Quasi-subordinate questions*

Donka Farkas
University of California Santa Cruz

Floris Roelofsen
University of Amsterdam

May 20, 2024

Abstract

Building on previous work, especially on Woods (2016), McCloskey (2006), and Dayal (2023), this paper re-examines the phenomenon of quasi-subordinate questions, i.e., embedded interrogative clauses that nevertheless involve matrix interrogative syntax. Our main empirical contributions are to separate such constructions from what we call *commented root clauses*, and to examine in more detail the conditions that license quasi-subordinate questions. On the analytical side we propose a novel compositional account which captures the fact that quasi-subordinate clauses have a dual role: (i) just like ordinary subordinate clauses, they are interpreted as the semantic argument of the matrix predicate; (ii) just like matrix clauses, they update a context by raising an issue in it. The main difference between this account and that of Woods (2016) and Dayal (2023) is that the burden of the work is borne not by the syntactic but rather, by the semantic component.

1 Introduction

In English, questions can occur either in a standalone form, which triggers subject-auxiliary inversion, or subordinated, in which case they typically don't involve inversion:

(1) **Standalone**

a.	Should Bill leave?	polar question
b.	Should Bill leave or should he stay?	alternative question
c.	Where should Bill go?	wh-question

(2) **Embedded**

a.	Bill will soon be told whether he should leave.	polar question
b.	Bill will soon be told whether he should leave or stay.	alternative question
c.	Bill will soon be told where he should go.	wh-question

It is well-known, at least since Emonds (1976) and Hooper and Thompson (1973), that the standalone form (also called the root form) may occur subordinated, as illustrated in (3):

(3)
a. Bill wondered should he leave.
b. Bill wondered should he leave or stay.
c. Bill wondered where should he go.

*We are very grateful to Kajsa Djärv and Ciyang Qing for feedback on previous drafts and discussions which resulted in substantial improvements. We also gratefully acknowledge financial support from the Netherlands Organisation for Scientific Research (NWO).

(4) a. Bill asked should he leave.
b. Bill asked should he leave or stay.
c. Bill asked where should he go.

We will use the term *quasi-subordinate* questions for such embedded questions which nonetheless exhibit root question syntax. For earlier discussion of this phenomenon, see McCloskey (2006), Woods (2016), and, most recently, Dayal (2023).

Woods (2016) points out that this construction is common in Irish English, and it is judged as grammatical by its speakers. She notes tht it exists in British English as well as in American English, though speakers of these latter two dialects are more prone to label it as degraded. We will ignore here such differences and assume that they are a matter of 'linguistic habit' rather than due to a deeper divergence.

Previous literature has noted that the distribution of quasi-subordinate questions is restricted, i.e., they are subject to licensing conditions. These conditions fall into two categories, *local*, which pertain to the matrix verb, and *non-local*, which go beyond the verb-complement relation. The unacceptability of the example in (5) is due to a local restriction prohibiting interrogative complements from serving as the internal argument of *believe*.

(5) *I believe where did Stephanie go.

The effect of non-local restrictions is illustrated by the contrasts below:

(6) a. I forget where did he go.
b. *I didn't forget where did he go.

(7) a. I don't remember where did he go.
b. *I remember where did he go.

(8) a. *I know where did he go.
b. Do you know where did he go?

It has also been noted that not all question forms may occur in such constructions, as illustrated in (9):

(9) a. Bill asked should he leave.
b. *Bill asked he should leave, shouldn't he.

The above discussion gives rise to the following two empirical questions:

1. Under which conditions are quasi-subordinate questions licensed?
2. What types of questions may occur quasi-subordinated?

A final empirical issue that arises, which has received much less attention in the literature, is:

3. What, if anything, is the interpretive effect of quasi-subordination?

For instance, what, if any, is the difference in interpretation between (10a) and (10b):

(10) a. Bill wondered whether he should leave.
b. Bill wondered should he leave.

Below, we address the empirical properties of quasi-subordinate questions by first distinguishing them from closely related constructions in Section 2, and then by addressing the three questions

just mentioned, in Section 3. The main contribution of Section 2 is to distinguish quasi-subordinate questions from what we call *commented root questions*, exemplified in (11), a distinction which, to our knowledge, have not been explicitly made before:

(11) I am really curious to know, what did she say about me?

There are two main contributions in Section 3. First, the licensing conditions on quasi-subordination are discussed in more detail than in previous literature. Second, the interpretive contrast between ordinary subordination and quasi-subordination is given more attention than it has received so far. On the analytical side, we follow Woods (2016) and Dayal (2023) in assuming that quasi-subordination differs from regular subordination in that it involves an extra syntactic layer, namely an FP. We depart from both Woods and Dayal in not assuming any further syntactic structure. The central idea of our account is that quasi-subordinate clauses combine semantically with the matrix predicate, a property they share with regular subordinate clauses. In this respect, our account differs from Woods (2016), for whom the semantic argument of the matrix predicate is an empty nominal referring to a speech act, whose content is specified by the appositive quasi-subordinate clause.

In our account, on the interpretive side, quasi-subordinate clauses are like matrix clauses, and unlike ordinary subordinate clauses, in that they update a context. This context may be either the current or a subordinate context. This aspect of the account, as well as the details of the semantic composition involved are novel. Going back to the licensing conditions on quasi-subordination, we claim that they are the result of the content of the matrix clause having to support the contextual update performed by the quasi-subordinate clause.

2 What are quasi-subordinate questions?

This section is devoted to distinguishing quasi-subordinate questions from close relatives, namely quotations, free indirect speech and a novel category we call *commented root questions*.

Quasi-subordinate questions vs. quotations Quotations, exemplified in (12), involve matrix sentences which report a speech or thought act. The complement, flanked by quotation marks in writing, reproduces the reported speaker's words *verbatim*.[1]

(12) Sam: Joan asked Sylvia: 'Am I annoying you?'

Here, the current speech act is an assertion whose speaker is Sam. The verb *ask* refers to a reported speech act whose speaker was Joan and whose addressee was Sylvia. The reported speech act consisted in Joan uttering the interrogative sentence in quotation marks. When reporting a speech act via quotation, there is no 'perspectival shift' affecting the interpretation of the pronouns or verbal tense: *you* in (12) refers to Sylvia, and *I* to Joan, and the present tense refers to the time of the reported speech act. Thus, the perspective of the direct quotation is the same as that of the reported speech act.

One way in which quasi-subordination is different from direct quotation, known at least since McCloskey (2006) and discussed in insightful detail in Woods (2016), is that the perspective in the quasi-subordinate clause shifts to that of the current speech act, as illustrated in (13):

(13) Sam: Paul$_i$ asked/wondered where had he$_i$ left his wallet.

[1] In case the language used in the reported speech act is different from the language used in the report, the translation is supposed to be as close to the original as possible.

Here the perspective of the embedded clause is the same as that of the matrix clause: the speaker of the reported speech/thought act, Paul, is referred to by a third person pronoun because he is not a participant in the current speech act. The perspective shift is also seen in the verb tense.[2]

A second way in which quasi-subordination differs from direct quotation concerns the fact that quasi-subordination does not necessarily involve a reported speech act.[3] There are cases, such as those in (14), where the quasi-subordinate clause involves a speech act authored by the matrix speaker, and anchored to the matrix context:

(14) a. The question is are we doing the right thing.
b. I don't remember am I supposed to bring dessert?

Finally, quasi-subordination is different from quotation in that the quasi-subordinated clause is prosodically integrated into the matrix, while the quotation is not.

Quasi-subordinate questions vs. free indirect speech A construction closely related to, yet different from, quasi-subordination is that of *free indirect discourse* (Banfield, 1973; Schlenker, 2004; Sharvit, 2008; Maier, 2015, among others), illustrated in (15):[4]

(15) Paul was putting on his coat to leave the house
but then he wondered, was he doing the right thing?

Free indirect discourse is similar to quasi-subordination in that it involves perspective shift with respect to deictic pronouns and tense. In other respects, however, it is similar to direct quotation and different from quasi-subordination. Just like quotation, free indirect discourse necessarily involves a reported speech/thought act, the form of the complement must be faithful to that used in the reported act modulo pronouns and tense, and the clause is not prosodically integrated into the matrix.

Quasi-subordinate questions vs. commented root questions So far, this section built on the insightful and detailed discussion in Woods (2016). We now go beyond it and distinguish quasi-subordinate questions from what we suggest is a construction not previously discussed in the literature, and which we dub *commented root questions*, exemplified in (16):

(16) a. You've told me already but I forgot, when do you plan to leave?
b. I don't remember anymore, you got the job in the end?
c. I am asking just to make sure, you are on the list, aren't you?
d. The question now is: What did he do with the money?
e. I seem to have forgotten, isn't Tom the president of the company?

[2] As Woods (2016) notes, however, the current speaker's choice of words, when reporting a speech act using quasi-subordination, is not quite as free as it is when using ordinary subordination, which is why she calls such constructions 'quasi-quotational'. We will not discuss this issue in detail here but note that, in our account, the effect of quasi-subordination is to re-enact the reported speech act. This, we claim, is responsible for the fact that the current speaker is understood as having witnessed the reported speech act, and therefore, is assumed to stay as faithful to it as possible.

