FORMAL ANALYSIS OF THE VIETNAMESE SENTENCE-FINAL PARTICLE *CƠ*

by

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Declaration

I hereby declare that this thesis is my original work and it has been written by me in its entirety. I have duly acknowledged all the sources of information which have been used in the thesis.

This thesis has also not been submitted for any degree in any university previously.

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Abstract

Formal Analysis of the Vietnamese Sentence-final Particle *Cơ*

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The thesis considers the meaning and use of the Vietnamese sentence-final particle *cơ* and aims to present a formal unified semantics for the particle. The discussion focuses on the distribution of the particle in declaratives, polar questions and *wh*-questions. Previous descriptive work on *cơ* describes the two former constructions with different implications. Declaratives with *cơ* are described as being used to correct the Addressee's assumptions. *Cơ* in polar questions is believed to indicate that the Speaker has received new information and is surprised. I argue that these intuitions about *cơ* in declaratives and polar questions are derived from a unified characterization of *cơ*. I will show that the use of *cơ* is in fact further restricted by a scalar constraint. I propose that *cơ* is a scalar mirative particle. The mirativity of *cơ* reflects surprise which is characterized in terms of belief revision. The scalar component of *cơ* is defined with scales. *Cơ* in *wh*-questions, at first glance, seems to make different contributions to its host question: *wh*-questions with *cơ* appear to have the same distribution and range of uses as echo *wh*–questions. However, I argue that *cơ* in this sentence type in fact has the function of mirative marking and is scale sensitive, too. I claim that the differences can be accounted for by proposing that the particle in *wh*-questions operates at discourse level rather than propositional level as it does in declaratives and polar questions.

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List of Abbreviation

CL	Classifier
CT	Contrastive topic
F	Focus
FUT	Future tense marker
POSS	Possessive marker
PROG	Progressive aspect marker
PRT	Particle
PQ	Polar question
PST	Past tense marker
Q	Question marker
QUD	Question under discussion

Chapter 1

Introduction

1.1 Overview

This work documents the use of the Vietnamese sentence-final particle *cơ* and aims to develop a unified formal account of the meaning and distribution of the particle.

The particle *cơ* is one of a number of sentence-final particles in Vietnamese. The particle is used with various sentence types. (1) shows *cơ* in three types of constructions: declaratives, polar questions, and *wh*-questions.

(1) *Cơ* in basic constructions

a. Em muốn nhìn ông trưởng thôn với cà-vạt mỗi ngày **cơ**.
I want see CL village-chief with tie everyday CƠ
'I want to see the village chief wearing a tie everyday *cơ*.'
(from Le (2015))

b. Ngoài tiếng Anh ra, anh ấy còn nói được tiếng Nhật
Besides CL English PRT, he even speak able CL Japanese
cơ à?
KIA Q
'Besides English, he even speaks Japanese *cơ*?'
(from Adachi (2013))

c. Việc gì **cơ**?
CL what CƠ
'What *cơ*?' (from *Từ điển Tiếng Việt* (2003))

Despite the common use of *cơ*, the particle has been poorly understood in the literature, as is the case of many Vietnamese sentence-final particles. In descriptive

grammar books or dictionaries like *Từ điển Tiếng Việt* (2003), *cơ* is simply classified as a particle used in spoken language without elaboration on its uses and meaning. There are a few attempts to give the particle a more specific description. Nguyen (1997) mentions the use of *kia*, a variant of *cơ* [1], in a particular type of context and takes the contextual details to be the contribution of the particle. The particle is described with the meaning of "expressing preference". In (2), the declarative with *cơ* implies that the Speaker prefers blue shirts over shirts of some other colors.

(2) Preference expressing

Nó thích sơ-mi màu xanh **kia**.
He like shirt color blue KIA
'He likes blue shirts.' (⇝ He does not like shirts of some other colors.)

(from Nguyen (1997))

This description of *cơ* is narrow and unable to account for the distribution of *cơ* in other types of context and constructions. For example, the polar question with *cơ* in (1.b), repeated here in (3), does not seem to express anything related to the Speaker's preference. There is no implication that the Speaker prefers if the mentioned man is able to speak Japanese over some other language. A background context is provided to make clear how the polar question with *cơ* should be interpreted. As suggested by the translation, which is a rising declarative, the question intuitively expresses B's surprise at A's information.

(3) Sentences with *Cơ* that do not express the Speaker's preference

Context: A tells B that Sam speaks Japanese in addition to English. B then says:

Ngoài tiếng Anh ra, anh ấy còn nói được tiếng Nhật **cơ** à?
Besides CL English PRT, he even speak able CL Japanese CƠ Q
'Besides English, he even speaks Japanese?'

(from Adachi (2013))

[1] *Cơ* is mainly used in the North of Vietnam. The variant *kia* is less common in the North and is used in other regions. They are interchangeable in terms of their functions or meaning (*Từ điển Tiếng Việt* 2003). Some studies claim that *cơ* is phonologically reduced from *kia* which is grammaticalized from the demonstrative of the same form *kia* (Adachi 2013, Le 2015). These studies however agree that the meaning and distribution of the sentence-final particles *cơ* and *kia* are very different from the demonstrative *kia*. The issue of grammaticalization is out of the scope of this work.

Le (2015) aims to unify the use of *cơ* in all the basic sentence types listed in (1). However, besides reporting the use of the particle in different constructions, Le's work contributes little to the understanding of *cơ*. Le posits that *cơ* has the "emphasis" use, "strengthening the force of sentences" without concrete definitions for these terms. Le elaborates the description of *cơ* with examples but it remains unclear. For instance, Le suggests that for the declarative with *cơ* in (1.a), repeated here in (4), "we feel a stronger expression of the Speaker's wish of seeing the village chief" (Le 2015:55). It is unclear what Le means by "a stronger expression". For *cơ* in polar questions, it is simply claimed that the particle increases the force of the host question.

(4) Le's illustration for the "emphasis use" of *cơ*

a. Em muốn nhìn ông trưởng thôn với cà-vạt mỗi ngày **cơ**.
I want see CL village-chief with tie everyday CƠ
'I want to see the village chief with tie everyday *cơ*.'

(from Le (2015))

Adachi (2013), to my knowledge, presents a description that fairly captures the use of *cơ* in declaratives and polar questions. In particular, declaratives with *cơ* are attributed with the function of correcting the Addressee's assumptions. In contrast, instances of *cơ* in polar questions are taken to reflect the Speaker's surprise when receiving information.

I take Adachi (2013)'s observations about *cơ* to be the starting point for my investigation of the particle in this work. A thorough examination of *cơ* in declaratives and polar questions will be implemented, dealing with a number of issues: the use of *cơ* in declaratives in various types of context, the interaction between *cơ* and different types of polar questions, contextual constraints on sentences with *cơ* and ultimately an exact characterization of *cơ* [2]. That descriptive discussion will revolve around the two following generalizations. Note that Speaker and Addressee refer respectively to the agent who utters a sentence with *cơ* and the agent to whom the sentence is delivered.

[2]There does not appear to be any interactions between the semantics or pragmatics of *cơ* and intonation. As noted in Brunelle et al. (2012), for many other Vietnamese sentence-final particles (e.g *hả* for polar questions, *đi* for imperative, *mà* for contradiction, see Thompson (1965)), "intonation appears to be largely redundant" and therefore intonation will not be discussed here.

(5) **Generalizations of *cơ* in declaratives and polar questions**

a. Generalization 1: A declarative with *cơ* implies that (i) its propositional content will surprise the Addressee because (ii) they have "low expectations".

b. Generalization 2: A polar question with *cơ* implies that (i) its propositional content surprises the Speaker because (ii) they have "low expectations".

This thesis then aims to propose a formal semantics for *cơ* that can unify the two generalizations above as well as derive the specific implication of each type of constructions with *cơ*.

The two generalizations above suggest that part of the meaning of *cơ* is concerned with surprise and therefore the particle should be found in contexts that support this component of its meaning. Interestingly, some of such contexts are similar to contexts that support particles like English *man* and Japanese *yo*. Those particles have been described as having strengthening effects to urge the Addressee to accept the sentence they modify (McCready 2008, Davis 2009). (6) shows the kind of context in which the sentences marked by *cơ*, *man*, and *yo* all are used to deny the content of another utterance. The characterization that I propose for *cơ* can capture this similarity between *cơ* and particles like *man* and *yo*.

(6) *Cơ* and the particles *man* and *yo*

a. A: Chị lấy thuốc B1 nội nhé
You take medicine B1 domestic PRT
'You take domestic vitamin B1, okay?

B: Không, tôi lấy B1 ngoại **cơ**
No, I take B1 imported CƠ
'No, I will take imported B1.

(from Adachi 2013)

b. B: John came to the party.

A: No he didn't.

B: John came to the party, **man**.

(from McCready (2008))

c. A: Souridaijin-ga nakunat-ta
prime.minister-NOM die-PAST
'The prime minister died.'

B: Sin-de-nai **yo**
die-INF-NEG YO
'(No), he did not die.'

(from Davis (2009))

The intuition concerning "low expectations" is manifested by the novel observation in (7). The later elaboration on "low expectations" will lead to the finding of another component in the meaning of the particle: scalarity.

(7) "Low expectations"

a. A: Tớ đoán Sam đạt **giải ba**.
I guess Sam get prize third
'I guess Sam got the third prize.'

B: Không phải. Nó đạt giải nhì **cơ**.
Not true He get prize second CƠ
'That's not true. He got the second prize.'

b. A: Tớ đoán Sam đạt **giải nhất**.
I guess Sam get prize first
'I guess Sam got prize first.'

B: Không phải. Nó đạt giải nhì (#**cơ**).
Not true He get prize second CƠ
'That's not true. He got the second prize.'

The use of *cơ* in *wh*-questions is documented (*Từ điển Tiếng Việt* 2003, Adachi 2013, Le 2015) but remains understudied. The consideration of *wh*-questions with *cơ* in context reveals that they have the properties and uses similar to those of echo *wh*-questions. In (8), the *wh*-question with *cơ* is only felicitous in Context 1 in which the question "echoes" part of a previous utterance. The question is bad in Context 2 in which an information seeking question rather than an echo question is expected to be a response to A's claim.

(8) *Wh*-questions with *cơ*

✓Context 1: A tells B that A saw a ghost in the library.

Context 2: A tells B that it was scary in the library.

B's response to A:

Cậu nhìn thấy cái gì ở thư viện **cơ**?
You see what PREP library CƠ
'You saw WHAT in the library?'

The descriptive findings of this work on *cơ* in this type of constructions are summarized in (9).

(9) **A generalization of *cơ* in *wh*-questions**
Generalization 3: *Wh*-questions with *cơ* function as echo *wh*-questions.

We will see that *cơ* in *wh*-questions seems to be different from *cơ* in polar questions and declaratives with respect to both mirativity and scalarity. Unlike polar questions with *cơ*, *wh*-questions with *cơ* have several echoic uses, some of which are not related to Speaker surprise.

(10) Echoic uses irrelevant to Speaker surprise
Context: A tells B that A saw a ghost in the library. B then says:

Cậu nhìn thấy cái gì ở thư viện **cơ**? Tớ không nghe rõ
You see what in library CƠ I not hear clearly
'You saw WHAT in the library? I didn't hear it.'

In addition, for *wh*-questions with *cơ* there seems no intuition that the Speaker's expectations must be "low". A contrast as in (7) is not observed in (11).

(11) No "low expectations" intuition for *wh*-questions with *cơ*
Context: A tells B that Sam got the second prize. B then says:

Sam đạt giải mấy **cơ**? Tớ tưởng nó đạt {giải ba/ giải nhất}
Sam get prize what CƠ I thought he get prize third prize first
'Sam got WHAT prize? I thought he got {the third prize/ the first prize}.'

I argue that the seemingly challenging issues are illusion. The proposal for *cơ* in declaratives and polar questions can extend to the use of *cơ* in *wh*-questions to form echo questions.

1.2 The plan

The dissertation is structured as follows: In chapter 2, I discuss the use of *cơ* in declaratives, arguing for Generalization 1 stated in (5). I will examine declaratives

with *cơ* in their common types of context as well as those in which they are not supported. The discussion argues for the contribution of *cơ* concerning the Addressee's potential surprise. Then I will elaborate on the intuition about "low expectations" and argue for the scalarity of the particle.

In chapter 3, I investigate the use of *cơ* in polar questions. The focus is the interaction between *cơ* and three types of polar questions: questions with Q marker *không*, questions with Q marker *à*, and questions with Q marker *á*. An account for the incompatibility between *cơ* and questions with *không* and the perfect combination of *cơ* with questions with *à* and *á* argues for the contribution of *cơ* concerning the Speaker's surprise. I will also discuss the scalarity of *cơ* in polar questions. As a whole, Generalization 2 stated in (5) emerges from the discussion of *cơ* in polar questions.

In chapter 4, I present my proposal that unifies the generalizations of *cơ* in declaratives and polar questions. I propose that *cơ* is a scalar mirative marker. The mirative component is formalized as reflecting the Speaker's beliefs about an agent's belief revision. The scalar component is characterized with scales. I will then discuss two relevant issues: the mirative orientation of declaratives and polar questions with *cơ* and the generalization of scales associated with the particle.

In chapter 5, I investigate the use of *cơ* in *wh*-questions. I will present arguments for Generalization 3 that *wh*-questions with *cơ* are interpreted as echo *wh*-questions. I will extend the proposal given in chapter 4 to the use of *cơ* in *wh*-questions.

In chapter 6, I conclude the thesis with some remarks and notes about future work.

Chapter 2

Cơ in Declaratives

2.1 Introduction

This chapter documents and discusses the use of declaratives with *cơ* in a variety of contexts. Contexts that support the particle are descriptively classified into three groups, labelled as corrective, contrastive, and scalar contexts. In corrective contexts, a declarative with *cơ* is typically preceded by expressions signaling objection such as *không phải* 'not true' in italics in (12.a). Contrastive contexts are characterized by the presence of contrastive topics (CTs) and the incompatibility of the two contrastive statements with respect to the current QUD. (12.b) illustrates this kind of context with the contrastive topics marked by the subscripted CT. In scalar contexts, a declarative with *cơ* often contains an *even*-like particle such as *thậm chí* in (12.c) and is interpreted with a scalar meaning.

(12) Classification of contexts for a declarative with *cơ*

a. Corrective contexts

A: Sam chỉ đạt 70 điểm.
Sam only get 70 point
'Sam only scored 70 points.'

B: *Không phải*. Nó đạt 90 điểm **cơ**.
Not true he get 90 point CƠ
'That's not true. He scored 90 points.'

b. Contrastive contexts

The current QUD: Who is the tallest?

A: Kim cao nhất. *[Nó]*$_{CT}$ cao 1.85m.
Kim tall most he tall 1.85m
'Kim is the tallest. Kim is 1.85m tall.'

B: *[Sam]*$_{CT}$ cao 1.9m **cơ**.
Sam tall 1.9m CƠ
'Sam is 1.9m tall.'

c. Scalar contexts

A: Sam có qua vòng đầu không?
Sam PRT pass round first Q
'Did Sam pass the first round?'

B: Có. Nó *thậm chí* vào đến vòng bán kết **cơ**.
Yes he even enter to round semi-final CƠ
'Yes. He even made it to the semi-final.'

The discussion of *cơ* in declaratives revolves around the intuition about the particle concerning potential surprise and "low expectations", as stated in (13):

(13) **The implications of declaratives with *cơ***
A declarative with *cơ* implies that (i) the propositional content of the sentence *will* surprise the Addressee because (ii) they have *low* expectations.

The first goal, which is the focus of Section 2.2, is to show that *cơ* is found in the three types of contexts mentioned above because they all support the first implication in (13.i) pertaining to potential surprise. I argue that this implication is derived from the meaning of *cơ*, which in turn imposes a contextual restriction on the host declarative.

The second goal implemented in Section 2.3 is concerned with the second implication in (13.ii). I will first elaborate the intuitive notion of "low expectations". Then I will show that reflecting that the Addressee has low expectations is also part of the contribution of *cơ*. This meaning component of the particle further restricts its host declarative to a subset of corrective, contrastive and scalar contexts.

2.2 The Addressee's potential surprise

This section expands on the intuition that a declarative with *cơ* gives rise to the implication that the proposition denoted by the sentence will surprise the Addressee. Surprise is defined as involving a change in an agent's information set when they obtain some contrasting information, as stated in (14).

(14) **Surprise**:
An agent X is surprised at a proposition p if X obtaining evidence for p triggers a change in X's information set from favoring $\neg p$ to favoring p.

By information set, I refer to a set of propositions that represent an agent's beliefs and partial beliefs, i.e. what the agent thinks is likely true. A formal distinction between beliefs and partial beliefs will be presented later. An agent's information set favors a proposition p if the set includes p, i.e. the agent thinks p is likely true. The information set prior to which evidence for p is obtained is referred to as the initial set. I will use the term *expectation* to refer to the propositions in the initial set that are incompatible with p. The information set that is influenced by the obtaining of evidence for p is referred to as the resulting set. Evidence for p can be direct, like the agent's own observations or indirect like someone's testimony. The agent may then accept the evidence and become biased toward p. It is also possible for the agent to reject the evidence. In the case of surprise, the attitude holder must ultimately believe that p is likely true, i.e. the resulting information set includes p.

In what follows, I will carry out an investigation of the contexts that facilitate declaratives with *cơ*: corrective, contrastive and scalar contexts. I argue that all these types of context support the implication concerning the Addressee's potential surprise of declaratives with *cơ*. Then I will discuss several other types of context which fail to support this implication. The infelicity of *cơ* in such contexts confirms that reflecting the Addressee's potential surprise is part of the particle's contribution in declaratives.

2.2.1 Corrective contexts

By corrective contexts, I refer to contexts in which declaratives with *cơ* have the function of objecting to and correcting some prior information. These sentences are often preceded by expressions explicitly reflecting objection. Consider again the example in (12.a), repeated below as (15):

(15) *Cơ* in corrective contexts

A: Sam chỉ đạt 70 điểm.	B: *Không phải.* Nó đạt 90 điểm **cơ**.
Sam only get 70 point	Not true he get 90 point CƠ
'Sam only scored 70 points.'	'That's not true. He scored 90 points.'

In this scenario, the declarative with *cơ* in (15B) and the assertion (15A) cannot simultaneously be true. The declarative with *cơ* forms an objection to and a correction of A's assertion. The objection is explicitly realized by the expression *không phải*.

Further examples of *cơ* in corrective contexts are shown in (16). In these examples, what is corrected by a declarative with *cơ* varies. In (16.a – b), the declaratives with *cơ* constitute an objection to what A predicts and reports respectively. In (16.c), A's bias reflected by the biased polar question with the question marker *à* is rectified by a declarative with *cơ* as well. (Further discussion about *à* will be presented in the next chapter.) Furthermore, the correction formed by a declarative with *cơ* can target a request. In (16.d), A's utterance is marked as a request by the in bold final particle *nhé*, which expresses "a friendly proposal" (Nguyen 1997). Note that the examples in (16) also show that the overt realization of objections varies. For example, the objection to a prediction takes the form of *sai* 'wrong' in (16.a) and the objection to a report is *không phải* 'not true' (16.b). With slightly different meanings, these expressions are not always interchangeable.

(16) Further instances of *cơ* in corrective contexts

a. Rejecting a prediction

A: Tớ đoán Sam đạt giải ba hoặc giải nhì.
I guess Sam get prize third or prize second
'I guess Sam got the third prize or the second prize.'

B: *Sai.* Nó đạt giải nhất **cơ**.
Wrong He get prize first CƠ
'That's wrong. He got the first prize.'

b. Rejecting reported information

A: Kim bảo là Sam sẽ làm phần giới thiệu.
Kim say that Sam FUT do part introduction
'Kim said that Sam will do the introduction.'

B: *Không phải.* Nó sẽ làm phần kết luận **cơ**.
Not true. He FUT do part conclusion CƠ
'That's not true. He will do the conclusion.'

c. Rejecting a bias

A: Sam chỉ cao 1.7m thôi **à**?
Sam only tall 1.7m PRT Q
'Sam is only 1.7m tall, right?'

B: *Ai bảo thế.* Nó cao 1.8m **cơ**.
Who say so He tall 1.8m CƠ
'Who said so. He is 1.8m tall.'

d. Rejecting a request

A: Cậu hát một bài **nhé**?
You sing a song PRT
'Will you sing a song?'

B: *Không.* Tớ sẽ nhảy **cơ**.
No I will dance CƠ
'No. I will dance.'

Given the typical structure of exchanges in corrective contexts and the definition of surprise in (14), we can understand why they can support the implication about the Addressee's potential surprise carried by a declarative with *cơ*. First, the fact that a declarative with *cơ* that denotes the proposition p is used to correct the Addressee's utterances suggests that the Addressee's utterances support $\neg p$. This means that the Addressee holds expectations favoring $\neg p$. Second, the Speaker is assumed to commit to their own utterance, i.e. p, and expect the Addressee to commit to p as well. As the result, a declarative with *cơ* in corrective contexts may change the Addressee's information set, potentially triggering the Addressee's surprise. Take (15) as an example, repeated here in (17).

(17) *Cơ* in a corrective context:

A: Sam chỉ đạt 70 điểm.	B: *Không phải.* Nó đạt 90 điểm cơ.
Sam only get 70 point	Not true he get 90 point CƠ
'Sam only scored 70 points.'	'That's not true. He scored 90 points.'

In this scenario, the declarative with *cơ* denotes the proposition p that *Sam scored 90 points*. The sentence objects to A's assertion that *Sam only scored 70 points* which entails $\neg p$. B thus can infer that A expects $\neg p$. On the other hand, B as the Speaker of the declarative with *cơ* commits to p and thinks A will also commit to p. The declarative with *cơ* therefore can imply that p will surprise A. The same can be said of the examples in (16). In each scenario, the Speaker is attempting to object to the Addressee and thus is able to surprise the Addressee.

The awareness of the Addressee's expectations is crucial for the Speaker to make an implication about the Addressee's potential surprise. There are various ways that the Speaker can obtain the information about the Addressee's expectations. The most obvious would be for the Addressee to explicitly state what they expect, as in (15) and (16.a). The Speaker can also infer the Addressee's expectations from their utterances. In (16.c, d), A's expectations are expressed through conventional implicatures derived from the lexical meanings of the particles *à* and *nhé*. For clarity, expectations that A might have in each scenario in (16) are explicitly indicated in italics in (18). The Speaker can even make assumptions about the Addressee's expectations. In (16.b), A's expectations, as indicated in (18.b), are not entailed from A's utterance. B merely assume that A holds the indicated expectations given

A's utterance.

(18) The Addressee's expectations

a. Rejecting a prediction

A: Tớ đoán Sam đạt giải ba hoặc giải nhì.
I guess Sam get prize third or prize second
'I guess Sam got the third prize or the second prize.'

⇝ A's expectations: *Sam got the third prize or the second prize.*

b. Rejecting reported information

A: Kim bảo là Sam sẽ làm phần giới thiệu.
Kim say that Sam FUT do part introduction
'Kim said that Sam will do the introduction.'

⇝ A's expectations: *Sam will do the introduction.*

c. Rejecting a bias

A: Sam chỉ cao 1.7m thôi **à**?
Sam only tall 1.7m PRT Q
'Sam is only 1.7m tall, right?'

⇝ A's expectations: *Sam is at most 1.7m tall.*

d. Rejecting a request

A: Cậu hát một bài **nhé**?
You sing a song PRT
'Will you sing a song?'

⇝ A's expectations: *B will sing a song.*

The Speaker can also make assumptions about the Addressee's expectations with non-linguistic clues. The data in (19) is taken from a children's story book.

(19) Non-linguistic cues for inferring the Addressee's expectations

Context: A group of kids, lost in a jungle, meet mysterious menacing people. Later they see strange symbols and a knife sticking out of the trunk of a tree next to their shelter. They are so scared, staring without saying a word.
⇝ The kids' expectations: *The items have just appeared. Nobody saw them before. The mysterious people have left these things to threaten them.*
To calm her friends, a kid says:

Tớ nhìn thấy chúng từ hôm qua cơ.
I saw them since yesterday CƠ
'I saw them yesterday already.' (from Nguyen (2012))

It is likely that the kids' expectations regarding the scary things as indicated are what the girl infers from her friends' reactions and emotions, and her awareness of their circumstances. The declarative with *cơ* confirms the earlier existence of these things, implying an objection to the other kids' inferred expectations. What she says then can not only calm down the kids but also surprise them. In this case, the girl's inference about the other kids' expectations is supported by non-linguistic evidence.

The Speaker's inference can even rely on information from their private sources rather than from the immediate context. In (20), the information in italics indicates B has private evidence for making assumptions about A's expectations about Sam.

(20) *B is told that A hates Sam and that A said Sam would not get a good prize in the contest.* Later when the result is released, B sees A and says:

'Cậu sai rồi. Sam đạt giải nhất cơ.'
You wrong already Sam get prize first CƠ
'You are wrong. Sam got the first prize.'

Note that the use of *cơ* becomes odd for A if what B is told turns out to be a misunderstanding or if A does not remember what A had said earlier about Sam. The oddity of *cơ* in such scenarios suggests that the Speaker's assumptions are required to be accommodated. In particular, from B's perspective, B's assumptions about A's expectations concerning Sam are still justified as B thinks B has evidence for the assumptions. B therefore can object to the assumed expectations and make an implication about A's potential surprise. From A's perspective, B's assumptions cannot be accommodated because A does not hold any expectations about Sam. On the other hand, it is not necessary that the accommodation of B's assumptions requires A's expectations to actually exist. B's assumptions from a private source can be accommodated if B explicitly mentions what B was told. In (21) below, the presence of the sentence in bold makes B's assumptions about A's expectations accessible to A. Therefore, even though the assumptions are wrong, A can accommodate them and accept the use of *cơ*.

(21) B's assumptions required to be accommodated
Context: B is told that A said Sam would only get the third prize in the

contest Sam participated. However, this is a misunderstanding. A didn't say this. Later when the result is released, B sees A and says:

Cậu bảo Sam chỉ đạt giải ba. Cậu sai rồi. Nó đạt giải nhất cơ.
You say Sam only get prize third You wrong PRT He get prize first CƠ
'You said Sam would get the third prize only. You're wrong. He got the first prize.'

In sum, corrective contexts always allow the Speaker to assume that their utterance as an objection to the Addressee's utterances is not expected by the Addressee. Such contexts therefore support declaratives with *cơ* which I claim carry the implication about the Addressee's potential surprise. I have also discussed how the Speaker becomes aware of the Addressee's expectations. The Speaker can be directly told by the Addressee or indirectly make an inference with evidence from the Addressee's utterances, from the immediate context, and a private source.

2.2.2 Contrastive contexts

Next we move on to consider the second type of context that support declaratives with *cơ*. The most noticeable characteristic of contrastive contexts is the presence of contrastive topics (CTs) as illustrated previously in (12). Further examples of declaratives with *cơ* in contrastive contexts are given in (22) below. In these examples, instances of *cơ* are situated in dialogue sequences containing contrastive statements uttered by different speakers and in monologues with contrastive statements from the same speaker.

(22) *Cơ* in contrastive contexts:

i. Dialogue sequences

a. A: Kim khỏe nhất. $[Nó]_{CT}$ có thể chạy 10 vòng.
Kim strong most he able run 10 round
'Kim is the strongest. He can run 10 rounds.'

B: $[Sam]_{CT}$ có thể chạy 11 vòng **cơ**.
Sam able run 11 round CƠ
'Sam can run 11 rounds.'

b. A: $[Tôi]_{CT}$ hơn cậu 3 tuổi nên chúng ta chỉ có thể là bạn.
I more you 3 year-old so we only can be friend
'I am 3 years older than you so we can be friends only.'

B: [*Mẹ* anh]$_{CT}$ hơn bố anh 8 tuổi **cơ**.
Mother I more father I 8 year-old CƠ
'My mother is 8 years older than my father.'

ii. Monologue sequences:

a. Chúng ta chỉ [*nhịn khát*]$_{CT}$ được 3 ngày nhưng [*nhịn đói*]$_{CT}$
We only resist thirst able 3 day but resist hunger
được 3 tuần **cơ**.
able 3 week CƠ
'We can survive without water for only 3 days, but we can survive without food for 3 weeks.'

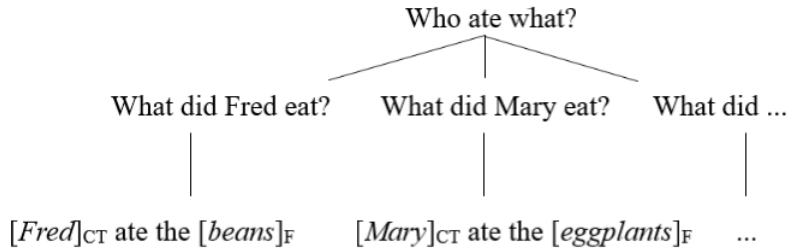
(from Nguyen (2012))

b. Chỗ này cách [*thị trấn* S]$_{CT}$ chỉ tầm 10km nhưng
Place this be-distant town S only about 10km but
cách [*thị trấn* G]$_{CT}$ khoảng 80km **cơ**.
be-distant town G about 80km CƠ
'This place is only about 10km away from the town S but about 80km away from the town G.'

Work on contrastive topic shows that CTs indicate the existence of multiple contrasting sub-questions for the current question under discussion (QUD) (Büring 2003, Constant 2014). (23) illustrates how a construction with CTs is analyzed.

(23) Constructions with CTs

[*Fred*]$_{CT}$ ate the [*beans*]$_F$. [*Mary*]$_{CT}$ ate the [*eggplant*]$_F$



(from Büring (2003))

Exchanges considered in this section are only a subtype of those with CTs defined above. Particularly, in those exchanges, contrastive statements marked with CTs support mutually exclusive answers to the current QUD. The current QUD is the one at the top of the QUD stack defined in Roberts (2012) as "the ordered set of all as-yet unanswered but answerable, accepted questions" of a discourse. Take (22.i.a)

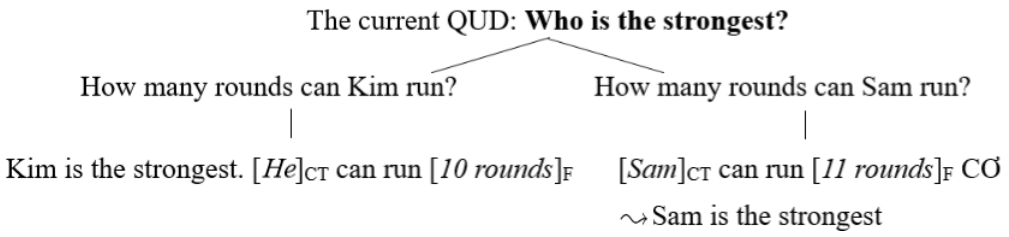
as an example for a declarative with *cơ* in a dialogue sequence. An analysis for the example is shown in (24). A possible current QUD for the exchange is indicated in bold in the discourse tree. Note that the discourse tree here is simplified, ignoring other information irrelevant to this discussion.

(24) *Cơ* in dialogue sequences of contrastive statements

a. A: Kim khỏe nhất. $[Nó]_{CT}$ có thể chạy 10 vòng.
Kim strong most he able run 10 round
'Kim is the strongest. He can run 10 rounds.'

B: $[Sam]_{CT}$ có thể chạy 11 vòng cơ.
Sam able run 11 round CƠ
'Sam can run 11 rounds.'

b. The discourse tree for the exchange:



The first contrastive statement about Kim's ability supports A's claim that Kim is the strongest which is an exhaustive answer to the current QUD. Note that it is not necessary for A to explicitly claim Kim to be the strongest. It can arise simply as an implication from the first contrastive statement. The declarative with *cơ* implies an objection to the claim and supports a different exhaustive answer to the QUD.

