Exhaustivity.

On exclusive particles, clefts, and progressive aspect in Ga (Kwa)

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List of glossing conventions

1	1st person		COMPL	complementizer
2	2nd person		REL	relativizer
3	3rd person		NOM	nominalizer
SG	singular		COP	copula
PL	plural		QPRT	question particle
IMPF	imperfective		NEG	negation
PROG	progressive		FM	focus marker
PVF	perfective		REFL	reflexive
PROSP	prospective		ACC	accusative
INDF	indefinite		LOC	locative
DET	determiner		á	high tone
PRT	particle		à	low tone

* means that the example was judged as unacceptable in the given context and I hypothesize that it is for grammatical reasons

#'/[?] means that the example was judged as unacceptable in the given context I hypothesize that it is for semantic or pragmatic reasons; in the case of '?' the judgments were not so clear as in the case of '#'

% means that 50% of the language consultants judged the example as acceptable in the given context and 50% of the language consultants judged the example as unacceptable in the given context

Examples without any diacritics were judged as acceptable in the given context

Glosses of the examples taken from other authors are given in the original

1 Introduction

It is widely observed that some linguistic expressions, in particular exclusive particles and cleft structures, trigger an exhaustive meaning. It states that everything in the complement of the set of things described by the focus is excluded (Coppock and Beaver, 2014). Consider a sentence with the exclusive particle 'only' given in (1):

(1) Only Kofi ate fufu yesterday.
    a. PREJACENT: Kofi ate fufu yesterday.
    b. EXHAUSTIVE MEANING: Nobody other than Kofi ate fufu yesterday.

The sentence in (1) conveys the meaning that Kofi ate fufu yesterday and that nobody but Kofi ate fufu yesterday. The second meaning is an exhaustive meaning and there is a general agreement in the literature that it is asserted (Horn, 1969, 1996; McCawley, 1981; Rooth, 1992; Atlas, 1993; van Rooij and Schulz, 2005; Roberts, 2006; Ippolito, 2008).

Now, consider a cleft structure in (2). It also conveys the meaning that Kofi ate fufu and that nobody but Kofi ate fufu, but this time the exhaustive meaning is not asserted (Horn, 1981; Percus, 1997; Velleman et al., 2012; Büring and Križ, 2013):

(2) It is Kofi who ate fufu yesterday.
    a. PREJACENT: Kofi ate fufu yesterday.
    b. EXHAUSTIVE MEANING: Nobody other than Kofi ate fufu yesterday.

This dissertation is concerned with the exhaustive meaning conveyed by exclusive particles and cleft structures in Ga (Kwa), an under-researched language spoken in Ghana, and their interactions with various elements in the nominal and the verbal domain, respectively.

As for the semantics of the exclusive particles, the empirical focus of this dissertation is put on two exclusives *pɛ* and *too*. They show similar properties when they combine with bare NPs. Interestingly, however, when their associate NP is marked overtly for indefiniteness, one can observe several splits in their semantics. For example, while

too can combine with both singular count nouns and mass nouns, *pɛ* can only combine with singular count nouns, as demonstrated in (3) and (4):

(3)   *pɛ/too* AND SINGULAR COUNT NOUNS:

      Q: What did Kofi buy yesterday?

      A: Kòfí hé wòlò **kòmé pɛ́/tóó** nyɛ̀.
          Kofi buy book.SG INDF ONLY/ONLY yesterday
          'Kofi bought only a book yesterday.

(4)   *pɛ/too* AND MASS NOUNS:

      Q: What did Kofi buy yesterday?

      A: Kòfí hé yɔ̀ɔ̀ **kòmé #pɛ́/tóó** nyɛ̀.
          Kofi buy bean.SG INDF ONLY/ONLY yesterday
          'Kofi bought only beans yesterday.