[3] This aspect of quasi-subordination is neglected in Woods (2016).

[4] Note that, strictly speaking, this instance of free indirect discourse is not really 'free', because of the presence of the matrix verb and its subject. Still, such cases are usually considered to fall under the header of free indirect discourse—see, e.g., Section 1.2 of Maier (2015) for discussion. Truly free instances of free indirect discourse are not relevant here because they do not resemble quasi-subordination constructions at all.

A commented root question is similar to a quasi-subordinate question in that the question is interpreted as the semantic argument of the matrix predicate and yet, its form is that of a matrix question.

As our term for them suggests, we view commented root questions as root questions preceded by a meta comment on the speech act performed in uttering the question. As such, they can only update the current context, and the comment cannot introduce a reported speech act. The comment that precedes them serves to motivate the act of raising the question or simply introducing it, as in (16d).

Formally, commented root questions differ from their quasi-subordinate sisters in two respects. First, they are not prosodically integrated into the matrix, a fact we signal in writing by a comma or a colon in (16). Second, their syntactic form and intonation are indistinguishable from root questions. As exemplified above, commented root questions may involve not only 'regular' question forms but also rising declaratives, tag interrogatives, and high negation polar questions. We will see below that the form of quasi-subordinate questions is more restricted.

A further reason for distinguishing commented root questions from quasi-subordination is that they resist further embedding:[5]

(17) a. *Jon is aware that I don't remember, what did she say exactly?
b. *Everybody found out that I forgot, were we supposed to bring dessert?

By contrast, a clause containing a quasi-subordinate question that does not raise an issue in the current context, *may* function as a subordinate clause in a larger structure, as illustrated in (18).

(18) a. Bill and Mary agreed that the main question was when should they sell the house.
b. Xiaoli vividly remembers that when she first encountered Professor Daniels, she wondered what would a guy like that, every inch an Englishman, be able to teach her about Chinese culture and history.

Along with our earlier observations on prosodic integration, this contrast supports our view that commented root questions are a special kind of root questions, while quasi-subordinate questions are closer to true subordinate questions.

Establishing that commented root questions are indeed a separate category would require careful empirical work controlling for prosody. Here we will assume that our examples are quasi-subordinate, i.e., involve prosodically integrated clauses, and leave an in depth comparison of commented root questions and quasi-subordinate questions for the future.

3 Empirical properties of quasi-subordinate questions

In this section we discuss the empirical properties of quasi-subordinate questions by considering the issue of which types of questions allow quasi-subordination (Subsection 3.1), what matrix clause conditions allow quasi-subordinate questions (Subsection 3.2), and the interpretive effect of quasi-subordination (Subsection 3.3).

[5]Commented root questions may be preceded by multiple comments, as shown in (i), without, however, resulting in a nested structure.

(i) a. I'm curious, have you heard already, did John get the job?
b. I'm asking for the third time now, can you please tell me, when will the package be delivered?

Such cases, however, do not involve successive embedding.

3.1 What questions can be quasi-subordinated

Following Farkas and Roelofsen (2017) and Farkas (2022), we assume that there are two distinct though related dimension along which questions should be classified, a semantico-pragmatic and a formal dimension. Formally, sentences used to ask questions can be **marked** or **unmarked**. Unmarked interrogative forms are the simplest forms with widest distribution. For English, they are exemplified by the polar and constituent questions in (19):

(19) a. Is Amy coming with us?
b. Who is coming with us?

Formally marked question forms have a special morphological, syntactic, or prosodic form. To exemplify, English tag interrogatives, and rising declaratives (RDs) used as questions are examples of marked question forms.

(20) a. Amy is coming with us, isn't she?
b. Amy is coming with us?

Tag interrogatives involve a falling declarative followed by a tag whose intonation and polarity vary. Such forms are obviously marked relative to non-tagged polar interrogatives. RDs are marked question forms in that their syntax is that of declaratives but their intonational contour is that of polar questions, a situation that is special in English, where regular polar questions have a specific syntax.

On the semantico-pragmatic side, questions fall into two categories, **canonical** and **non-canonical**. To characterize this distinction, one has to first clarify one's assumptions about the semantics of questions. We assume here that a question (i.e., an interrogative sentence) denotes an *issue* I, a non-singleton set of propositions that partition the logical space.[6] The propositions in the issue denoted by a question are its semantic answers. Given what was said so far, for any issue I that is the denotation of a question, there is a proposition p in I such that the actual world w_a is in p. This proposition p is the true answer to I.

The core assumptions characterizing canonical questions are given in (21).

(21) a. *Speaker ignorance* The speaker does not know the true answer to the question, i.e., she does not know which $p \in I$ is such that $w_a \in p$.
b. *Addressee competence* The speaker assumes that another conversational participant, who by default is the addressee, knows the true answer to the question.
c. *Addressee compliance* The speaker assumes that the participant who knows the true answer (by default the addressee) will provide the answer in the immediate future of the conversation.

Thus, canonical questions are speech acts whereby a speaker raises an issue whose true answer she doesn't know, assuming that her addressee knows the answer and will provide it. The main goal the speaker is assumed to pursue in raising the issue is to have it resolved.[7]

Non-canonical questions are questions that depart from canonical ones with respect to at least one standard assumption. We exemplify two of the many ways in which a question can be non-canonical. First, so called quiz questions, exemplified in (22),

(22) *Teacher to student:*

[6] We abstract away here from details that distinguish Hamblin semantics from Inquistive Semantics.
[7] For further details, see Farkas (2022).

What was the main cause of the Civil War?

are asked by a speaker who already knows the true answer in order to check the addressee's knowledge.

Second, biased questions are non-canonical in that they register an epistemic (or deontic) bias on the part of the speaker for one of the answers in the denotation of the question. In Sudo's (2013) terms, the grounds that lead to bias can be *epistemic*, in which case bias is rooted in the speaker's beliefs, or *contextual*, in which case bias is rooted in information publicly available to the discourse participants. It is possible for bias to be both epistemic and contextual, in which case the two parameters point in contradictory directions.

In English, formally marked questions are used to perform non-canonical questions. The two parameters need to be distinguished, however, even if we restrict our attention to English because quiz questions show us that unmarked forms may be used to ask non-canonical questions.

Returning now to quasi-subordination, the issue is whether such constructions are sensitive to these two parameters of classifying questions. To test whether quasi-subordination is sensitive to the canonical/non-canonical distinction we consider instances of unmarked non-canonical questions. In (23) we see an example of a quasi-subordinated quiz-question:

(23) *Teacher to student:*
The question is what was the main cause of the Civil War.

In (24), we have an example of a quasi-subordinated unmarked biased question:

(24) I suspect the answer is 'no' but I still wonder can we persuade you to join us for dinner.

We conclude therefore that quasi-subordination is not sensitive to the canonical/non-canonical distinction.

The issue of whether marked question forms can occur as quasi-subordinate questions is harder to settle. First, recall that marked question forms occur freely as commented root questions, and therefore keeping track of the prosody in examples that probe this issue is crucial.

Based on the unacceptability of (25), Dayal (2023) claims that tag questions, questions involving addressee oriented adverbs, as well as 'remind me' questions and RDs resist quasi-subordination:[8]

(25) a. *Paul wonders he should leave, shouldn't he?
b. *Susan wondered quickly what's his name?
c. *Paul wondered what was her name again?
d. *Amy wondered she was supposed to bring dessert?

Such data support the empirical generalization in (26):

(26) *Ban on marked quasi-subordinate questions*
Marked question forms cannot function as quasi-subordinate questions.

An immediate question that arises is whether this generalization holds cross-linguistically as well, an issue that we leave open here. Furthermore, (26) appears to be too stringent even for English. As noted in Hooper and Thompson (1973), tag interrogatives may occur embedded in some constructions, as exemplified in (27a), and Djärv (2022) notes that the same is true for rising declaratives, as illustrated in (27b):

[8] 'Remind me' questions are discussed in Sauerland and Yatsushiro (2017).

(27) a. I think Mrs. Turner said five o'clock, didn't she?
b. I've heard one isn't supposed to move a child back and forth?

As Djärv (2022) observes, however, the embedded clauses in (27) have a declarative interpretation *qua* argument of the embedding predicates. In (27a) the speaker states that she thinks that Mrs. Turner said five o'clock (not that she is thinking *whether* Mrs. Turner said five o'clock), and in (27b) the speaker reports having heard that one is not supposed to move a child back and forth (not *whether* one is not supposed to move a child back and forth). These clauses, therefore, are not, strictly speaking, quasi-subordinate questions. These examples thus contrast with those in (25), where the predicate is rogative, forcing an interrogative interpretation of the complement.[9]

Note next that (27a) and (27b) are interpreted as raising an issue in the matrix context. In both cases the speaker raises an issue and conveys a bias, in a way that is parallel to uttering (28a) and (28b), respectively:

(28) a. Mrs. Turner said five o'clock, didn't she?
b. One isn't supposed to move a child back and forth?