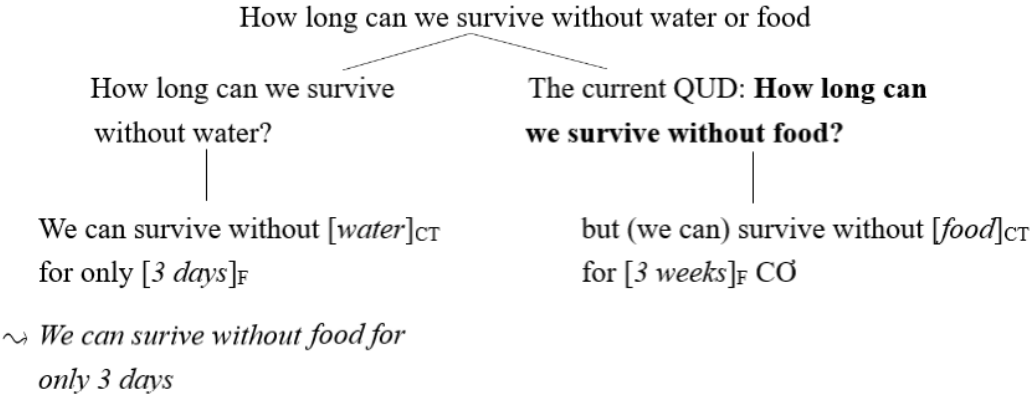
Contrastive statements in monologues can be analyzed in the same way. Take (22.ii.a) as an example, repeated here in (25). A possible current QUD for the exchange is indicated in bold in the discourse tree.

(25) *Cơ* in monologue sequences of contrastive statements:

a. Chúng ta chỉ $[nhịn\ khát]_{CT}$ được 3 ngày nhưng $[nhịn\ đói]_{CT}$ được 3 tuần cơ.
We only resist thirst able 3 day but resist hunger able 3 week CƠ
'We can survive without water for only 3 days, but we can survive without food for 3 weeks.'

(from Nguyen (2012))

b. The discourse tree of the exchange:



I argue that the existence of the implication in italics is marked by the presence of the contrastive coordinator *nhưng* 'but'. In Toosarvandani (2014), the English contrastive coordinator *but* with the counter-expectational use reflects that the contrastive statement following *but* contradicts an implication from the preceding contrastive statement. In (25), *nhưng* 'but' is used for the same purpose and thus can signal the emergence of the implication in italics. The two contrastive statements therefore support incompatible answers to the current QUD.

For completion, possible current QUDs for the other examples in (22i.b, ii.b) are respectively *'Can A and B have an intimate relationship?'* and *'How far is this place from the town G?'*.

Now we will see why *cơ* is found in contrastive contexts characterized by the presence of CTs and the relation between contrastive statements and the current QUD. I argue that these properties allow this type of context to license the implication of declaratives with *cơ* concerning the Addressee's potential surprise. First, the first contrastive statement of a sequence with CTs provides an answer to the current QUD. This answer allows the Speaker to make assumptions about the Addressee's expectations. Furthermore, this answer is in conflict either directly with the second contrastive statement of the sequence or indirectly with an implication from the second contrastive statement. This means the second contrastive statement is not expected by the Addressee. Second, the Speaker commits to the second contrastive statement and expects the Addressee to do the same. The second contrastive statement is therefore able to surprise the Addressee and thus is accepted with *cơ*. Take (18) again as an example, repeated here in (26). It is straightforward that B

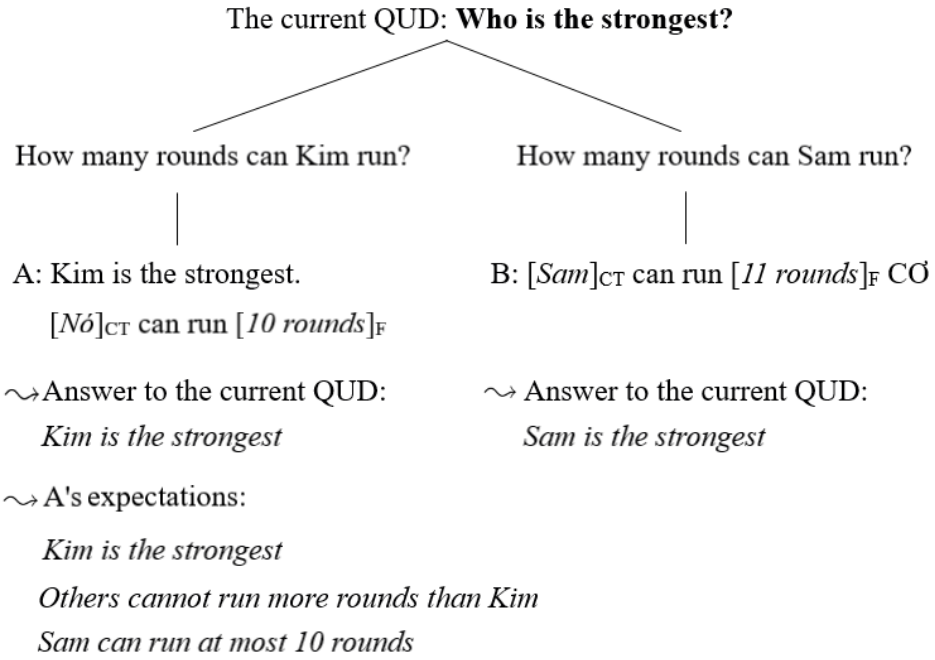
can make assumptions about A's expectations as indicated, given the answer to the QUD implied from A's statement.

(26) How dialogue sequences of contrastive statements support *cơ*

a. A: Kim khỏe nhất. $[Nó]_{CT}$ có thể chạy 10 vòng.
Kim strong most he able run 10 round
'Kim is the strongest. He can run 10 rounds.'

B: $[Sam]_{CT}$ có thể chạy 11 vòng cơ.
Sam able run 11 round CƠ
'Sam can run 11 rounds.'

b. An analysis for the exchange:

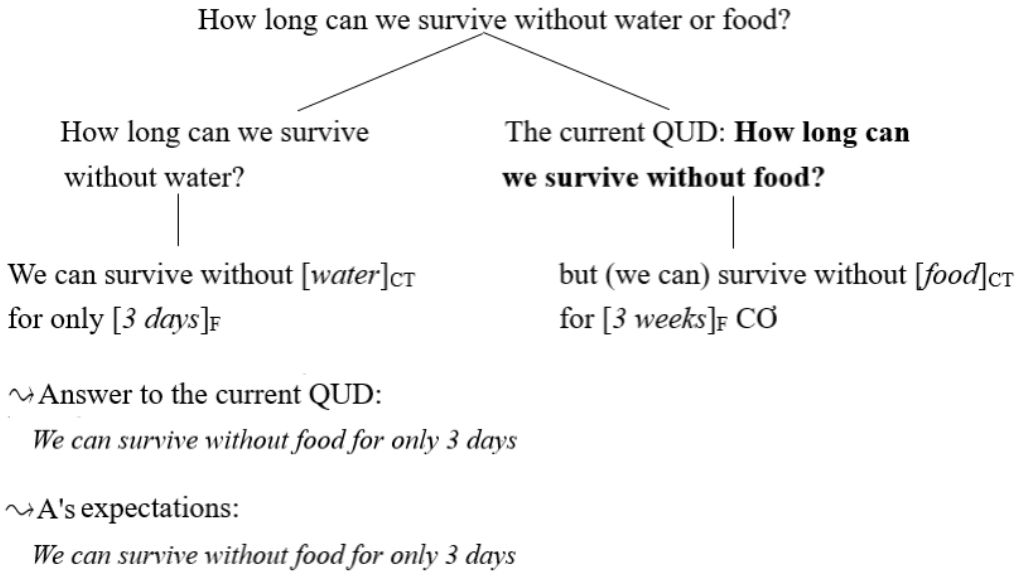


Things are similar but slightly more complicated for declaratives with *cơ* in monologues. In this case, contrastive statements are uttered by the same interlocutor. This, however, does not mean there is only one interlocutor in the context. It is very likely that the sentences in monologues with *cơ* are being delivered to someone else. The possibility that the Speaker is talking to themselves is also available. That case is considered as a conversation with one person playing the roles of the Speaker and the Addressee. With this in mind, (25) can be analyzed as shown in (27) below.

(27) How monologue sequences of contrastive statements support *cơ*

a. Chúng ta chỉ [*nhịn khát*]$_{CT}$ được 3 ngày nhưng [*nhịn đói*]$_{CT}$ được 3 tuần cơ.
We only resist thirst able 3 day but resist hunger able 3 week CƠ
'We can survive without water for only 3 days, but we can survive without food for 3 weeks.'

b. The discourse tree of the exchange:



As mentioned earlier, the contrastive coordinator reflects the existence of the answer to the current QUD implied from the first contrastive statement, as shown in italics. It is possible for the Speaker to assume that the Addressee has also reached the same answer to the QUD after hearing the first contrastive statement. In the same way that we saw in (26), the Speaker can make assumptions about the Addressee's expectations and continue with the second contrastive statement implying that the Addressee will be surprised.

In sum, I have addressed the two main properties of contrastive contexts: the presence of CTs and the incompatibility between the two contrastive statements with respect to the current QUD. I have shown that with these properties, contrastive contexts support the implication of declaratives with *cơ* about the Addressee's potential surprise. I have also indicated that the Speaker's awareness about the Addressee's expectations is mainly the result of the Speaker's inference based on the first contrastive statement and the current QUD.

2.2.3 Scalar contexts

In this section, I consider scalar contexts in which declaratives with *cơ* contain scalar *even*-like particles and receive a scalar meaning. I demonstrate examples of scalar contexts in (28) with the *even*-like particles *tận*, *còn* and *thậm chí*.

(28) *Cơ* in scalar contexts:

a. The declarative contains the *even*-like particle *tận*

Context: A asks B whether Sam's team got to the quarterfinal. B says:

Có. Bọn họ vào đến ?(**tận**) vòng chung kết **cơ**.
Yes they reach to EVEN round final CƠ
'Yes. They even made it to the final.'

b. The declarative contains the *even*-like particles *còn* and *nữa*.

Context: A asks B how Sam did in the test. B says:

Nó giải được câu 4. Nó #(**còn**) giải được câu 5 #(**nữa**) **cơ**.
He solve able CL 4 he EVEN solve able CL 5 EVEN CƠ
'He solved problem 4. He even solved problem 5.'

c. The declarative contains the *even*-like particle *thậm chí*.

Context: A asks B how their team members practiced. B says:

Kim chạy 6 vòng. Sam #(**thậm chí**) chạy 8 vòng **cơ**.
Kim run 6 round Sam EVEN run 8 round CƠ
'Kim ran 6 rounds. Sam even ran 8 rounds.'

Throughout this section, however, I will mainly consider examples with the most studied particle *thậm chí*. This particle is analyzed as an equivalent to English *even* (Hole 2013, Zimmermann 2015). Previous work on *even* agrees that the particle presupposes that its prejacent is less likely than other contextually salient alternatives (Horn 1969, Karttunen and Peters 1979, Rooth 1992, Kay 1990, Chierchia 2013 Greenberg 2016). I assume *thậm chí* with a similar meaning.

Now I will discuss the examples in (28) in more details. Since the *even*-like particles are replaced by *thậm chí*, the examples are repeated below.

(29) *Cơ* in scalar contexts:

a. Context: A asks B whether Sam's team got to the quarterfinal. B says:

Có. Bọn họ **thậm chí** vào đến vòng chung kết **cơ**.
Yes they EVEN reach to round final CƠ

'Yes. They even made it to the final.'

$\rightsquigarrow$ B's implicit claim: *Sam's team made it very far in the contest*

b. Context: A asks B how Sam did in the test. B says:

Nó giải được câu 4. Nó **thậm chí** giải được câu 5 **cơ**.
He solve able CL 4 he EVEN solve able CL 5 CƠ
'He solved problem 4. He even solved problem 5.'

$\rightsquigarrow$ B's implicit claim: *Sam did well in the test*

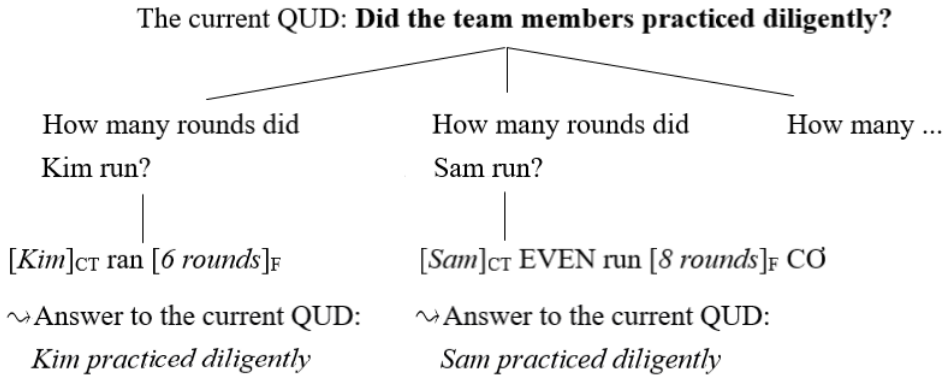
c. Context: A asks B how their team members practiced. B says:

$[Kim]_{CT}$ chạy 6 vòng. $[Sam]_{CT}$ **thậm chí** chạy 8 vòng **cơ**.
Kim run 6 round Sam EVEN run 8 round CƠ
'Kim ran 6 rounds. Sam even ran 8 rounds.'

$\rightsquigarrow$ B's implicit claim: *The team members practiced diligently*

In all three exchanges above, the declaratives with *cơ* and *thậm chí* are stronger than their preceding statement in arguing for the Speaker's purpose. In (29.a), B implicitly claims that Sam's team could go very far in the contest. The answer *có* 'yes' of B to A's question supports B's possible implicit claim as indicated. Given the world knowledge about contests, the content of B's second statement also supports this implicit claim and clearly strengthens B's first confirmation. In (28.b), both statements in B's utterance can argue for the claim that Sam did well in the contest. *Thậm chí* indicate that solving problem 5 is presupposed as least likely than solving other problems. The second statement asserting that Sam solved problem 5 thus is a stronger argument that the first statement saying that Sam solved problem 4. The last example (29.c) contain CTs and seems to resemble the example of contrastive contexts (22.i.a). The structure of this exchange is in fact different due to the presence of *thậm chí*, as shown in (30). In particular, the two contrastive statements are construed as supporting compatible answers to the current QUD rather than mutually exclusive answers as in (22.i.a). The two statements here therefore both argue for B's implicit claim that the team members practiced diligently. The declarative with *thậm chí* and *cơ* in this case also forms a stronger argument than its preceding statement.

(30) The structure of the exchange in (29.c):



The discussion above shows that scalar contexts are rather different from corrective and contrastive contexts. For those two types of context, there exists some sort of conflict between the Speaker and the Addressee or between the two contrastive statements. Such conflict is the source of the Addressee's potential surprise. Scalar contexts do not involve such conflict. For an exchange in scalar contexts, the sentence to which *cơ* can be added even strengthens its preceding sentence. The fact that the implication about the Addressee's potential surprise of declaratives with *cơ* is satisfied in scalar contexts thus is interesting. I argue that the presupposition of the scalar *even*-like particle *thậm chí* plays a crucial role. Consider again the example in (28.a), repeated here in (31).

(31) How scalar contexts support declaratives with *cơ*

Context: A asks B whether Sam's team got to the quarterfinal. B says:

Có. Bọn họ thậm chí vào đến vòng chung kết cơ.
Yes they EVEN reach to round final CƠ
'Yes. They even made it to the final.'

⇝ *Thậm chí*'s presupposition: *It is less likely for Sam's team to reach the final than for them to reach the previous rounds*

⇝ A's expectations: *Sam's team only made it to the quarterfinal*

In this context, *thậm chí* indicates that the chance for Sam's team to reach the final is presupposed very small. B assumes that it is A who holds this presupposition. Based on both the presupposition and A's question, B makes a further extreme inference about A's expectations as indicated in (31). The declarative with *thậm chí*

then asserts that A's expectations are false which will in turn surprise A. The use of *cơ* in this sentence with *thậm chí* therefore is accepted.

A similar explanation can be proposed for (28.b – c). In both exchanges, B assumes A holds the presupposition indicated by *thậm chí*. B then further assumes that A has the expectations as shown when hearing B's first sentence. This is similar to what the Speaker assumes for declaratives with *cơ* in monologue sequences of contrastive statements as in (25). However, more effort is needed in (28.c) than (28.b) to infer A's expectations about Sam since B's first sentence in (28.c) does not directly refer to Sam but Kim.

(32) How scalar contexts support declaratives with *cơ*

a. Context: A asks B how Sam did in the test. B says:

Nó giải được câu 4. Nó thậm chí giải được câu 5 cơ.
He solve able CL 4 he EVEN solve able CL 5 CƠ
'He solved problem 4. He even solved problem 5.'

$\rightsquigarrow$ *Thậm chí*'s presupposition: *It is less likely for Sam to solve problem 5 than for him to solve other problems*

$\rightsquigarrow$ A's expectations: *Sam solved problem 4 only*

b. Context: A asks B how their team members practiced. B says:

$[Kim]_{CT}$ chạy 6 vòng. $[Sam]_{CT}$ #(thậm chí) chạy 8 vòng cơ.
Kim run 6 round Sam EVEN run 8 round CƠ
'Kim ran 6 rounds. Sam even ran 8 rounds.'

$\rightsquigarrow$ *Thậm chí*'s presupposition: *It is less likely for Sam to run 8 rounds than for him to run 7 rounds or less*

$\rightsquigarrow$ A's expectations: *Sam ran at most 6 rounds*

In sum, I have discussed the third type of context for declaratives with *cơ*. In scalar contexts, declaratives with *cơ* additionally contain so-called *even*-like particles which result in the interpretation of the whole sentence with a scalar meaning. The discussion mainly focused on *thậm chí*, which is established to be equivalent to English *even*. I showed that the contribution of *thậm chí* is critical in supporting the implication about the Addressee's potential surprise of declaratives with *cơ*.

2.2.4 The surprise restriction

The issue we have looked at in this chapter thus far is why declaratives with *cơ* can be licensed in corrective, contrastive, and scalar contexts. I have pointed out that these contexts license the implication about the Addressee's potential surprise of declaratives with *cơ*. Now, I argue that this is a necessary contextual condition for the felicity of declaratives with *cơ*. I will show that in contexts which fail to support the implication, declaratives with *cơ* are prohibited. Simultaneously, I argue that this restriction is derived from the meaning of *cơ* based on the observations that their *cơ*-less counterparts are accepted in those contexts. I therefore argue that *cơ* in declaratives reflects the Addressee's potential surprise.

The first observation is that declaratives with *cơ* cannot be used out of the blue or to initiate a topic or a conversation but it is possible for most ordinary declaratives without *cơ*. We can straightforwardly account for this contrast if the implication about the Addressee's potential is a part of a declarative with *cơ* and is derived from the meaning of the particle. In the observed scenarios, there is no contextual information or prior assumptions except the content of the declarative itself. It is thus impossible for the Speaker in this kind of context to obtain information about the Addressee's expectations and signal that their sentence will surprise the Addressee. Declaratives with *cơ* always carry this implication, and therefore, cannot be licensed in such contexts. The implication, in contrast, is not part of *cơ*-less declaratives' meaning, allowing them to have wider distribution.

The meaning component pertaining to the Addressee's potential surprise is, in fact, the underlying reason for why declaratives with *cơ* are incapable of various other functions which are typical of ordinary declaratives (Asher and Lascarides 2003), some of which are illustrated in (33).

(33) Examples of discourse functions which declaratives with *cơ* are incapable of

a. Confirmation

A: Sam mua 10 hộp à?
Sam buy 10 box Q
'Sam bought 10 boxes, right?'

B: Phải (#cơ). Nó mua 10 hộp (#cơ).
Right CƠ he buy 10 box CƠ
'Right. He bought 10.'

b. Elaboration

Context: A asks B how Sam did in the examination. No further information is provided. B says:

Nó làm bài khá tốt. Nó giải được 4 câu (#cơ).
He do test quite well he solve able 4 CL CƠ
'He did quite well. He solved 4 problems.'

c. Responding to an information-seeking question

A: Sam đạt giải mấy?
Sam get prize what
'What prize did Sam get?'

B: Nó đạt giải nhất (#cơ).
He get prize first CƠ
'He got the first prize.'

In (33.a) where B aims to confirm A's bias implied by A's question, both the confirmation particle *phải* and the declarative echoing A's question are accepted given the absence of *cơ*. This is straightforward since it is impossible for A to simultaneously expect and to be surprised at the same piece of information. In (33.b – c), B's purpose is to elaborate on their previous claim and to respond to A's information-seeking *wh*-question respectively. The infelicity of *cơ* arises since no contextual information suggests that B can make assumptions about A's expectations. The use of *cơ* can be improved if further contextual information is provided. For example, it is assumed that B has private information regarding A's expectations. Then even though A's question does not imply anything about A's expectations, B still can use *cơ* to convey that B's information will surprise A. The same pattern is observed if A asks information-seeking polar or alternative questions instead of a *wh*-question.

In the discussion about contrastive contexts, we saw that the first contrastive statement and the declarative with *cơ* support mutually exclusive answers to the QUD. Now, we will see that some contexts where there is no such relation between the two contrastive statements fail to license *cơ*. Consider the scenario in (34) below.

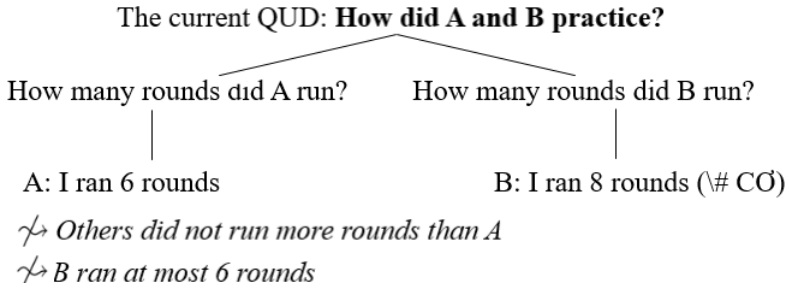
(34) Contrastive statements support compatible answers to the current QUD

a. Context: B is a humble person. A and B run many rounds today. Later C asks about their practice, A and B say:

A: [*Tớ*]$_{CT}$ chạy 6 vòng.
I run 6 round
'I ran 6 rounds'

B: [*Tớ*]$_{CT}$ chạy 8 vòng (#cơ).
I run 8 round CƠ
'I ran 8 rounds.'

b. The discourse tree of the exchange



In this exchange, the information about B's personality allows us to assume that B does not want to compare himself with A. Therefore, the QUD *who practiced most diligently* is not raised. Both A and B are answering the QUD *how did A and B practice* instead. Their answers to this QUD are compatible. A's and B's statements are partial answers to this QUD and are not mutually exclusive. The implications in italics indicated in the discourse tree, therefore, do not arise. It means B does not make any assumptions about A's expectations and the potential unexpectedness of their own sentence. The infelicity of *cơ* in this context is expected and thus supports the claim that *cơ* in declaratives reflects the Addressee's potential surprise.

We have seen many contexts in which *cơ* cannot occur. Those contexts all share the common property that they fail to help the Speaker infer the Addressee's expectations. As a result, they cannot support the implication about the Addressee's potential surprise required of declaratives with *cơ*. Note that the given definition of surprise includes constraints on the resulting information set of the attitude holder, i.e the Addressee for declaratives with *cơ*, in addition to constraints on the initial set. In particular, for a declarative with *cơ*, the Addressee is expected to become biased toward the proposition denoted by the sentence, as the resulting of hearing the sentence from the Speaker. This condition is always satisfied by the pragmatic properties of declaratives. As discussed in the previous sections, the Speaker of a declarative commits to the denoted proposition and thinks the Addressee will commit to it as well. We may wonder whether the constraint on the resulting information set of the Addressee is part of the contribution of *cơ* in declaratives. I argue that it is indeed. Evidence comes from the use of *cơ* in polar questions, which will be discussed in the next chapter. I therefore maintain the conclusion that the surprise restriction on declaratives with *cơ* is rooted from the meaning of the particle.

2.3 Expectation and Scalarity

This section addresses the second part of the intuition about *cơ* in declaratives: the implication that the Addressee has "low expectations". In what follows, I will elaborate on the intuitive notion of "low expectations". I argue that this implication imposes further restriction on the distribution of declaratives with *cơ* and is derived from the scalar component in the meaning of *cơ*. In particular, I will show that only a subset of contexts that meet the surprise restriction can license the use of *cơ*. In addition, I will carry out a cross-linguistic comparison of *cơ* with the English scalar particle *even* to show that the scalar component cannot derive the implication about the Addressee's potential surprise. I argue that the implications of declaratives with *cơ* must be derived from different components in the meaning of *cơ*.

2.3.1 Low expectations

Let's start with the interpretation of "low expectations". When *cơ* is used, there is a strong intuition that the content of the declarative with *cơ* is able to surprise the Addressee because they have "low expectations". By way of example, consider an instance of *cơ* in a corrective context.

(35) Low expectations

A: Sam đạt 70 điểm.	B: Không phải. Nó đạt 90 điểm cơ.
Sam get 70 point	Not true he get 90 point CƠ
'Sam scored 70 points.'	'That's not true. He scored 90 points.'

$\rightsquigarrow$ A's expectations: *Sam scored 70 points.*

The exchange above revolves around the issue concerning the score Sam got. The score A expects, referred to in A's statement, is lower than the score B informs. In this scenario, we can say that A has low expectations relative to B's claim on the scale determined by scores.

In (35) above, A's expectations are concerned with one alternative score, i.e. a score of 70. The Addressee's expectations can refer to a set of alternative scores as well. In (36), the quantifier *nhiều nhất* 'at most' in A's statement reflects that A's expectations about Sam's score refer to a set of scores. All scores in this set are lower than the score B informs. A's expectations in this scenario therefore are also considered low relative to B's claim on the scale determined by scores.

(36) Low expectations as a set of alternatives

A: Sam nhiều nhất đạt 70 điểm. B: Không phải. Nó đạt 90 điểm cơ.
Sam many most get 70 point Not true he get 90 point CƠ
'Sam scored at most 70 points.' 'That's not true. He scored 90 points.'

$\rightsquigarrow$ A's expectations: *Sam scored at most 70 points*

The two examples above suggest that for the use of *cơ*, the Addressee has low expectations if the proposition denoted by the declarative with *cơ*, i.e. the prejacent proposition of *cơ*, is higher than all the propositional alternatives that the Addressee's expectations refer to on a given scale. For short, I call those alternatives as expected alternatives. A formal definition of expected alternatives will be given in chapter 4. For now, I argue that focus, in addition to the Addressee's expectations, plays a crucial role in determining the set of expected alternatives needed for the interpretation of *cơ*. Evidence comes from the observation that *cơ* is focus sensitive. Consider the contrast in (37). The subscripted F indicates where focus is placed [3].

(37) *Cơ* is focus sensitive

a. Focus is placed on the indirect object

A: Sam cho 10 người vay nhiều nhất \$200.
Sam allow 10 people borrow many most \$200
'Sam lent 10 people at most \$200.'

$\rightsquigarrow$ A's expectations: *Sam lent 10 people at most \$200*

$\rightsquigarrow$ The expected alternative set = {*For every n* $\leq$ *200, Sam lent 10 people \$n*}

B: Không phải. Sam cho 10 người vay $[\$500]_F$ cơ.
Not true Sam allow 10 people borrow \$500 CƠ
'That's not true. Sam lent 10 people \$500.'

b. Focus is placed on the direct object

A: Sam cho nhiều nhất 5 người vay \$500.
Sam allow many most 5 people borrow \$500
'Sam lent at most 5 people \$500'

$\rightsquigarrow$ A's expectations: *Sam lent at most 5 people \$500*

$\rightsquigarrow$ The expected alternative set = {*For every n* $\in \mathbb{N}$ *such that n* $\leq$ *5, Sam lent n people \$500*}

[3]On the phonetic realization of focus in Vietnamese, see Jannedy (2007)

B: Không phải. Sam cho [10 người]$_F$ vay \$500 cơ.
Not true Sam allow 10 people borrow \$500 CƠ
'That's not true. Sam lent 10 people \$500.'

The exchange in (37.a) revolves around the amount of money Sam lent people. As inferred from A's claim, A's expectations are also concerned with this issue. This correlates with the placement of focus on the indirect object in the declarative with *cơ*. Such a correlation is also observed in (37.b). In this case, the same declarative with *cơ* is uttered but focus is placed on the direct object. A's expectations here vary accordingly. A's expectations inferred from A's claim are concerned with the number of people Sam lent money. The correlation between the placement of focus and A's expectations observed in the two exchanges suggests that focus plays a role in specifying the set of expected alternatives relevant to the interpretation of *cơ*.

2.3.2 The scalar restriction

In the previous section, I claimed that declaratives with *cơ* imply that the prejacent proposition of *cơ* is higher than its expected focus alternatives on a given scale. Now I will show that this implication imposes a scalar restriction on declaratives with *cơ*, in addition to the surprise restriction. I argue that the scalar restriction is also derived from the meaning of *cơ*.

At the first glance, there seems to be a violation of the scalar restriction in all infelicitous instances of *cơ* in corrective, contrastive and scalar contexts. For each scenario in (38), only the declarative with *cơ* with the prejacent of *cơ* being higher than its expected focus alternatives on a given scale is accepted. For the infelicitous declarative with *cơ*, the prejacent is not higher than its alternatives.

(38) Apparent violation of the scalar restriction

a. Corrective contexts

A: Sam mua nhiều nhất 10 quyển
Sam buy at-most 10 CL
'Sam bought at most 10 books.'

B: Nó mua {15/ #5} quyển cơ.
He buy 15 5 CL CƠ
'He bought {15/ 5} books.'

$\rightsquigarrow$ The expected focus alternative set = *{For every n $\leq$ 10, Sam bought n books}*

b. Contrastive contexts

A: Kim chăm nhất. $[Nó]_{CT}$ chạy 8 vòng.
Kim diligent most he run 8 rounds
'Kim is the most diligent. He ran 8 rounds.'

$\rightsquigarrow$ The expected focus alternative set = *{For every n ≤ 8, Sam ran n rounds}*

B: $[Sam]_{CT}$ chạy {10/ #6} vòng cơ.
Sam run {10 6} round CƠ
'Sam ran {10/ 6} rounds.'

c. Scalar contexts

Kim đạt giải bạc. Sam thậm chí đạt giải {vàng/ #đồng} cơ.
Kim get CL silver Sam EVEN get CL {gold bronze} CƠ.
'Kim got a silver medal. Sam even got {a gold/ #a bronze}.'

$\rightsquigarrow$ The expected focus alternative set = {*For every medal n ranking lower than or equal to the silver medal, Sam got the medal n*}

However, observe that the surprise restriction discussed previously can also account for the contrasts in (38). In (38.a), the infelicitous declarative with *cơ*, which refers to a smaller number of books, is expected by A. This sentence therefore cannot satisfy the surprise requirement. It is similar in (38.b – c). The sentence referring to a smaller number of rounds and the one referring to a prize of lower rank are both also expected by A and thus unable to surprise A.

The actual argument for the scalar restriction comes from the infelicity of *cơ* in some corrective contexts. Consider the example below:

(39) Violation of the scalar restriction

A: Sam mua **ít nhất** 10 quyển sách phải không?
Sam buy at-least 10 CL book correct Q
'Sam bought at least 10 books, right?'

