representation is not well-formed because the NPI *anyone* is not licensed.

7.2.2. Rhetorical *wh*-questions

Just like rhetorical positive *yes–no* questions, rhetorical positive *wh*-questions license both weak and strong NPIs. Under the rhetorical question reading, both (55a) and (56a) are interpreted as negative assertions.

- (55) a. What has Sam ever contributed to the project?
 b. $\neg\exists x[\text{Sam has ever contributed } x \text{ to the project}]$
 (56) a. Who lifted a finger to help Mary?
 b. $\neg\exists x[x \text{ lifted a finger to help Mary}]$

The interpretation of these questions can be represented as in (55b) and (56b). The NPIs *ever* and *lift a finger* are licensed because they end up in the scope of negation in the derived representations for the rhetorical questions.

Moreover, just like rhetorical negative *yes–no* questions, rhetorical negative *wh*-questions do not license NPIs, (again, the asterisk on (57a) applies to the rhetorical question reading).

- (57) a. * Who didn't say anything interesting at the seminar?
 b. $\neg\exists x[\neg(x \text{ said anything interesting at the seminar})]$
 c. * $\forall x(x \text{ said anything interesting at the seminar})$

Under the rhetorical question reading, (57a) is interpreted as a positive assertion because the two negations contributed by the *wh*-phrase (which is equivalent to a negative QP) and the propositional content of the question cancel out each other. The interpretation of (57a) can be represented as in (57c). But this representation is not well-formed because the NPI *anything* is not licensed.

7.3 Rhetorical questions with a deontic modal

Further evidence for the proposal comes from rhetorical questions with deontic modals. In a sentence where a deontic modal c-commands negation *not* or a negative QP, the deontic modal unambiguously takes scope over the negation or the negative QP. For instance, in (58), the deontic modal *must* or *should* c-commands *not*. In (59), the deontic modal c-commands *nothing*.

- (58) a. John must not eat the cake.
 ≈ It is obligatory for John to not eat the cake.
 b. John should not leave.
 ≈ It is obligatory for John to not leave.
- (59) a. John must say nothing.
 ≈ It is obligatory for John to say nothing.
 b. John should eat nothing.
 ≈ It is obligatory for John to eat nothing.

In these examples, the deontic modal unambiguously takes scope over the negation, as can be seen by the paraphrases given for each sentence.

Interestingly, rhetorical questions with a deontic modal unambiguously have the interpretation in which the deontic modal has narrow scope with respect to a negation or a negative QP, although there is no negation or a negative QP in the surface syntax. This is illustrated in (60) and (61).

- (60) a. Must John say anything?
 ≈ It is not obligatory for John to say anything.
 b. Should John do the homework?
 ≈ It is not obligatory for John to do the homework.
- (61) a. What must John say?
 ≈ There is nothing such that it is obligatory for John to say it.
 b. What should John do?
 ≈ There is nothing such that it is obligatory for John to do it.

Under the proposal given here, in rhetorical *yes-no* questions, the covert *wh*-phrase *whether* which has the negative value is located in [Spec, CP], c-commanding the deontic modal. Hence, it is not surprising that rhetorical *yes-no* questions with a deontic modal have an interpretation in which the negation takes scope over the deontic modal. The interpretation of the rhetorical *yes-no* questions in (60) can be represented as in (62).

- (62) a. ¬[John must say anything]
 b. ¬[John should do the homework]

Similarly, under the proposal given here, in rhetorical *wh*-questions, the *wh*-phrase, which is equivalent to a negative QP, is in [Spec, CP], c-commanding the

deontic modal. Hence, it follows that rhetorical *wh*-questions with a deontic modal have an interpretation in which the negation takes scope over the deontic modal. The interpretation of the rhetorical *wh*-questions in (61) can be represented as in (63).

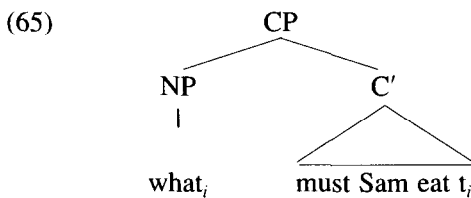
- (63) a. $\neg\exists x[\text{John must say } x]$
 b. $\neg\exists x[\text{John should do } x]$

Although there is no negation in the surface syntax, the questions in (60) and (61) can have a rhetorical question reading in which the negation takes scope over the deontic modal. This is because the covert *whether* in *yes–no* questions and the *wh*-phrase in *wh*-questions contribute wide scope negation under the proposed analysis.