The generalization in (26) predicts that even if rising declaratives can be used in this way under predicates like *hear*, *think* and *suspect*, which take declarative complements, they cannot be used under predicates like *wonder*. While not strictly speaking examples of quasi-subordinate questions, the examples in (27) are interesting in their own right. We will briefly sketch an account of these constructions in Section 4.3, though we leave a full-blown analysis of their distribution and interpretation for future work.

Finally, Woods (2016, Chapter 3) notes that some discourse markers, such as *please*, may occur in quasi-subordinate questions, while others, such as tag questions or *huh* interpreted as requesting immediate addressee reaction, may not. She suggests that the crucial factor is whether the marker involves a direct call on the addressee to respond, in which case it is not allowed, or whether it does not, in which case it is allowed. More work is needed to establish whether this is indeed a relevant parameter, and, if so, whether it is the only relevant one. For the time being, we conclude that quasi-subordination is indeed sensitive to the marked/unmarked distinction.

3.2 What licenses quasi-subordination?

Much of the discussion in the literature on the issue of quasi-subordination licensing revolves around the issue of which matrix predicates allow it and which do not. We will start with this issue below. We will then widen the inquiry to involve matters that go beyond the local predicate/argument relation between the matrix predicate and the quasi-subordinate question.

Which predicates allow quasi-subordination? Most examples of quasi-subordinate questions in the literature involve the verbs *wonder* and *ask* (McCloskey, 2006), and the specificational construction *the question is* (Dayal, 2023). Based on these cases, a natural hypothesis that suggests itself is that a predicate can take a quasi-subordinate question as its complement if and only if it is *rogative*. A predicate is rogative if and only if it can take interrogative but not declarative complements.[10]

[9] A predicate is rogative if and only if it can take interrogative but not declarative complements.

[10] The term 'rogative predicates' is from Lahiri (2002). McCloskey (2006) uses the term 'question predicates' from Ginzburg and Sag (2000). He defines such predicates as ones that "embed complements whose semantic type is the same as that of a root question" (p.29). We opt to formulate the hypothesis in (29) in terms of rogative predicates rather than in terms of question predicates, because the former but not the latter are characterized in

(29) *Rogative Connection Hypothesis*
A predicate can take a quasi-subordinate question as its complement if and only if it is rogative.

This hypothesis connects the occurrence of quasi-subordinate questions to a particular lexical property of the governing predicate. Besides *ask* and *wonder*, other commonly discussed rogative predicates such as *investigate* and *be curious*, allow quasi-subordination as well:[11]

(30) *Context: Mrs. Jones was found dead in her car, with a suitcase containing two million euros. A detective is interrogating her husband.*
Mr. Jones, we are investigating where did your wife get all that money from. Do you have any idea?

(31) The defeated headmaster started to investigate when did the young teacher really arrive.[12]

A potential counterexample to the Rogative Connection Hypothesis is the verb *depend*. While this verb is rogative, McCloskey (2006), for instance, reports that it does *not* license quasi-subordination:

(32) *How many people should you invite depends on how big is your place.(McCloskey's (3c))

We observe, however, that there are circumstances in which *depend* may take a quasi-subordinate question as its complement, as illustrated in (33) and (34), and therefore it is not a *bona fide* counterexample to the Rogative Connection Hypothesis:

(33) A: Does Mr. Willis want to buy the car?
B: That depends on how much discount are you willing to give him.

(34) Q: I have some savings. Should I invest it in the stock market?
A: There is no simple answer to that question. Many factors need to be considered [...] It also depends on when would you need the money back and how big a loss can you take on the money.[13]

As seen in (35), commented root questions are also fine with *depend*:

(35) A: Are you interested in buying this house?
B: It depends, how much does it cost?

terms of directly observable empirical properties. That is, it is straightforward to determine whether a certain predicate is compatible with ordinary interrogative and/or declarative complements. On the other hand, whether a predicate embeds complements whose semantic type is the same as that of a root question, is not something that can be determined purely by looking at the predicate's empirical behaviour—it depends on one's theoretical assumptions about the semantic type of root questions, and about the empirical manifestations of this in clause-embedding constructions. For instance, it is not clear whether the predicate *depend* is a 'question predicate' or not for McCloskey. On the other hand, it is clear that it is a rogative predicate.

[11]Note that predicates that allow quasi-subordinate questions also allow commented root questions, as long as the issue raised by the question can be interpreted as relevant to the current context. We illustrate with *investigate* in (i).

(i) Mr. Jones, my team and I are investigating, who was your wife going to meet on the night of the murder?

[12]http://allfilm.ee/work/the-fencer/

[13]https://www.moneycontrol.com/news/business/markets/classroom-why-markets-exist-and-should-i-invest-in-stocks-equity-part-1-4467401.html

While *depend* is thus, in fact, similar to *ask* and *wonder* in allowing quasi-subordinate questions, it also differs from these predicates in an important way, which explains the contrast between (32) on the one hand, and (33)-(35) on the other: when the complement of *depend* is quasi-subordinated, it must be interpreted as raising an issue in the current context. As we will see below, this is so because the quasi-subordinate question must be interpreted as updating a context. Since *depend* does not introduce a reported context, the only context available for update is the matrix context. Examples (33)-(35) are compatible with such an interpretation, while the example in (32) is not. With the predicates *ask* and *wonder*, the quasi-subordinate clause must also raise an issue, but this issue can be raised either in the current context or in the reported context or in the mind of the attitude holder. The essential contrast then involves the question of whether the predicate reports an external or internal speech act, as in the case of *ask* and *wonder*, or not, as in the case of *depend*. We will go into more details concerning non-lexical constraints on quasi-subordination below. For now, we conclude that rogatives do license quasi-subordinate questions in appropriate contexts.

We show next that rogatives are not alone in licensing quasi-subordinate questions: responsive predicates can do so as well. A predicate is responsive if and only if it allows both interrogative and declarative complements. We illustrate the ability of responsive predicates to license quasi-subordination in (36)-(39).

(36) *Context: We are discussing whether to hire Mrs. Jones.*
We should take into consideration how many single-authored papers has she published in top-tier journals. Do you know?

(37) Let's first discuss what could the Clinic do for you as parents, independently of your kids.

(38) Let's try to imagine what would Jane think of all this.

(39) Let's figure out what should we do next.

The inclusive imperative examples in (37)-(39) involve 'discourse management' in the sense that they direct the discourse towards addressing the issue raised by the quasi-subordinate question.

A further class of responsive predicates that license quasi-subordination are predicates of relevance, exemplified in (40):

(40) a. What matters to me most is why did he lie.
b. What is most important to me is why did he lie.
c. What I care about most is why did he lie.

Just like with *depend*, the quasi-subordinate complement must be interpreted in these cases as raising an issue in the current context. If the sentence does not lend itself to interpreting the complement in this way, quasi-subordination is no longer acceptable:

(41) Looking back at all the races in his career, Mr. McLaren stated that it never really mattered to him whether he won. *What mattered to him was did he have a good time.

(42) *What is important in the life of a buddhist monk is did he help others.

These examples show that the Rogative Connection Hypothesis is too restrictive given that at least some responsive predicates can license quasi-subordinate questions as well.

Note, however, that not all responsive predicates allow quasi-subordinate questions, as shown by the contrast between epistemic responsives, like *forget*, which may license such questions, and emotive factives, like *regret*, which do not.

(43) a. I forgot who did they appoint?
b. *I regret who did they appoint?
c. *Do you regret who did they appoint?
d. *Are you surprised who did they appoint?

The fact that *regret* and *surprise* allow ordinary interrogative complements is shown in (44):

(44) a. I regret who they appointed.
b. Are you surprised who they appointed?

In view of the data discussed above we put forward the hypothesis in (45):

(45) *Lexical Compatibility Hypothesis*
A predicate licenses quasi-subordinate questions only if it can take a plain interrogative subordinate clause as its complement.

This hypothesis correctly predicts that anti-rogatives, i.e., predicates that cannot take an interrogative complement, such as *believe*, do not allow quasi-subordination, as shown in (46):

(46) a. *Molly believed why was Jon lying to her.
b. *Molly believed why Jon was lying to her.

The connection in (45) is not surprising: the quasi-subordinate question is interpreted as the semantic argument of the predicate just as a plain subordinate complement is. There must therefore be compatibility between the lexical meaning of the predicate and the denotation of the complement.

The condition in (45) is not a bi-conditional because of examples like (43). We return to the incompatibility of quasi-subordinate questions with emotive factive predicates in the next subsection. For now, we note that lexical compatibility between the predicate and the question complement is a necessary but not a sufficient condition for licensing quasi-subordinate questions. Further, non-local, conditions have to be met as well.

We end by noting that the view laid out above, while building on McCloskey (2006), Woods (2016) and Dayal (2023), differs from them in significant ways. The novel distinction we have drawn between quasi-subordinate and commented root questions has proven relevant to the issue of which type of questions allow quasi-subordination. We have also scrutinized the lexical parameter relevant to licensing quasi-subordinate questions, rejecting the Rogative Connection Hypothesis and establishing that lexical compatibility between the predicate and the question is a necessary but not a sufficient condition for quasi-subordinate questions to be felicitous. We now turn to non-local factors affecting the acceptability of quasi-subordinate questions.