$\rightsquigarrow$ A's expectations: *Sam bought at least 10 books*

$\rightsquigarrow$ The expected focus alternative set = {*For every n ≥ 10, Sam bought n books*}

B: Không phải. Nó mua 5 quyển (#cơ).
Not true He buy 5 CL CƠ
'That's not true. He bought 5 books.'

In this scenario, A's expectations about the number of books Sam bought are inferred from the biased question (39A). The expression *ít nhất* 'at least' in the question

reflects a set of alternatives referring to the numbers of books ranging from 10. The number B informs (5 books) is clearly unexpected for A. The infelicity of *cơ* in this context can therefore only be accounted for by the scalar restriction. The prejacent proposition of *cơ* is clearly not higher than its expected focus alternatives. Furthermore, the *cơ*-less counterpart is acceptable in this context, suggesting that the scalar restriction is derived from the meaning of *cơ*.

Further examples illustrating the effect of the scalar restriction are given in (40).

(40) Violation of the scalar restriction

a. A: Tớ đoán Sam đạt giải ba hoặc giải nhì.
I guess Sam get prize third or prize second
'I guess Sam got the third prize or the second prize.'

⇝ A's expectations: *Sam got the third prize or the second prize*

⇝ The expected focus alternative set = {*Sam got the third prize; Sam got the second prize*}

B: Không phải. Nó đạt giải khuyến khích (#cơ).
Not true He got prize consolation CƠ
'That's not true. He got the consolation prize.'

b. A: Thùng hàng này phải nặng trên 20kg.
Packet this must weigh more-than 20kg
'This packet must weigh more than 20kg.'

⇝ A's expectations: *This pack weighs more than 20kg*

⇝ The expected focus alternative set = {*For every n > 20, this pack weighs n kg*}

B: Không phải. Nó nặng 15kg (#cơ).
Not true it weigh 15kg CƠ
'That's not true. It weighs 15kg.'

2.3.3 *Cơ* and English *even*

In the previous section, I argued that the surprise restriction is not sufficient to account for the distribution of declaratives with *cơ* and submitted the scalar restriction. This section focuses on the other side of the issue, arguing for the necessity of both restrictions. The cross-linguistic comparison between *cơ* and the English scalar *even* will show that scalarity alone cannot derive the surprise restriction.

For this discussion, *even* has a scalar meaning as illustrated in (41). The scalar component of *even* requires the prejacent proposition to be stronger than all its focus alternatives on a given scale (Horn 1969, Karttunen and Peters 1979).

(41) Contribution of *even*:
Donna **even** ate the [stinky tofu]$_{\text{F}}$

a. Assertion: *Donna ate the stinky tofu*

b. Scalar inference: *It is less likely for Donna to eat the stinky tofu than for her to eat other things*

(from Erlewine 2014)

I have shown that *cơ* requires the prejacent proposition of *cơ* to be higher than all its expected focus alternatives on a given scale. The scalar restriction of *cơ* is different from that of *even* with respect to the alternative set. For *cơ*, in addition to focus, the Addressee's expectations play a role in determining this set. If scalarity itself can derive the surprise restriction, i.e. *cơ* merely invokes a set of focus alternatives, *cơ* should have the same meaning and distribution as *even*. This is, however, contrary to the fact. In some contexts, the two particles have complementary distributions. I argue that the surprise restriction is necessary. In what follows, I will present two sets of data that support the claim. The discussion also includes *thậm chí* which is proposed to be a Vietnamese counterpart of *even*.

The first set of data is concerned with the sensitivity of the particles to the current QUD. The scenarios in (42) invoke different current QUDs. The judgements for the particles correlate with the variation in the current QUD. Furthermore, in both scenarios, the judgement for *cơ* and for *even* and *thậm chí* are the opposite of one another.

(42) Sensitivity to the current QUD

i. **The current QUD: Which student is the tallest?**
Context: C asks A and B about the tallest student in their school. A mentions Kim and his height of 1.85m.
$\rightsquigarrow$ A's expectations: *Kim is the tallest, Sam is at most 1.85m tall*
$\rightsquigarrow$ *It is least likely for Sam to be 1.9m tall*
B then says:

a. Sam cao 1.9m **cơ**.
   Sam tall 1.9m CƠ

b. ?? Sam **thậm chí** cao 1.9m.
   Sam EVEN tall 1.9m

c. ?? Sam is **even** 1.9m tall.

ii. **The current QUD: Does the school have tall students?**

Context: C heard that A and B's school has tall students. Later, C ask them if that is true. A confirms it, mentioning Kim and his height of 1.85m.

$\not\rightsquigarrow$ A's expectations: *Kim is the tallest*, *Sam is at most 1.85m tall*

$\rightsquigarrow$ *It is least likely for Sam to be 1.9m tall*

B then adds:

a. # Sam cao 1.9m **cơ**.
   Sam tall 1.9m CƠ

b. Sam **thậm chí** cao 1.9m.
   Sam EVEN tall 1.9m

c. Sam is **even** 1.9m tall.

The context in (42.i) is a typical instance of contrastive contexts in which the contrastive statements from A and B support mutually exclusive answers to the current QUD. Both the scalar restriction of *cơ* and the scalar inference of *even* and *thậm chí* can be supported in this context. The felicity of *cơ* in (42.i), therefore, is expected. *Even* and *thậm chí*, however are not licensed. This suggests that the meaning of *even* and *thậm chí* given in (41) might be inadequate.

Now, consider (42.ii). The current QUD is different, and the two contrastive statements now support compatible answers to this QUD. Nothing in this context prevents the scalar inference of *even* and *thậm chí*. The two particles are acceptable. If *cơ* and these scalar particles have same meaning, the infelicity of *cơ* is puzzling. If the scalarity of *cơ* however is different, the contrast between the particles can be straightforwardly accounted for. The context in (42.ii) cannot meet the surprise restriction, akin to (34) discussed previously, rendering *cơ* infelicitous.

Further support for the importance of the surprise restriction comes from the observations concerning the interaction of the particles with coordinators. In (43 –

44), the judgement for the particles correlates with the use of coordinators. Again, *cơ* and the scalar particles *even* and *thậm chí* have complementary distributions.

(43) Interaction with contrastive coordinator *nhưng* 'but'

a. Chúng ta chỉ nhịn khát được ba ngày **nhưng** (chúng ta) nhịn
We only resist thirsty able three day BUT we resist
đói được ba tuần **cơ**.
hungry able three week CƠ

b. Chúng ta chỉ nhịn khát được ba ngày **nhưng** (chúng ta)
We only resist thirsty able three day BUT we
(#**thậm chí**) nhịn đói được ba tuần.
EVEN resist hungry able three week

c. We can survive without water for only three days, **but** we can (#**even**) survive without food for three weeks.

$\rightsquigarrow$ *It is least likely for us to survive without food for three weeks*

$\rightsquigarrow$ Implication from the first contrastive statement: *We can survive without food for at most three days.*

$\rightsquigarrow$ A's expectations: *We can survive without food for at most three days.*

(44) Interaction with logical conjunction *và* 'and'

a. Chúng ta nhịn khát được ba ngày **và** (chúng ta) nhịn đói
We resist thirsty able three day AND we resist hungry
được ba tuần (??**cơ**).
able three week CƠ

b. Chúng ta nhịn khát được ba ngày **và** (chúng ta) **thậm chí**
We resist thirsty able three day AND we EVEN
nhịn đói được ba tuần.
resist hungry able three week

c. We can survive without water for three days **and** we can **even** survive without food for three weeks.

$\rightsquigarrow$ *It is least likely for us to survive without food for three weeks*

$\not\rightsquigarrow$ Implication from the first contrastive statement: *We can survive without food for at most three days.*

$\not\rightsquigarrow$ A's expectations: *We can survive without food for at most three days.*

The exchange with *cơ* in (43) was already discussed in (27), which is a monologue sequence of contrastive statements conjoined by the contrastive coordinator *nhưng* 'but'. This contrastive context clearly can support the scalar restriction of *cơ* and thus can license the particle. The scalar inference of *even* and *thậm chí* can be supported as well. However the two particles are again unexpectedly odd, possibly for the same reason as in (42.i) above.

In (44), *nhưng* 'but' is replaced by the logical conjunction *và* 'and'. The contrast between *cơ* and the two particles *even* and *thậm chí* confirms that they have different meanings. The infelicity of *cơ* is explained as follows. Following Toosarvandani (2014) on English *but* and *and*, I claim that unlike *nhưng* 'but', *và* 'and' reflects that the implication from the first contrastive statement as indicated does not arise. In addition, the second statement does not include an *even*-like particle. Therefore, nothing prevents the Speaker to think people can survive without food for more than 3 days. As a result, the second statement is expected for the Addressee and cannot be combined with *cơ*.

I conclude that the surprise and scalar restrictions are both necessary and derived from the meaning of *cơ*. In addition, the cross-linguistic comparison of *cơ* with English *even* contributes to refine the meaning of *even* and its equivalents in other languages.

2.4 Summary

I have discussed the use of *cơ* in declaratives. The generalization about its contribution to its host sentence is given in (45):

(45) The generalization about *cơ* in declaratives
Cơ in declaratives reflects that:
   a. The prejacent proposition of *cơ* will surprise the Addressee, and
   b. The prejacent proposition is higher than all its expected focus alternatives on a given scale.

In the next Chapter, I will investigate *cơ* in polar questions. We will see that the contribution of *cơ* to the host question is similar to its contribution in declaratives. This is crucial for proposing a unified formal characterization of *cơ* in chapter 4.

Chapter 3

Cơ in Polar Questions

3.1 Introduction

This chapter investigates the use of *cơ* in polar questions (PQs), focusing on the interaction of *cơ* with PQs marked by question particles *không*, *à*, and *á*. The main observation is that *cơ* is incompatible with PQs with *không* but is licensed in PQs with *à* and *á*, as shown in (46).

(46) Cơ in polar questions

a. PQs with *không*	Sam (có) đạt giải nhất (#**cơ**) **không**? Sam PRT get prize first CƠ KHÔNG 'Did Sam get the first prize?'
b. PQs with *à*:	Sam đạt giải nhất (**cơ**) **à**? Sam get prize first CƠ À 'Sam got the first prize?'
c. PQs with *á*:	Sam đạt giải nhất (**cơ**) **á**? Sam get prize first CƠ Á 'Sam got the first prize?'

I argue that the observation in (46) empirically supports the claim that *cơ* in polar questions has a similar contribution as *cơ* in declaratives: to reflect someone's surprise due to low expectations. The behavior of *cơ* in (46) can be accounted for by considering the contextual constraints of *cơ* and the PQ markers.

The structure of this chapter is as follows. First, in section 3.2, I will describe the uses of the three type of PQs without *cơ* and point out their felicity conditions respectively. We will see that PQs with *không* are neutral and are used for seeking

information. PQs with *à* and *á* carry the Speaker's bias and have multiple uses. Next, in Section 3.3, I will examine PQs with *cơ* in detail. The main observation is that PQs with *cơ* always involve Speaker surprise and thus are subject to stricter contextual constraints than their *cơ*-less counterparts. I argue that whether *cơ* is compatible with a PQ marker depends on whether the contextual constraints of these particles are simultaneously satisfied. In addition, I will show that PQs with *cơ* obey the same scalar restriction as declaratives with *cơ*. I conclude that it is possible to unify the uses of *cơ* in declaratives and in polar questions.

3.2 Polar questions in Vietnamese

In this section, we will study the PQs marked by the question particle *không*, *à* and *á*, as illustrated in (47).

(47) Three types of PQs

a. PQs with *không* [4]
Sam (có) thích màu xanh không?
Sam PRT like CL blue KHÔNG
'Does Sam like blue?'

b. PQs with *à*:
Sam thích màu xanh à?
Sam like CL blue À
'Does Sam like blue?' and ⇝ *there is evidence that he does and therefore I think he does.*

c. PQs with *á*:
Sam thích màu xanh á?
Sam like CL blue Á
'Does Sam like blue?' and ⇝ *there is evidence that he does but I think he doesn't.*

[4]The label "PQs with *không*" used here refers to questions with the syntactic structure as in (47.a). It excludes those formed by inserting the combination of *không* with *đúng/ phải*, as shown below. These questions have different syntactic structures (Trinh 2005) and are semantically biased (McClive 2002).

(1) Có {phải/ đúng} là Sam thích màu xanh không?
PRT RIGHT that Sam like CL blue KHÔNG
'Is it right that Sam likes blue?'

(2) Sam thích màu xanh (có) {phải/ đúng} không?
Sam like CL blue PRT RIGHT KHÔNG
'Sam likes blue, right?'

As shown in (47), PQs with *không* are formed by bordering the predicate of a declarative sentence with the morphemes *có* and *không* [5]. For the other two types, a question particle, *à* or *á*, is placed at the right edge of a declarative sentence. For further discussion on the syntactic structure of these PQs, see Nguyen (1997), McClive (2002), Trinh (2005), Duffield (2013), Le (2015)).

What is of interest to us here is the use-conditional or pragmatic aspect in the meaning of these PQs. As roughly suggested by the translations in (47), PQs with *không* are neutral whereas the other two are biased. In the following sections. I will discuss in detail their uses and their use conditions.

3.2.1 Polar questions with *không*

The use of PQs with *không* as neutral questions has been noted in the literature on Vietnamese PQs (McClive 2002, Trinh 2005). Evidence for the neutrality of PQs with *không* presented in Trinh (2005) comes from cross-linguistic comparison. It is claimed that English PQs which necessarily carry bias, as in (48), cannot be expressed in Vietnamese by a PQ with *không*.

(48) Some types of English biased questions that cannot be expressed in Vietnamese by a PQ with *không*

a. Rising declarative: Sam likes blue?

b. Preposed negation: Doesn't Sam like blue?

The neutrality of PQs with *không* in McClive (2002) is defined in terms of bias in response. McClive claims that the Speaker has no bias toward a positive answer as well as toward a negative answer when asking a PQ with *không* [6].

[5] Below is an example with the negation marker *không*:

(1) Sam không thích màu xanh.
Sam NEG like CL blue
'Sam does not like blue.'

For a thorough discussion on the syntactic structure of constructions containing the question morpheme *không* and the negation marker *không*, the reader is referred to Trinh (2005) and Duffield (2013).

[6] What I mean by 'positive' and 'negative' answers is that the former confirms whereas the latter rejects the propositional content of the corresponding question. For example, for a PQ with *không* of the form *'p không?'*, its positive answer entails p and its negative answer entails $\neg p$.

The consideration of bias in response can capture the intuition about the neutrality of PQs with *không* but is insufficient to deal with the complexity of biased questions with *à* and *á*. The infelicity of the PQs in (49) below illustrates the point.

(49) The complexity of biased question with *à* and *á*

Context: A tells S that Sam has no blue clothes. A then says:

a. # Sam thích màu xanh à?
Sam like CL blue À
'Does Sam like blue?'

(and ⇝ *there is evidence that he does and therefore* <u>*I think he does*</u>.)

b. # Sam thích màu xanh á?
Sam like CL blue Á
'Does Sam like blue?'

(and ⇝ *there is evidence that he does but* <u>*I thinks he doesn't*</u>.)

The information in italics suggests the need to consider both contextual evidence and the Speaker's bias in response when judging these PQs. The part concerning the Speaker's bias, which is underlined, expresses that the expected response to (49.a) is a positive *yes* and to (49.b) a negative *no*. If only the Speaker's bias is considered, the infelicity of the PQ with *á* in (49) is puzzling. Particularly, our reasoning for the infelicity of *à* can be that the context does not support A's bias toward a positive answer. However, we can also reason in the same way that the context supports A's bias toward a negative answer and the PQ with *á* should be felicitous, which is however not the case. On the other hand, if contextual evidence is taken into account, it is straightforward that the contextual requirements of both PQs are violated, which is the actual reason for their infelicity.

I submit that both contextual evidence and the Speaker's bias are considered when studying PQs with *không*, *à* and *á*. I adopt the notion of contextual evidence proposed in Buring and Gunlogson (2000), as stated in (50). The definition excludes information in the common ground, i.e. the set of beliefs and assumptions agreed by all the participants, and private beliefs of the participants.

(50) **Contextual evidence**: Evidence that has just become mutually available to the participants in the current discourse situation

The consideration of contextual evidence allows us to distinguish between neutral contexts and non-neutral contexts. Buring and Gunlogson (2000)'s definition of neutral contexts is given in (51).

(51) **Neutral Context**: A context is neutral for a PQ with propositional content p if there is neither contextual evidence for nor against p.

Accordingly, if a context does not have the properties indicated in (51), it is classified as a non-neutral context.

With respect to bias in response, I follow Sudo (2013) to classify bias into "epistemic bias" and "evidential bias". Epistemic bias is only concerned with the Speaker's private beliefs. Evidential bias is rooted in contextual evidence. I assume the descriptive condition in (52) to identify if the Speaker is biased toward a response.

(52) **Bias in response**: The Speaker is biased toward p when asking a PQ with the propositional content p or $\neg p$ if the Speaker either has private evidence for p or accepts contextual evidence for p.

With all the necessary definitions in place, I will now describe the use of PQs with *không* and their felicity conditions. The central observation is that PQs with *không* are used to seek information, found in neutral contexts, and require the Speaker to be unbiased. Consider the below example:

(53) PQs with *không* require a neutral context
Context: A considers a blue hat for Sam because it looks very nice. However, since she does not know much about Sam, she worries that Sam may hate blue. A goes to ask B. A says:

a. Sam có thích màu xanh không?
Sam PRT like CL blue KHÔNG
'Does Sam like blue?'

b. Sam có ghét màu xanh không?
Sam PRT hate CL blue KHÔNG
'Does Sam hate blue?'

In the above context, A can ask the PQ in (53.a) or the one in (53.b), both of whose propositional contents are contradictory. Two factors allow this to happen. First, the context is neutral, with no contextual evidence for either proposition. Second, A

has neither contextual evidence nor private evidence to be biased toward one of the propositions, i.e. A is unbiased. If A had evidence that Sam liked blue, she would not worry about the opposite possibility and could directly seek for A's confirmation instead. If A had evidence against Sam liking blue, she would not be considering a blue hat in the first place.

PQs with *không* are necessarily uttered in neutral contexts. They are prohibited in non-neutral contexts, whether their propositional content is favored or opposed.

(54) A PQ with *không* in a non-neutral context

Context 1: **A tells B Sam has many blue clothes**. B then asks:

a. # Sam có thích màu xanh không?
Sam PRT like CL blue KHÔNG
'Does Sam like blue?'

b. # Sam có ghét màu xanh không?
Sam PRT hate CL blue KHÔNG
'Does Sam hate blue?'

The information in bold is assumed to support the possibility that Sam likes blue. This information is contextual evidence for the propositional content of the PQ in (54.a) and against that of the PQ in (54.b). The context in (54) therefore is not neural for both PQs, and this is the reason for their infelicity.

There is no difference if contextual information suggests that Sam hates blue instead, as shown in (55). The two PQs are also bad in Context 2 in which the contextual information in bold is assumed to oppose the content of the first PQ and support that of the second, which is the opposite of what happens in (54).

(55) A PQ with *không* in a non-neutral context

Context 2: Sam is a comedian, performing on stage frequently. **A tells B that Sam has refused to wear blue clothes many times**. B then asks:

a. # Sam có thích màu xanh không?
Sam PRT like CL blue KHÔNG
'Does Sam like blue?'

b. # Sam có ghét màu xanh không?
Sam PRT hate CL blue KHÔNG
'Does Sam hate blue?'

The requirement that the Speaker is unbiased is also necessary. Evidence for this comes from the observation that in neutral contexts, PQs with *không* are infelicitous if the Speaker has private evidence for one of the two responses.

(56) The use of PQs with *không* when the Speaker has private evidence
Context: A considers a blue hat for Sam because A notices he has many blue clothes and thinks he likes this color. However, A is unsure. So, A asks B:

a. # Sam có thích màu xanh không?
Sam PRT like CL blue KHÔNG
'Does Sam like blue?'

b. # Sam có ghét màu xanh không?
Sam PRT hate CL blue KHÔNG
'Does Sam hate blue?'

In this context, the immediate context is neutral, without any evidence for the propositional content of either question. The information about Sam's clothes is just A's private evidence. The infelicity of the PQs therefore must be due to A's bias. The private evidence allows A to assume that blue is Sam's favorite color. A's bias therefore prevents A from asking the PQs with *không*.

Notice that in (54 - 55), both the requirements of a neutral context and an unbiased Speaker are violated. In fact, it is likely that all cases that violate the former requirement also violate the latter requirement. When contextual evidence for the proposition p emerges, the Speaker may accept p or may not. If p is accepted, the Speaker becomes biased toward p. If p is not accepted, the Speaker as a rational person must have a reason to do so. This means the Speaker must have evidence for $\neg p$ and is biased toward $\neg p$. The reverse that all cases violating of the requirement concerning the Speaker's bias also violate the requirement of a neutral context does not hold as illustrated in (56). Therefore, I take the requirement that the Speaker is unbiased to be the key felicity condition of PQs with *không*. Nevertheless, for a comparison with the other two types of PQs, I will have the requirement of a neutral context in the felicity conditions of PQs, as stated below in (57).

(57) **Felicity conditions of PQs with *không***: For a PQ of the form *'p không?'*,

i. There is neither contextual evidence for nor against p.

ii. The Speaker is neither biased toward p nor $\neg p$.

3.2.2 Polar questions with *à*

Next we study PQs with *à*. In the literature on Vietnamese PQs, the consensus is that PQs with *à* are biased (Nguyen 1997, Thompson 1965, Trinh 2005, Tran 2009, Duffield 2013, Le 2015). However, previous analyses of PQs with *à* are inadequate. Most studies describe PQs with *à* as reflecting the Speaker's surprise when things turn out different from what they ought to be or normally are. For example, in Trinh 2005, PQs with *à* are referred to as 'checking questions', carrying an implicature about the Speaker's suspicion or presupposition incompatible with what the Speaker is seeking confirmation for, as illustrated in (58).

(58) A PQ with *à* can express the Speaker's surprise

Context: A has always known John as a non-reader. One day, A and B saw John holding a book. A asked B:

John đọc sách à?
John read book À
'Does John read books?' ($\rightsquigarrow$ and *I suspect that he does not.*)

(Trinh (2005))

Le 2015, as far as I know, was first to notice that PQs with *à* are not limited to contexts with surprise. Le points out another type of context for PQs with *à*, in which the Speaker aims to "make a conjecture based on observed fact" (Le 2015:29). (59) shows Le's example of a PQ with *à* in such a context.

(59) A PQ with *à* is used to seek confirmation

Context: A returned home from a different area where it didn't rain and saw that the streets were wet. A asked:

Hôm qua trời mưa à?
Yesterday it rain À
'Did it rain yesterday?'

(Le (2015))

Le argues that the PQ in this context does not convey surprise. The Speaker (A) saw the wet streets and suspected that it might have rained the day before and thus tried to seek a confirmation for this. Le's argument for this specific example, however, is not infallible. The given context does not rule out the possibility that returning

from a region with no rain, the Speaker might expect dry weather in her place and thus she should be surprised when seeing the wet streets. This is supported by the observation that the addition of a surprise marker such as *ồ* is accepted, as shown in (60).

(60) PQs with *à* can be preceded by the surprise marker *ồ*

Context: A returned home from a different area where it didn't rain and saw that the streets were wet. A asked:

Ồ hôm qua trời mưa à?
Oh yesterday it rain À
'Oh. It rained yesterday?'

Despite this concern, I agree with Le (2015) in that PQs with *à* can be asked for the sole purpose of seeking confirmation. In what follows, I will show that PQs with *à* are used to seek confirmation, felicitous if the requirements that the Speaker is biased toward the positive response and that there is no contextual evidence against it are both met. We will see that the Speaker may or may not be previously biased toward the negative response. This explains the distribution of PQs with *à* in contexts with and without surprise.

As the discussion makes reference to contexts with and without surprise, I will define them as follows.

(61) **Contexts with and without surprise**

A context c is a context with surprise for an agent A if A is surprised in *c*. Otherwise, c is a context without surprise for A

Furthermore, I will use the same definition of surprise as the one for *cơ* in declaratives given in (14), repeated here in (62).

(62) **Surprise**

An agent X is surprised at a proposition p if X obtaining evidence for p triggers a change in X's information set from favoring $\neg p$ to favoring p.

Now, I will first show that for the felicitous instances of PQs with *à*, two conditions are satisfied: (i) there is no contextual evidence against the positive response; (ii) the Speaker is biased toward the positive response. For PQs with *à* in a surprise context, consider again Trinh's example, repeated in (63).

(63) PQs with *à* in a context with surprise

Context: A has always known John as a non-reader. One day, A and B saw John holding a book.

$\rightsquigarrow$ A's expectations: *John does not read books*

A then asked B:

John đọc sách à? (#**Tớ không tin**.)
John read book À I not believe
'Does John read books? ($\rightsquigarrow$ and *I think he does.*) #I don't believe it.

This is a typical context with surprise as defined in (61). A has expectations that John does not read books. The event of John holding a book then changes A's information set to favoring the proposition that *John reads book*, which is incompatible with A's expectations. Thus, the PQ with *à* in (63) is uttered in a context with surprise. The two felicity conditions stated above are satisfied in this scenario. The event of John holding a book is qualified as contextual evidence for the positive response. A's bias influenced by the contextual evidence thus also favors this proposition. This is evidenced by the unacceptability of the follow-up in bold. The follow-up suggests that A does not believe what A has seen, contradicting the bias implied by the PQ with *à*. Notice that the interpretation of the PQ in (63) does not contradict Trinh (2005). The implicature that Trinh (2005) points out refers to the Speaker's expectations. Such an implicature however only arises in contexts with surprise. I will show later that the requirement of the Speaker's bias toward the propositional content of the PQ, rather than that constraint regarding the Speaker's expectations is necessary for the felicity of PQs with *à*.

An instance of PQs with *à* in contexts without surprise is shown in (64). The scenario is originally constructed in Buring and Gunlogson (2000)) to argue that English PPQs are not neutral.

(64) A PQ with *à* in a context without surprise

Context: A enters B's windowless computer room wearing a dripping wet raincoat. B has always been in the room and thus has no idea about the weather outside. B asks:

a. Is it raining?

b. (#Ồ), trời đang mưa à? (#**Tớ không tin**.)
Oh it PROG rain À I not believe
'(#Oh,) is it raining? (⇝ and *I think it is*) #I don't believe it.'

The given context indicates B has no expectations about the weather outside. The lack of expectations precludes the possibility that B is surprised when seeing A in wet raincoat. The PQ in (64) therefore is used solely to seek confirmation. This is supported by the infelicity of the surprise marker *ồ*. Despite being uttered in a context without surprise, the PQ in (64), akin to the PQ in (63) above, satisfies both requirements concerning contextual evidence and the Speaker's bias. The event of A entering the room in a wet raincoat is contextual evidence for the positive response. That B agrees with the contextual evidence and becomes biased toward the positive response is supported by the infelicity of the follow-up in bold.

In both scenarios we have looked at, the context provides evidence favoring the positive response. As claimed previously, however, PQs with *à* only require the absence of contextual evidence for the negative response. They indeed can be uttered in neutral contexts. In such cases, the Speaker has private evidence supporting their bias toward the content of their question. Consider the example below:

(65) PQs with *à* in neutral contexts

Context: A notices that Sam has many blue clothes. Later when A meets B, A asks:

Sam thích màu xanh à?
Sam like CL blue À
'Does Sam like blue?' (⇝ and *I think he does*.)

In this context, A holds a bias toward the positive response that Sam likes blue, which is based on A's private observation. The condition concerning the Speaker's biases is satisfied. The context in (65) is neutral. The background information implies that there is no contextual evidence from the immediate context in (65). The felicity of the PQ therefore suggests that a neutral context can support PQs with *à*.

Now we will see that PQs with *à* are not licensed if any of the two requirements we have discussed are not satisfied. We will consider three types of scenarios: (i) those in which the requirement concerning the Speaker's bias is met but there is contextual evidence for the negative response; (ii) those in which the requirement

concerning contextual evidence is met but the Speaker is biased toward the negative response; (iii) those in which the requirement concerning contextual evidence is met but the Speaker is unbiased. (66) illustrates the first type.

(66) PQs with *à* are bad in contexts that provide evidence for a negative response
Context: A enters B's windowless computer room wearing a dripping wet raincoat. **B, however, has been told that it is sunny outside**. B asks:

Trời nắng lắm à?
It sunny very À
'Is it sunny?' (⇝ and *I think it is.*)

The information in bold suggests that B has private evidence for and is biased toward the positive response. Thus, there is no violation of the requirement concerning the Speaker's bias. However, the event of A entering the room in wet raincoat, which is accessible to both A and B, is contextual evidence for the negative response. This is the only difference between (66) and the felicitous instances above. The infelicity of the PQ in (66) thus confirms the necessity of the requirement that there is no contextual evidence against the propositional content of PQs with *à*.

An instance of PQs with *à* in the second type of context is shown in (67).

(67) PQs with *à* are bad if the Speaker is biased toward a negative answer
Context: Sam's sister tells A that Sam hates Mai. Later, when B tells A that Sam liked Mai, A does not believe B. A says one the following sentences:

a. # Sam thích Mai à?
Sam like Mai À
'Does Sam like Mai?' (⇝ and *I think it is.*)

b. ✓ Không phải. Sam không thích Mai.
Not correct Sam not like Mai
'Not correct. Sam doesn't like Mai.'

c. ✓ Sam thích Mai á? Tớ không tin.
Sam like Mai Á I not believe
'Does Sam like Mai? (⇝ and *there is evidence that he does but I think he doesn't.*) I don't believe it.'

The context set up in (67) implies that A does not agree with the contextual evidence provided by B and remains to think that Sam hated Mai. This is evidenced by the

observation that A can immediately object to B with the utterance in (67.b), or ask the PQ with *á* in (67.c) to express doubt. (PQs with *á* will be discussed further in the next section.) The infelicity of the PQ with *à* in this scenario supports the claim that it is necessary that the Speaker of a PQ with *à* is biased toward the positive response. There is no violation of the requirement concerning contextual evidence because the immediate context in (67) provides evidence for the positive response. The information from B is accessible to both A and B and thus is contextual evidence for the positive response. The infelicity of the PQ with *à* therefore must be due to the fact that A is biased toward the negative response.

For the last type of context, we will consider the use of a PQ with *à* in a context that licenses the PQ with *không* with the same propositional content.

(68) PQs with *à* are bad in contexts that support PQs with *không*
Context: A considers a blue hat for Sam because it looks very nice. However, since she does not know much about Sam, she worries that Sam may hate blue. A goes to ask B. A says:

a. ✓ Sam thích màu xanh (không/ #à)?
Sam like CL blue KHÔNG À
'Does Sam like blue?'(⇝ and *I think he does.*)

b. # Sam ghét màu xanh (không/ #à)?
Sam hate CL blue KHÔNG À
'Does Sam hate blue?'(⇝ and *I think he does.*)

The felicity of the two PQs with *không* suggests that the context in (68) is neutral and the Speaker is unbiased. For the PQ with *à*, that the context is neutral means that there is no violation of the requirement concerning contextual evidence. The infelicity of the PQs with *à* in this context therefore must be due to the Speaker's bias.

I argue that the infelicity of PQs with *à* in the first type of context suggests the need for the requirement that there is no contextual evidence against the propositional content. The arguments from the use of PQs with *à* in the second and third types of context together confirm the requirement that the Speaker is biased toward the positive response. I restate these two felicity conditions of PQs with *à* in (69) below:

(69) **Felicity conditions of PQs with *à***: For a PQ of the form *'p à?'*,

i. There is no contextual evidence against p.

ii. The Speaker is biased toward p.