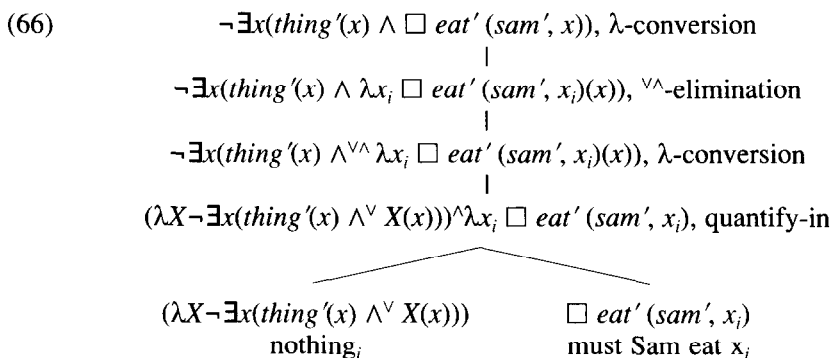
An example of a compositional derivation of the interpretation of a rhetorical *wh*-question with a deontic modal is illustrated in (64).

- (64) What_{*i*} must Sam eat t_{*i*}?

At LF, the rhetorical question in (64) has the structure in (65).



This LF structure undergoes a post-LF derivation where *what* maps onto a negative QP that corresponds to *nothing*. The output of this post-LF derivation directly maps onto semantic interpretation. The derived logical form represents the correct scope between the negation and the deontic modal, as shown in (66).



7.4. Evidence from a negative concord language: Italian

We have seen that *wh*-words in rhetorical *wh*-questions behave like negative quantifiers. Here, I present some facts from the behavior of negative constituents in

wh-questions in Italian that support my analysis in general and the link between *wh*-words and negative QPs in particular.

In Italian, pure sentential negation is expressed by the negative marker *non*.

(67) Italian

Gianni non telefona a sua madre.
Gianni Neg telephones to his mother
'Gianni does not call his mother.'

Sentential negation can also be expressed by one or more negative constituents. In Italian, postverbal negative constituents behave differently from preverbal negative constituents. Postverbal negative constituents are similar to English NPIs in that they have to be licensed by *non* or a preverbal negative constituent (Zanuttini, 1991; Haegeman, 1995). Both (68a) and (68b) are well-formed because *nessuno* is licensed by *non* in (68a), and *niente* is licensed by *nessuno* in (68b). But (68c) is not well-formed because there is no licenser for *nessuno*.

(68) Italian

- a. Gianni non telefona a nessuno.
Gianni Neg telephones to nobody
'Gianni does not call anyone.'
- b. Nessuno ha detto niente.
nobody has said nothing
'Nobody said anything.'
- c. * Gianni telefona a nessuno.
Gianni telephones to nobody

On the other hand, a preverbal negative constituent, like *nessuno* in (69), is a full-fledged negative QP, requiring no licensing negative element.

(69) Italian

Nessuno ha visto Maria.
nobody has seen Maria
'Nobody has seen Maria.'

In ordinary information-seeking *wh*-questions with a postverbal negative constituent, the negative marker *non* must be present in order to license the postverbal negative constituent.

(70) Italian

- a. Chi non ha baciato nessuno?
who Neg has kissed nobody
'Who has not kissed anybody?'
- b. * Chi ha baciato nessuno?
who has kissed nobody

However, a rhetorical positive question with a postverbal negative constituent does not require *non*. Assume that speaker A has accused speaker B of kissing Mary, and that B denies this accusation by uttering the rhetorical question in (71b).

(71) Italian

- a. A: Hai baciato Maria!
 have-2sg kissed Maria
 ‘You have kissed Mary!’
- b. B: Ma chi ha baciato nessuno?
 but who has kissed nobody
 ‘But who has kissed anyone?’

Under the proposed analysis, the *wh*-word *chi* is equivalent to a negative QP. It licenses *nessuno*.

Moreover, a rhetorical negative question that has *non* is interpreted as a positive assertion.

(72) Italian

- Chi non sposerebbe Maria?
 who non marry Maria
 ‘Who would not marry Mary?’

Under the proposed analysis, *chi* is equivalent to a negative QP. It has true negative force. *Chi* and *non* cancel out each other, and the question is interpreted as a positive assertion.

In summary, since the *wh*-phrase in a rhetorical question denotes an empty set and is equivalent to a negative QP, it can license postverbal negative constituents.

8. Conclusion

I have shown that rhetorical questions and ordinary questions do not pattern alike with respect to various well-formedness conditions. I have proposed a way of deriving the interpretation of rhetorical questions and addressed the question of why rhetorical questions are interpreted as an assertion of the opposite polarity. According to my analysis, the polarity reversal effects in the interpretation of rhetorical questions fall out from the semantics of questions and the general pragmatic principle of informativeness. Moreover, I demonstrated that to account for the formal properties of rhetorical questions, in particular NPI licensing, the level of representation over which various well-formedness conditions are stated must be quite distant from surface syntax. My proposal is that this abstract representation is the result of a post-LF derivation driven via interaction with a sub-part of the interpretational component, i.e., pragmatics. This post-LF derivation maps *wh*-elements in rhetorical questions to the bottom element in their denotational domains. We have also seen that a compositional semantics for rhetorical questions is possible by

directly mapping this post-LF representation onto the semantic interpretation. The approach pursued here has implications for the architecture of the grammar in general, and in particular for the nature of the interface between the computational system of syntax and the conceptual/intentional system of mental representation.

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