Non-local factors affecting the acceptability of quasi-subordination So far we have seen that the acceptability of quasi-subordinate questions is sensitive to (i) the nature of question, and (ii) the nature of embedding predicate. We refer to these as *local factors* affecting the acceptability of quasi-subordinate questions. However, as mentioned above, *non-local factors* play a role as well. McCloskey (2006), Woods (2016), and Dayal (2023) have already discussed such factors, based on examples similar to those in (47) and (48):

(47) a. I forget were we supposed to bring dessert?
b. *I haven't forgotten were we supposed to bring dessert?

(48) a. I don't remember were we supposed to bring dessert?
b. *I remember were we supposed to bring dessert?

An immediate hypothesis that these examples suggest is that quasi-subordination is sensitive to assumptions about the state of knowledge of the 'questioner', who in this case is the speaker. In particular, the content of the matrix should support assumptions characterizing canonical questions given in (21) above.

(49) *Compatability hypothesis*
A quasi-subordinate question is only licensed if the content of the matrix sentence is compatible with the characteristic assumptions accompanying a canonical question speech act involving the quasi-subordinate question.

Dayal (2023) widens this hypothesis to require compatibility with assumptions concerning non-canonical quasi-subordinate questions in view of the fact that both quiz questions and rhetorical questions may occur as quasi-subordinate questions. In the approach in Dayal (2023), the relevant assumptions have to be spelled out for each type of question.

In this section we refine the hypothesis in (49) by showing that requiring the content of the matrix to be merely *compatible* with the assumptions accompanying the question asked by the subordinate question is too weak, and we will propose an alternative.

The example in (32), repeated below, shows that requiring the matrix to be merely compatible with the characteristic assumptions accompanying canonical questions is not enough to guarantee that quasi-subordination is licensed.

(50) *How many people should you invite depends on how big is your place.(McCloskey's (3c))

If acceptable, example (50) would assert that there is a dependency between the number of guests the addressee should invite and the size of the addressee's place. This information is compatible with the speaker not knowing the answer to the specific question raised, wishing to know it, and assuming that the addressee might know the answer, and thus, the compatibility hypothesis predicts, contrary to fact, that this example should be fine.

What then, is the proper way of characterizing the required relation between the content of a quasi-subordinate question and the content of the matrix clause? We suggest that the relevant requirement is that the content of the matrix clause must *support* the act of raising the issue that the quasi-subordinate question expresses.[14] We suggest that this can happen in the following two ways:

(i) The content of the matrix clause explicitly highlights that there is a need to address the issue that is expressed by the quasi-subordinate question, or it directs the discourse towards addressing it. We call this way of supporting the act of raising the issue *direct* because it immediately conveys the urgency of addressing the issue.

(ii) The content of the matrix clause verifies pragmatic assumptions concerning the state of mind of the participants which leads to the act of raising the issue. This supports the act of raising the issue by making reference to the conditions the participants are assumed to meet in order for the issue to be raised felicitously. We call this way of supporting the act of raising the issue *indirect* because the support involves the conditions the act imposes on the participants.

We hypothesize that the relevant non-local constraint on the relation between the matrix clause and the quasi-subordinate question is the one in (51):

[14]The same is true for commented root questions.

(51) *Support Hypothesis*
In order for a quasi-subordinate question to be appropriate, the content of the matrix clause must support, directly or indirectly, the act of raising the issue expressed by the quasi-subordinate question.

Note that supporting the act of raising the issue by verifying pragmatic assumptions concerning the discourse participants may involve either assumptions targeting the questioner's state of mind or assumptions targeting what the questioner assumes about the state of mind of the responder. In canonical question speech acts, the speaker is assumed to be ignorant of the answer and interested in learning it, and she assumes that the addressee knows the true answer and will provide it.

Under these assumptions, the Support Hypothesis in (51) predicts the data discussed above. Let us consider (47) and (48) first. Intuitively, (47a) can be thought of as involving two speech acts, one whereby the speaker asserts that she forgot the answer to the question expressed by the complement, and another speech act whereby the speaker raises the issue expressed by the complement. Both update the current context. The assertive act supports the questioning act because its content entails that one of the pragmatic assumptions associated with the questioning act, namely *Speaker ignorance*, is met. The same holds for (48a). Examples (47b) and (48b) are predicted to be bad because the matrix clause asserts that the *Speaker ignorance* assumption of the question act is **not** met, and that cannot be taken as providing support for the questioning act.

Further examples where the content of the matrix clause supports the act of raising the issue by describing relevant aspects of the speaker's state of mind, i.e., her ignorance of the answer or her interest in learning the answer, are given in (52):

(52) a. I am curious did John get the job?
b. I want to know when did she leave and where did she go?

Now consider the case in (53).

(53) Do you remember were we supposed to bring dessert?

Intuitively, in uttering this sentence two issues are raised: (i) the issue expressed by the quasi-subordinate question, i.e., whether we were supposed to bring dessert, and (ii) the issue expressed by the matrix sentence, i.e., whether the addressee remembers the answer to the first issue. The content of the matrix sentence supports the act of raising the issue expressed by the quasi-subordinate question because it underwrites the *Addressee competence* assumption with regard to the quasi-subordinate question. Namely, it conveys that the speaker considers it possible that the addressee may know the answer to the issue of whether we were supposed to bring dessert. So the Support Hypothesis in (51) correctly predicts that the quasi-subordinate question is licensed in this case as well.

In (54), we have further examples where the content of the matrix clause supports the *Addressee competence* assumption w.r.t. the quasi-subordinate question:

(54) a. Sara must have told you already did she get the job?
b. You must have found out by now did Sara get the job?

Note next that the examples in (55) are predicted to be felicitous because in these examples, the content of the matrix sentence supports the act of raising the issue expressed by the quasi-subordinate question by highlighting its importance or by directing the discourse towards addressing it.

(55) a. It is crucial to know why did he falsify the data?
b. Let's figure out why did he falsify the data?
c. The issue to investigate next is why did he falsify the data?

The example in (50) is infelicitous because the dependency statement does not support the act of raising the issue expressed by the question. This, however, is not always the case for dependency statements. In some cases, such statements do support the act of raising the issue expressed by the quasi-subordinate question, and in such cases such questions are indeed licensed, as illustrated in (56):

(56) A: Are you interested in buying this house?
B: That depends on how much does it cost.

Here, the matrix clause justifies the need to raise the issue expressed by the quasi-subordinated question: this issue needs to be resolved in order to address the question that A asked.

Note that the *Support Hypothesis* in (51) above is neutral relative to the canonical/non-canonical distinction. It predicts, correctly, that if the quasi-subordinate question is a non-canonical question, the content of the matrix clause should support whatever assumptions are relevant to that question.

We end this section by pointing out an open issue, namely the fact that emotive factives do not appear to allow quasi-subordinate questions, as shown in (57):

(57) a. *I hear Paul regrets who did they appoint.
b. *Paul is devastated, who did they appoint?
c. *Do you regret who did they appoint?

The unacceptability of the examples in (57) contrasts with the acceptability of their counterparts involving ordinary embedded interrogative complements, given in (58):

(58) a. I hear Paul regrets who they appointed.
b. Paul is devastated by who they appointed.
c. Do you regret who they appointed?

A possible explanation of the contrast could be provided by the fact that emotive factives involve entailments concerning the emotional rather than the epistemic state of the referent of their subject and such states do not support raising an issue. We would have to assume that the emotional state of participants is irrelevant to the type of support the matrix clause has to provide for the speech act performed by the quasi-subordinate question.

We conclude that while the Support Hypothesis in (51) appears to be on the right track further refinement is needed to turn it into a full account. The larger picture that emerges is that there are two sources responsible for the restrictions on quasi-subordination: (i) the semantic content of the quasi-subordinate clause must be compatible with its interpretation as the semantic argument of the matrix predicate; (ii) the content of the matrix clause must be interpretable as supporting the context update triggered by the quasi-subordinate clause.

3.3 The semantic effect of quasi-subordination

We turn now to the last empirical issue raised in the introduction, namely what the difference is, if any, between a quasi-subordinate question and the corresponding plain subordinate question, in situations in which both are licensed, as exemplified in (59):

(59) Bill's mother passed away a month ago and Susan noticed that it affected him very much...

a. She wondered what she could do to make him happy. regular subordination
b. She wondered what could she do to make him happy. quasi-subordination

Our suggestion is that the subtle semantic difference between the two constructions in (59) is that in the case of quasi-subordination, unlike in the case of regular subordination, the issue expressed by the interrogative complement is interpreted as becoming the current question, the one with the highest immediate priority and salience, in the relevant context or mental state, at the time of reference.[15] Regular subordination is compatible with such an interpretation but does not force it.

Thus, quasi-subordination, unlike regular subordination, signals the existence of an event whereby the issue expressed by the interrogative complement becomes the 'current question' (at the reference time), either in a discourse context or in the mental state of the attitude holder.

The contrast between (60) and (61) illustrates the same point.

(60) A: So, do you want to rent the apartment?
B: That depends on when I would be able to move in.