Before we move on the last type of PQs, it is worth highlighting that PQs with *à* can be used for acknowledgement. Consider the example below:

(70) PQs with *à* can be used for acknowledgement

Context: Sam always arrives home from school at 12pm. Today is a normal day. At 12pm, he enters the living room and sees his mother there. She says:

Con về rồi à? Đi rửa mặt đi rồi ăn cơm.
you return already À go wash face PRT then eat rice
'Have you arrived? ($\rightsquigarrow$ and *I acknowledge that*) Wash your face, then have lunch.'

In this scenario, the mother is not surprised to see Sam because he usually comes home at that time. Furthermore, with the direct observation of Sam entering the living room, the mother is not biased but knows that Sam has arrived home. Therefore, the PQ in this context is interpreted as expressing the mother's acknowledgment of Sam's arrival at home.

This kind of use is not specific to PQs with *à*. English PPQ and rising declaratives, as pointed out in Gunlogson (2001), can be used for this purpose as well.

(71) English PPQs and rising declaratives are used for acknowledgement:

A: Jake's here.

B's response:

a. Is Jake here? Then let's get started.

b. Jake's here? Then let's get started.

(Gunlogson (2001))

I take this use to be an extreme case of seeking confirmation. PQs with *à* used for this purpose are still subject to the felicity conditions given in (69).

3.2.3 Polar questions with *á*

PQs with *á* have received less attention than the two other types of PQs. In fact, the questioning effect of *á* when placing at the right edge of a sentence is not mentioned in established work on Vietnamese grammar and vocabulary (Thompson 1965, Nguyen 1997, *Từ điển Tiếng Việt* 2003). In *Từ điển Tiếng Việt* (2003), *á* is described only as a sound made when the Speaker is surprised by a sudden pain, as shown in (72).

(72) *Á* as a sound made when the Speaker feels a sudden pain

Á đau!
á hurt
'Ouch, it hurts!' (from *Từ điển Tiếng Việt* (2003))

This variant of *á* cannot appear at the right edge of a sentence.

(73) *Á* as a sound expressing pain is ungrammatical at the sentence-final position

Đau á!
Hurt Á
Intended: 'Ouch, it's hurt!'

I argue that there is a sentence-final particle *á* which forms a type of PQs that is used to express the Speaker's surprise or doubt. The definition of surprise is already given in (62) above. A definition for doubt is spelled out in (74) below.

(74) **Doubt**:
An agent A doubts p if A is biased toward ¬p, where p is a proposition.

In what follows, I will discuss the uses of PQs with *á* in more detail. Then I will show that PQs with *á* are licensed if (i) the context provides evidence for the positive response and (ii) the Speaker's initial information set prior to the emergence of the contextual evidence favors the negative response.

Let's start with the use of expressing the Speaker's surprise of PQs with *á*.

(75) PQs with *á* can express the Speaker's surprise
Context: A tells B that Sam can run 10 rounds. B says:

Mười vòng {á/ à}? Khỏe thế!
Ten round Á À strong PRT
Is it 10 rounds? (⇝ and *I am surprised*) Very strong!

Á in (75) is sentence-final and grammatical, suggesting that it is not the *á* that expresses pain. B utters the PQ with *á* to respond to A. The follow-up sentence makes it clear that B is surprised at what A has said. Furthermore, with or without B's follow-up, A can respond back to B by reconfirming what A has said earlier or elaborating on how strong Sam is to eliminate B's remaining suspicions. Notice that a version with *à* is also felicitous in this context. This is expected as (75) is an instance of context with surprise.

The use of PQs with *á* to express the Speaker's doubt is illustrated in (76). Notice that this is the default use of PQs with *á*. When they are judged out of the blue, they are naturally interpreted as expressing doubt.

(76) PQs with *á* can express the Speaker's doubt

Context: A tells B that A can run 10 rounds, but B does not believe A. B says:

a. ✓ 10 vòng á? Cậu nói phét.
10 round Á You exaggerate
'Is it 10 rounds? (⇝ and *there is evidence that it is but I think it is not*) You must be exaggerating.'

b. ✓ Cậu nhầm rồi. Sam chỉ chạy được 6 vòng thôi.
You wrong PRT Sam only run able 6 round PRT
'You are wrong. Sam can only run 6 rounds.'

c. # 10 vòng à? Khỏe thế!
10 round À strong PRT
'Is it ten rounds (⇝ and *I am surprised*) Very strong!'

The context in (76) is set up so that B cannot agree with A. This is evidenced by the infelicity of the PQ with *à* followed by an exclamation in (76.c), which as a whole expresses the Speaker's surprise. Further support comes from the fact that B can respond to A with the objection in (76.b). The PQ with *á* behaves in line with the immediate objection in (76.b) and thus cannot be interpreted as expressing surprise as in (75) above. The sentence following the PQ with *á* makes it clear that the PQ implies that B doubts A's claim.

Next, we move on to discuss the felicity conditions of PQs with *á*. As mentioned earlier, they require that (i) the context to provide evidence for the positive response and (ii) the Speaker's initial information set favors the negative response. These

two conditions are both met in the felicitous instances of PQs with *á* in (75 - 76). In both examples, A's claim is accessible to both A and B and thus functions as contextual evidence for the propositional content of the PQs. The constraint regarding contextual evidence is thus satisfied. The condition about the Speaker's initial information set is straightforwardly met in (75). B can be surprised at the positive response if B expects the negative one. In (76), the PQ conveys B's doubt despite the emergence of the contextual evidence for the positive response. This means that the contextual evidence does not change B's information set, which remains favoring the negative response.

I argue that these two conditions are necessary. Evidence for the requirement of contextual evidence for the positive response comes from the following observations. First, PQs with *á* cannot be asked out-of-the-blue or be used to initiate a topic or a conversation. In such scenarios, the immediate context is neutral, containing no information except the PQ itself. Second, PQs with *á* are bad if there is contextual evidence for the negative response. Consider the examples in (77), in which contextual evidence can arise linguistically or non-linguistically.

(77) PQs with *á* require contextual evidence for the positive response

a. Linguistic evidence

Context: A tells B that Sam can run 6 rounds. B says:

i. ✓ Không phải Sam có thể chạy 10 vòng à?
Not true Sam able run 10 round À
'Can't Sam run 10 rounds?'

ii. # Sam có thể chạy 10 vòng á?
Sam able run 10 round Á
'Can Sam 10 rounds? (⇝ and *there is evidence that he can but I think he cannot.*)'

iii. ✓ Sam có thể chạy 6 vòng á?
Sam able run 6 round Á
'Can Sam 6 rounds? (⇝ and *there is evidence that he can but I think he cannot.*)'

b. Non-linguistic evidence

Context: Sam participates in a cooking contest. Competitors can cook either noodle or soup. A knows Sam cooks noodle very well and thinks

Sam will choose this dish. When A sees Sam taking material for cooking soup, A talks to B:

i. ✓ Không phải Sam sẽ nấu mì à?
Not true Sam FUT cook noodle À
'Isn't Sam cooking noodle?'

ii. # Sam sẽ nấu mì á?
Sam FUT cook noodle Á
'Is Sam cooking noodle? (⇝ and *there is evidence that he is but I think he is not.*)'

iii. ✓ Sam sẽ nấu canh á?
Sam FUT cook soup Á
'Is Sam cooking soup? (⇝ and *there is evidence that he is but I think he is not.*)'

The same pattern is observed from the two scenarios: the PQs with *á* to which the positive response is favored by the immediate context, (77a.iii – b.iii), are acceptable but those to which the negative response is supported, (77a.ii – b.ii) are infelicitous. In addition, the questions in (77a.i – b.i) have the same propositional content as the infelicitous PQs in (77a.ii – b.ii). This rules out the reasoning that the PQs in (77a.ii – b.ii) are bad because they are irrelevant questions. These examples therefore show that PQs with *á* require contextual evidence for their positive response.

To argue for the necessity of the restriction regarding the Speaker's initial information set, I will consider two types of scenarios, which both satisfy the condition about contextual evidence: those in which the Speaker' initial set favors the positive response; those in which the Speaker's initial set favors neither response. We will see that PQs with *á* are infelicitous in both types of scenarios. (78) below is an instance of the first type.

(78) The Speaker's initial information set favors the positive response
Context: A tells B that Sam can run 10 rounds. B says:

Mười vòng á? {Khỏe thế!/ Cậu nói phét/ #Tớ biết ngay mà}.
Ten round Á strong PRT you exaggerate I know PRT PRT
Is it 10 rounds? (⇝ and *there is evidence that it is but I think it is not*)
{Very strong!/ You must be exaggerating/ #I knew it.}

This scenario meets the constraint on contextual evidence. A's claim is accessible to both A and B and supports the positive response to the PQ. There are three possible follow-up statements for the PQ, as shown in (78). The first two are compatible with the PQ; the first signals B's surprise at A's claim and the second signals B's doubt over A's claim. Both follow-up statements indicate that B's initial information set favors the negative response. In contrast, the last follow-up suggests that A's claim is what B has always believed. This means that B's initial information set favors the same proposition as the contextual evidence: the positive response. The different judgments for the three follow-up statements therefore support the claim that PQs with *á* are not licensed in contexts in which contextual evidence agrees with the Speaker's initial information set in favoring the positive response.

The second type of scenarios can be illustrated by the example in (64) above which argues for PQs with *à* in contexts without surprise, repeated here in (79).

(79) The Speaker's initial information set favors neither of the responses
Context: A enters B's windowless computer room wearing a dripping wet raincoat. B has always been in the room and thus has no idea about the weather outside. B asks:

a. (#Ồ), trời đang mưa à?
Oh it PROG rain À
'(#Oh,) is it raining? ($\rightsquigarrow$ and *I think it is*)'

b. # Trời đang mưa á?
It PROG rain À
'Is it raining? ($\rightsquigarrow$ and *there is evidence that it is but I think it isn't*)'

As analyzed previously, the PQ with *à* is interpreted as seeking confirmation rather than expressing doubt. The event of A entering the room in wet raincoat is contextual evidence for the propositional content of the PQ with *à* and thus for that of the PQ with *á* as well. The requirement regarding contextual evidence of the PQ with *á* is thus met. The infelicity of the PQ with *á* then must be related to B's initial information set. B in this context has no expectations about the weather outside. This suggests that B's initial information set favors neither response to the PQ with *á*. Combining with the observation in (78), we can conclude that the Speaker's initial set must favor the negative response.

In sum, PQs with *á* can be used to express surprise or doubt. Their felicity conditions are summarized in (80):

(80) **Felicity conditions of PQs with *á***: For a PQ of the form *'p á?'*,

i. There is contextual evidence for p.

ii. The Speaker's initial information set favors $\neg p$.

3.2.4 Summary

I have discussed the uses and the felicity conditions of PQs with *không*, *à* and *á*. The Table in (81) summarizes the discussion. Some information in the Table, such as the Speaker's initial set when uttering PQs with *không* or the Speaker's resulting set when uttering PQs with *á*, was not discussed previously but are entailed by their felicity conditions:

(81) Summary of the uses and the felicity conditions of the Vietnamese PQs:

PQs	Uses	Contextual Evidence	The Speaker's Information Set	
			Initial Set	Resulting Set/ Bias in Response
'p không?'	Seeking Information	None	None	None
'p à?'	Seeking Confirmation	None or For p	None or Toward p or Toward $\neg p$	Toward p
'p á'	Expressing Surprise or Doubt	For p	Toward $\neg p$	Toward p or Toward $\neg p$

As shown in the table, PQs with *không* are neutral, requiring a neutral context and that the Speaker stays unbiased. PQs with *à* and *á* are different with respect to various aspects besides the Speaker's resulting information set or bias in response: contextual evidence; the Speaker's initial information set. These considerations allow us to derive all the uses of these two types of PQs as well as to make a thorough description of their biasedness.

3.3 PQs with *cơ*

This section investigates the use of *cơ* in polar questions. Generally, PQs with *cơ* are formed by placing *cơ* between the declarative sentence and the question particle. Biased question markers *à* and *á* are compatible with *cơ*. Neutral questions with *không* cannot combine with *cơ*. The observed pattern is illustrated in (82).

(82) Cơ in polar questions:

a. PQs with *không*
Sam (có) đạt giải nhất (#cơ) không?
Sam PRT get prize first CƠ KHÔNG
'Did Sam get the first prize?'

b. PQs with *à*:
Sam đạt giải nhất (cơ) à?
Sam get prize first CƠ À
'Sam got the first prize?'

c. PQs with *á*:
Sam đạt giải nhất (cơ) á?
Sam get prize first CƠ Á
'Sam got the first prize?'

The first goal of this section then is to account for the interaction between *cơ* and the three question markers. I argue that the consideration of the felicity conditions of each type of PQs can offer an explanation. The second as well as the main goal of this chapter is to point out the contribution of *cơ* to the host PQ and thus confirm the possibility to unify PQs with *cơ* and declaratives with *cơ*

3.3.1 The interaction between *cơ* and PQ markers

In this section, I will first show that PQs with *cơ* are used to reflect the Speaker's surprise. I argue that given this use, PQs with *cơ* involve a change in the Speaker's information set, as stated in (83):

(83) **A felicity condition of PQs with *cơ***
For a PQ of the form *'p cơ Q?'*, the Speaker's information set changes from favoring $\neg p$ to p.

I will then move on to explain why *cơ* is compatible with *à* and *á* but unable to combine with *không*.

The use of PQs with *cơ* to express the Speaker's surprise is illustrated in (84). In this example, *cơ* can be combined with *à* or *á*. Both PQs are preceded by the surprise marker *ồ* and followed by an exclamation explicitly expressing surprise.

(84) PQs with *cơ* express the Speaker's surprise

Context: A tells B Sam bought 20 packets of candy the day before. B says:

(Ồ,) Nó mua 20 gói cơ {à/ á}? **Nhiều thế!**
Oh He buy 20 packet CƠ À Á many PRT
'Oh, did he buy 20 packets? (⇝ and *I think he did, it's surprising.*) So many!'

Arguments for the condition concerning the Speaker's information set come from the infelicity of PQs with *cơ* in scenarios in which contextual evidence cannot trigger a change in the Speaker's information set. The example in (85) is an instance of PQs with *cơ* when the Speaker's state remains to favor the positive response.

(85) The Speaker continues to favor the positive response

Context: A tells B that Sam bought 20 packets of candy. B says:

#Nó mua 20 gói cơ {à/ á}? **Tớ biết ngay mà**.
He buy 20 packet CƠ À Á I know PRT PRT
Intended: 'Did he buy 20 packets? (⇝*I think he did, and it's surprising.*) I knew it.'

The context in (85) provides contextual evidence for the positive response. The follow-up sentence in bold suggests that the contextual evidence agrees with B's initial information set. The resulting set influenced by the contextual evidence also favors this response. The contextual evidence in this scenario therefore strengthens B's favoring of the positive response rather than reversing it, rendering the PQ infelicitous.

Similarly, PQs with *cơ* are odd if the Speaker continues to favor the negative response despite the emergence of contextual evidence for the positive one.

(86) The Speaker continues to favor the negative response

Context: A tells B that Sam bought 20 packets of candy. B however does not believe A and says:

a. Nó mua 20 gói á? **Cậu nói phét**.
He buy 20 packet Á you exaggerate

'Did he buy 20 packets? (⇝*there is evidence that he did, but I think he didn't.*) You must be exaggerating.'

b. # Nó mua 20 gói cơ {à/ á}?
He buy 20 packet CƠ À Á
'Did he buy 20 packets? (⇝*I think he did, and it's surprising.*)'

In (86) above, what A tells B is contextual evidence for the positive response. It is also mentioned that B does not agree with the contextual evidence. This is supported by the felicity of the PQ with *á* followed by the sentence explicitly expressing B's doubt in (86.a). Given the felicity conditions of PQs with *á*, B must have always thought of the negative response as likely true. The contextual evidence in this scenario thus does not have any influence on B's initial information set and is unable to license the PQ with *cơ*.

Notice that a change in an agent's information set must be triggered by some information supporting the positive response to the PQ under consideration. However, PQs with *cơ* do not require such a change to always be triggered by contextual evidence. For PQs with *cơ* and *à*, the Speaker's private evidence is sufficient. PQs with *cơ* and *á*, however, only accept contextual evidence. (83) illustrates the contrast. I assume that the constraints on each sub-type of PQs with *cơ* are derived from the properties of the question markers.

(87) Private evidence

Context: A reads that people in Sam's village eat rats. B thinks it is likely to be the case although it is very shocking to know that. Later, A meets Sam, and A asks:

a. PQs with *cơ* and *à*

✓ Người làng cậu ăn cả thịt chuột cơ **à**?
People village your eat even meat rat CƠ À
'Do the people in your village eat rats? (⇝*I think they do, and it's shocking.*)'

b. PQs with *cơ* and *á*

?? Người làng cậu ăn cả thịt chuột cơ **á**?
People village your eat even meat rat CƠ Á
'Do the people in your village eat rats? (⇝*I think they do, and it's shocking.*)'

Now I will demonstrate that the felicity conditions of the four types of PQs can account for the interaction between *cơ* and the PQ markers in (81). The table summarizing the felicity conditions of PQs with *không*, *à*, and *á* in (82) is repeated here in (88) together with the condition about the Speaker's information set of PQs with *cơ*.

(88) Summary of the uses and the felicity conditions of the Vietnamese PQs

PQs	Uses	Contextual Evidence	The Speaker's Information Set	
			Initial S	Resulting Set/ Bias in Response
'p không?'	Seeking Information	None	None	None
'p à?'	Seeking Confirmation	None or For *p*	None or Toward *p* or Toward ¬*p*	Toward *p*
'p á'	Expressing Surprise or Doubt	For *p*	Toward ¬*p*	Toward *p* or Toward ¬*p*
'p cơ Q?'	Expressing Surprise	For *p*	Toward ¬*p*	Toward *p*

I claim that the felicity conditions imposed on PQs with *không*, *à*, and *á* are derived from the meaning of the PQ markers. For PQs with *cơ*, I submit that *cơ* puts further constraints on their distribution which is already restricted by PQ markers. PQs with *cơ* therefore are licensed in a subset of contexts that support the *cơ*-less versions. We can see from the Table that there are no contexts that can support both PQs with *không* and PQs with *cơ*. This explains why the two particles are unable to combine to form a PQ. The Table also shows that some of the contexts that support PQs with *à* or *á* can license PQs with *cơ*, accounting for the compatibility between *cơ* and these two PQ markers.

3.3.2 Contribution of *cơ* in polar questions

In the previous section, I have discussed the uses of PQs with *cơ* and claimed that the particle further restricts the distribution of its host PQ. Now I will point out the exact contribution of the particle. In what follows I will show that *cơ* in polar questions reflects the Speaker's surprise. Furthermore, the surprise must be

resulted from the fact that the Speaker has low expectations. I conclude that *cơ* in polar questions and *cơ* in declaratives have similar contributions.

We already know that PQs with *cơ* carry an implication that the Speaker is surprised at the PQ's propositional content. The question is whether the implication is the contribution of *cơ* or that of PQ markers, since the *cơ*-less PQs also have this use. I argue that reflecting surprise must also be what *cơ* contributes to its host question. There are two pieces of evidence for this claim: (i) a PQ with *à* used merely to seek confirmation cannot go with *cơ*; (ii) the addition of *cơ* to a PQ with *á* that expresses doubt is prohibited. The argument is as follows. These types of scenarios do not support the implication about the Speaker's surprise. The meaning of PQ markers makes them felicitous in such contexts. The presence of *cơ*, however, is odd. This can be accounted for if *cơ* contributes to derive the implication concerning the Speaker's surprise. An instance of the scenarios type (i) is given in (89)

(89) *Cơ* is bad in a merely confirmation seeking PQ with *à*

Context: A and B helps their friends to buy candies. The average number of packets of candy ranges from 15 to 25. B is looking at the list A made including names and the numbers of packets to buy. Sam's information is obscured for some reason. B thinks it is 20 but B is not sure. B asks A:

Sam muốn mua 20 gói (#cơ) à?
Sam want buy 20 packet CƠ À
R1: ✓ 'Does Sam want to buy 20 packets? ($\rightsquigarrow$ and *I think he does*)'
R2: '# Does Sam want to buy 20 packets? ($\rightsquigarrow$ and *I think he does, which is surprising*)'

The context implies that the number of 20 packets cannot surprise B. The information about the average number makes it unlikely that B thinks 20 packets is impressive or unexpected. The obscured number on the list allows B to guess at Sam's number of packets. The PQ is thus interpreted with the reading R1 as a confirmation-seeking question rather than the reading R2 concerning surprise.

The scenario of type (ii) is illustrated in (90). The follow-up sentence in bold makes it clear that B doubts A's claim. Thus, the right interpretation for the PQ is not the surprise reading R2 but the doubtful reading R1.

(90) *Cơ* is bad in a PQ with *á* expressing doubt.

Context: A tells B that Sam wants to buy 20 packets of candies. B says:

S: Nó muốn mua 20 gói (#cơ) á? **Cậu nói phét**!
He want buy 20 packet CƠ Á you exaggerate
R1: ✓ 'Does he want to buy 20 packets? (⇝ and *there is evidence that he does but I think he does not.*) You must be exaggerating.'
R2: # 'Does he wants to buy 20 packets? (⇝ and *I think he does, which is surprising.*) You must be exaggerating.'

I have shown that *cơ* in polar questions reflects a change in the Speaker's information set. It is reminiscent of the contribution of *cơ* in declaratives, reflecting the Addressee's potential change. Recall that for *cơ* in declaratives, however, the pragmatic properties of declaratives impose the same constraint, raising the concern that *cơ* may only restrict the initial set of the attitude holder, i.e. the Addressee for *cơ* in declaratives. I argue that the observations of *cơ* in polar questions motivate a stronger claim that *cơ* imposes constraints on both the initial and resulting sets. The weaker claim that *cơ* only restricts the initial set cannot capture the use of *cơ* in polar questions. It fails to account for the observation that the addition of *cơ* to PQs with *á* prevent the use of expressing doubt, as discussed in (90) above. I therefore conclude that declaratives with *cơ* and PQs with *cơ* are mainly different with respect to who is the attitude holder and whether the surprise is potential. This will be elaborated on in the next chapter.

Now we will consider the last felicity condition of PQs with *cơ*, which is also seen when *cơ* is in declaratives: the Speaker has low expectations, i.e. the prejacent of *cơ* is higher than its expected focus alternatives on a given scale. Consider (91).

(91) PQs with *cơ* reflect that the Speaker has low expectations.

Context: A tells B Sam will go on a business trip for 2 weeks. B then says:

a. Nó sẽ đi 2 tuần cơ {à/ á}? **Tớ tưởng nó chỉ đi 1 tuần thôi**.
He FUT go 2 week CƠ À Á I think he only go 1 week PRT
'He will go for 2 weeks? I thought he would go for only 1 week.'

b. Nó sẽ đi 2 tuần cơ {à/ á}? #**Tớ tưởng nó sẽ đi tận 3 tuần**.
He FUT go 2 week CƠ À Á I think he FUT go PRT 3 week.
'He will go for 2 weeks? I thought he would go for 3 weeks.'

The follow-up sentences in bold manifest B's expectations about the length of Sam's trip. In (91.a), the follow-up refers to a period shorter than A claims. In (91.b), it is reversed with the follow-up referring to a longer period. Only in (91.a), the PQs are compatible with the follow-up. This suggests PQs with *cơ* require the Speaker to have low expectations relative to the propositional content of the host PQ.

There are other ways to make the Speaker's expectations explicit. (92) does it with exclamations.

(92) The Speaker's expectations are manifested by exclamations

Context: A tells B that Sam will go on a trip for 2 weeks. B then says:

a. Nó sẽ đi 2 tuần cơ {à/ á}? **Dài thế**!
He FUT go 2 week CƠ À Á long PRT
'He will go for 2 weeks? So long!'

b. Nó sẽ đi 2 tuần cơ {à/ á}? #**Ngắn thế**!
He FUT go 2 week CƠ À Á Short PRT.
'He will go for 2 weeks? So short!'

It is also possible for the Speaker's expectations to be inferred. The follow-up sentences in (93) do not directly suggest B's expectations about Sam as those in (91 – 92). The sentences imply a comparison between Kim and Sam, which in turn allows A to infer B's expectation about Sam.

(93) The Speaker's expectations are inferred.

Context: A tells S that Sam will go on a trip for 2 weeks. S then says:

a. Nó sẽ đi 2 tuần cơ {à/ á}? **Kim chỉ đi 1 tuần thôi**.
He FUT go 2 week CƠ À Á Kim only go 1 week PRT
'He will go for 2 weeks? Kim will go for only 1 week.'

$\rightsquigarrow$ Inference from the follow-up: *I thought Sam would go for 1 week only.*

b. Nó sẽ đi 2 tuần cơ {à/ á}? #**Kim sẽ đi tận 3 tuần**.
He FUT go 2 week CƠ À Á Kim FUT go PRT 3 week.
'He will go for 2 weeks? Kim will go for 3 weeks.'

$\rightsquigarrow$ Inference from the follow-up: *I thought Sam would go for 3 weeks.*

No matter how the Speaker's expectations are manifested, in all these examples, the PQs with *cơ* are only compatible with the follow-up sentences implying low expectations. Notice that the explicit manifestation of the Speaker's is optional. It

is always possible for the Addressee to accommodate that the Speaker holds some low expectations when hearing a PQ with *cơ*.

The sensitivity of PQs with *cơ* to scalarity is derived from the meaning of *cơ*. When the particle is absent, no such effect is observed. In (94), there is no contrast between the follow-up statements referring to a shorter period of time and those referring to a longer period. The PQs without *cơ* are compatible with both follow-up sentences.

(94) PQs without *cơ* are not sensitive to scalarity.

Context: A tells B Sam will go on a business trip for 2 weeks. B then says:

a. Nó sẽ đi 2 tuần {à/ á}? **Tớ tưởng nó chỉ đi 1 tuần thôi**.
He FUT go 2 week À Á I think he only go 1 week PRT
'He will go for 2 weeks? I think he will go for only 1 week.'

b. Nó sẽ đi 2 tuần {à/ á}? **Tớ tưởng nó sẽ đi tận 3 tuần**.
He FUT go 2 week À Á I think he FUT go PRT 3 week.
'He will go for 2 weeks? I think he will go for 3 weeks.'

The scalar properties of *cơ* in polar questions and in declaratives are the same. I therefore claim that focus also plays a role in determining the expected alternatives to the prejacent of *cơ* in polar questions, akin to what focus does for *cơ* in declaratives.

I conclude that *cơ* in polar questions reflects the Speaker's surprise due to low expectations. The generalization is given below in (95).

(95) The generalization about *cơ* in polar questions:

Cơ in polar questions reflects that:

i. The propositional content of the host PQ surprises the Speaker, and

ii. The prejacent proposition is higher than all its expected focus alternatives on a given scale.

The similarity between the generalizations about *cơ* in polar questions and *cơ* in declaratives motivates a unified meaning for *cơ*. In the next chapter, I will propose a formal semantics for *cơ* and account for the differences between its uses in declaratives and in polar questions.

Chapter 4

A Formal Semantics for *Cǒ*

4.1 A scalar mirative marker

The two previous chapters describe the use of *cǒ* in declaratives and polar questions and point out the contribution of the particle. In both constructions, the use of *cǒ* is related to surprise. Declaratives with *cǒ* carry an implication about the Addressee's potential surprise. The implication of *cǒ* in polar questions is slightly different, referring to the Speaker's surprise. Furthermore, *cǒ* in both constructions imposes the same scalar restriction on its host sentence. I therefore propose that *cǒ* is uniformly a scalar mirative particle.

The idea about the mirativity of *cǒ* is built on the characterization of surprise in terms of belief revision. This characterization of surprise can capture the intuition about surprise given in the previous chapters, repeated here in (96).

(96) **Surprise**

An agent X is surprised at a proposition p if X obtaining evidence for p triggers a change in X's information set from favoring $\neg p$ to favoring p.

Belief revision is one of the fundamental mechanisms of belief changes in theories of the dynamic logic of information change (Gardenfors 1988, van Benthem 2012, among others). Gardenfors (1988) defines belief revision as an operation that transform an agent's information state, as spelled out in (97). Information states are modelled in Gardenfors (1988) as sets of propositions. Note that in Gardenfors (1988), information state is referred to with other terms as *belief system* or *belief state*.

(97) **Belief revision**

"A new sentence that is inconsistent with a belief system K is added to a

> belief system K, but in order to maintain consistency in the resulting belief system, some of the old sentences in K are deleted."
>
> (from Gardenfors (1988):3)

Accordingly, the characterization of surprise is given in (98). Notice that I assume for the analysis of *cɔ* that belief revision can be applied to an information state which takes into account both beliefs and partial beliefs.

(98) **Surprise as belief revision**
An agent X is surprised at a proposition p if belief revision is necessary to add p to X's information set when X obtains evidence for p.

With the characterization of surprise in place, I propose that *cɔ* reflects the Speaker's beliefs that a belief revision is triggered at the speech time. The marking of *cɔ* is concerned with a particular stage in the process of revision: when the revision is triggered. At that early stage of revision, the contrasting information, which is the prejacent proposition of *cɔ*, is incompatible with an agent's information set. The whole process of revision is expected to take place afterwards to add the proposition to the agent's information set.

The structure of this chapter is as follows. In Section (4.2), I will present several alternative analyses for *cɔ* in declaratives and polar questions that are not possible. In the next section (4.3), I will discuss previous work on mirativity and show that their approaches are inadequate for capturing the meaning of *cɔ*. Then in Section (4.4), I will present a formal semantics for *cɔ* that can capture the behaviors of *cɔ* discussed in the last two descriptive chapters. In particular, I will argue for and formalize the above idea about the mirativity of *cɔ*. Then I will characterize the scalar component of *cɔ* and present the unified semantics for *cɔ*. This chapter also includes the discussion of the following relevant issues in the last section (4.5):

i. Interrogative flip:
In declaratives, the use of *cɔ* refers to the Addressee's expectations. In polar questions, it is the Speaker's expectations that matter for the use of *cɔ*. This change in perspective is reminiscent of the phenomenon called "interrogative flip" mentioned in the literature on evidentials. I will present further data on

the phenomenon of interrogative flip observed in the use of *cơ* and attempt to give an account for it.

ii. Scales

I will first discuss popular existing approaches to scales. Then I propose that *cơ* associates with multiple types of scales. The ordering relation can be entailment or another conventionally or contextually determined ordering.

4.2 Alternative analyses

I argue that the generalizations about *cơ* that emerged from the discussion of *cơ* in declaratives and polar questions, in chapters 2 and 3 above, are best to describe the contribution of the particle. Here I will discuss some alternative analyses and argue against them.

One alternative is to suggest that the use of *cơ* is a strategy to claim epistemic authority. Epistemic authority of a speaker over a proposition p means the speaker is taken to be authoritative in p (Northrup 2014, McCready and Winterstein 2017). Such an analysis is proposed for the Japanese particle *yo* in Northrup (2014). His idea is that *yo* indicates that the Speaker has no less epistemic authority than any other discourse participants with respect to the content of the sentence. This analysis of *yo* can capture its use with two intonational patterns, a final rise (notated as ↑, as in (99.a)) and a final fall (notated as ↓, as in (99.b)). The felicity of *yo* in (99.a – b) is predicted because in both cases, the Addressee Ayaka is unauthoritative.

(99) Japanese *yo* and epistemic authority

a. Context: Souta (S) sees Ayaka (A) hasn't noticed her train has arrived.