Clefts in Ga, on the other hand, pose challenges for the existing formulations of exhaustivity of clefts available on the market (e.g., Büring, 2011; Velleman et al., 2012; Büring and Križ, 2013). In particular, all of them have problems with accounting for the contrast presented in (5):

(5)   a.   Jééé Fred nì è-fɔ̀   nìnè è-tsɛ́ lɛ. È-tsɛ́ Fred kɛ̀ Gord.
          neg Fred PRT 3SG-throw hand 3SG-call PRT 3SG-call Fred and Gord
          'It wasn't Fred she invited. She invited Fred and Gord.'

      b. #Jééé Kòfí nì Màríà fɔ́.   È-fɔ́   Kòfí kɛ̀ Èmmánùèl.
          NEG Kofi PRT Maria give.birth she-give.birth Kofi and Emmanuel
          'It's not Kofi Maria gave birth to. She gave birth to Kofi and Emmanuel.'

In addition, the exhaustivity effect triggered by clefts interacts with an aspectual information conveyed by a sentence. Namely, clefted sentences with the imperfective aspectual form and the definite determiner *lɛ* attached to the VP invariably obtain a progressive interpretation, as illustrated in (6):

(6)   Ánnà nì sèlè-ɔ́   lɛ.
      Anna PRT swim-IMPF DET
      'It is Anna who is swimming.'

      a.   Direct evidence context: Tom and his family (wife, two sons, and two daughters) are on the beach. Tom can see that his two sons and the youngest daughter are playing with sand, and his oldest daughter, Anna, is swimming. He says to his wife:
          ⇒   Tom can utter (6) in this context

b.   Indirect evidence context: Tom and his family (wife, two sons, and two daughters) are on the beach. Tom can see that his two sons and the youngest daughter are playing with sand. He cannot see his oldest daughter, but the younger one told him that she was in the process of swimming. Tom says to his wife:

⇒   Tom cannot utter (6) in this context

The next section shortly summarizes the main findings of the dissertation.

1.1 Organization of the dissertation

The dissertation is organized as follows.

Chapter 1 gives a general introduction to the phenomena analyzed in the dissertation, provides the outline, and discusses the methodology.

Chapter 2 provides a theoretically informed description of some linguistic phenomena in the Ga language, which are important for understanding the chapters to follow. In particular, I discuss different types of common nouns, the realization of focus, and temporal and aspectual reference in Ga. Some of the topics discussed in this chapter are taken up later in chapters to follow.

Chapter 3 provides an empirical description and a semantic analysis of exclusive particles in Ga. It turns out that the domain exhaustified by exclusive particles depends both on the choice of the particle (*pɛ* vs. *too*) and the presence or absence of the overt indefinite determiner *kome*. The chapter extends also a typology of exclusive particles in a cross-linguistic perspective. It identifies an exclusive that functions as Landman's (1989; 2010; 2013) group-forming operator and by that changes the denotation of the modified NP. Thus the Ga data point to the previously unattested variation at the semantics of exclusive particles in a cross-linguistic perspective.

Chapter 4, in turn, deals with the syntax and the semantics of the cleft structure in Ga, which is introduced by the particle *ni*. I argue that the particle *ni* induces a structural bi-partition in which the exhaustively interpreted focused constituent is to its left and the backgrounded part is to its right. Importantly, the Ga cleft structure poses challenges for the existing accounts for the exhaustivity of clefts. I claim that the proposed pragmatic rescue strategy along with the assumed presupposed and asserted meaning components properly model the exhaustivity effect triggered by clefts in Ga. The analysis might account for the exhaustivity of clefts in a cross-linguistic perspective.

Chapter 5 analyzes the interaction between clefts and an aspectual interpretation conveyed by a sentence. I demonstrate how a progressive interpretation compositionally derives from the interaction between the cleft structure (in particular, its exhaustive interpretation), the general imperfective, and the definite determiner. I argue that the progressive interpretation is the result of a domain restriction mechanism in the verbal domain analogous to the one in the nominal domain, which I propose analyzing in terms of situation semantics. Thus I argue for a full parallelism between both domains, in spirit of Bach (1986); Krifka (1989), among others. In particular, I show that not only lexical but also grammatical aspect exhibits parallelism with the nominal domain and thus can be analyzed with the use of the same formal tools.

Chapter 6 summarizes and identifies directions for future research.

1.2 The Ga language

Ga is a Kwa language spoken in the Greater Accra Region of Ghana by ca. 600,000 speakers. It is an SVO language with two tones: High and Low. Ga is not an endangered language: it is spoken at homes and it is taught in schools.