(61) A: So, do you want to rent the apartment?
B: That depends on when would I be able to move in.

B's response in (60) expresses that her interest in renting the apartment depends on the date by which she would be able to move in. This may of course be interpreted as an indirect way of asking by which date she would be able to move in, but the issue is not raised directly. In (61) on the other hand, B does not only convey that her interest in renting the apartment depends on the date by which she would be able to move in, but at the same time, she also directly raises the issue of what that date is. Thus, B's utterance in (60) can be felicitous even if it is clear that A doesn't know when B would be able to move in, while B's utterance in (61) is only felicitous if A does possibly know when B would be able to move in.

4 Towards an account of the compositional semantics of sentences with quasi-subordinate questions

In this section we take steps towards an account of the compositional semantics of sentences with quasi-subordinate questions. In order to be able to formulate such an account we first make explicit our assumptions about the syntactic structure of such constructions in Section 4.1. Then, in Section 4.2, we turn to semantics.

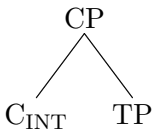
4.1 Syntactic assumptions

As we have seen, the empirical properties of quasi-subordinate questions overlap both with those of plain subordinate questions and with those of root questions. We therefore start by laying out our assumptions about the syntax of plain subordinate questions as well as that of root questions before turning to quasi-subordinate structures.

All interrogative clauses, we assume, involve the basic structure in (62), where the presence of the feature INT is characteristic for interrogative CPs.

[15] This, we take it, is in line with what McCloskey (2006, p.6) means when he characterizes quasi-subordinate questions as 'direct questions'.

(62)



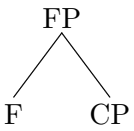
In plain subordinate clauses, the CP is the sister of a lexical head, as exemplified in (63) with the verb *wonder*.

(63) Bill [wondered [$_{CP}$ [$_{C_{INT}}$ whether] [$_{TP}$ Susan would be home]]

On the semantic side, in such cases, the denotation of the CP is the semantic argument of its sister predicate. Following the terminology in McCloskey (2006) we call the position occupied by such CPs *argumental.* Plain subordinate questions, then, are argumental.

In root questions, we assume that the CP is the sister of the head of an undominated Force Phrase (FP), as in (65):

(64)



Thus, the root interrogative *Is Susan home?* has the following structure:

(65) [$_{FP}$ F [$_{CP}$ [$_{C_{INT}}$ is][$_{TP}$ Susan home]]]

In such clauses, the FP dominating the CP is not part of a larger syntactic structure. Semantically, the role of the CP is not to fill an argument slot of a lexical predicate but rather, to specify the content of an operator that updates the input context. We call CPs which are immediately dominated by an FP *non-argumental*.

Besides the distinction between argumental and non-argumental CPs, another distinction is relevant here as well, namely that between *embedded* and *unembedded* CPs. We define embedded CPs as CPs that are dominated by a lexical head, and unembedded CPs as CPs that are not dominated by such a head. Note that this distinction is different from that between argumental and non-argumental CPs. A root question is non-argumental and unembedded. A plain subordinate question is argumental and embedded. But it is possible, in principle, for a clause to be non-argumental (immediately dominated by an F head) and yet embedded (dominated, though not immediately, by a lexical head). This is exactly the case, we propose, of quasi-subordinate questions. Thus, in the spirit of McCloskey (2006) (though with some differences that are discussed below), we assume that quasi-subordinate questions involve a CP dominated by an FP, which in turn is dominated by a lexical head, as illustrated in (66):

(66) Bill [wondered [$_{FP}$ F [$_{CP}$ would Susan be home]]]

The three types of interrogative CPs that we have distinguished are listed in (67), together with their characteristic syntactic properties.

(67)

	Argumental	Embedded
Root interrogative CP	−	−
Plain subordinate interrogative CP	+	+
Quasi-subordinate interrogative CP	−	+

It is clear from this characterization that quasi-subordinate interrogative CPs have one fundamental syntactic property in common with plain subordinate interrogative CPs, namely that they are embedded, but also share a fundamental syntactic property with root interrogative CPs, namely that they are non-argumental.

This hybrid syntactic nature of quasi-subordinate clauses will be echoed by the semantics we propose in Section 4.2: their semantic content serves both as the argument of a context update procedure, and as the argument of the predicate that the FP is a sister of.

The structure proposed in (66) is similar to that proposed in McCloskey (2006), given in (68).

(68) Bill [wondered [$_{\text{CP}}$ C [$_{\text{CP}}$ was Susan home]]]

The difference is that McCloskey assumes a recursive CP structure for quasi-subordinate questions, with a higher CP and a lower CP, where we assume an FP in addition to a single CP layer. As we will see in the next subsection, in our account, C and F have different semantic functions.

Our proposal shares with Woods (2016) and Dayal (2023) the fact that quasi-subordinate clauses are dominated by an FP, and therefore have their own illocutionary force (i.e., trigger a context update) but it differs from each in being much simpler.

4.2 First steps towards a semantic account of quasi-subordinate questions

The task at hand is to give an account of quasi-subordinate questions that captures their hybrid nature. To achieve this goal, we propose that the interpretation of these questions proceeds along two dimensions. On the one hand, quasi-subordinate questions have propositional content which serves as the semantic argument of the matrix predicate, just as in ordinary subordination. On the other hand, a quasi-subordinate question also contributes a context update, just like root questions do. In general, the context that is updated can be either the actual discourse context or a local context, which is either a reported discourse context or an agent's mental state. We concentrate here on cases in which a quasi-subordinate question contributes an update of the actual discourse context, illustrated in (69).

(69) I wonder what should we do next.

An exploration of how the account may be extended to local context updates is left for future work.

Before presenting our proposal, we briefly review some relevant notions from inquisitive semantics that we will make use of, and some minimal assumptions about discourse contexts. In what follows, we use the term *proposition* to refer to a set of possible worlds.

Relevant notions from inquisitive semantics Following Ciardelli *et al.* (2018) and much other work on inquisitive semantics, we define an *issue* as a downward closed set of propositions. A set of propositions P is downward closed if for any proposition $p \in P$, any stronger proposition $q \subset p$ is also in P. The elements of an issue P are referred to as the *resolutions* of P. An issue is taken to be downward closed because it is meant to contain *all* its resolutions, and if p is a resolution, then any stronger proposition $q \subset p$ should count as a resolution as well. We will write $P^{\downarrow}$ for the downward closure of a set of propositions P:

(70) $P^{\downarrow} := \{q \mid q \subset p \text{ for some } p \in P\}$

The *informative content* of an issue P, $\mathsf{info}(P)$, is the set of all worlds that are contained in some resolution of P. That is, $\mathsf{info}(P) := \bigcup P$. An issue P is *informative* just in case $\mathsf{info}(P)$ does not cover the set of all possible worlds. On the other hand, an issue P is *inquisitive* just in case all

its resolutions are proper subsets of $\mathsf{info}(P)$, i.e., if $\mathsf{info}(P) \notin P$. This means that, in order to resolve P, more information is needed than already conveyed by P itself. If $\mathsf{info}(P) \notin P$, then P is non-inquisitive.

We will make use of two simple operations on issues, ! and ?, which are defined as follows.

(71) a. $!P := \{\mathsf{info}(P)\}^{\downarrow}$

b. $?P := P \cup \{\overline{\mathsf{info}(P)}\}^{\downarrow}$

These definitions ensure that $!P$ is always non-inquisitive with the same informative content as P itself, while $?P$ is always non-informative and is resolved by any proposition that resolves P itself or rejects $\mathsf{info}(P)$.

Minimal assumptions about discourse contexts Following Farkas and Bruce (2010), Farkas and Roelofsen (2017), and the large body of literature these works build on, we assume that a discourse context has at least the components defined in (72):

(72) A *discourse context* is a triple <Participants, Table, Commitments>, where:

a. Participants is the set of discourse participants;

b. Table is a stack of issues, representing the proposals made so far;

c. Commitments is a function that maps every participant $x \in$ Participants to a set of propositions, namely those propositions that x has publicly committed to in the course of the conversation.[16]

We assume that in every context one of the Participants can be identified as the speaker. The speaker in context c is denoted as $Sp(c)$.

(73) If c is a discourse context and P an issue, we define $c + P$ as the discourse context that is obtained by:

a. adding P to the Table in c.

b. adding $\mathsf{info}(P)$ to the Commitments of $Sp(c)$ in c.

A hybrid semantic architecture: the core idea Our semantic proposal is based on the following idea. In classical, static semantic frameworks, the semantic value of a clause is a propositional object: a set of propositions in case the clause is interrogative, and either a set of propositions or a single proposition in case the clause is declarative (depending on the choice of semantic framework). In dynamic semantics, the semantic value of a clause is not a propositional object, but rather a context update function, specifying how any context in which the clause may be uttered would change as a result of such an utterance.

Our proposal is that these are not two competing, mutually exclusive ways of thinking about semantic content, but rather that each of them captures one aspect of interpretation, and that they need to be combined to arrive at a comprehensive account of compositional interpretation. What is particularly important for our proposal is that a single constituent can in principle contribute *both* propositional content and a context update. For instance, the quasi-subordinate clause in (69) above, *what should we do next*, contributes a context update, raising the issue of what we should do next, and at the same time contributes a propositional object that serves as the semantic argument of the predicate *wonder*.