S: Densya kita #(**yo**↑).
Train came YO↑
'The train is here.'

b. Context: Ayaka (A) and Souta (S) have conflicting information about whether the prime minister has died, and Ayaka has just said, "The prime minister died."

S: Sinde-nai #(**yo**↓).
Die-not YO↓
'He did NOT die!' (from Northrup (2014))

We can see that various contexts for declaratives with *cơ* discussed in Chapter 2 are very similar to the context in (99.b) in that the Speaker and the Addressee have conflicting information, or at least it is assumed so. We thus may wonder whether *cơ* can be analyzed in terms of epistemic authority as *yo*. There are however two reasons for not adopting such an analysis of *cơ*. First, *yo* is felicitous in contexts in which the Speaker and the Addressee do not have conflicting information as in (99.a) or when the sentence with *yo* is a response to an information-seeking question. As shown previously, *cơ* is subject to the surprise restriction and thus is peculiar in non-conflicting contexts. A declarative with *cơ* cannot be used as a response to an information-seeking question either, as shown again in (100) below:

(100) Responding to an information-seeking question

A: Sam đạt giải mấy?	B: Nó đạt giải nhất (#**cơ**).
Sam get prize what	He get prize first CƠ
'What prize did Sam get?'	'He got the first prize.'

In both contexts as in (99) and those as in (100), the Addressee is unauthoritative with respect to the Speaker's sentence. If *cơ* is described with the function of indicating that the Speaker has more epistemic authority than other participants, it is unclear why *cơ* behaves differently in contexts with and without conflict. My analysis of *cơ* in terms of surprise can directly account for the distribution of the particle only in surprise contexts.

Another challenge for an analysis of *cơ* in terms of epistemic authority is that the particle is incompatible with information-seeking questions but is able to cooccur with confirmation-seeking questions, as thoroughly discussed in Chapter 3. The analysis of *yo* as a way to claim epistemic authority for the Speaker directly explains the fact that *yo* does not occur with questions except rhetorical questions. Since the presence of *yo* marks the Speaker as having the most authority, it is infelicitous for the Speaker to seek an answer from the Addressee. Following this analysis, the combination of *cơ* and confirmation-seeking questions suggests that for *cơ*, it is not always the Speaker who has the most authority. In other words, the claim of epistemic authority marked by *cơ* would have to be Speaker-oriented in declaratives and Addressee-oriented in polar questions. The Speaker of a declarative needs a marker of authority to claim that they have more authority. The Speaker of a polar question uses *cơ* to assure the Addressee that the Addressee is more authoritative

and can go on making a confirmation. The main problem with this account is that it fails to explain why *cơ* is incompatible with information-seeking questions. My analysis of *cơ* in terms of surprise can provide an account for this issue, as presented in Chapter 3. I suggested that there is no context that can simultaneously satisfy the restrictions derived from *cơ* and those from the information-seeking question marker *không*.

Another alternative is to claim that *cơ* always reflects the Speaker's surprise rather than that the surprise marked by the particle is Addressee-oriented in declaratives and Speaker-oriented in polar questions. We saw that this is the case for many instances of PQs with *cơ* discussed in the last chapter. Declaratives with *cơ* can be analyzed in the same way, as illustrated by (101). In both corrective and contrastive contexts, A's utterance is unexpected for B, licensing B's use of *cơ*.

(101) The Addressee's sentence surprises the Speaker

a. Corrective contexts

A: Sam chỉ đạt 70 điểm.
Sam only get 70 point
'Sam only scored 70 points.'

B: Không phải. Nó đạt 90 điểm **cơ**.
Not true he get 90 point CƠ
'That's not true. He scored 90 points.'

b. Contrastive contexts:

The current QUD: Who is the tallest?

A: Kim cao nhất. $[\text{Nó}]_{\text{CT}}$ cao 1.85m.
Kim tall most he tall 1.85m
'Kim is the tallest. Kim is 1.85m tall.'

B: $[\text{Sam}]_{\text{CT}}$ cao 1.9m **cơ**.
Sam tall 1.9m CƠ
'Sam is 1.9m tall.'

The analysis, however, can be easily ruled out. *Cơ* is licensed even in cases when the Addressee's utterance does not trigger the Speaker's surprise. In (102) A's question is certainly not a surprise for B.

(102) The Addressee's utterance does not trigger the Speaker's surprise

A: Sam thi thế nào?
Sam do how
'How did Sam do?'

B: Sam qua vòng hai. Nó thậm chí vào đến vòng bán kết **cơ**.
Sam pas round two he even enter to round semi-final CƠ
'Sam passed the second round. He even made it to the semi-final.'

Alternatively, we could claim that it is the Addressee's expectations rather than their actual utterances that surprise the Speaker. I argue that this alternative analysis does not hold either. In the example below, B has learnt about A's expectations long before B utters the declarative with *cơ*. Therefore, B is not surprised by A's expectations at the speech time. The use of *cơ* is still fine in this context.

(103) The Addressee's expectations do not surprise the Speaker at the speech time
Context: *B is told that A said Sam would not get a good prize in the contest.*
Later when the result is released, B sees A, and says:

Cậu sai rồi. Sam đạt giải nhất **cơ**.
You wrong already Sam get prize first CƠ
'You are wrong. Sam got the first prize.'

We can try to maintain this analysis by claiming that the situation in (103) involves the Speaker's *past* surprise. However, the cost is that we have to explain why *cơ* in declaratives sometimes reflects the Speaker's surprise at the speech time, as in (101), and at other times the Speaker's past surprise, as in (103), and why *cơ* in polar questions only refers to the Speaker's surprise at the speech time. I therefore pursue the idea that *cơ* reflects the Addressee's potential surprise in declaratives and the Speaker's surprise in polar questions.

4.3 Mirativity

Mirativity refers to the widespread phenomenon of linguistically marking some information as new or unexpected for the Speaker. The term is introduced in Delancey (1997) in which it is attributed to Jacobsen (1964). In Aikhenvald (2012)'s typological review of mirativity across languages, a wider range of mirative readings are documented, as quoted below:

> (i) sudden discovery, sudden revelation or realization (a) by the Speaker, (b) by the audience (or Addressee), or (c) by the main character;
> (ii) surprise (a) of the Speaker, (b) of the audience (or Addressee), or (c) of the main character;
> (iii) unprepared mind (a) of the Speaker, (b) of the audience (or Addressee), or (c) of the main character;

(iv) counterexpectation (a) to the Speaker, (b) to the Addressee, or (c) to the main character;
(v) information new (a) to the Speaker, (b) to the Addressee, or (c) to the main character.

(from Aikhenvald (2012))

However, what exactly mirative markers are expressing and how to characterize them are still matters of some debate. In what follows I will discuss several approaches to mirativity and point out the challenges of capturing the mirative contribution of *co* if following those approaches.

4.3.1 Rett (2011) and Rett and Murray (2013)

Rett (2011) studies exclamatives in English, as illustrated in (104).

(104) English exclamatives
a. (My,) What delicious desserts John bakes!
b. (Boy,) Does John bake delicious desserts!
c. (My,) The desserts John bakes!

(from Rett (2011))

The paper analyzes the mirativity of exclamatives as an illocutionary force and addresses the felicity conditions of constructions with this kind of force. The basic idea is that the illocutionary force operator, labelled as E-Force, takes an argument Υ of a variety of semantic types, and returns E-Force(Υ) with the propositional content p which is an expression of the Speaker's attitude toward p, i.e. surprise. E-Force (Υ) requires a context c such that in c, (i) the Speaker has direct evidence for p, (ii) the Speaker believes p, and (iii), the Speaker finds p noteworthy or remarkable.

Building on this work and Murray (2010) on evidentiality, Rett and Murray (2013) proposes an account for mirative evidentials in Cheyenne which are markers with dual functions: evidentiality in some contexts and mirativity in others. Their account is grounded within a framework of structured representations which considers the semantic contribution of sentences at three levels: at-issue, not-at-issue and locutionary levels. They propose that constructions with mirative evidentials as well as English exclamations, at the locutionary level, simultaneously involve an act of

assertion and an act of expression. Assertion is a proposal to update the Common Ground with the at-issue proposition p. The act of expression indicates that p is not in the Speaker's set of expectations when they learned p. The act of expression is conditioned by the Recency Restriction which, as the authors define, requires that the speech time is recent relative to the event of the Speaker learning p. The example in (105) illustrates how an exclamation is analyzed under their framework.

(105) Rett and Murray's analysis for an exclamation

a. Hawk won (the race yesterday)!

b.

At-issue proposition	p = λw. Hawk won in w
Not-at-issue restriction	None
Illocutionary relation	(i) Propose to add p to CG (ii) The recency restriction is satisfied → Speaker did not expect that p

(from Rett and Murray (2013))

The main issue with the two analyses above is that they do not offer an natural explanation for the phenomenon of interrogative flip observed in the use of *co͘*. *Co͘* can attach to declaratives, polar questions, as well as *wh*-questions which will be discussed later. Only the contribution of *co͘* to polar questions is akin to the mirative effect of exclamations and mirative evidentials, i.e. expressing the Speaker's surprise. Change in perspective occurs when *co͘* appears in declaratives and *wh*-questions, with the potential attitude of the Addressee's rather than the Speaker's becoming the concern. The use of *co͘* is therefore not always interpreted as reflecting the Speaker's attitude. This means that Rett and Murray's analyses need to find a way to integrate the parameter of perspective to include mirative markers like *co͘*.

A further minor concern is that for polar questions with *co͘*, the Speaker ultimately may not fully believe the propositional content of their question. The example in (106) shows that polar questions with *co͘* behave differently from exclamations with respect to the Speaker's degree of belief.

(106) The Speaker ultimately may not fully believe the propositional content of their polar question with *co͘*

Context: A tells B that their business trip will be 2 week long. B then says:

a. Chúng ta phải đi 2 tuần cơ à? **Cậu có chắc không**?
We must go 2 week CƠ Q You PRT sure Q
We have to go for 2 weeks? Are you sure?

b. Chúng ta phải đi nhiều ngày thế! #**Cậu có chắc không**?
We must go many day PRT You PRT sure Q
Intended: We have to go that many days! Are you sure?

The follow-up in bold suggests that the Speaker suspects the information the Addressee has said and is seeking the Addressee's reconfirmation. Rett and Murray's analyses above can only account for the incompatibility between this follow-up and the exclamation in (106.b). They claim that exclamations require the Speaker to fully believe their propositional content. The Speaker therefore cannot express the maximal degree of belief in a proposition and, at the same time, express uncertainty about it. I argue that this requirement is specific to exclamations. Polar questions with *cơ* do not require the Speaker to fully believe the propositional content. The Speaker in (106.a) partially believes the propositional content of the question and thus can continue with the follow-up sentence expressing uncertainty to seek confirmation.

4.3.2 Merin and Nikolaeva (2008)

Merin and Nikolaeva (2008) develops an account for English exclamations within the framework of Decision-Theoretic Semantics. Their proposal is that exclamations "communicate an ostensible drastic change in the Speaker's expectations". They claim that a change of expectation involves a change of belief or a change of desirative valuation, or both. Belief, desirative valuation, and expectation are all weighed and mathematically represented, using the theory of probability. Belief in a possible outcome is measured by the probability of the realization of the outcome conditioned by evidence. Desirative valuation of a possible outcome is specified by decision theory which assigns the outcome some desirative value. Expectation then is calculated based on the probability and the desirative value of all the possible outcomes. A change in expectation is measured by the difference between the prior expectation and the posterior expectation, which can be positive or negative. The example in (107) shows a simple version of their analysis for an English exclamation. This example is an instance of a negative change in expectations induced by a change of belief.

(107) An example of Merin and Nikolaeva (2008)'s account for exclamations.

a. The things she eats!

b. Let ⟦she⟧ = Linda

Let x range over D = {cheddar, frog legs} = {c, f}

Let +X := 'Linda eats x' and -X := 'Linda doesn't eat x' (X = C, F)

Let P_{s-1} ostensible prior probability distribution

P_s ostensible posterior probability distribution

Let Des := affective-aesthetic evaluation (for example, in terms of how people like cheddar and frog legs.)

	+C+F	-C+F	+C-F	-C-F
Des	-10k	-10k	0	0
P_{s-1}	v.low	v.low	v.high	v.high
P_s	v.high	v.high	v.low	v.low

The prior Expectation:

$E_{s-1}(X) = \text{-10k} \cdot P_{s-1}(\text{+C+F}) + \text{-10k} \cdot P_{s-1}(\text{-C+F}) + 0 \cdot P_{s-1}(\text{+C-F}) + 0 \cdot P_{s-1}(\text{-C-F}) \approx 0$

The posterior Expectation:

$E_s(X) = \text{-10k} \cdot P_s(\text{+C+F}) + \text{-10k} \cdot P_s(\text{-C+F}) + 0 \cdot P_s(\text{+C-F}) + 0 \cdot P_s(\text{-C-F}) \approx \text{-10k}$

Conclusion: There is a drastic change in expectations.

There are two concerns with Merin and Nikolaeva (2008)'s proposal. First, just like the analyses of Rett (2011) and Rett and Murray (2013), this proposal aims to account for exclamations — the type of mirative constructions which are only concerned with the Speaker's attitude. The work therefore also faces with the issue raised by the phenomenon of interrogative flip in the use of *co*. Second, *co* makes reference to a set of expectations which are a set of propositions that represent what the relevant agent believes or partially believes. This notion of expectation is different from expectations as mathematical values for a particular proposition in Merin and Nikolaeva (2008)'s work. Without modification, an analysis for *co* will contain two notions of expectations, which is confusing and undesirable.

4.3.3 Peterson (2016)

Peterson (2016) investigates evidential markers that can express the Speaker's surprise, akin to mirative evidentials studied in Rett and Murray (2013). The central claim of this study is that mirativity is the linguistic encoding of surprise as a cognitive process. Peterson presents two fundamental ways of characterizing surprise: a "schema theory" which analyzes surprise as a cognitive process and a probabilistic approach akin to Merin and Nikolaeva (2008)'s. He argues that the schema theory is sufficient for explanatory purposes. In the schema theory, the key notion *schemata* is "defined as non-linguistic formal objects that are organized knowledge structures representing concepts such as situations, objects, events, and actions at various levels of abstractness" (Peterson 2016:1330). The core idea of the schema theory is that surprise is an event of *schema discrepancy*, induced when one obtains from sensory or direct evidence some new information involving "a deviation to some degree from *activated cognitive schema*" (Peterson 2016:1331).

My analysis for *cƟ* shares with Peterson (2016) the intuition that mirative markers reflect surprise triggered by some kind of discrepancy between input information and one's expectations or activated schema in Peterson's terms. A shortcoming of the schema theory is that it gives the impression that new information triggering a schema discrepancy is sufficient to induce surprise. There is, in fact, a possibility that the agent chooses not to go along with the new information and thus will not experience surprise. The characterization of mirative markers should be able to rule out this possibility with further constraints on the agent's resulting information state due to the emergence of the new information in addition to the condition of schema discrepancy.

4.3.4 Zeevat(2008) and Khatib (2013)

In Zeevat (2008), the term of mirativity is applied to a wide range of English particles such as *already*, *still*, *even* and *only*:

> In all four cases, they are specialised mirative markers, they express surprise at the large size of a quantity (even), surprise at the small size of a quantity (only), surprise at the early time of some event or the advent of some state (already) or at the long continuation of a state

(still). Surprise would be a question of conflict with an expectation.

(from Zeevat (2008))

The paper mainly focuses on *only* and argues that the core meaning of the particle is to express a denial of a weak presupposition about some expectation, i.e. to implicate that some weakly presupposed expectation is false. The weakly presupposed expectation "can be common ground... they can be the speaker's, the hearer's, but they can also be the expectation of a possible third party. The weakest expectation is there might be somebody who might think that" (Zeevat 2008:3). The example in (108) shows Zeevat (2008)'s analysis for an instance of *only*.

(108) Zeevat (2008)'s account for *only*

Yesterday, only Ronald went shopping.

a. The set of salient individuals: {Ronald, Susan}

b. Weak presupposition: Susan and Ronald were expected to go shopping together.

c. Assertion: Susan did not go shopping.

(adapt from Zeevat (2008))

Khatib (2013) points out that Zeevat's analysis for *only* which figures expectation or surprise into the particle's meaning faces the problem posed by the example in (109). This example shows that *only* is felicitous despite the lack of counter-expectation or unexpectedness.

(109) As everyone/I expected, only John showed up. (from Khatib (2013))

The issue is first addressed in Löbner (1989) which cites examples as in (110) to criticize the work on *already* and *still* that makes reference to expectation.

(110) As I expected, the light was {already/still} on. (from Löbner (1989))

Khatib (2013), in revising Zeevat's account, claims that particles like *only* allow certain degree of flexibility in their construal. In particular, in situations as in (109 - 110), the particles "should not be taken to signal contrariness to everyone's/my expectation, but rather to what perhaps *ought* to be the case" (p.49). Then, he proposes to generalize Zeevat's idea as in (111), in which *only* is licensed by a larger

set of propositions that are regarded as expected, neutral or normal. The formulation also takes Klinedinst (2005)'s idea about the low position of the prejacent proposition of *only* on a given scale. The formulation in (111) specifies that some alternatives that are higher than the prejacent of *only* (S) on a given scale is normal or expected.

(111) *Only*'s mirative presupposition
Given a scale σ, $[\![\text{only}_\sigma\ \text{S}]\!]$ is defined if there is an alternative S' $\in$ ALT(S) such that S' $>_\sigma$ S and N(λw$[\![\text{S'}]\!]^w$)

(112) N is a set of expected or neutral propositions. N holds of a proposition p if p is true in at least one world that is compatible with expectation
(from Khatib (2013))

Khatib's analysis for the mirative component of *only* is promising when applied to *cơ* which, as claimed, is a scalar mirative particle. However, it is worth highlighting that the meaning of *cơ* is strictly connected with expectation. Preferences or norms can derive expectations but cannot directly license *cơ*, as shown in (113).

(113) Being counter to expectation must be part of *cơ*'s meaning

a. A tells B that Sam got the first prize. B then says:

Đúng như {cậu/ mọi người} đoán, Sam đạt giải nhất (#cơ).
Correct as you everyone guess Sam get prize first CƠ
'As you/everyone guessed, Sam got the first prize.'

b. A tells B that Sam got the first prize. B then says:

Sam đạt giải nhất (#cơ) à? Đúng như tớ đoán.
Sam get prize first CƠ Q Correct as I guess
'Sam got the first prize? It is as I guessed.'

The examples in (113) are similar to (109 - 110) which are claimed to invoke propositions representing what ought to be the case rather than those connected with expectations. The infelicity of *cơ* in (113) suggests that the particle cannot tolerate the lack of counter-expectation as *only*, *already*, and *still* can.

In sum, I have discussed how mirative markers have been characterized in the literature on mirativity. I have also shown that the existing theories are insufficient to capture the meaning of *cơ*. In the next section, I will propose a different approach to mirativity and a formal semantics for the particle.

4.4 Proposal

This section presents the proposal for the meaning of *cơ*. I first argue that the particle's meaning contribution is use-conditional. Then I move on to formalize the mirative component of *cơ* using theories about information update. A formal semantics for *cơ* will be proposed after its scalar component is defined.

4.4.1 Use-conditional meaning

Kaplan's manuscript on German particles points out that "for certain expressions of natural language, a correct Semantic Theory would state rules of use rather than something like a concept expressed" (Kaplan 1999). I argue that the sentence-final particle *cơ* is best described with such a use-conditional meaning since the particle meets many criteria listed in Gutzmann (2008, 2015) for modal particles, a subclass of expressions with use-conditional meaning.

Gutzmann's list of criteria for modal particles is modified in McCready (2012), in order to be more applicable across languages.

(114) Particles ...

a. are not inflectable.

b. cannot be coordinated.

c. cannot be expanded.

d. are optional.

e. cannot be negated or questioned.

f. have sentential scope.

g. are sentence mood dependent.

(from McCready (2012))

The first criterion (114.a) does not apply here because Vietnamese is an isolating language (Thompson 1965). On the other hand, *cơ* does not meet the last criterion (114.g). As discussed in the previous chapters, *cơ* is found in declaratives and polar questions. The use of *cơ* in wh-questions is also common and will be further investigated later. The particle, however, does have all the other properties listed in (114).

Cơ cannot be coordinated with any other expressions including other sentence-final particles such as *mà* for expressing contradiction (Thompson 1965, Le 2015) or *đấy* for conveying the Speaker's commitment (Le 2015) [7].

(115) *Cơ* cannot be coordinated

a. *Sam đạt 90 điểm [**cơ** {**và**/ **hoặc**} **mà**].
Sam get 90 point CƠ and or MÀ
'Sam scored 90 points [CƠ and/or MÀ].'

b. *Sam đạt 90 điểm [**cơ** {**và**/ **hoặc**} **đấy**].
Sam get 90 point CƠ and or ĐẤY
'Sam scored 90 points [CƠ and/or ĐẤY].'

c. Sam đạt [90 điểm {**và**/ **hoặc**} một giấy chứng nhận] .
Sam get 90 point and or one CL certificate
'Sam scored [90 points CƠ and/or a certificate].'

The particle cannot be modified by any other expressions to form a phrasal constituent. (116) illustrates that *cơ* is unable to cooccur with an adverb like *rất* 'very' or a quantifier like *vài* 'a few'.

(116) *Cơ* cannot be modified

a. Sam đạt 90 điểm (***rất**) **cơ**.
Sam get 90 point very CƠ
'Sam scored 90 points very CƠ.'

b. Sam đạt 90 điểm **rất dễ**.
Sam get 90 point very easily
'Sam scored 90 points very easily.'

c. Sam đạt 90 điểm (***vài**) **cơ**.
Sam get 90 point a-few CƠ
'Sam scored 90 points a few CƠ.'

[7] Note that *cơ* and some other sentence-final particles can form a cluster of particles. A precise description for the meaning of a cluster and the contribution of individual particles requires additional work and are out of the scope of this thesis.

(1) Sam đạt 90 điểm **cơ mà**.
Sam get 90 point CƠ MÀ
'Sam scored 90 points CƠ MÀ.'

(2) Sam đạt 90 điểm **cơ đấy**.
Sam get 90 point CƠ ĐẤY
'Sam scored 90 points CƠ ĐẤY.'

d. Sam đạt 90 điểm **vài lần**.
Sam get 90 point a-few time
'Sam scored 90 points a few times.'

The optionality of *cơ* is implied in the previous chapters. As shown in the previous chapters, the *cơ*-less version is grammatical and felicitous in all contexts that support a sentence with *cơ*.

(117) *Cơ* is optional

a. Corrective contexts

Context: A says Sam only got 70 points. B then says:

B: *Không phải*. Nó đạt $[90]_{F}$ điểm (**cơ**).
Not true he get 90 point CƠ
'That's not true. He scored 90 points.'

b. Contrastive contexts

Context: A claims that Kim is the tallest with the height of 1.85m. B then says:

B: $[\text{Sam}]_{CT}$ cao $[1.9\text{m}]_{F}$ (**cơ**).
Sam tall 1.9m CƠ
'Sam is 1.9m tall.'

c. Scalar contexts

Context: A asks if Sam passed the first round. B then says:

B: Có. Nó *thậm chí* vào đến $[\text{vòng bán kết}]_{F}$ (**cơ**).
Yes he even enter to round semi-final CƠ
'Yes. He even made it to the semi-final.'

d. Polar questions

Context: A tells B Sam bought 20 packets of candy. B says:

(Ồ,) Nó mua $[20\ \text{gói}]_{F}$ (**cơ**) à? **Nhiều thế!**
Oh he buy 20 packet CƠ À many PRT
'Oh, did he buy 20 packets? ($\rightsquigarrow$ and *I think he did, it's surprising.*) So many!'

Cơ is also observed to have the property (114.e). The implication derived from the particle cannot be negated or questioned.

(118) *Cơ*'s contribution cannot be negated or questioned

A: Sam đạt giải nhất **cơ**
Sam get prize first CƠ
'Sam got the first prize.'

B then says:

a. B: Không phải. ...
Not true
'That's not true. ...'

i. ✓Nó không đạt giải nhất.
He not get prize first
'He didn't get the first prize.'

ii. #Tớ không ngạc nhiên vì Sam đạt giải nhất.
I not surprised because Sam get prize first
'I am not surprised that Sam got the first prize.'

b. B: Thật à? ...
Really Q
'Really? ...'

i. ✓Nó thực sự đạt giải nhất à?
He really get prize first Q
'Did Sam really get the first prize?'

ii. #Cậu thực sự nghĩ tớ ngạc nhiên vì Sam đạt giải nhất à?
You really think I surprised because Sam get prize first Q
'Did you really think I am surprised that Sam got the first prize?'

In this example, B can respond to A's declarative with *cơ* with either a denial, as in (118.a), or a confirmation seeking question, as in (118.b). The follow-up sentences (118.a.i-ii) and (118.b.i-ii) make explicit what is denied and what is questioned respectively. As shown, the denial can only be followed by (118.a.i) which negates the propositional content of the declarative with *cơ*. Similarly, the question only accepts (118.b.i) which questions this proposition. The follow-up sentences (118.a.ii) and (118.b.ii) targeting the implication of *cơ* are not infelicitous.

Lastly, the particle cannot be interpreted as part of an embedded clause or appear in the scope of other operators such as modals. In other words, *cơ* is assumed to have sentential scope.

(119) *Cơ* cannot be embedded

Kim bảo là Sam đạt giải nhất cơ.
Kim say that Sam get prize first CƠ

a. 'Kim said that Sam got the first prize'
   ⇝ that Kim said so will be unexpected to you. (*cơ* > *said*)

b. *'Kim said that Sam got the first prize'
   ⇝ that Sam got the first prize will be unexpected to you. (*said* > *cơ*)

(120) *Cơ* cannot be under the scope of a modal

Sam **nhất định** sẽ đạt giải nhất cơ.
Sam certainly FUT get prize first CƠ

a. 'Sam certainly will get the first prize'
   ⇝ that will be unexpected to you. (*cơ* > *certainly*)

b. *'Sam will get the first prize'
   ⇝ that certainly will be unexpected to you. (*certainly* > *cơ*)

Since *cơ* passes most of the diagnoses for modal particles listed in (114) above, we are able to assume that *cơ* has the not-at-issue meaning of the same type as those particles. In addition, as shown in the previous chapters, which describe *cơ* in declaratives and polar questions, the distributional restrictions imposed on sentences with *cơ* are considered to be the contribution of *cơ*. Therefore, I take *cơ* to be a particle with purely use-conditional meaning, with no truth-conditional contribution.

4.4.2 The mirativity of *cơ*

Next, I will present arguments for the claim that the mirativity of *cơ* reflects a stage of belief revision that has already been triggered. I argue that that stage of belief revision is characterized by (i) the incompatibility between the prejacent proposition of *cơ* and the agent's information state and (ii) that the agent will add the proposition to their information set. Evidence for the first property comes from the use of *cơ* in declaratives. Consider (121).

(121) The prejacent proposition is incompatible with an agent's information set

Context: A tells B that Sam bought at most 10 books.

⇝ A's expectations: *Sam bought at most 10 books*

B then says:

Không phải. Sam mua 15 quyển cơ.
Not correct Sam buy 15 CL CƠ
'That's not true. Sam bought 15 books.'

Given the discussion about *cơ* in declaratives, *cơ* in (121) implies that A will be surprised by what B is saying. At the speech time of *cơ*, the prejacent of *cơ* is being delivered to A. Therefore, it is very likely that A still believes A's own information.

Further support comes from the presence of sentences including the phrase *can't believe*. English exclamations can be followed by such sentences. The same holds for Vietnamese.

(122) Follow-up sentences with *can't believe*

a. Sam got the first prize! **I can't believe it**!

b. Sam đạt giải nhất! **Không thể tin nổi**!
Sam get prize first not able believe PRT
'Sam got the first prize! (I) can't believe (it).'

I argue that the presence of a follow-up sentence with *can't believe* indicates an ongoing process to integrate the propositional content of the exclamation into the Speaker's information set. Particularly, sentences with *can't believe* can be used veridically or non-veridically (Roberts 2019).

(123) The use of *can't believe*

a. I **can't believe** Sam got the first prize. I'm so impressed!
$\rightsquigarrow$ Sam got the first prize. (veridical use)

b. I **can't believe** Sam got the first prize. I will find evidence to show you that he didn't.
$\not\rightsquigarrow$ Sam got the first prize. (non-veridical use)

When these sentences follow exclamations, they always carry a veridical inference as in (123.a). This is supported by the observation that sentences expressing disbelief are not allowed to follow the exclamation and the veridical *can't believe* in (123.a) but can strengthen the non-veridical example in (123.b), as shown in (124).

(124) Follow-up sentences expressing disbelief

a. Sam got the first prize! I can't believe it. {# **In fact, I don't believe it**/ #**In fact, I am sure he didn't**}.

b. I can't believe Sam got the first prize. **In fact, I don't believe it**. I will find evidence to show you that he didn't.

Roberts (2019) proposes a compositional account for the veridical use of *can't believe* as follows. Take (122.a), repeated below in (125), as an illustration.

(125) Sam got the first prize! **I can't believe it**!

Robert's idea is that the modal *can* quantifies over a set of ideal worlds in which all the Speaker's long-standing existing beliefs are true. Then, negation is applied and yields the inference that there is no ideal world in which the Speaker believes p, that Sam got the first prize. This is compatible with scenarios in which the Speaker holds a belief of p in some non-ideal worlds, which includes the actual world. The veridical use of *can't believe* arises in such cases.

Given this account of Roberts (2019), if we assume that the information set of the Speaker only represents the long-hold existing beliefs of the Speaker, we can see that an exclamation is associated with a process of belief revision that will change the Speaker's information set. At the utterance time of the exclamation, its propositional content is not in the Speaker's ideal beliefs set, i.e. the set of the long-standing existing beliefs. However, that the proposition holds true in some non-ideal worlds, possibly due to some new evidence, will ultimately lead to the removal of some contrasting ideal beliefs of the Speaker. The removal is needed to avoid inconsistency in the Speaker's information set. What is crucial here is that this belief revision takes time and has not settled yet at the utterance time of the exclamation. The presence of follow-up sentences with veridical *can't believe* therefore can be taken as an indicator of an ongoing process of belief revision, reflecting a conflict between a speaker's current beliefs and their long-standing beliefs.

Both declaratives and PQs with *cơ* can be followed by sentences with phrases similar to English *can't believe*, as illustrated in (126).

(126) *Cơ* and *can't believe*

a. A declaratives with *cơ*

Context: A thinks Sam could at most get the third prize as he is always an average student. After A tells B so:

B: Sam đạt giải nhất **cơ**.	A: **Không thể tin nổi**.
Sam get prize first CƠ	Not able believe PRT
'Sam got the first prize CƠ.'	'(I) can't believe (it).'

b. A polar question with *cơ*

Sam đạt giải nhất **cơ** à? **Không thể tin nổi**.
Sam get prize first CƠ Q not able believe PRT
'Sam got the first prize CƠ? (I) can't believe it.'

Furthermore, the Vietnamese counterpart of *can't believe* as in (126) is used veridically. It is straightforward for PQ with *cơ* as they do not allow follow-up sentences expressing disbelief.

(127) PQ with *cơ* incompatible with follow-up sentences expressing disbelief

Sam đạt giải nhất **cơ** à? #Tớ không **tin**.
Sam get prize first CƠ Q I not believe
'Sam got the first prize CƠ? I don't believe it.'

Declaratives with *cơ* require further comments. We will see right after this discussion that a belief revision of the Addressee's information set is assumed by the Speaker but may not actually occur. In other words, it is possible for A in (126.a) to say *I don't believe it* instead of *I can't believe it*. A follow-up sentence expressing disbelief uttered by the Addressee thus cannot be a diagnostic for the veridicality of the Vietnamese *can't believe* in (126.a). A solution to this is a follow-up sentence uttered by the Speaker. Since the Speaker assumes that the Addressee will revise their information set with the contrasting information, it is impossible for the Speaker to tell the Addressee not to believe the information. This is borne out. Note that such an act is also peculiar because the Speaker is naturally assumed to expect the Addressee to believe what they say.

(128) Declaratives with *cơ* take veridical *can't believe*

Context: A thinks Sam could at most get the third prize as he is always an average student. After A tells B that, B says:

B: Sam đạt giải nhất **cơ**. #Cậu không được tin điều tớ vừa nói.
Sam get prize first CƠ You not allow believe thing I just say
'Sam got the first prize CƠ. You must not believe what I have said.'

Now, let's see in more details how the mirativity of *cơ* is relative to the Speaker's beliefs. In particular, it is the Speaker's beliefs that the prejacent proposition is incompatible with an agent's information set, the Addressee in declaratives and the Speaker in polar questions, and that the agent will add the proposition to their information set. Such an incompatibility and an addition may not be actual. For

example, in declaratives, it is the Speaker's beliefs that the Addressee will believe the prejacent proposition and be surprised. It is thus possible for the Addressee to actually reject the proposition, as shown in (129)

(129) The Addressee refuses to add the prejacent of *cơ* to their information set

Context: A tells B that Sam bought 10 books.

$\rightsquigarrow$ A's expectations: *Sam bought 10 books*

B: Sam mua 15 quyển **cơ**. Kim bảo tớ thế.
Sam buy 15 CL CƠ Kim tell me that
'Sam bought 15 books. Kim told me that.'

A: Không phải đâu. Nó chỉ mua 10 quyển thôi.
Not true PRT He only buy 10 CL only
'That's not true. He only bought 10 books.'

In this scenario, A's initial and restated claims indicate A's expectations. It is clear that the prejacent proposition of *cơ that Sam bought 15 books* is incompatible with A's expectations and thus with A's information set. A's restated claim, however, expresses A does not believe the prejacent proposition. In other words, A refuses to add the prejacent proposition to their information set. The felicity of *cơ* is unexpected if such an addition is actually required. The requirement that the Speaker expects such an addition, on the other hand, is met in (129). B commits to his own statement and thus expects A to do so.

The incompatibility between the prejacent proposition and an agent's information is not actually required either. As discussed in the chapter on *cơ* in declaratives, the Speaker can make assumptions about the Addressee's expectations and thus the Addressee's information set at the speech time of *cơ*. These assumptions may turn out to be incorrect. I argued that even in such a scenario, the use of *cơ* is acceptable. Consider the example in (130).

(130) Assumptions regarding the Addressee's information set can be false

Context: B was told that A said Sam would only get the third prize in the contest Sam participated.

$\rightsquigarrow$ B's assumptions about A's expectations: *Sam would get the third prize*

What B was told is, however, a misunderstanding. A didn't say this. Later when the result is released, B sees A and says:

B: Cậu bảo Sam chỉ đạt giải ba. Cậu sai rồi. Nó đạt giải nhất
You say Sam only get prize third You wrong PRT He get prize first
cơ.
CƠ
'You said Sam would only get the third prize. You're wrong. He got the first prize.'

A: Tớ có bảo thế đâu.
I PRT say that not
'I didn't say that.'

In the scenario above, A's response invalidates B's assumptions about A's expectations and thus the incompatibility between A's information set and the proposition marked by *cơ*. The felicity of *cơ* here confirms that *cơ* can be licensed as long as the incompatibility holds according to the Speaker's beliefs.

This intuition about the mirativity of *cơ* is generalized in (131).

(131) The mirativity of *cơ*

The Speaker S marks a proposition p with *cơ* at a time t if S believes at t that for an agent X

a. p is incompatible with X's information set at t, and

b. X will add p to X's information set at t at some later time t' that is close to t.

4.4.3 Formal preliminaries

Now we turn to formalize the mirativity of *cơ*. I will start with the characterization of *information set*. As mentioned in the chapter on *cơ* in declaratives, an information set refers to a set of propositions that represent an agent's beliefs and partial beliefs. I take information sets to be relative to time. To formally define beliefs and partial beliefs, I adopt the notion of *credence of belief* (Ramsey 1926, Lewis 1980). The idea about credence of belief is that a proposition is believed by an agent at a particular moment to a particular degree based on the evidence the agent has at that moment. (132) below presents a formulation for measuring credence of belief from Davis et al. (2007), in which the concepts in Lewis's original work on credence of belief are related to the linguistic concepts for modeling belief states. Note that I

have adapted the formulations from Davis et al. (2007) to be relative to time rather than to context as in their work.

(132) Credence of belief under Davis et al. (2007)'s model

a. Probability distribution

A probability distribution for a countable set W is a function P^W from subsets of W into real numbers in the interval [0,1] obeying the conditions: (i) $P^W(W) = 1$; (ii) $P^W(w) \geq 0$ for all $w \in$ W; (iii) if p and q are disjoint subsets of W, then $P^W\ (p \cup q) = \mathrm{P}^W\ (p) + \mathrm{P}^W\ (q)$.

b. Conditional probability distribution

Let $P(—|p)$ be the function that maps any proposition q to

$$P(q|p) \stackrel{def}{=} \frac{P(p \cap q)}{P(p)} \text{ (undefined if } P(p) = 0)$$

where P is a probability distribution. $P(—|p)$ maps propositions to their conditional probabilities (for P) given p.

c. **Subjective probability distribution**

Let $C_{X,t}$ be a function that maps any proposition p to an agent X's degree of belief in p at a time t, $\mathrm{Dox}_{X,t}$ be a proposition that represents the belief state of X at t.

The subjective probability distribution for A at t:

$$C_{X,t} \stackrel{def}{=} \mathrm{P}(—|\mathrm{Dox}_{X,t})$$

where P is a uniform distribution over W, i.e. $P(w) = \frac{1}{|W|}$ for all $w \in W$.

(from Davis et al. (2007))

Within this extended model, propositions representing beliefs have the maximal degree of credence, i.e. $C_{X,t}(p) = 1$. Partial beliefs, on the other hand, are propositions with degrees of credence that are lower than 1 but greater than some contextual threshold. A definition of information set that makes reference to credence of belief is given in (133)

(133) **Information set**

The information set of an agent X at a time t:

$\mathbf{Inf}_{X,t} = \{p \mid C_{X,t}(p) > \theta\}$

where the threshold θ is contextually determined.

To formally address the two properties of the early stage of belief revision reflected by *co͘*, I borrow Gardenfors (1988)'s idea that belief revision is formally defined as a function from one information state into another. Gardenfors takes information state to be a set of beliefs that is closed under logical consequences. The postulates of the revision function are given in (134). For the notation of belief revision, Gardenfors uses an update + symbol and a dot over it.

(134) **Belief revision function**

i. For any proposition p, and an information state $\mathbf{K}$, $\mathbf{K}\dot{+}p$ is the revision of $\mathbf{K}$ with p.

ii. $\mathbf{K}\dot{+}p$ is an information state.

iii. $p \in \mathbf{K}\dot{+}$p

iv. If $\neg p \in \mathbf{K}$, $\mathbf{K}\dot{+}p \subseteq \mathbf{K}{+}p$,

v. If $\neg p \notin \mathbf{K}$, $\mathbf{K}{+}p \subseteq \mathbf{K}\dot{+}p$,
where $\mathbf{K}{+}p = \{q\text{: } \mathbf{K} \bigcup p \vdash q\}$.

The last two postulates state that the belief revision function can be applied to any information state. The function is normally used when the input proposition p is incompatible with $\mathbf{K}$, as in (134.iv). The incompatibility is fixed by removing propositions incompatible with p from $\mathbf{K}$[8]. The addition of p to $\mathbf{K}$ follows. Motivations for resolving incompatibilities are to avoid yielding an absurd information state, i.e. an inconsistent set of beliefs. The function can be extended to cases in which $\neg p$ is not in $\mathbf{K}$. In such cases, the revision is identified with the ordinary update of $\mathbf{K}$ with p.

As described in (131), the mirative component of *co͘* makes reference to sets of beliefs and partial beliefs. I therefore take the notation $\mathbf{Inf}\dot{+}p$ to be a shorthand for performing a belief revision of the information state so that, as the result, *Inf* includes p. I propose the formalization for the mirative component of *co͘* in (135). The first condition in (135.i) requires that the prejacent proposition p of *co͘* is incompatible with the agent X's information set at the speech time of *co͘*. The second condition in (135.ii) guarantees that p will be added to X's information set.

[8]The retraction may be complex because some beliefs are more important or entrenched than others. The reader is referred to Gardenfors (1988) for more details

(135) **The mirative component of *cɔ***

The Speaker S marks a proposition p with *cɔ* at a time t if S believes at t that for an agent X,

a. $\mathbf{Inf}_{X,t} \vdash \neg p$, and

b. At *t'* that is later than and close to t [9], $\mathbf{Inf}_{X,t'} = \mathbf{Inf}_{X,t} \dot{+} p$.

4.4.4 A formal semantics for *cɔ*

Now I will formalize the scalar component of *cɔ* and present the unified semantics for *cɔ*. The generalization of the component is that the prejacent of *cɔ* is higher than all its expected focus alternatives on a given scale. I take $\mathbf{ALT\text{-}Exp}_{p,A,t}$ to be the set of propositions that are expected focus alternatives to a proposition p relative to an agent A at a time t. I propose the characterization of $\mathbf{ALT\text{-}Exp}_{p,A,t}$ in (136). The condition (136.i) indicates that q is a focus alternative to the proposition p under consideration. The condition (136.ii) states that q is true in at least one world in the set of worlds representing A's information set at t.

(136) **Expected focus alternative set**

Let p and q be propositions

A an agent, t a time, w a possible world

$q \in \mathbf{ALT\text{-}Exp}_{p,A,t}$ if

i. $q \in [\![p]\!]^f$ and

ii. $\exists w$ ($w \in \bigcap \mathbf{Inf}_{A,t}$ and $q(w) = 1$)

where $[\![p]\!]^f$ is a set of alternative propositions which are obtained by replacing all the F-marked constituents in p with contextually-determined alternatives (Rooth 1985, 1992).

The scalar component of *cɔ* makes reference to a set of expected focus alternatives, indicating that the prejacent of *cɔ* is stronger than all propositions in this set on a given scale. The formulation is given in (137).

[9] Exactly how to formalize "close" will left for future work.

(137) **The scalar component of *cơ***

Let p be the prejacent proposition of *cơ*

X be an agent,

t be the speech time

The scalar component of *cơ* requires that $\forall q \in \textbf{ALT-Exp}_{p,X,t}$, $p \gneqq_{\sigma} q$ on a contextually given scale σ

For illustration, the example in (138) shows how the formalization of the scalar component of *cơ* above can represent the scalar implication of a sentence with *cơ*.

(138) A sample analysis for the scalar implication of a sentence with *cơ*

a. A tells B that Sam got the third prize or the second prize. B then says:

Không phải. Nó đạt giải nhất **cơ**.
Not true He get prize first CƠ
'That's not true. He got the first prize.'

b. Analysis

i. $\textbf{Inf}_{A,t}$ entails that *Sam got the third prize or the second prize*

ii. $\textbf{ALT-Exp}_{p,A,t}$ = {*Sam got the third prize*, *Sam got the second prize*}

iii. p = *Sam got the first prize*

iv. $\forall q \in \textbf{ALT-Exp}_{p,A,t}$, $p \gneqq_{prize-ranking} q$

A nice consequence of the formulation given in (137) is that it derives the incompatibility between the prejacent proposition p and an agent's information set $\textbf{Inf}_{X,t}$. Since p is required to be stronger than all propositions q in $\textbf{ALT-Exp}_{p,X,t}$, p cannot be in $\textbf{ALT-Exp}_{p,X,t}$. Therefore p is false in all worlds that verify $\textbf{Inf}_{X,t}$.

The unified semantics of *cơ* is established by putting together the mirative and scalar components, as shown in (139).

(139) **Proposal for *cơ***

The Speaker S marks a proposition p with *cơ* at a time t if S believes at t that for the contextually salient discourse agent X,

i. $\forall q \in \textbf{ALT-Exp}_{p,X,t}$, $p \gneqq_{\sigma} q$ on a given scale σ, and

ii. At *t'* that is later than and close to t, $\textbf{Inf}_{X,t'} = \textbf{Inf}_{X,t} \dot{+} p$.

A point to note is that *cơ* is not subject to a non-vacuity constraint. The condition in (139.i) is satisfied even when $\textbf{ALT-Exp}_{p,X,t}$ is an empty set. Furthermore, in such cases, it still entailed that p is not in $\textbf{ALT-Exp}_{p,X,t}$. The requirement of an incompatibility between p and $\textbf{Inf}_{X,t}$ is thus derived in those extreme cases. This is empirically supported, as shown in (140).

(140) *Cơ* can be licensed with an empty set $\textbf{ALT-Exp}_{p,A,t}$

a. A guesses Sam could not solve any problem in the exam. B then says:

Cậu nhầm rồi. Sam giải được 3 câu **cơ**.
You wrong PRT Sam solve able 3 CL CƠ
'You are wrong. Sam solved 3 problems.'

$\rightsquigarrow \textbf{Inf}_{p,A,t}$ entails that *Sam could not solve any problem*

$\rightsquigarrow \textbf{ALT-Exp}_{p,A,t} = \emptyset$

b. A tells B that Sam solved 3 problems in the exam. B then says:

Sam giải được 3 câu **cơ** à? Tớ tưởng nó không giải nổi một câu.
Sam solve able 3 CL CƠ Q I think he not solve even one CL
'Sam solved 3 problems? I thought he didn't solve even one.'

$\rightsquigarrow \textbf{Inf}_{p,B,t}$ entails that *Sam could not solve any problem*

$\rightsquigarrow \textbf{ALT-Exp}_{p,B,t} = \emptyset$

4.5 Further issues

This section is concerned with the issues about interrogative flip, scales, and the relation between *cơ*, other mirative markers, and markers of belief revision. First, I will discuss in detail and attempt to give an account for the phenomenon of interrogative flip observed in the use of *cơ*. This provides support for the part in the proposal stating that the mirative orientation is contextually determined. Then in the discussion of scales, I will show that *cơ* can make reference to multiple types of scales and argue for their unequal status in scale competition. The last section focuses on a comparison between *cơ* and mirative markers and the deep connection between mirative markers and markers of belief revision.

4.5.1 Interrogative flip

Interrogative flip is a phenomenon of perspective change, which has been discussed in the evidential literature (Garrett 2001, Faller 2002, Speas and Tenny 2003, Aikhenvald 2004). An evidential particle communicates that the Speaker has a certain form of evidence for the proposition marked by the particle when it appears declaratives. For many of such evidential markers, in polar questions, it is the Addressee who is assumed to have a certain form of evidence supporting the marked proposition. The scalar mirative particle *cǒ* is observed to participate in a similar phenomenon of interrogative flip. The mirativity of *cǒ* is Addressee-oriented in declaratives and Speaker-oriented in polar questions. In fact, the mirativity of *cǒ* in declaratives and polar questions also differ in terms of forms of surprise. The particle reflects a potential surprise in declaratives and a present surprise in polar questions. In what follows, I will attempt to provide an explanation for the observed pattern.

The following discussion is based on several assumptions. First, agents in a discourse include the Speaker, the Addressee, and potentially a third person. As mentioned in the Introduction, the Speaker is the one who utters the sentence with *cǒ* and the Addressee the one which the sentence with *cǒ* is delivered to. A third person is neither the Speaker nor the Addressee, who may be present or absent in the discourse. In the sense as defined, the contextually salient agent for the semantics of *cǒ* is never a third person but always the Speaker or the Addressee. Second, the discussion makes reference to the following terms: past, present, and potential surprise. The classification is based on the definition of surprise in (98), repeated here in (141).

(141) **Surprise**

An agent X is surprised at a proposition p if belief revision is necessary to add p to X's information set when X obtains evidence for p.

Accordingly, for cases of past surprise, the addition of p to X's information set has already completed at the speech time. This implies that X's information set at the speech time may entail the proposition under consideration. A surprise is a present surprise if the speech time is within the time of the belief revision that results in changes X's information set. So, in contrast to a past surprise, for a present surprise, the agent's information set at the speech time does not entail the proposition under

consideration. For cases of potential surprise, the change in the relevant agent's information set is expected at the speech time. Examples of three types of surprise are given in (142).

(142) Three types of surprise

a. Past surprise

Yesterday Kim told me Sam got the first prize and I was very surprised.

b. Present surprise

Kim has told me Sam got the first prize. I still can't believe it.

c. Potential surprise

If Sam gets the first prize, I will be very surprised.

4.5.1.1 Declaratives

Let's first look at *co* in declaratives. The mirativity of *co* always reflects a potential surprise and is Addressee-oriented. I will show that the pragmatic properties of declaratives rule out the possibility that the mirativity of *co* reflects the Speaker's present or potential surprise. Then I will present data showing that *co* cannot be licensed in scenarios with a third person's surprise as well as with the Speaker's or the Addressee's past surprise. I argue that the data can be accounted for by the proposed semantics of *co* given in the previous section in (139).

A declarative commits the Speaker to the proposition it denotes. I assume that declaratives with *co* have the same pragmatic properties. This means that at the speech time t of a declarative with *co*, the Speaker's information set $\mathbf{Inf}_{S,t}$ includes the prejacent proposition p. If there was a change in $\mathbf{Inf}_{S,t}$ from favoring $\neg p$ to p, such a change already took place prior the speech time t. As a result, a declarative with *co* cannot reflect the Speaker's surprise at the present time t or the Speaker's potential surprise.

Now, we will see that *co* cannot refer to a third's person surprise.

(143) A third person's surprise

Context: A tells B that Kim told A Sam bought at most 6 books, but A thinks Sam bought 10 to 15 books.

$\rightsquigarrow$ A's expectations at t: *Sam bought 10 to 15 books*

B then says:

a. A third person's past surprise

Sam mua 14 quyển (#**cơ**). Hôm qua tớ bảo Kim, nó rất ngạc nhiên.
Sam buy 14 CL CƠ Yesterday I tell Kim, he very surprised
'Sam bought 14 books. I told Kim yesterday, (and) he was surprised.'

$\rightsquigarrow$ Kim's past expectations: *Sam bought at most 6 books*

$\rightsquigarrow$ Prejacent of *cơ*: *Sam bought 14 books*

b. A third person's present surprise

Sam mua 14 quyển (#**cơ**). Kim vừa biết, nó vẫn rất ngạc nhiên.
Sam buy 14 CL CƠ Kim just know, he still very surprised
'Sam bought 14 books. Kim has just learned it, (and) he is still surprised.'

$\rightsquigarrow$ Kim's expectations at t: *Sam bought at most 6 books*

$\rightsquigarrow$ Prejacent of *cơ*: *Sam bought 14 books*

c. A third person's potential surprise

Sam mua 14 quyển (#**cơ**). Khi Kim biết sẽ rất ngạc nhiên.
Sam buy 14 CL CƠ When Kim know, FUT very surprised
'Sam bought 14 books. When Kim learns it, he will be surprised.'

$\rightsquigarrow$ Kim's expectations at t: *Sam bought at most 6 books*

$\rightsquigarrow$ Prejacent of *cơ*: *Sam bought 14 books*

In (143) above, the provided context implies that the number of books that B mentions is unexpected for the third person Kim but not the Addressee A. B's sentences following the declarative with *cơ* then make it clear whether Kim's surprise is past, present, or potential. In all three cases, the use of *cơ* is odd. This observation motivates the claim that the mirativity of *cơ* is relative to the contextually salient discourse agent. Since a third person is never the contextually salient discourse agent as required by *cơ*, it is straightforward that the particle cannot be licensed by the surprise of a third person.

Cơ in declaratives cannot make reference to the Speaker's or the Addressee's past surprise either. (144) illustrates the former scenario.

(144) The Speaker's past surprise

Context: A and B are outside a store, looking at a bike. A guesses that it is at most $500. B thinks it is $600 to $700.

⇝ A's expectation: *The bike costs at most $500*

⇝ B's expectation: *The bike costs $600 to $700*

One of them goes to ask for the price, comes back and says:

Cái xe giá $650 **cơ**
CL bike price $650 CƠ
'The bike costs $650.'

#Scenario 1: It is A who says the sentence

✓Scenario 2: It is B who says the sentence

In the above example, the actual price of the bike is unexpected for A and expected for B. Therefore, only B can be the one who announces the actual price and expects the Addressee's surprise, accounting for the acceptability of Scenario 2. In contrast, in Scenario 1, A is surprised when A learns the price, earlier than the speech time of the utterance with *cơ*. The infelicity of Scenario 1 suggests that A's past surprise cannot license *cơ*.

A scenario illustrating that *cơ* cannot be licensed with the Addressee's past surprise is shown in (145) below.

(145) The Addressee's past surprise

Context: A and B are outside a store, looking at a bike. A guesses that it is at most $500. B thinks it is $600 to $700.

⇝ A's expectation: *The bike costs at most $500*

⇝ B's expectation: *The bike costs $600 to $700*

A goes to ask for the price, comes back and says that the bike is $650. B then says:

Vậy là, cái xe giá $650 (#**cơ**).
So CL bike price $650 CƠ
'So, the bike costs $650.'

Similar to the scenario in (144), in (145), the actual price is a surprise for A but not for B. A's surprise, however, occurred in the past, prior to the speech time of the declarative with *cơ*. The infelicity of *cơ* shows that A's past surprise cannot license the use of *cơ*.

The above data provides arguments for the constraint that the prejacent proposition of *cơ* must be incompatible with an agent's information set at the speech

time. Past surprise, as defined, implies that the relevant agent's information set at the speech time may include the proposition. A scenario involving past surprise therefore cannot license *cơ* if the constraint is a requirement of the particle.

We are left with two possibilities: the Addressee's present surprise and the Addressee's potential surprise. Cases of the Addressee's present surprise can be ruled out by considering the pragmatic properties of declaratives together with the semantics of *cơ*. Discourse functions of declaratives may vary (see e.g. Asher and Lascarides 2003) but can be classified in two groups in terms of whether the denoted proposition is informative to the Addressee or not. When a declarative with *cơ* is informative to the Addressee, the Addressee has not fully obtained the denoted proposition at the speech time. Notice that a belief revision to add a proposition p to in a agent's information set must be triggered by the obtaining of evidence for p. For a declarative with *cơ*, the Addressee's surprise does not exist yet at the speech time. Instead, the Speaker commits to the denoted proposition and expects the Addressee to do so as well, which then causes the Addressee's surprise. In other words, the Addressee's surprise is potential rather than actual at the speech time. When a declarative is not informative to the Addressee, it must be the case that the Speaker expresses agreement or acknowledgement with the Addressee, as in (145). The hedging expression *vậy là* 'so' indicates that the declarative is used with this discourse purpose. As discussed above, the semantics of *cơ* is not supported in this scenario. Declaratives with *cơ* therefore are always concerned with the Addressee's potential surprise.

4.5.1.2 Polar questions

Next we turn to *cơ* in polar questions. As stated above, the mirativity of *cơ* in polar questions reflects present surprise and is Speaker-oriented. We will see again that the pragmatic properties of polar questions and the proposed semantics of *cơ* together explain these properties of the mirativity of the particle in polar questions. In particular, the Addressee of a polar question is normally expected to provide an answer to the question at the speech time. The possibility that the Addressee does not need to answer the question is also available. It is the case when a rhetorical question is asked. Despite their differences, in both cases, the Speaker assumes that the Addressee believes either the positive answer or the negative one at the speech

time. Notice that the Addressee is not required to actually hold such a belief. In other words, the Addressee may not know the answer. For example, a teacher can ask a question which the student cannot answer. Another property of polar questions is that the Speaker does not commit to the propositional content of their question. Therefore, unlike with declaratives, with polar questions, the Speaker cannot express that the Addressee will believe the proposition. Notice that the Speaker may be biased toward the proposition, as in the case of asking a rising declarative. Even in such a case, the question cannot express that the Addressee is expected to believe the proposition by the Speaker.

I assume that polar questions with *co* have these properties. Accordingly, for a polar question with *co* with the propositional content p, the Speaker believes that the Addressee's information set at the speech time t $\mathbf{Inf}_{A,t}$ includes either p or $\neg p$. If p is entailed, the belief revision that results in a change in $\mathbf{Inf}_{A,t}$ must have completed already. It is therefore impossible that the Speaker believes at t that the Addressee is surprised or will be surprised. In this case, only reflecting the Addressee's past surprise is possible for a polar question with *co*. On the other hand, if it is the case that $\mathbf{Inf}_{A,t}$ includes $\neg p$, no belief revision to add p to $\mathbf{Inf}_{A,t}$ is expected. A polar question with *co*, like other types of polar questions, cannot imply that the Addressee will turn to believe p. In other words, $\mathbf{Inf}_{A,t}$ is implied to remain the same, always including $\neg p$. This means that there is no implication at the speech time that the Addressee was surprised, is surprised or will surprised at p. So, whether the Addressee is assumed to believe p or $\neg p$ at the speech time, a polar question with *co* cannot reflect the Addressee's present or potential surprise.

The other possibilities including the Addressee's past surprise, the Speaker's past surprise, and a third person's surprise are all ruled out by the proposed semantics for *co*. The first two cases fail to support the incompatibility between the prejacent proposition and an agent's information set at the speech time. Cases concerning a third person's surprise violate the requirement that the attitude holder is the contextually salient discourse agent. Empirical data showing that *co* cannot be licensed with any of these three forms of surprise is given in (146).

(146) *Co* in polar questions does not refer to the Addressee's past surprise, the Speaker's past surprise, or a third person's surprise

a. The Addressee's (A's) past surprise

Context: A tells B that A thought Sam bought at most 6 books but A leaned that in fact Sam bought 14 books.

$\rightsquigarrow$ A's past expectations: *Sam bought at most 6 books*

B then says:

B: Sam mua 14 quyển (#**cơ**) à? Tớ biết ngay mà.
Sam buy 14 CL CƠ Q I know PRT PRT
'Sam bought 14 books? I knew it.'

b. The Speaker's (B's) past surprise

Context: A and B are told that Sam bought at most 6 books. A then learns that in fact Sam bought 14 books.

$\rightsquigarrow$ B's past expectations: *Sam bought at most 6 books*

When A tells B that, B says:

B: Vậy là, Sam mua 14 quyển (#**cơ**) à? Tớ đã rất ngạc nhiên khi
So Sam buy 14 CL CƠ Q I PST very surprised when
nghe Kim bảo thế hôm qua.
hear Kim say that yesterday
'So, Sam bought 14 books? I was very surprised when hearing Kim said that yesterday.'

c. A third person's past surprise

Context: Kim tells A and B that Sam bought at most 6 books. Later, Kim learns that in fact Sam bought 12 books. **Kim then tells B that and how surprised Kim was when learning that**.

$\rightsquigarrow$ Kim's past expectations: *Sam bought at most 6 books*

So when A tells B that Sam bought 12 books, B says:

B: Vậy là, Sam mua 14 quyển (#**cơ**) à? Kim đã rất ngạc nhiên
So Sam buy 14 CL CƠ Q Kim PST very surprised
khi nghe thế.
when hear that
'So, Sam bought 14 books? Kim was surprised when hearing that.'

d. A third person's present surprise

Context: Kim tells A and B that Sam bought at most 6 books. **A and B do not believe that because they saw Sam carried a very big bag of books.**

$\rightsquigarrow$ Kim's expectations at t: *Sam bought at most 6 books*

Later, A tells B that it was 14 books. B then says:

B: Vậy là, Sam mua 14 quyển (#**cơ**) à? Kim cũng vừa biết, nó vẫn
So Sam buy 14 CL CƠ Q Kim also just know he still
đang rất ngạc nhiên.
PROG very surprised
'So, Sam bought 14 books? Kim has learned it, (and) he is still surprised.'

e. A third person's potential surprise

Context: Kim tells A and B that Sam bought at most 6 books. **A and B do not believe that because they saw Sam carried a very big bag of books.**

$\rightsquigarrow$ Kim's expectations at t: *Sam bought at most 6 books*

Later, A tells B that it was 14 books. B then says:

B: Vậy là, Sam mua 14 quyển (#**cơ**) à? Khi Kim biết, nó sẽ rất
So Sam buy 14 CL CƠ Q When Kim know he FUT very
ngạc nhiên.
surprised
'So, Sam bought 14 books? When Kim learns it, he will be surprised.'

In all scenarios in (146), B the Speaker is not surprised at the speech time. In (146.a–b), this is indicated by the sentences following the questions. In (146.c), the background information in bold suggests that if B was surprised, it would have been when Kim told B the correct information, prior the speech time. In (146. c–d), the background information in bold indicates that the Speaker never holds expectations incompatible with the prejacent proposition of *cơ* and thus is not surprised when learning it at the speech time. On the other hand, the context makes clear who is (potentially) surprised in each scenario in (146). Expectations of the agent who is surprised, as explicitly indicated, are accessible to both the Speaker and the Addressee. The infelicity of *cơ* in all these scenarios empirically supports the claim that the particle cannot be licensed by the Addressee's past surprise, the Speaker's past surprise, and a third person's surprise.

We are left with two possibilities: the Speaker's present surprise and the Speaker's potential surprise. To conclude that polar questions with *cơ* always requires the Speaker's present surprise, we have to rule out the latter. The two forms of surprise

are different in terms of whether the Speaker actually obtains evidence for the contrasting information. A present surprise requires the actual obtaining of evidence at the speech time. In contrast, it is a potential surprise if the obtaining of evidence is only expected at the speech time. The Speaker of a polar question with *cơ* must actually obtain evidence for the prejacent of *cơ*. Recall that *cơ* is incompatible with neutral questions. The Speaker of a neutral question is unbiased, which means there is no incompatibility between the Speaker's information set and the propositional content of the question. *Cơ* is only compatible with biased questions instead. As shown in the chapter on *cơ* in polar questions, biased questions imply that the Speaker has evidence for the propositional content of the question. In other words, the Speaker of a polar question with *cơ* actually has evidence for its prejacent proposition at the speech time. *Cơ* in polar questions therefore can be licensed with the Speaker's present surprise but not with the Speaker's potential surprise.

In sum, I have attempted to give an account for the phenomenon of interrogative flip observed in the use of *cơ*. First, the condition regarding the incompatibility between the prejacent of *cơ* and an agent's information set prevents the particle from reflecting a past surprise. Second, the requirement of *cơ* that the agent who is surprised is contextually salient makes *cơ* infelicitous in contexts involving a third person's surprise. Finally, the pragmatic properties of the host sentence of *cơ* forces the mirativity of the particle to reflect the Addressee's potential surprise in declaratives and the Speaker's present surprise in polar questions.

4.5.2 Scales

This section focuses on the nature of scales associated with *cơ*. I will first discuss several existing approaches to scales and their challenges. Most of those theories postulate a unified basis for scales. I follow Klinedinst (2005) and propose that *cơ* makes reference to multiple types of *scales*.

The nature of scales has been under debate in the literature on scalarity. The popular likelihood-based view orders alternative propositions according to their likelihood (Karttunen and Peters 1979, Rooth 1992, Lahiri 1998). Arguments against this view come from the characterization of English *even*. Karttunen and Peters propose that *even* presupposes that its prejacent is more likely than all its contextual

alternatives. Work against the likelihood-based view points out cases in which the particle is licensed even though the prejacent is not more likely than its alternatives (Francescotti 1995, Rullmann 1997, Greenberg 2016), as given in (147).