[16] In Farkas and Bruce (2010) a further component is assumed, namely the Projected set. Since this component is not relevant to our present concerns it will be ignored here.

Formalizing this idea requires an extension of the usual semantic composition machinery. Under usual assumptions expressions denote simple functions that take a certain input and return a certain output, without the possibility of inducing any additional effects. Under our proposal, drawing on Shan (2004), Charlow (2019) and others, clausal constituents do not express such a plain function but rather the kind of function that is commonplace in computer programs, namely one that takes an input, then performs a certain action, and then returns some output. To exemplify this, consider the following simple Python program:

(74)
```
action_history = []

def add(n,m):
 action_history.append("addition")
 return n + m

def multiply(n,m):
 action_history.append("multiplication")
 return n * m
```

This program first defines a global variable `action_history`. Initially this is an empty list. The function `add(n,m)` does two things. First, it adds an element to the `action_history`, namely the string "addition", taking record of the fact that an addition took place. Second, it returns the sum of its two arguments, n and m. The same is true for `multiply(n,m)`, which adds the string "multiplication" to the `action_history`, and returns the product of its two arguments. Thus, every time one of the functions `add` or `multiply` is performed, a new element is added to the `action_history`, recording whether an addition or a multiplication took place in addition to performing the relevant operation. If we think of `action_history` as the discourse context, the functions `add` and `multiply` update the discourse context, in addition to returning a numerical value. We propose that clausal constituents behave similarly. They update a context *and* yield a propositional semantic value.

A hybrid semantics for clausal constituents If K is the semantic type of a discourse context and T the semantic type of an issue (i.e., a set of propositions), then we assume that the semantic type of a clausal constituent is $K \to (T \times K)$, where $(T \times K)$ is the type of *pairs* whose first element is of type T and whose second element is of type K. This means that a clausal constituent maps a given input context to a pair consisting of (i) an issue and (ii) an output context. We abbreviate the type of clausal constituents, $K \to (T \times K)$, as Γ. If α is a pair of type $T \times K$, we write $\mathsf{prop\_content}(\alpha)$ for the first element of α, which is a set of propositions, and $\mathsf{output\_context}(\alpha)$ for the second element of α, a context.

We assume that the semantic value of a simple TP clause is a function that takes a context c as its input, and yields a pair whose first element is an issue, i.e., a set of propositions, and whose second element, the output context, is the same as the input context c. This is illustrated in (75).

(75) $$[\![\,[_{\text{TP}}\,\text{Mary left}]\,]\!] = \lambda c_K.\left\langle \begin{array}{c} \{\lambda w.\,\text{Mary left in } w\}^{\downarrow} \\ c \end{array} \right\rangle$$

Thus, as far as simple TP clauses are concerned, our proposal is not radically different from standard approaches. The only difference is that, besides propositional content, we also associate a TP with an input and output context. However, the output context is exactly the same as the input context in this case, which means that a simple TP does not directly contribute a context update. The input-output context layer that is wrapped around the propositional content of the clause is trivial

in this case.

It will be convenient below to have a compact notation for the issue $\{\lambda w.\,\text{Mary left in } w\}^{\downarrow}$. We will denote it as Lm. With this notation, (75) can be rewritten more succinctly as follows.

(76) $[\![\,[_{\text{TP}}\,\text{Mary left}]\,]\!] = \lambda c_K.\left\langle \begin{array}{c} \mathsf{Lm} \\ c \end{array} \right\rangle$ Type: Γ

Let us now turn to the declarative complementizer C_{DEC} and the interrogative complementizer C_{INT}. We will assume here that C_{DEC} applies ! to the propositional content of the TP, and that C_{INT} applies ?.[17]

(77) $[\![\text{C}_{\text{DEC}}]\!] = \lambda\mathcal{P}_{\Gamma}.\lambda c_K.\left\langle \begin{array}{l} !\,\mathsf{prop\_content}(\mathcal{P}(c)), \\ \mathsf{output\_context}(\mathcal{P}(c)) \end{array} \right\rangle$ Type: $\Gamma \to \Gamma$

(78) $[\![\text{C}_{\text{INT}}]\!] = \lambda\mathcal{P}_{\Gamma}.\lambda c_K.\left\langle \begin{array}{l} ?\,\mathsf{prop\_content}(\mathcal{P}(c)), \\ \mathsf{output\_context}(\mathcal{P}(c)) \end{array} \right\rangle$ Type: $\Gamma \to \Gamma$

When we combine C_{DEC} with the simple TP in (76), we get the following:

(79) $[\![\,[\text{C}_{\text{DEC}}\ [\text{Mary left}]]\,]\!] = \lambda c_K.\left\langle \begin{array}{c} !\,\mathsf{Lm} \\ c \end{array} \right\rangle$ Type: Γ

The ! contributed by C_{DEC} has no effect in this case, because Lm is non-inquisitive. It would only have a non-trivial effect if the TP was inquisitive, e.g., if it contained a disjunction (see Ciardelli *et al.*, 2018, for discussion).

When we combine C_{INT} with the simple TP in (76), we get the following:

(80) $[\![\,[\text{C}_{\text{INT}}\ [\text{Mary left}]]\,]\!] = \lambda c_K.\left\langle \begin{array}{c} ?\,\mathsf{Lm} \\ c \end{array} \right\rangle$ Type: Γ

The ? contributed by C_{INT} does have a non-trivial effect: it adds resolutions entailing that Mary did *not* leave:

(81) $?\,\mathsf{Lm} = \{\lambda w.\,\text{Mary left in } w,\ \lambda w.\,\text{Mary did not leave in } w\}^{\downarrow}$

So far, then, the proposal is still quite similar to previous accounts of declarative and interrogative clauses. In particular, the propositional content that our proposal associates with declarative and interrogative CPs is the same as in other accounts couched in inquisitive semantics and can easily be mapped to the corresponding semantic values in other frameworks, such as Hamblin semantics (Hamblin, 1973). The input-output context layer is still trivial at this point: the output context is exactly the same as the input context.

This changes when the Force head F enters the picture. F takes as its input the semantic value $\mathcal{P}$ of its sister CP, which is of type Γ, and yields as its output another object of type Γ, i.e., a function mapping each input context c to a propositional content and an output context. The propositional content is just the propositional content of $\mathcal{P}(c)$. The output context, however, is not just the output context of $\mathcal{P}(c)$. Rather, it is the output context of $\mathcal{P}(c)$ *updated with* the

[17] In Ciardelli *et al.* (2018) and much other work on inquisitive semantics, it has been argued that C_{INT} actually only applies ? to the issue expressed by its sister TP if that issue is not already inquisitive. If it *is* already inquisitive, then ? is not applied. This refined treatment of C_{INT} is needed for wh-questions and alternative questions. For simplicity, we focus here only on polar questions, and therefore stick to the more straightforward analysis of C_{INT} as always applying ? to its sister TP.

propositional content of $\mathcal{P}(c)$.

$$(82) \qquad [\![\text{F}]\!] = \lambda\mathcal{P}_{\Gamma}.\lambda c_K.\left\langle \begin{array}{c} \mathsf{prop\_content}(\mathcal{P}(c)), \\ \mathsf{output\_context}(\mathcal{P}(c)) + \mathsf{prop\_content}(\mathcal{P}(c)) \end{array} \right\rangle$$

Combining F with the interrogative CP in (80) thus yields an FP with the following semantic value:

$$(83) \qquad [\![\,[\text{F } [\text{C}_{\text{INT}} \text{ did}] \text{ [Mary leave]}]\,]\!] = \lambda c_K.\left\langle \begin{array}{c} ?\,\mathsf{Lm}, \\ c + ?\,\mathsf{Lm} \end{array} \right\rangle \qquad \text{Type: } \Gamma$$

Conventional discourse effects We assume that the conventional discourse effect of uttering a sentence is straightforwardly determined by the semantic value of the sentence, namely as follows.

(84) The conventional discourse effect of uttering a sentence φ in a context c is a context update turning c into $\mathsf{output\_context}([\![\varphi]\!](c))$.

Of course, besides conventional discourse effects an utterance typically has pragmatic discourse effects as well. These, however, are not directly relevant for our purposes here, so we leave them out of consideration (see Farkas and Roelofsen, 2017, for further discussion).

Thus, the root question *Did Mary leave?*, with the semantic value given in (83), when uttered in a context c, is predicted to yield the output context $c + ?\,\mathsf{Lm}$. In this output context, the issue whether Mary left has been placed on the Table. Furthermore, $\mathsf{info}(?\,\mathsf{Lm})$ has been added to the speaker's $\mathsf{Commitments}$, but since $\mathsf{info}(?\,\mathsf{Lm})$ is the set of *all* possible worlds (since in all worlds Mary either left or didn't leave) this commitment is trivial. This prediction for root questions echoes the prediction made and argued for in Farkas and Roelofsen (2017). However, in Farkas and Roelofsen (2017), only propositional content was derived compositionally, and context updates were determined *post*-compositionally. In the present account, both propositional content and context updates are derived compositionally, in tandem. This makes no difference yet for root questions like (83). We will see, however, that it is crucial for quasi-subordinate questions.