(147) Arguments against the likelihood-based view

a. Granny was accused of kidnapping, and even [murder]$_F$. (Francescotti (1995):165)

b. John is a political nonconformist. He even read [Manufacturing Consent]$_F$ although it has been banned by the censorship committee. (Rullmann (1997):55)

c. John drank tea or coffee. Bill (#even) drank [tea]$_F$. (Greenberg (2016):8)

Some theories then propose to replace the likelihood scale with a scale based on pragmatic entailment (Fauconnier 1975a, 1975b, Kay 1990). In Kay (1990), the scalarity of *even* is analyzed as reflecting the relation between the prejacent of *even* called text proposition (tp) and a proposition called context proposition (cp). *Even* requires the tp to pragmatically entail the cp. By way of example, consider (148).

(148) Pragmatic entailment

George drank a little wine, a little brandy, a little rum, a little calvados, and even a little armagnac. (Fauconnier (1976):261)

a. cp = *George drank a little wine, a little brandy, a little rum, a little calvados*

An entailment of the cp: *George drank four different types of beverages*

b. tp = *George drank a little wine, a little brandy, a little rum, a little calvados, and a little armagnac*

An entailment of the tp: *George drank five different types of beverages*

Kay argues that the indicated entailment of the tp entails that of the cp and thus the tp pragmatically entails the cp. Rullmann (1997) argues that the cases concerning mutually exclusive alternatives pose a problem for this view, as shown in (149). Rullmann claims that it is unclear how being an associate professor pragmatically entails being an assistant professor.

(149) Arguments against the informativity-based view

A: Is Claire an [assistant]$_F$ professor?

B: No, she's even an [associate]$_F$ professor.

(from Horn (1972))

Winterstein et al. (2018)'s work on the Cantonese scalar particle *tim1* proposes a scale of "argumentative strength" built on Anscombre and Ducrot (1983), which offers a solution for the issue. An argumentative scale orders propositions according to their argumentative strength relative to another proposition called a conclusion. For the example in (149), assume the conclusion under discussion is that Claire has a good job; it is now clear that being an associate professor is a stronger argument for the conclusion than being an assistant professor. In fact, such a approach is already implied in Kay (1990) itself. There is however an issue with this approach. Suppose the conclusion instead is that Claire has a bad job; then the ordering of the two propositions is reversed. Since *even* is licensed, the argumentative scale must be tied with the original conclusion, which is puzzling.

The gradability-based view proposed in Greenberg (2018) attempts to resolve this problem by defining scales as associated with some gradable properties. She argues that the prejacent of *even* and its alternatives each corresponds to a degree that exceeds the standard on a scale associated with a gradable property and the former refers to a greater degree than the latter. For the example in (149), the relevant scale is associated with degrees of goodness. *Even* is licensed because Claire has a better job in all worlds where she is an associate professor than in all worlds where she is an assistant professor. Furthermore, in both sets of worlds, Claire has a good job. The requirement of exceeding a contextual standard prevents the ordering of the prejacent and its alternative in (149) on a scale associated with a gradable property such as badness. The degree of badness that the prejacent refers to is still greater than the degree of badness which the alternative refers to. However, both degrees are below the standard of badness because they are both above the standard of goodness. Scales associated with gradable properties like badness are thus ruled out.

The gradability-based view, however, does not work for *co*. The requirement that the degrees which the prejacent and its alternatives refer to all exceed the standard

on a particular scale is specific to *even*. *Cơ* is not subject to such a constraint, as illustrated in (150).

(150) *Cơ* is insensitive to standards of gradable predicates

Context: A and B are talking about Sam's score. The average score is 60.

A: Tớ đoán điểm của Sam rất thấp.
I guess score POSS Sam very low
'I guess Sam's score is very low.'

B: Cậu đoán sai rồi. Sam đạt 80 điểm **cơ**.
You guess wrong PRT Sam get 80 point CƠ
'You guessed it wrong. Sam got 80 points.'

It is implied from the scenario that the average score is taken to be the standard for evaluating how good Sam's score is. The score A guesses is below this standard whereas the score B claims is above. Since *cơ* is felicitous, the particle does not require the degrees which the prejacent and its alternatives refer to to be both greater than the standard on the scale of goodness. Without this requirement, nothing to prevent *cơ* to make reference to the opposite scale concerning how bad Sam's score is. On this scale of badness, the prejacent of *cơ* refers to a degree lower than the standard and the degree associated with the alternative. The scalar restriction is not met, predicting *cơ* infelicitous, which is not the case.

The argumentative approach also fails to fully capture the distribution of *cơ*. There are cases in which *cơ* is not licensed even though its scalar restriction is met with an argumentative scale.

(151) *Cơ* does not make reference to an argumentative scale

Anh của Sam cao 1.8m nhưng Sam chỉ cao 1.6m (#**cơ**).
Brother POSS Sam tall 1.8m but Sam only tall 1.6m CƠ
'Sam's brother is 1.8m tall but Sam is only 1.6m.'

$\rightsquigarrow$ The conclusion under discussion: *Sam is short*

I assume that the conclusion relevant to the two contrastive statements is the one as indicated. Following Winterstein (2012)'s argumentative analysis for English *but*, the first contrastive statement argues against the conclusion whereas the second argues for it. More crucially, the second contrastive statement is argumentatively stronger than the first. If *cơ* makes reference this scale, it should be licensed as the

surprise restriction is also met. The infelicity of *cơ* in this scenario suggests that argumentation is insufficient to define scales for the use of the particle.

I follow Klinedinst (2005) and argue that *cơ* associates with multiple types of scales. Klinedinst classifies scales for *only* into entailment scales and pragmatic scales. Entailment scales take logical entailment to be the basis for the ordering of propositions. In contrast, for pragmatic scales, the ordering is pragmatically determined. (152) shows an instance of *cơ* interpreted with an entailment scale. The prejacent of *cơ* entails the only alternative in the expected focus alternative set and thus is stronger than all expected alternatives.

(152) Entailment scales

Context: A asks B if Sam bought 10 books.

$\rightsquigarrow$ **ALT-Exp**$_{p,A,t}$ = {*Sam bought 10 books*}

B then says:

Sam mua 15 quyển **cơ**.
Sam buy 15 CL CƠ
'Sam bought 15 books.'

Pragmatic scales for *cơ* are illustrated in (153). In both examples, there is no logical relation between the prejacent of *cơ* and its alternatives in the set **ALT-Exp**$_{p,A,t}$. In (153.a), the ordering of propositions correlates with the ranking of prizes which is world knowledge or conventional. The prejacent of *cơ* refers to a higher ranking prize than its alternatives do and thus is stronger. In (153.b), the ordering of propositions is relative to the house types and is constrained by the Speaker's contextual goals concerning house sizes. The prejacent of *cơ* refers to the larger type than its alternative does and is stronger than all expected alternatives.

(153) Pragmatic scales

a. Conventional scales

Context: A tells B that Sam got the second prize.

$\rightsquigarrow$ **ALT-Exp**$_{p,A,t}$ = {*Sam got the second prize*}

B then says:

Không phải. Sam đạt giải nhất **cơ**.
Not true Sam get prize first CƠ
'That's not true. Sam got the first prize.'

b. Contextual scales

Context: Houses of type 1 are larger than houses of type 2 and type 3. Houses of type 3 are nicer than houses of type 1 and 2. A tells B that Kim got a house of type 1. B then says:

Sam được nhận một căn loại 3 **cơ**.
Sam able get one CL type 3 CƠ
'Sam got a house of type 3.'

$\rightsquigarrow$ The current QUD: Who got the nicest house?

$\rightsquigarrow$ **ALT-Exp**$_{p,A,t}$ = {*Sam got a house of type 1*}

I therefore submit that pragmatic scales can be further divided into conventional scales and contextual scales. Conventional scales are associated with world knowledge, reflecting the ordering relation that is fixed from context to context. Contextual scales, in contrast, depend on the Speaker's contextual goals and thus may order the same set of propositions differently, depending on the context. The difference between the two sub-types of pragmatic scales is evidenced by the fact that swapping the prejacent and its alternatives is only possible with contextual scales, as shown in (154).

(154) Swapping the prejacent and its alternatives

a. Conventional scales

Context: A tells B that Sam got the first prize.

$\rightsquigarrow$ **ALT-Exp**$_{p,A,t}$ = {*Sam got the first prize*}

B then says:

Không phải. Nó đạt giải nhì (#**cơ**). (c.f. (153.a))
Not true. He get prize second CƠ
'That's not true. He got the second prize.'

b. Contextual scales

Context: Houses of type 1 are larger than houses of type 2 and type 3. Houses of type 3 are nicer than houses of type 1 and 2. A tells B that Kim got a house of type 3. B then says:

Sam được nhận một căn loại 1 **cơ**. (c.f. (153.b))
Sam able get one CL type 1 CƠ

'Sam got a house of type 1.'
$\rightsquigarrow$ The current QUD: Who got the largest house?
$\rightsquigarrow$ **ALT-Exp**$_{p,A,t}$ = {*Sam got a house of type 3*}

The infelicity of *cơ* in (154.a) indicates the prejacent is not stronger than its alternative. The ordering in (154.a) therefore must be the same as in (153.a). In contrast, *cơ* is licensed in (154.b). I argue that this scenario is involved with a change in the Speaker's contextual goals. The Speaker's goals in (154.b) are concerned with house quality, which defines a new ordering for the set of propositions. On the contextual scale relative to house quality, the prejacent is stronger than its alternative.

That *cơ* can make reference to three types of scales suggests that for the interpretation of *cơ*, there may occur a competition of scales. In such cases, entailment scales and conventional scales rewrite contextual scales, as illustrated in (155).

(155) Scale competition

a. Entailment scales rewrite contextual scales

Context: **A asks B and C who practiced most lazily**. B says that Kim ran only 5 rounds.

$\rightsquigarrow$ B's inferred expectations: *Kim was the laziest, Sam did not run less rounds than Kim*

$\rightsquigarrow$ **ALT-Exp**$_{p,B,ts}$ = {*For every n* $\geq$ *5, Sam ran n rounds*}

C then says:

Sam chạy 3 vòng (#**cơ**).
Sam run 3 round CƠ
'Sam ran 3 rounds.'

b. Conventional scales undermined contextual scales

Context: **A asks B and C whose performance is worst**. B says that Kim only got to the quarter-final.

$\rightsquigarrow$ B's inferred expectations: *Kim's performance was the worst, Sam at least got to the quarter-final*

$\rightsquigarrow$ **ALT-Exp**$_{p,B,ts}$ = {*For every round n ranking higher than the quarter-final, Sam got to n.*}

C then says:

Sam vào đến vòng bốn (#**cơ**).
Sam get to round fourth CƠ
'Sam got to the 4th round.'

In both scenarios, A's question indicates the topic the conversation revolves around, which in turn suggests A's goals when uttering the declarative with *cơ*. In particular, A's goals are concerned with how lazy Sam was in (155.a), and with how bad Sam's performance was in (155.b). The prejacent of *cơ* then implies respectively that Sam was lazier than expected and that Sam's performance was worse than expected. In both scenarios, the prejacent of *cơ* is thus stronger than its alternatives in the set $\textbf{ALT-Exp}_{p,B,ts}$ on the contextual scale relative to these goals. There is, however, another scale that is available in each scenario. (155.a) can make reference to an entailment scale. In this example, all propositions in $\textbf{ALT-Exp}_{p,B,ts}$ entails the prejacent of *cơ*. (155.b), on the other hand, involves a conventional scale relative to the ranking of rounds. With respect to these scales, the prejacent of *cơ* is not stronger than its alternatives in $\textbf{ALT-Exp}_{p,B,ts}$. The infelicity of *cơ* indicates that the relevant scale is the entailment scale in (155.a) and the conventional scale in (155.b) rather than the contextual scales.

4.5.3 *Cơ*, mirative particles, and markers of belief revision

In this section, I will discuss some implications of the characterization of *cơ* and mirativity in terms of belief revision. First, this approach to mirativity is compatible with existing analyses of mirative markers like Rett (2011), Rett and Murray (2013), Merin and Nikolaeva (2008) or Peterson (2016) discussed above. For example, in Rett and Murray (2013) on mirative evidentials, the mirative content is encoded at the illocutionary level. At this level, there is a component indicating that the Speaker's expectations do not include the marked proposition. A proposal to add the marked proposition to the common ground is contributed by the declarative mood of the host sentence. Such a proposal implies a change in the Speaker's information set and thus a process of belief revision.

My analysis of *cơ* suggests a broader category of mirativity to include markers with non-expressive mirative content. The literature on mirativity has been mainly focused on mirative markers with expressive meaning. Expressions with expressive content are used to *express* a kind of emotion or attitude such as surprise and thus is

Speaker-oriented (Soames 2002, Potts 2005). It is impossible for an agent to express another agent's emotion or attitude. Mirative markers with expressive content are therefore prohibited in questions and not able to participate in interrogative flip. For example, mirative evidentials discussed in Rett and Murray (2013) are observed with similar restrictions. Mirative evidentials do not have a mirative interpretation in questions and thus do not show interrogative flip. The meaning of *cơ* is Speaker-oriented but not expressive, reflecting the Speaker's beliefs about an agent's surprise. The particle therefore can refer to any agent's surprise as long as the agent is contextually salient.

The characterization of surprise in terms of belief revision indicates a deep connection between mirative markers and markers of belief revision. In particular, the analysis of *cơ* offers an explanation for the observation that *cơ* is found in some contexts that license English *man* and Japanese *yo*, as shown in (156).

(156) *Cơ* and the particles *man* and *yo*

a. A: Chị lấy thuốc B1 nội nhé
You take medicine B1 domestic PRT
'You take domestic vitamin B1, okay?

B: Không, tôi lấy B1 ngoại **cơ**
No, I take B1 imported CƠ
'No, I will take imported B1.

(from Adachi 2013)

b. B: John came to the party.

A: No he didn't.

B: John came to the party, **man**.

(from McCready (2008))

c. A: Souridaijin-ga nakunat-ta
prime.minister-NOM die-PAST
'The prime minister died.'

B: Sin-de-nai **yo**
die-INF-NEG YO
'(No), he did not die.'

(from Davis (2009))

The use of *man* and *yo* in the scenarios above is intuitively described as pushing A to accept B's assertion. On the other hand, with *co*, B expresses that A will be surprised by B's assertion. The strengthening effects of *man* and *yo* and the mirative effects of *co* are both related to belief revision. *Man* and *yo* are defined with the function of instructing the Addressee to downdate their information state with propositions incompatible with the marked proposition before the update with the proposition (McCready 2008, Davis 2009). The formulation for an update of an information set preceded by a downdate presented in McCready (2008) and Davis (2009) is equivalent to Gardenfors's formulation of belief revision. The characterization of *co* in terms of belief revision can therefore account for the overlapping distribution of *co*, *man*, and *yo* in declaratives. As suggested above, other mirative markers can be characterized in a similar way. This suggests a deep connection between mirative markers and markers of belief revision.

4.6 Summary

In this chapter, I proposed that *co* is a scalar mirative particle with the formal semantics in (157).

(157) **A formal semantics of *co***

The Speaker S marks a proposition p with *co* at a time t if S believes at t that for the contextually salient discourse agent X,

i. $\forall q \in \textbf{ALT-Exp}_{p,X,t}$, $p \gneqq_{\sigma} q$ on a given scale σ, and

ii. At t' that is later than and close to t, $\textbf{Inf}_{X,t'} = \textbf{Inf}_{X,t} \dot{+} p$.

In addition, I addressed the issues concerning interrogative flip and scales and discussed further implications of the proposed analysis. I showed that the interrogative flip observed from the use of *co* can be accounted for by the pragmatic properties of the host sentence and the proposed semantics of *co*. With respect to scales, I argued that *co* can make reference to entailment, conventional, and contextual scales. Entailment and conventional scales outweigh contextual scales in cases of scale competition. I concluded the chapter with a claim about a deep connection between mirative markers and markers of belief revision.

Chapter 5

Cơ in *Wh*-questions

This section focuses on the use of *cơ* in *wh*-questions. At the first glance, the contribution of *cơ* in *wh*-questions appears to be different from what we have learned about *cơ* in the previous chapters. In the first part of the chapter, I will show that *wh*-questions with *cơ* function as echo *wh*-questions with various echoic uses. The description of the echoic uses of *wh*-questions with *cơ* seems to suggest that *cơ* in *wh*-questions does more than just reflect an agent's surprise. Furthermore, we will see that *wh*-questions with *cơ* do not seem to follow the same scalar restriction that declaratives and polar questions with *cơ* do. I then argue that the core contribution of *cơ* remains the same in all of its uses. The proposed semantics for *cơ* is able to explain all aspect of its behavior in *wh*-questions.

5.1 *Wh*-questions with *cơ*

In this section, I will discuss how *wh*-questions with *cơ* are used. I will first show that *wh*-questions with *cơ* have the same distribution and use as echo *wh*-questions. Then I will address some concerns about the contribution of *cơ* in *wh*-questions.

5.1.1 *Wh*-questions with *cơ* as echo questions

I will start with the distribution of *wh*-questions with *cơ*, comparing them with information-seeking *wh*-questions and echo *wh*-questions. The term *echo question* used in this chapter is understood in a broad sense, equivalent to *reprise questions* defined in Ginzburg and Sag (2001) as "queries whose meaning is partially determined directly from the immediately prior utterance" (p.255). The characterization of the relation between echo questions and their immediately preceding utterance is still debated (Sobin 2010, Blakemore 1994, Noh 1998, Iwata 2003, Sudo 2011, Ginzburg

and Sag 2001, Artstein 2002, Beck and Reis 2018). I will not pursue a generalization of the relation between echo questions and their preceding utterance but instead I will discuss specific scenarios. Another point to note is that since Vietnamese is a *wh*-in-situ language (Bruening and Tran 2006), some *wh*-constructions, as illustrated in (158) are ambiguous between information-seeking questions and echo questions when uttered out-of-the-blue. What reading the *wh*-question has can be determined by the discourse context in which it is uttered. Some native speakers note that a *wh*-question with the echoic interpretation has stress on the *wh*-word.

(158) Ambiguous *wh*-questions

a. Sam gặp **ai** ở thư viện?
Sam meet who in library
'Who did Sam meet in the library?'/ 'Sam met WHO in the library?'

b. Sam đưa **cái gì** cho Kim?
Sam give what to Kim
'What did Sam give to Kim?'/ 'Sam gave WHAT to Kim?'

c. Sam thường mua sách **ở đâu**?
Sam often buy book in where
'Where does Sam often buy books?'/ 'Sam often buys books WHERE?

d. Sam mua quyển sách này **khi nào**?
Sam buy CL book this when
'When did Sam buy this book?'/ 'Sam bought this book WHEN?

e. Sam mua **bao nhiêu** quyển?
Sam buy how much/many CL
'How many books did Sam buy?'/ 'Sam bought HOW MANY books?'

Let's first look at the distribution of information-seeking *wh*-questions and echo *wh*-questions. Consider the example below:

(159) Echo *wh*-questions echo the immediately prior utterance.

Context: A tells B that A saw a ghost in the library. B then responds:

Cậu nhìn thấy cái gì ở thư viện?
You see what in library
✓'You saw WHAT in the library?'/ #'What did you see in the library?'

In (159) above, the *wh*-question can be interpreted as an echo question expressing incredulity. It is evidenced by the fact that for some speakers, stress on the *wh*-word

is required. The *wh*-question "echoes" A's utterance in the sense that A's utterance functions as an answer to the information-seeking version of the *wh*-question and the utterances are similar in form. On the other hand, the interpretation as an information-seeking question is not available. A possible reason is that A's utterance provides an answer to the question raised. A move to raise the question already addressed by A's utterance for the sole purpose of seeking an answer is inappropriate.

The absence of an appropriate prior utterance makes echo *wh*-questions infelicitous. In such a context, information-seeking *wh*-questions may be fine.

(160) Echo *wh*-questions are bad in contexts without an appropriate immediately prior utterance.

Context: A tells B that it was scary in the library the night before. B says:

Cậu nhìn thấy cái gì ở thư viện?
You see what in library
#'You saw WHAT in the library?'/ ✓'What did you see in the library?'

In this context, B utters the *wh*-question simply to seek further information relevant to what A has said. The *wh*-question does not "echo" A's utterance the way defined in Ginzburg and Sag (2001) and intuitively must be interpreted as an information-seeking question. Stress on the *wh*-word in this case is unacceptable for some speakers.

Information-seeking *wh*-questions and echo *wh*-questions can be also distinguished in terms of embeddability. Unlike information-seeking questions, echo questions cannot be embedded (see e.g. Iwata 2003, Sobin 2010, Sudo 2011).

(161) Echo questions are unembeddable

*Mary wonders John met WHO (from Iwata (2003))

It is similar in Vietnamese. In the language, a *wh*-question in this environment must be interpreted as an information-seeking question.

(162) Vietnamese echo *wh*-questions are unembeddable

Kim vẫn chưa gặp Sam. Nó không biết Sam đã mua cái gi.
Kim still yet see Sam He not know Sam PST buy what
R1:#'Kim hasn't seen Sam yet. He doesn't know Sam bought WHAT.'
R2:✓'Kim hasn't seen Sam yet. He doesn't know what Sam bought.'

Now we consider *wh*-questions with *cơ*. They are formed by adding *cơ* to the sentence-final position of a *wh*-question, as illustrated in (163):

(163) *Cơ* in *wh*-questions

Cậu nhìn thấy cái gì ở thư viện **cơ**?
You see what in library CƠ
✓'You saw WHAT in the library?'/ #'What did you see in the library?'

As shown in (163), *wh*-questions with *cơ* are intuitively interpreted as echo questions. We therefore expect that *wh*-questions with *cơ* have the same distribution as echo *wh*-questions, which is indeed the case. In (164), just like the echo *wh*-questions considered above, the *wh*-question with *cơ* is only fine in a context with an appropriate prior utterance.

(164) *Wh*-questions with *cơ* have the same distribution as echo *wh*-questions

a. Context from (159): A tells B that A saw a ghost in the library. B then responds:

Cậu nhìn thấy cái gì ở thư viện (**cơ**)?
You see what in library CƠ
'You saw WHAT in the library?'

b. Context from (160): A tells B that it was scary in the library the night before. B says:

Cậu nhìn thấy cái gì ở thư viện (#**cơ**)?
You see what in library CƠ
#'You saw WHAT in the library?'/ ✓'What did you see in the library?'

In (165), the *wh*-question with *cơ* is embedded and the particle is infelicitous.

(165) *Wh*-questions with *cơ* are unembeddable

Kim vẫn chưa gặp Sam. Nó không biết Sam đã mua cái gì (#**cơ**).
Kim still yet see Sam He not know Sam PST buy what CƠ
'Kim hasn't seen Sam yet. He doesn't know what Sam bought.'

Furthermore, as expected, *wh*-questions with *cơ* have the same echoic uses as echo *wh*-questions. I classify the echoic uses into two groups: (i) seeking misperceived information, and (ii) expressing incredulity (Blakemore 1994, Noh 1998, among others). The example in (166) illustrates the first use of *wh*-questions with *cơ*.

(166) Seeking misperceived information

Context: A tells B Sam can run 10 rounds. It is very noisy around. B asks:

Sam có thể chạy bao nhiêu vòng (**cơ**)? Tớ không nghe rõ
Sam can run how many round CƠ I not hear clear
'Sam can run HOW MANY rounds? I didn't hear it.'

In this scenario, part of the information A has informed B is not successfully delivered to B, i.e. B did not hear that part. The *wh*-question with *cơ* is used to retrieve this missing part.

There are various sources of misperception. In the example above, the Speaker does not hear part of the Addressee's utterance. In the scenarios in (167) below, the Speaker fails to interpret a referential term in the Addressee's utterance, indicated in bold. In the first case, the Speaker is completely ignorant of the intended referent of the deictic particle *kia* 'that'. In the second scenario, the referent of the pronoun *anh ta* 'he' was known earlier in the conversation but then forgotten by the Speaker. In both cases, the *wh*-questions are used to seek clarification of the misperceived information.

(167) Seeking misperceived information

a. Context: A is pointing at a book in a stack of books.

A: Cháu muốn quyển sách **kia**.
I want CL book that
'I want that book.'

B: Cậu muốn quyển nào (**cơ**)?
You want CL which CƠ
'You want WHICH book?'

b. Context: B tells A about an impressive player who have won 3 games in a show. B continues to watch the show while A goes out for a while. When A is back, B talks to A.

A: **Anh ta** lại thắng rồi.
He again win PRT
'He won again.'

B: Ai lại thắng rồi (**cơ**)?
Who again win PRT CƠ
'WHO won again?'

The second type of echoic uses reflects the Speaker's incredulity toward the immediately prior utterance. The term *incredulity* is used to refer to both *surprise* and *doubt* as discussed in the previous chapters. In (168), we see that the Speaker is willing to believe the Addressee's claim in the first scenario and is biased against it in the second. In both cases, the Addressee's (A's) claim was successfully perceived by the Speaker (B).

(168) Expressing the Speaker's incredulity

a. Surprise

Context: A tells B that A ran 10 rounds in the last practice. B says:

B: Cậu chạy bao nhiêu vòng (**cơ**)?
You run how many round CƠ
'You ran HOW MANY rounds?'

When A repeats A's utterance, B says that A is very strong since people normally run roughly 5 rounds.

b. Doubt

Context: A tells B that A ran 10 rounds in the last practice. B says:

B: Cậu chạy bao nhiêu vòng (**cơ**)?
He run how many round CƠ
'He ran HOW MANY rounds?'

When A repeats A's utterance, B claims that A is exaggerating since people normally run roughly 5 rounds.

Again, there are various reasons for the Speaker's incredulity. In the example below, the Speaker's incredulity arises due to a presupposition of the Addressee' utterance rather than due to its at-issue content.

(169) The Speaker's incredulity about a presupposition

Context: A tells B that A met Sam's sister the day before. B then says:

B: Cậu gặp ai (**cơ**)?
You meet who CƠ
'You met WHO?'

When A repeats A's utterance, B says that Sam is an only child.

Wh-questions with *cơ* can also be used to target the linguistic form of the immediately prior utterance. In (170), the pronunciation of some words in the Addressee's utterance is not expected for the Speaker.

(170) The Speaker's incredulity about pronunciation

Context: A and B are talking about cities in Vietnam.

A: Tớ thích Hà Lội.
I like Ha Loi
'I like Haloi.'

B: Hà gì (**cơ**)?
Ha what CƠ
'Ha-WHAT?'

Then A corrects his pronunciation with Hanoi.

Echo *wh*-questions have all the echoic uses discussed. As we have seen, the presence of *cǒ* is optional in each of these echoic uses but is infelicitous in information-seeking questions. The similarity between echo *wh*-questions and *wh*-questions with *cǒ* in terms of their distribution and range of uses allow us to conclude that *wh*-questions with *cǒ* are a type of echo questions. In fact, for some native speakers, *wh*-questions with *cǒ* are preferred over their *cǒ*-less echo counterparts.

5.1.2 Puzzles

This section raises two concerns regarding the contribution of *cǒ* in *wh*-questions. First, expressing the Speaker's surprise is only one of the uses of *cǒ* in *wh*-questions. Second, *wh*-questions with *cǒ* do not seem to be subject to the scalar restriction imposed on declaratives and polar questions with *cǒ*.

In the previous chapters, I argued that part of the core meaning of *cǒ* is to reflect surprise. *Cǒ* in declaratives are concerned with the Addressee's or a third person's surprise and *cǒ* in polar questions with the Speaker's. Contexts in which a sentence with *cǒ* is uttered must support this meaning component of *cǒ*. The first observation is that *wh*-questions with *cǒ* are very different from polar questions with *cǒ*. Unlike polar questions with *cǒ*, the discussion of the echoic uses of *wh*-questions with *cǒ* above clearly shows that they are not required to be uttered in contexts in which the Speaker is surprised by the immediately prior utterance. In the case of misperception, the Speaker may altogether lack prior knowledge or expectations regarding the immediately prior utterance. The Speaker does not even properly perceive the utterance. The function of expressing incredulity is similar to the use of polar questions with *cǒ* in that the immediately prior utterance is unexpected for the Speaker. However, for *wh*-questions with *cǒ*, incredulity might be interpreted as doubt as well. This is in contrast to polar questions with *cǒ*. I showed previously that the addition of *cǒ* to a polar question with the question marker *á* prevents the question from expressing the Speaker's doubt. The analysis of *wh*-questions with *cǒ* in terms of their echoic uses therefore suggests that the semantics for *cǒ* proposed in the previous chapter cannot capture its use in *wh*-questions. I argue that this problem can be resolved with a different analysis for *wh*-questions with *cǒ*. I suggest that *cǒ* in *wh*-questions reflects the Addressee's surprise rather than the Speaker's.

This will be presented in detail in the next section.

Now we will see how *wh*-questions with *cơ* are seemingly not limited by the scalar restriction. The restriction states that the prejacent proposition of *cơ* is higher than all its expected focused alternatives on a given scale. But at this stage, we do not know the exact denotation of a *wh*-question with *cơ*. Therefore, I restate the restriction so that a comparison of *cơ* across sentence types is plausible. In particular, the surprising proposition is required to be higher than all its expected focused alternatives on a given scale. A violation of the restriction occurs for the use of expressing incredulity, whether the attitude is surprise or doubt. Consider the example in (171):

(171) Violation of the scalar restriction

a. Surprise

Context: A is an athlete. A tells B that A ran 10 rounds in the last practice. B says:

B: Cậu chạy bao nhiêu vòng (**cơ**)?
You run how many round CƠ
'You ran HOW MANY rounds?'

When A repeats A's utterance, B says that A is very weak since ordinary people can run about 15 rounds.

$\rightsquigarrow$ B's expectations: *A ran at least 15 rounds*

b. Doubt

Context: A is an athlete. A tells B that A ran 10 rounds in the last practice. B says:

B: Cậu chạy bao nhiêu vòng (**cơ**)?
He run how many round CƠ
'He ran HOW MANY rounds?'

When A repeats A's utterance, B claims that A is joking since ordinary people can run about 15 rounds.

$\rightsquigarrow$ B's expectations: *A ran at least 15 rounds*

In both scenarios, B's claim about ordinary people and B's knowledge that Sam is an athlete implies B's expectations about A's practice result. As indicated, the number that A reports is not higher than the number B expected. Despite this, the

wh-question with *cǒ* in both scenarios are felicitous. There is no contrast between these scenarios and those in (168) above in which B expected A to run a smaller number of rounds. The felicity of *wh*-questions with *cǒ* in both types of contexts seems to suggest that the felicity of *cǒ* in *wh*-questions is not sensitive to contextually determined scales.

I argue that with a different analysis for *wh*-questions as mentioned above, *wh*-questions with *cǒ* are subject to the same scalar restriction as declaratives and polar questions with *cǒ*. However, unlike those two constructions, *wh*-questions with *cǒ* always makes reference to a scale of markedness for discourse moves.

5.2 Analysis

The central claim of this section is that *cǒ* in *wh*-questions reflects that the host sentence, which is an echo *wh*-question, is unexpected for the Addressee. I will first review existing major work on echo *wh*-questions and argue that my analysis of *wh*-questions with *cǒ* fares better under the theories that take echo *wh*-questions to be interrogative. In the second part of this section, I will present the analysis in detail and show that the proposed semantics for *cǒ* can be extended to resolve the concerns raised.

5.2.1 Echo questions

Existing debate on echo questions centers around two main issues. The first is concerned with whether they are semantically questions or not and the second is concerned with the exact content communicated by echo questions. The first group of approaches to echo questions argue that they are non-interrogative (Huddleston 1984, Radford 1988, Blakemore 1994, Noh 1998, Iwata 2003, among others). Their argument is that echo questions syntactically resemble the sentences they echo more than their non-echo counterpart wh-questions. The English examples in (172) below are taken from Blakemore (1994). The non-echo counterparts are added for comparison. The echo questions in (172) echo different types of sentences. Their non-echo counterparts have quite different structures, involving *wh*-fronting and subject-auxiliary inversion. In (172.c – d), the echo questions do not even have a non-echo counterpart.

(172) Syntactic resemblance between echo questions and the sentences they echo

a. A: I've bought you an aeroplane.
B: You've bought me a WHAT?
Non-echo counterpart: What have you bought me?

b. A: My parents will be arriving tonight.
B: They will be arriving WHEN?
Non-echo counterpart: When will they be arriving?

c. A: Did you get drunk?
B: Did I get WHAT?
Non-echo counterpart: ??What did I get?

d. A: Don't go near my agapanthus!
B: Don't go near my WHAT?
Non-echo counterpart: ???

(from Blakemore (1994))

For the proponents of the non-interrogative approach, the apparent questioning force of echo questions is explained in many different ways. For example, Noh (1998) analyses echo questions as free indirect speech rather than interrogatives, explaining the syntactic similarity between echo questions and the sentence echoed. Noh argues that free indirect speech can be used to express the Speaker's questioning attitude to the information echoed. Iwata (2003) adopts Noh's metarepresentational account but argues that the questioning effect is contributed by the rising intonation.

The other group of studies argue that echo questions are interrogatives, semantically denoting a set of propositions (Ginzburg and Sag 2001, Sudo 2011, Beck and Reis 2018). They vary in terms of the exact denotation of echo questions and the derivation of the echo effect. For example, the core idea of Ginzburg and Sag (2001)'s proposal is that echo questions refer to the illocutionary force of the utterance echoed. (173) shows examples from Ginzburg and Sag (2001), illustrating how the meanings of echo questions are paraphrased under their proposal.

(173) Echo questions under Ginzburg and Sag (2001)'s proposal

a. You like WHO?
The echo question's meaning: *Who did you say (just now) that you like?*

b. A: [Go home, Bo!]
B: Go WHERE?
The echo question's meaning: *Where did you order me (just now) to go?*
(from Ginzburg and Sag (2001))

Sudo (2011) concentrates on a smaller set of echo questions which pose problems for Ginzburg and Sag (2001)'s proposal. Paraphrasing the echo question in (174) in the way proposed in Ginzburg and Sag (2001) is problematic.

(174) Data against Ginzburg and Sag (2001)'s proposal from Sudo (2011)
A: Try our new chajitas!
B: Cha-WHAT-as?
The echo question's meaning:???

Sudo proposes that echo *wh*-questions of this type ask about the expression that participates in generating the meaning of the sentence echoed. The idea is illustrated in (175)

(175) Echo questions under Sudo (2011)'s account
A: John speaks Uyghur
B: John speaks WHAT?
The echo question's meaning: *What is the expression '**X**' such that the sentence '**John speaks X**' would mean what A meant?*
(from Sudo (2011))

Beck and Reis (2018) argues against studies like Ginzburg and Sag (2001) and Sudo (2011) which, they claim, derive the echo effect from the quotative component of echo questions. They propose instead a form-based account for echo *wh*-questions. The core idea is as follows. Echo *wh*-questions contain a phrasal Q operator and have the wh-word narrowly focused. With the phrasal Q operator, echo *wh*-questions are interpreted as questions. The ordinary semantic value of echo *wh*-questions is a set of propositions, like information-seeking *wh*-questions. The narrow focus on the wh-word then triggers the introduction of a set of alternatives. This set contains only one particular alternative which is the antecedent sentence that is being echoed. This accounts for the echo effect of echo *wh*-questions.

As mentioned previously, there remain differences of opinion around the characterization of echo *wh*-questions. I do not attempt to distinguish between these approaches here. The aim of this brief review instead is to present theories that can lay the groundwork for my analysis of *wh*-questions with *cǒ* discussed in the next section. I argue that my analysis fits better with the second group of prior analyses which take echo *wh*-questions to be interrogatives.

5.2.2 *Cǒ* at the discourse level

With the semantics of *wh*-questions in place, we will now consider an analysis for *cǒ* in *wh*-questions that can unify its contribution in this type of construction with its contribution in declaratives and polar questions. My proposal is that *cǒ* in *wh*-questions operates at the discourse level, reflecting that the echo *wh*-question is an unexpected responding move for the Addressee.

Let us consider the proposal in detail. The first assumption about *cǒ* at the discourse level is that the particle marks a discourse move (see e.g. Roberts 2012) rather than a proposition. Following van der Sandt and Maier (1991)'s theory of assertion and denial, I assume that a discourse move that *cǒ* can be associated with is defined in terms of its discourse functions. In particular, my analysis for *cǒ* in *wh*-questions will make reference to assertion, denial, and assertion confirmation. In van der Sandt and Maier (1991), an assertion is characterized as a move with the primary function of conveying new information. A denial is proposed as constituting an objection to an utterance. Assertion confirmation is introduced in Farkas and Bruce (2010) to refer to a move responding to a prior assertion which commits its speaker to the content of the prior assertion. Examples of denial and assertion confirmation moves are shown in (176).

(176) Examples of assertion, denial and assertion confirmation moves

a. A: Herb is tolerant.
   B: Herb is not tolerant.
   ⇝ A's utterance is an assertion.
   ⇝ B's utterance is a denial of A's assertion.

(from van der Sandt and Maier (1991))

b. A: Sam's home.
B: Yes, he is.
⇝ B's utterance is an assertion confirmation of A's assertion.

(from Farkas and Bruce (2010))

In addition to these types of moves, I assume the existence of moves formed by questions. I take questions that can raise an issue to form an asking move. For questions that additionally serve to verify the truth or evidential basis for a previous utterance, they are considered challenging moves. The two types of moves are illustrated in (177).

(177) Asking and challenging moves

a. A: What did Sam buy?
B: Sam bought a book.
⇝ A's utterance is an asking move.

b. A: Sam bought 10 books.
B: Are you sure?/ Did Sam really buy 10 books?
⇝ B's utterances are challenging moves.

I assume the following notation to represent the discourse moves discussed above. Notice that denial, assertion confirmation, and challenging move are all connected with a previous move. In Farkas and Bruce (2010), such moves are described as responding moves. As a contrast to responding moves, initiating moves have the function of raising a topic or a subtopic in a discourse. Assertion and asking moves belong to this group.

(178) Notation for discourse moves

a. Assertion
ASSERT[S] represents an assertion move formed by a sentence S.

b. Denial
DENIAL[S](M) represents a denial move formed by a sentence S which consitutes an objection to a discourse move M.

c. Assertion confirmation
CONFIRM[S](M) represents an assertion confirmation formed by a sentence S which constitutes a confirmation of an assertion M.

d. Asking move
   ASK[S] represents a questioning move formed by a question S.

e. Challenging move
   CHALLENGE[S](M) represents a challenging move formed by a question S which constitutes a challenge to a discourse move M.

As discussed in the previous section, I assume that echo *wh*-questions are interrogatives. Taking together this assumption, the properties of echo *wh*-questions, and the classification of discourse moves above, I propose that the prejacent of *cǒ* in *wh*-questions must be a challenging move.

As *cǒ* in *wh*-questions modifies a discourse move, I propose that in such cases the relevant information set includes discourse moves. A discourse move made at a time t is in an agent's information set if the agent thinks this discourse move is likely to be made at t. A discourse move made at a time t is incompatible with an agent's information set if the agent has the bias that this discourse move is not made at t. Expected focus alternative sets are proposed to be sets of discourse moves. I take $\textbf{ALT-Exp}_{M,X,t}$ to be the set of expected focus alternative moves relative to a particular discourse move M, an agent X and a time t. A discourse move M' is in $\textbf{ALT-Exp}_{M,X,t}$ if M' is made in at least one world compatible with X's information set at t. I also assume that the operation of belief revision defined in the previous chapter in 134 can be applied to add a discourse move to an information set when the discourse move is incompatible with the information set.

The analysis of *cǒ* in *wh*-questions requires one more assumption: one concerning the ordering of discourse moves. I propose that *cǒ* at the discourse level associates with a scale that ranks discourse moves according to their markedness. I follow Farkas and Bruce (2010) and assume that the markedness of a discourse move is determined relative to the ultimate goals of discourse. In the literature on discourse structure, there is a consensus that the ultimate goals of conversations is to increase the common ground, i.e. the set of beliefs and assumptions agreed by all the participants (Roberts 2012, Farkas and Bruce 2010, among others). Accordingly, assertions, asking moves, and confirmation moves are less marked than denials and challenging moves. Both assertions and asking moves raise an issue which settling, i.e. confirming the assertion or providing an answer to the question, results in additions to the common

ground. Confirmation moves immediately settle an issue raised by an assertion. In contrast, denials, and challenging moves result in a delay in increasing the common ground and thus are more marked. A further discussion of this type of scale will be presented in the next section.

With all these assumptions in place, we will turn to analyze *cơ* in *wh*-questions. I propose that *cơ* reflects that the challenging move marked by the particle will surprise the Addressee. The challenging move is stronger than its expected alternatives (other possible discourse moves) on the scale of markedness. Building on the semantics proposed for *cơ* in declaratives and polar questions shown in (139), a semantics for *cơ* in *wh*-questions is given in (179).

(179) A semantics for *cơ* in *wh*-questions

The Speaker S marks a discourse move M with *cơ* at a time t if S believes at t that for the contextually salient discourse agent X,

i. $\forall M' \in \mathbf{ALT\text{-}Exp}_{M,X,t}$, $M \gneqq_{marked} M'$, and

ii. At t' that is later than and close to t, $\mathbf{Inf}_{X,t'} = \mathbf{Inf}_{X,t} \dot{+} M$.

The condition in (179.i) states that the discourse move M marked by *cơ* is more marked than its expected alternative discourse moves in $\mathbf{ALT\text{-}Exp}_{M,X,t}$. This condition entails that M is not in $\mathbf{ALT\text{-}Exp}_{M,X,t}$ and thus is not made in any worlds compatible with $\mathbf{Inf}_{X,t}$, X's information set at t. This means X has the bias that M is not made at t. The condition in (179.i) therefore derives the mirative requirement that M made at t is incompatible with $\mathbf{Inf}_{X,t}$, X's information set at t. The condition in (179.ii) requires that the marked discourse move M is believed to be added to X's information set, which is the result of a process of belief revision.

A sample of analysis of *cơ* in *wh*-questions is shown in (180).

(180) Sample Analysis

Context: A tells B that Sam can run 10 rounds. B asks:

Sam có thể chạy bao nhiêu vòng (**cơ**)?
Sam can run how many round CƠ
'Sam can run HOW MANY rounds?'

a. A's assertion: M = ASSERT[Sam can run 10 rounds]
$\rightsquigarrow$ A's expectations: CONFIRM(M)

b. *Co͘*'s prejacent: CHALLENGE[S = Sam can run HOW MANY rounds](M)
$\rightsquigarrow$ **ALT-Exp**$_{CHALLENGE[S](M),A,t}$ = {CONFIRM(M)}

c. *Co͘* is felicitous because B believes at the speech time t that

i. CHALLENGE[S](M) $\gneqq_{marked}$ CONFIRM(M)

ii. $\mathbf{Inf}_{X,t}$ includes CONFIRM(M)

iii. At *t'* that is later than and close to t,
$\mathbf{Inf}_{X,t'} = \mathbf{Inf}_{X,t}\dot{+}$CHALLENGE[S]($M$)

In the scenario above, given A's assertion, B is expected to make a responding move that confirms A's assertion M, as indicated in (180.a). A's information set at the speech time t $\mathbf{Inf}_{A,t}$, therefore, includes a move CONFIRM(M) at t. The prejacent of *co͘* is the move CHALLENGE[S](M) at t, as indicated in (180.b), which is a responding move that challenges A's assertion. This means CHALLENGE[S](M) at t is incompatible with $\mathbf{Inf}_{A,t}$ and thus is unexpected by A. On the scale of markedness, CHALLENGE[S](M) is more marked than any move CONFIRM(M). The claim in (180.c.i) and its implication about the incompatibility between the discourse move marked by *co͘* and A's information set at the speech time both hold. Lastly, the fact that CHALLENGE[S](M) is made at t is undeniable. B's beliefs that CHALLENGE[S](M) at t will be added to A's information set thus is guaranteed. This allows us to reach the conclusion in (180.c.ii).

5.2.3 Consequences

In this section, I will discuss some welcome consequences of my analysis of *co͘* in *wh*-questions. First, we will see that the concerns raised in the previous sections about *co͘* in *wh*-questions are straightforwardly resolved. Second, I will show that this analysis of *co͘* can provide an account for the descriptive uses of echo *wh*-questions. Then, I will discuss the difference between *co͘* and English *man* when combined with *wh*-questions. I will end the section with discussion of potential ambiguity between *co͘* at the proposition level and at the discourse level.

Let us start with the seemingly challenging issues of *co͘* in *wh*-questions raised above. The first is that *co͘* can be licensed even when echo *wh*-questions do not express the Speaker's surprise at some contrasting information. This is expected given my analysis above. *Co͘* in *wh*-questions always reflects the Addressee's surprise

related to the challenging move formed by an echo *wh*-question. In the scenarios in which an echo *wh*-question does not express the Speaker's surprise, the echo *wh*-question itself is still a surprise for the Addressee and thus can be combined with *cơ*. Similarly, the apparent lack of scalar sensitivity with *cơ* in *wh*-questions is also explained with the proposal that *cơ* in *wh*-questions marks a discourse move rather than a proposition. The particle therefore makes reference to a scale of markedness for discourse moves rather than a scale related to propositional content.

A second consequence of my analysis of *cơ* in *wh*-questions is that it provides an explanation for the various descriptive uses of echo *wh*-questions. Under this analysis, the Speaker chooses to make a discourse move that is unexpected for the Addressee. I propose that the different possible motivation for that choice derives the descriptive range of echo *wh*-questions. Take (180) again as an example, repeated here in (181).

(181) Motivation for an unexpected discourse move

Context: A tells B that Sam can run 10 rounds.

$\rightsquigarrow$ A's assertion: M = ASSERT[Sam can run 10 rounds]

$\rightsquigarrow$ A's expectations: CONFIRM(M)

B asks:

Sam có thể chạy bao nhiêu vòng (**cơ**)?
Sam can run how many round CƠ
'Sam can run HOW MANY rounds?'

B chooses not to make a confirmation of A's assertion. There are various possible reasons for B's response. For example, B may misperceive A's assertion and thus not be able to confirm it. It is also possible that B is skeptical of A's assertion. Another reason is that B may be surprised at A's assertion and thus is not able to immediately accept it. The incorrect linguistic form of A's assertion can also be one of the reasons. Echo *wh*-questions, as discussed above, are felicitous in all these scenarios.

Next I discuss the idea of markedness for discourse moves. As defined previously, the degree of markedness of a discourse move is determined relative to the goal of shrinking the Common Ground, i.e. resolving the current QUD. An implication from this definition is that discourse moves on the same scale of markedness must raise the

same issue as the current QUD. Discourse moves that address different immediate QUDs are not able to be compared. There is no single scale for those discourse moves, leading to the inability to satisfy the scalar restriction of *cơ*. Empirical evidence for this claim is illustrated in (182)

(182) Discourse moves settling different immediate QUDs

Context: A tells B that Sam got the first prize.

Current QUD: What prize did Sam get?

B then responds with a sentence with *cơ*:

a. B: Sam đạt giải mấy **cơ**?
Sam get prize what CƠ
'Sam got WHAT prize?'

Immediate QUD: *What prize did Sam get?*

b. B: Tớ nghe không rõ (#**cơ**).
I hear not clear CƠ
'I can't hear you.'

M2 = ASSERT[I can't hear you]

Immediate QUD: *Can I hear you?*

c. B doesn't want to talk about Sam and starts a new topic.

B: Hôm nay cậu muốn làm gì (#**cơ**)?
Today you want do what CƠ
'What do you want to do today?

Immediate QUD: *What do you want to do today?*

The sentences in (182. a – b) are uttered in the same context in which speaker B didn't hear what speaker A said earlier. However, the follow-up assertion (182.b) cannot be marked by *cơ*. This discourse move, as shown, immediately raises the issue of whether speaker B heard what speaker A said earlier rather than the current topic regarding Sam's achievement. Similarly, in (182.c), speaker B made a topic shifting discourse move. The use of *cơ* is also unacceptable in this case. The account for the contrast between (182.a) and (182.b – c) is as follows. First, the common context for all the three discourse moves with *cơ* in (182) is analyzed in (183)

(183) An analysis for the common context:

Context: A tells B that Sam got the first prize. B then responds with a sentence with *cơ*.

a. **Current QUD**: What prize did Sam get?

b. A's assertion: *M1* = ASSERT[Sam got the first prize.]
   $\rightsquigarrow$ A's expectations: *M2'* = CONFIRM(*M1*)

c. *M2* = B's response with *cơ*
   $\rightsquigarrow$ **ALT-Exp**$_{M2,A,t}$ = {*M2'*}

The felicity of *cơ* in (182.a) can be explained in the same way as in (180) above. The challenging move marked by *cơ M2* and its expected alternative *M2'* address the same QUD as the current QUD. On the scale relative to this current QUD, the challenging move *M2* is more marked than the confirmation move M2'. The felicity of *cơ* here therefore is expected.

(184) An analysis for (182.a)

B: Sam đạt giải mấy **cơ**?
Sam get prize what CƠ
'Sam got WHAT prize?'

a. *M2* = CHALLENGE[S = Sam got WHAT prize]{*M1*}

b. **Immediate QUD**: *What prize did Sam get?*

c. *Cơ* is felicitous because

   i. *M2* and *M2'* address the same QUD as the current QUD

   ii. *M2* $\gtrneqq_{marked}$ *M2'*

On the other hand, the discourse moves in (182.b – c) are both infelicitous, due to the same reason as shown below.

(185) An analysis for (182.b – c)

a. (182.b)

B: Tớ nghe không rõ (#**cơ**).
I hear not clear CƠ
'I can't hear you.'

   i. *M2* = ASSERT[I can't hear you]

   ii. **Immediate QUD**: *Can I hear you?*

   iii. *Cơ* is infelicitous because *M2* addresses a different QUD from the current QUD and thus is not on the same scale of markedness with *M2'*.

b. (182.c): B doesn't want to talk about Sam and starts a new topic.

B: Hôm nay cậu muốn làm gì (#**cơ**)?
Today you want do what CƠ
'What do you want to do today?

i. *M2* = ASK[What do you want to do today]

ii. **Immediate QUD**: *What do you want to do today?*

iii. *Cơ* is infelicitous because *M2* addresses a different QUD from the current QUD and thus is not on the same scale of markedness with *M2'*.

The immediate QUDs these moves address are different from the current QUD that speaker A has just raised. These moves are not on the same scale of markedness with their expected alternative move *M2'* and thus are not comparable to *M2'*. The discourse moves in (182. b – c) are unable to meet the scalar restriction of *cơ* and thus cannot be marked by the particle. We therefore conclude that the current QUD plays a role in determining the scale of markedness for *cơ* at the discourse level.

Next, we turn to a comparison of *cơ* with English *man* in *wh*-questions. Theoretically, the contributions of *cơ* and *man* on a *wh*-question are predicted to be very similar. *Man* is proposed as strengthening the force of the host question by eliminating all the Addressee's reluctance to answer the question (McCready 2008). The elimination is characterized in terms of belief revision. The proposed semantics for *cơ* in *wh*-questions also involves belief revision. The Addressee is assumed to expect some other discourse move rather than the question marked by *cơ*. A process of belief revision is expected to take place so that the question as a discourse move will be added to the Addressee's information set. I argue that what distinguishes *cơ* and *man* when combined with *wh*-questions is concerned with scalarity. Unlike *man*, *cơ* further imposes a scalar constraint on its prejacent, which here is a discourse move. This scalar constraint restricts *cơ* to echo *wh*-questions, which functions as challenge moves, whereas *man* can modify ordinary information-seeking *wh*-questions, as shown in (186).

(186) *Cơ* and English *man* in *wh*-questions
Context: A asks B about the place when B wants to go. Seeing B's reluctance, A says:

a. Where do you want to go, **man**?

b. Cậu muốn đi nơi nào (#**cơ**)?
You want go place what cơ
'Where do you want to go?'

The infelicity of *cơ* is due to a violation of the scalar constraint. B's reluctance entails that B does not expect the asking move marked by *cơ*. For example, B may want A to ask another question or talk about something else. Those expected moves, however, will not be considered as alternatives to the asking move in (186.b) because their degrees of markedness are not able to be compared, as discussed above. There is one more possibility. B in (186.b) may even want to end the conversation, expecting A to stay silent. I take silence to be a discourse move as well. Furthermore, since a silence move does not raise any issue, I assume that there is always a scale of markedness for a silence move and any other discourse move. Silence is the last possible expected alternative to the asking move in (186.b). The silence move also delays additions to the common ground and thus is more marked than the asking move. The violation of the scalar constraint therefore makes *cơ* infelicitous in (181). Note that since a silence move is more marked than some initiating moves such as an assertion, in cases when the move is unexpected for the Addressee, the move is predicted to be felicitously marked by *cơ*. However, the fact is that we cannot put *cơ* on a silence move. I have no clear explanation for this observation yet. However, it is possible that a silence move is phonologically null and thus is unable to be marked by a phonologically realized element like *cơ*.

We come to the last issue in this section: the ambiguity between *cơ* attached at the discourse level and at the proposition level. I claim that *cơ* in *wh*-questions always operates at the discourse level whereas *cơ* in declaratives and polar questions only attach to propositions. The claim for *cơ* in *wh*-questions is motivated by the assumption that echo *wh*-questions denote a set of alternatives (Sudo 2011, Beck and Reis 2018, among others). Furthermore, I assume *cơ* has different semantic types when attached at the discourse level and at the proposition level. The argument of *cơ* at the discourse level is a discourse move and at the proposition level is a proposition. If *cơ* is attached to an echo *wh*-question at the proposition level, there is a type mismatch between *cơ* and its argument, i.e. the question, which is a set of alternatives rather than a proposition. For *cơ* in declaratives and polar questions,

the claim is supported by the observation that the particle makes reference to a scale related to propositional content rather than a scale of markedness. First, consider the declarative with *cơ* with two possible analyses in (187).

(187) The prize ranking scale over the scale of markedness

Context: A tells B that Sam got the first prize. B then says:

Không phải. Sam đạt giải nhì (#**cơ**).
Not true Sam get prize second CƠ
'That's not true. Sam got the second prize.'

a. *Cơ* at the proposition level: infelicitous.

i. A's expectations: q = *Sam got the first prize*

ii. The prejacent proposition p = *Sam got the second prize*

iii. $p <_{prize\ ranking} q$

b. *Cơ* at the discourse level: felicitous.

i. A's assertion: M = ASSERT[Sam got the first prize]
$\rightsquigarrow$ A's expectations: CONFIRM(M)

ii. The host declarative: S = Sam got the second prize
$\rightsquigarrow$ The prejacent move = DENIAL[S](M)

iii. DENIAL[S](M) $\gneq_{marked}$ CONFIRM(M)

In (187.a), *cơ* is assumed to operate at the proposition level. As shown in (187.a.iii), the prejacent proposition is not stronger than its expected focused alternative on the prize ranking scale, violating the scalar constraint of *cơ* at the proposition level. This analysis therefore predicts that *cơ* is infelicitous. (187.b) takes *cơ* to mark a denial as an unexpected responding move. The prejacent denial is stronger than the expected alternative confirmation move on the scale of markedness, as shown in (187.b.iii). Under this analysis, *cơ* should be felicitous. The actual judgement for *cơ* in (187) is in line with the first analysis and contradicts the second. This supports the claim that *cơ* in declaratives always attaches to propositions.

Similar observations hold for *cơ* in polar questions, as shown in (188). The infelicity of *cơ* in this scenario suggests that the particle must make reference to the prize ranking scale rather than the scale of discourse move markedness. In other words, only the analysis of *cơ* at the level of the propositional content correctly predicts the infelicity of *cơ*.

(188) The prize ranking scale over the scale of markedness

Context: A tells B that Sam got the second prize. B then says:

Sam đạt giải nhì (#cơ) à? Tớ tưởng nó đạt giải nhất.
Sam get prize second CƠ Q I think he get prize first
'Sam got the second prize? I thought he got the first prize.'

a. *Cơ* at the proposition level: infelicitous.

i. B's expectations: q = *Sam got the first prize*

ii. The prejacent proposition p = *Sam got the second prize*

iii. p $<_{prize\ ranking}$ q

b. *Cơ* at the discourse level: felicitous.

i. A's assertion: M = ASSERT[Sam got the second prize]
$\rightsquigarrow$ A's expectations: CONFIRM(M)

ii. The host polar question: S = Sam got the second prize?
$\rightsquigarrow$ The prejacent move = CHALLENGE[S](M)

iii. CHALLENGE[S](M) $\gneqq_{marked}$ CONFIRM(M)

I therefore conclude that there is no ambiguity in the use of *cơ*. In declaratives and polar questions, the marking of *cơ* targets a proposition. In *wh*-questions, *cơ* is concerned with discourse moves. The claim is empirically motivated. A possible explanation for the observations is that *cơ* is required to attach "as low as possible". Such a requirement is proposed for the focus-sensitive operation *chỉ* "only" in Erlewine (2017). This explanation is tentative and requires further work.

5.3 Summary

This chapter was concerned with the use of *cơ* in *wh*-questions. I showed that *wh*-questions with *cơ* function as echo *wh*-questions and I proposed an analysis for the particle which operates over discourse moves, as restated in (189).

(189) A semantics for *cơ* in *wh*-questions

The Speaker S marks a discourse move M with *cơ* at a time t if S believes at t that for the contextually salient discourse agent X,

i. $\forall M' \in \mathbf{ALT\text{-}Exp}_{M,X,t}$, $M \gneqq_{marked} M'$, and

ii. At t' that is later than and close to t, $\mathbf{Inf}_{X,t'} = \mathbf{Inf}_{X,t} \dot{+} M$.

The mirative component of the particle reflects that the Addressee will be surprised by the marked discourse move. The scalar component requires that the marked discourse move is stronger than its expected alternative moves on the scale of discourse move markedness.

Chapter 6

Concluding Remarks

This thesis was concerned with deriving a unified formal semantics for the Vietnamese sentence-final particle *cơ*. I documented the use of *cơ* in declaratives, polar questions and *wh*-questions. I proposed that *cơ* is a scalar mirative marker. The mirative component of *cơ* reflects the Speaker's beliefs about a contextually salient agent's need to invoke belief revision. I showed that *cơ* can mark a proposition or a discourse move with *cơ* operating at the proposition level in declaratives and polar questions and at the discourse level in *wh*-questions. The scalar component of *cơ* is associated with scales. I argued that the underlying ordering relations are based on entailment or reflect a conventionally or contextually determined ordering.

There are several important implications from this investigation of *cơ*. Some of them were pointed out previously. For example, my analysis of *cơ* suggests a broader category of mirativity to include particles with a non-expressive meaning. The marking of particles with a non-expressive meaning like *cơ* is not restricted to the Speaker's surprise but is able to reflect the surprise of other discourse agents. I also pointed out that the characterization of *cơ* in terms of belief revision reveals a deeper connection between mirative markers and markers of belief revision. One more crucial implication is that predicting the behavior of *cơ* requires us to understand some more fundamental concepts: the basic pragmatic properties of sentences, belief revision which is one of the primary operations of belief changes, and the predetermined ordering relations. We may expect that other particles with use-conditional meaning in Vietnamese and other languages may behave in a similar way. This can contribute to our understanding of particle learning for children.

Along the way, I have also discussed the relation between beliefs and credence. Recall that the mirativity of *cơ* is characterized here in terms of belief revision. In

addition, credence is employed to define both beliefs and partial beliefs. However, how binary beliefs, as utilized in Gardenfors's theory of belief revision, relate to credence is an issue that has generated controversy in the philosophy literature (see also Jackson 2020)[10]. One way to avoid taking a stance on this issue is to choose between the two mechanisms, belief revision and credence. This however requires further investigation. Therefore, my proposal here makes reference to both notions. Whether one mechanism is more appropriate than the other is left for future work.

As a final note, I want to highlight the behaviors of *cơ* that are left for future work much of which requires the understanding of many other understudied sentence-final particles in Vietnamese. First, *cơ* is also found optionally in imperatives and exclamations.

(190) *Cơ* in imperatives and exclamations

a. Mẹ bế con (**cơ**)!
You hold me CƠ
'You hold me (in your arms) *cơ*!' (from *Từ điển Tiếng Việt* (2003))

b. Món kem ngon **quá** (**cơ**)!
CL ice-cream delicious PRT CƠ
'The ice-cream is so delicious *cơ*!'

The sentence in (190.a) is interpreted as a command and is taken to be an imperative. Vietnamese imperatives are often modified with the sentence-final particle *đi*, which is described as an imperative marker in Le (2015). Imperatives with *đi* resist concurrent use of *cơ*. (191.a) shows an imperative with *đi*. (191.b) shows that *cơ* cannot precede or follow *đi*.

(191) Imperatives with *đi*

a. Ngủ **đi**!
Sleep ĐI
'Sleep!' (from Le 2015)

b. Mẹ bế con (#cơ) **đi** (#cơ)!
You hold me CƠ ĐI CƠ
'You hold me (in your arms).

The exclamation in (190.b) is typically marked with the particle *quá*. There is very little insight in the existing literature about what exactly this sentence-final *quá*

[10]I thank Bob Beddor for pointing me to the literature concerning this issue.

contributes to the exclamation (*Từ điển Tiếng Việt* 2003). However, there might be a connection between this *quá* and the excessive *quá* as illustrated in (192). See also Nguyen (2019) for discussion of excessive *quá*.

(192) Excessive *quá*

Cái hộp này to **quá**. Tìm cái nhỏ hơn đi.
CL box this big QUÁ find CL small more PRT
'This box is too big. Find a smaller one.'

Cơ is only compatible with exclamations with *quá*. Other exclamations do not allow the particle. The exclamation in (193.a) does not contain any particle. In (193.b), the sentence includes the sentence-final particle *thế* and is interpreted as an exclamation. The addition of *cơ* to both exclamations is not accepted.

(193) Other exclamations

a. Món kem rất ngon (#cơ)!
CL ice-cream very delicious CƠ
'The ice-cream is very delicious!'

b. Ngôi nhà này to **thế** (#cơ)!
CL house this big THẾ CƠ
'This house is so big!'

Another open set of data is concerned with combinations of particles. Two common clusters that involve *cơ* in declaratives are illustrated in (194).

(194) *Cơ* in clusters of particles

a. *Cơ* and *mà*

A: Tớ sợ tớ không làm được.
I worry I not do able
'I am worried that I can't do it.'

B: Cậu sẽ làm được. Cậu luyện 10 lần rồi **cơ mà**.
You will do able You practice 10 time already CƠ MÀ
'You will able to do it. You have practiced 10 times.'

b. *Cơ* and *đấy*

Cái nhẫn này giá $1000. $1000 **cơ đấy**. Không rẻ đâu.
CL ring this cost $1000 $1000 CƠ ĐẤY not cheap PRT
'This ring costs $1000. It's $1000. It's not cheap.'

We hope to understand what exactly the individual particles *mà* and *đấy* and the clusters *cơ mà*, *cơ đấy* contribute to their host sentences as in (194). The investigation of *cơ* in this thesis therefore is the starting point for further study of the particle and other sentence-final particles in Vietnamese.

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