Clause-embedding predicates: the case of *wonder* We have specified what the semantic values are of clausal constituents—TPs, CPs and FPs—and what the conventional discourse effects are of uttering a sentence. What remains to be specified is the semantic value of clause embedding predicates. We focus here on the predicate *wonder*. This predicate takes as its input the semantic value $\mathcal{P}$ of its complement clause, which can be either a CP or an FP, and the semantic value of its nominal subject, which is an individual x, and yields as its output a semantic object of type Γ. So *wonder* is of type $\Gamma \to (e \to \Gamma)$. The output is a function mapping every input context c to a propositional content P' and an output context c'. We propose that P' is the set of all propositions that entail that x is wondering about the propositional content of $\mathcal{P}(c)$, and that c' is the output context of $\mathcal{P}(c)$.

$$(85) \qquad [\![\text{wonder}]\!] = \lambda\mathcal{P}_{\Gamma}.\lambda x_e.\lambda c_K.\left\langle \begin{array}{c} \{\lambda w.\, x \text{ wonders } \mathsf{prop\_content}(\mathcal{P}(c)) \text{ in } w\}^{\downarrow}, \\ \mathsf{output\_context}(\mathcal{P}(c)) \end{array} \right\rangle$$

We do not spell out here when the 'wonder' relation holds between an individual x and an issue in a world w. This can be done in various ways (see, e.g., Ciardelli and Roelofsen, 2015; Uegaki, 2015) and the choice between these alternatives is orthogonal to our purposes here. What is crucial about the lexical entry in (85) is that *wonder*, when combined with an FP, does not only yield propositional content but also updates the input context. This is illustrated in (86).

(86) $[\![\,[\text{wonder } [\text{F } [\text{C}_{\text{INT}} \text{ did}]\,[\text{Mary leave}]]]\,]\!]$

$$= \lambda x_e.\lambda c_K.\left\langle \begin{array}{c} \{\lambda w.\,\text{x wonders ?}\mathsf{Lm}\text{ in } w\}^{\downarrow}, \\ c + \text{?}\mathsf{Lm} \end{array} \right\rangle \qquad \text{Type: } e \to \Gamma$$

If we combine the VP in (86) with a subject as well as a root declarative complementizer and force head we obtain the following.

(87) $[\![\,[\text{F } [\text{C}_{\text{DEC}} \text{ [I wonder } [\text{F } [\text{C}_{\text{INT}} \text{ did}]\,[\text{Mary leave}]]]]]\,]\!]$

$$= \lambda c_K.\left\langle \begin{array}{c} \{\lambda w.\,\text{I wonder ?}\mathsf{Lm}\text{ in } w\}^{\downarrow}, \\ c + \text{?}\mathsf{Lm} + \{\lambda w.\,\text{I wonder ?}\mathsf{Lm}\text{ in } w\}^{\downarrow} \end{array} \right\rangle \qquad \text{Type: } \Gamma$$

The prediction, then, is that this construction yields two updates of the input context: the first update, contributed by the embedded FP, places the issue whether Mary left on the Table, while the second update, contributed by the matrix FP, places the information that the speaker wonders whether Mary left on the Table.

It is also possible for *wonder* to take a CP clause as its argument, without the intervention of a force head. In that case the embedded clause is correctly predicted not to contribute a context update.

(88) $[\![\,[\text{F } [\text{C}_{\text{DEC}} \text{ [I wonder } [\text{C}_{\text{INT}} \text{ whether}]\,[\text{Mary left}]]]]\,]\!]$

$$= \lambda c_K.\left\langle \begin{array}{c} \{\lambda w.\,\text{I wonder ?}\mathsf{Lm}\text{ in } w\}^{\downarrow}, \\ c + \{\lambda w.\,\text{I wonder ?}\mathsf{Lm}\text{ in } w\}^{\downarrow} \end{array} \right\rangle \qquad \text{Type: } \Gamma$$

Thus, our semantic account allows both for CP embedding (ordinary subordination) and FP embedding (quasi-subordination), and derives what we take to be the core difference between these two in terms of discourse effects: in the case of quasi-subordination the issue expressed by the embedded clause is raised in the discourse context and also serves as input for the embedding predicate, while in the case of ordinary subordination it only serves as input for the embedding predicate.

4.3 Further predictions and extensions

Before concluding, we briefly discuss some further predictions of the account presented above, and some possible extensions which need to be explored in more depth in future work.

Predictions for quasi-subordinate declarative clauses First, while our empirical focus has been on quasi-subordinate interrogative clauses, the theoretical account formulated above is in fact more general and makes predictions about quasi-subordinate *declarative* clauses as well. Namely, it predicts that (unmarked) quasi-subordinate declarative clauses trigger a context update which places the propositional content expressed by the declarative clause on the Table and registers commitment to the information conveyed by the declarative clause. If the context update targets the current discourse context, the commitment is ascribed to the speaker. But the context update could also target a local context or an individual's mental state, in which case the commitment is ascribed to the speaker in that local context or the mental state holder. These predictions for quasi-subordinate declarative clauses are in line with Djärv's (2022) recent account of such constructions, building on Hooper and Thompson (1973) and much subsequent work. An important task for future

work is to explore whether the present account of quasi-subordinate questions and that of Djärv (2022) for quasi-subordinate declaratives can be fully unified.

Extension to rising declaratives and tag questions Recall that tag questions and rising declaratives can be embedded in certain constructions (Hooper and Thompson, 1973; Djärv, 2022). The relevant examples are repeated in (89):

(89) a. I've heard one isn't supposed to move a child back and forth?
b. I think Mrs. Turner said five o'clock, didn't she?

Djärv (2022) observes that the embedded clauses in (89) behave as declarative clauses in their role as arguments of the embedding predicates. That is, in (89a) the speaker reports having heard that one is not supposed to move a child back and forth (not *whether* one is not supposed to move a child back and forth) and in (89b) the speaker states that she thinks that Mrs. Turner said five o'clock (not that she is thinking *whether* Mrs. Turner said five o'clock).

On the other hand, the embedded clauses in (89a) and (89b) behave as questions when it comes to the discourse effect that they trigger. That is, in both cases an issue is raised and a speaker bias is conveyed, similar to when (90a) or (90b) are uttered, respectively:

(90) a. One isn't supposed to move a child back and forth?
b. Mrs. Turner said five o'clock, didn't she?

Our account can be extended in a natural way to capture this curious, hybrid behaviour of quasi-subordinate rising declaratives and tag questions. We assume that these types of marked clauses involve a special F head, $\mathrm{F}_{\mathrm{RISE}}$ and $\mathrm{F}_{\mathrm{TAG}}$, respectively. In terms of spell-out, $\mathrm{F}_{\mathrm{RISE}}$ contributes the rising contour that is characteristic for rising declaratives, while $\mathrm{F}_{\mathrm{TAG}}$ adds an interrogative tag to its declarative prejacent. Semantically, we propose that $\mathrm{F}_{\mathrm{RISE}}$ and $\mathrm{F}_{\mathrm{TAG}}$ do what the unmarked F head does, repeated in (91), but in addition they also register a speaker bias, as represented in (92) ($\mathrm{F}_{\mathrm{RISE}}$ and $\mathrm{F}_{\mathrm{TAG}}$ register slightly different speaker biases, but since this distinction is not directly relevant here we will abstract away from it).

(91) $$[\![\mathrm{F}]\!] = \lambda\mathcal{P}_{\Gamma}.\lambda c_K.\left\langle \begin{array}{c} \mathsf{prop\_content}(\mathcal{P}(c)), \\ \mathsf{output\_context}(\mathcal{P}(c)) + \mathsf{prop\_content}(\mathcal{P}(c)) \end{array} \right\rangle$$

(92) $$[\![\mathrm{F}_{\mathrm{RISE}} \,/\, \mathrm{F}_{\mathrm{TAG}}]\!] = \lambda\mathcal{P}_{\Gamma}.\lambda c_K.\left\langle \begin{array}{c} \mathsf{prop\_content}(\mathcal{P}(c)), \\ \mathsf{output\_context}(\mathcal{P}(c)) + ?\,\mathsf{prop\_content}(\mathcal{P}(c)) + \mathsf{speaker\ bias} \end{array} \right\rangle$$

The representation in (92) is meant to be schematic, not a fully worked out proposal. In particular, what '+ speaker bias' means exactly needs to be spelled out further, and in order to do this, a richer formal representation of discourse contexts would first have to be introduced. The account of rising declaratives and tag questions that we have given elsewhere (Farkas and Roelofsen, 2017) could be incorporated here, but the general scheme is compatible with other accounts of these biases as well.

While in need of further articulation and justification, the schematic account in (92) does already capture the hybrid behaviour of quasi-subordinate rising declaratives and tag questions. To see this, consider (93):

(93) $$[\![\,[\mathrm{F}_{\mathrm{RISE}}\,\mathrm{C}_{\mathrm{DEC}}\,[\text{Mary left}]]\,]\!] = \lambda c_K.\left\langle \begin{array}{c} \mathsf{Lm}, \\ c + ?\,\mathsf{Lm} + \mathsf{speaker\ bias} \end{array} \right\rangle$$

We see that on the one hand, a rising declarative is predicted to behave as a declarative clause in its role as argument of an embedding predicate, since its propositional content is Lm (and not ?Lm). On the other hand, in terms of discourse effects a rising declarative is predicted to behave like a question, placing the issue ?Lm on the Table (rather than just Lm, which would result from asserting a falling declarative). The hybrid behaviour of tag questions is captured in the same way.

As for the *distribution* of quasi-subordinate rising declaratives and tag questions, this seems to be much more restricted than the distribution of unmarked quasi-subordinate questions. Licensing constructions include *I suppose...*, *I've heard...*, *I guess...*, *It seems...*. We propose that what these constructions all have in common is that they affirm the speaker's bias, which is also registered as part of the context update triggered by the quasi-subordinate clause.

Recall the general *Support Hypothesis* we formulated in (51), repeated in (94) below:

(94) *Support Hypothesis*
In order for a quasi-subordinate question to be licensed, the content of the matrix clause must support, directly or indirectly, the act of raising the issue expressed by the quasi-subordinate question.

Why would it be necessary for the content of the matrix question to support the act of raising the issue expressed by the quasi-subordinate question? One way to think about this is as follows. When a question is embedded, it usually has subordinate form. A speaker who chooses to use a root form in an embedded context diverges from this default option. The *Support Hypothesis* requires that the content of the matrix clause must provide some form of justification for this non-default choice, i.e., it must support the speaker's intention to raise the issue expressed by the quasi-subordinate question—after all, this is what is achieved by using the root form and would not be achieved (at least not directly) when opting for the default subordinate form.

Now, through the lens of this 'non-default behaviour should be justified' perspective, consider a speaker who uses a quasi-subordinate *rising declarative*. This choice is next-level non-default: not only does it involve quasi-subordination rather than regular subordination; in addition it also involves a marked root form rather than an unmarked root form. In the spirit of the *Support Hypothesis*, we propose that this choice needs to be justified. In particular, what needs to be justified in this case is the discourse effect that the speaker achieves in this way and would not have achieved otherwise. In the case of a rising declarative or a tag question, this additional discourse effect amounts to registering a speaker bias for the positive answer to the issue that is placed on the Table.

(95) *Support Hypothesis w.r.t. Marked Question Forms*
In order for a marked question form to be licensed as a quasi-subordinate question, the content of the matrix clause must support the discourse effect that is achieved by using the marked form and would not have been achieved by using an unmarked form. This means that in the case of a rising declarative or a tag question, the content of the matrix clause must support the registration of a speaker bias toward the positive answer to the issue raised.

This hypothesis explains why matrix constructions like *I suppose...*, *I've heard...*, *I guess...*, and *It seems...* are licensors of quasi-subordinate rising declaratives and tag questions, while a construction like *Do you remember...* is not, even though it does license unmarked quasi-subordinate questions and *remember* is also compatible with declarative complements.[18]

[18]The fact that constructions like *I wonder...* do not license quasi-subordinate rising declaratives and tag questions may in part be explained by (95), but may also be explained in part by the fact that *wonder* is incompatible with

Remarks on commented root questions Providing a detailed account of the syntax and semantics of commented root questions is beyond the scope of this paper. An approach that seems promising, and to which we have alluded above, is to treat them as involving an independent root clause preceded by a comment that contains a co-referent null cataphor.[19] On this account, the semantic connection between the matrix clause and the commented root clause is achieved via the null cataphor which serves as the argument of the predicate, and whose antecedent is the ordinary semantic interpretation of the CP of the root clause. In this view, a commented root clause is similar to a quasi-subordinate question in that it triggers a context update but also provides propositional content that serves as input for the matrix predicate. The difference is that a commented root clause plays this dual role thanks to its connection with the null cataphor in the matrix expression. Under such an account, commented root questions are a case of parataxis rather than subordination.

5 Conclusion

In this paper, we have, we hope, advanced our understanding of quasi-subordinate questions both empirically and theoretically. On the empirical side, we have refined the landscape by distinguishing between quasi-subordinate and commented root questions, and have further clarified the conditions under which quasi-subordination is licensed. The generalization we defend is that as long as the predicate is compatible with interrogative complements it can in principle license quasi-subordinate questions. However, we also argued that there is an additional constraint, independent of the semantic type of the predicate, determining whether a quasi-subordinate question is felicitous or not. Namely, the content of the matrix clause must provide support for raising the issue expressed by the quasi-subordinate question in the relevant context. We have spelled out in some detail what the pertinent notion of 'support' amounts to in a way that is highly congenial to the recent work of Djärv (2022) on quasi-subordinate declaratives, and her notion of 'framing'.

On the theoretical side, in line with previous work, we have taken the common denominator of quasi-subordinate questions to be the fact that they raise an issue relative to a context, a property they share with root questions. At the same time, quasi-subordinate questions also function as semantic arguments of the matrix predicate. We have proposed a syntactic and semantic analysis of quasi-subordinate questions that accounts for this hybrid nature, blending properties of plain subordinate clauses with properties of matrix clauses. The semantic account we offered concerns a specific type of quasi-subordinate questions. In future work, it may be extended to other types, and may also form the basis of a uniform account of quasi-subordinate questions on the one hand, and main clause phenomena involving declarative clauses on the other (cf., Djärv, 2022).

A host of open issues remain. In particular, recent cross-linguistic work has uncovered a wealth of marked question forms which are typically used to perform non-canonical questioning speech acts, and which are subject to various distributional restrictions. Investigating to what extent such marked question forms can be quasi-subordinate and what their discourse effects are is bound to lead to further refinements of the empirical and theoretical proposals made in the present paper.

References

Banfield, A. (1973). Narrative style and the grammar of direct and indirect speech. *Foundations of language*, **10**(1), 1–39.

declarative complements.

[19] This approach is similar to what Woods (2016) proposes for quasi-subordination.

Charlow, S. (2019). Static and dynamic exceptional scope. To appear in the Journal of Semantics.

Ciardelli, I. and Roelofsen, F. (2015). Inquisitive dynamic epistemic logic. *Synthese*, **192**(6), 1643–1687.

Ciardelli, I., Groenendijk, J., and Roelofsen, F. (2018). *Inquisitive Semantics*. Oxford University Press.

Dayal, V. (2023). The interrogative left periphery: How a clause becomes a question. *Linguistic Inquiry*, pages 1–85.

Djärv, K. (2022). On the interpretation and distribution of embedded main clause syntax: new perspectives on complex discourse moves. *Glossa: a journal of general linguistics*, **7**(1).

Emonds, J. E. (1976). *A transformational approach to English syntax: root, structure-preserving, and local transformations*. Academic Press.

Farkas, D. F. (2022). Non-intrusive questions as a special type of non-canonical questions. *Journal of Semantics*, **39**(2), 295–337.

Farkas, D. F. and Bruce, K. B. (2010). On reacting to assertions and polar questions. *Journal of semantics*, **27**, 81–118.

Farkas, D. F. and Roelofsen, F. (2017). Division of labor in the interpretation of declaratives and interrogatives. *Journal of Semantics*, **34**(2), 237–289.

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

Hamblin, C. L. (1973). Questions in Montague English. *Foundations of Language*, **10**(1), 41–53.

Hooper, J. B. and Thompson, S. A. (1973). On the applicability of root transformations. *Linguistic inquiry*, **4**(4), 465–497.

Lahiri, U. (2002). *Questions and answers in embedded contexts*. Oxford University Press.

Maier, E. (2015). Quotation and unquotation in free indirect discourse. *Mind & Language*, **30**(3), 345–373.

McCloskey, J. (2006). Questions and questioning in a local English. *Crosslinguistic research in syntax and semantics: Negation, tense, and clausal architecture*, pages 87–126.

Sauerland, U. and Yatsushiro, K. (2017). Remind-me presuppositions and speech act decomposition: Evidence from particles in questions. *Linguistic Inquiry*, **4**(48), 651– 678.

Schlenker, P. (2004). Context of thought and context of utterance: A note on free indirect discourse and the historical present. *Mind & Language*, **19**(3), 279–304.

Shan, C.-C. (2004). Binding alongside Hamblin alternatives calls for variable-free semantics. In *Proceedings of Semantics and Linguistic Theory (SALT 14)*, pages 289–304.

Sharvit, Y. (2008). The puzzle of free indirect discourse. *Linguistics and Philosophy*, **31**(3), 353–395.

Sudo, Y. (2013). Biased polar questions in English and Japanese. In D. Gutzman and H.-M. Gaertner, editors, *Beyond expressives: explorations in use-conditional meaning*. Leiden: Brill.

Uegaki, W. (2015). *Interpreting questions under attitudes*. Ph.D. thesis, Massachusetts Institute of Technology.

Woods, R. (2016). *Investigating the syntax of speech acts: Embedding illocutionary force*. Ph.D. thesis, University of York.