Regarding previous work on the Ga language, there are several articles on various linguistic phenomena, in particular on information-structural notions (e.g., Dakubu, 1992, 2005), tense and aspect (Dakubu, 1970, 2008), pre-verbs (Dakubu, 2004b), verb constructions (Hellan and Dakubu, 2010), syntax (Dakubu, 2004a), and phonology (Dakubu, 2002; Paster, 2003). Moreover, there is a modern Ga-English dictionary with the English-Ga appendix (Dakubu, 1999). However, Ga still qualifies as an underresearched language. Especially, there is no work on the semantics of Ga which would be couched in a formal semantic framework. This dissertation aims at filling in this gap, at least partly.

1.3 Methodology

If not marked otherwise, all data presented in this dissertation stem from the author's own fieldwork with seven Ga native speakers (five women and two men) in May 2012, February 2013, January 2014, and October 2014 in Accra (twelve weeks in total) and one Ga native speaker in Berlin in 2011–2015. All of my language consultants, except for my Ga teacher in Berlin, were students at the time of conducting the fieldwork, one of them has a background in linguistics. Seven of the language consultants grew up in a Ga speaking community and they all speak Ga in their families.

The data were gathered using the fieldwork methodology presented in Matthewson (2004). Five main types of elicitation tasks were used, i.e., translation tasks, production tasks, cloze tasks, acceptability judgment tasks in the given context, and implication tasks, which are exemplified below.

At the initial stage of the research, I conducted translation tasks, productions tasks (a *picture description* task), and cloze tasks (a *story with gaps* task). In the translation tasks, the language consultants were asked to translate different sentences from English into Ga. Often, the target sentences were preceded by contexts. Examples of translation tasks are presented in (7) and (8):

(7)   context: James bought oranges and bananas.

        target sentence: No, James only bought bananas.

        Dààbí, James hé   àkwàdú pέ.
        no   James buy banana only

(8)   Tom's father was on a business trip yesterday and he does not know, whether there was good weather in his city or not. He says to his colleague:

        target sentence: If there was good weather yesterday, Tom played football yesterday.

        Kέjí hùnú lɛ   tsò   nyέ   lɛ, bélέ Tom tswà bɔ́ɔ̀lú nyὲ.
        if   sun   DET shine yesterday DET then Tom play ball   yesterday

In addition to the translation task, a production task was conducted in the form of a picture description task, e.g., in order to elicit exclusive particles. It consisted of pictures and descriptions of them in Ga. The language consultants were asked to correct a description if it did not correspond to what they saw in the picture. Descriptions and pictures were designed to encourage language consultants to use an exclusive particle, as in (9):

(9)   picture: A boy (Felix) holding a flower.

        description: Felix is holding a flower and a book.

        Dààbí, Felix hὶέ   fɔ̀fɔ́í   pέ.
        no   Felix hold flower only
        'No, Felix is only holding a flower.'

A variation of this task is a storyboard task (http://www.totemfieldstoryboards.org/) in which language consultants are asked to tell the story depicted in pictures. In order to make sure that the course of events depicted in the pictures is clear for a language consultant and she feels confident about it, we went together through the story in

English (usually several times). Subsequently, the language consultant told the same story in Ga with the support of the visual material but without any support of the linguistic material.

Another task conducted at the initial stage of the research was a cloze test in the form of a *story with gaps* task used for identifying exclusive particles. In this task, language consultants were presented with a story written in Ga which contained eighteen gaps. Out of these, nine favored the use of an exclusive particle. The language consultants were asked to fill in the gaps. They were informed that they could put more than one word in each gap. The beginning of the story is given in (10):

(10) **Text in Ga:** Àtsɛ́ɔ̀ mì Philomina. Míshíà gbɛ́ì jí Àblá. Míwèkú lɛ gbɛi jí Nyɔ̀ŋmɔ̀kɛ̀wɔ̀yɛ̀. Wɔ̀yì ékpàà féɔ̀ wèkú lɛ́. Christoph jí mítsɛ̀ nì mínyè gbɛ́ì jí Màríà. Mìyɛ̀ nyɛ̀mímɛ̀ì hìì ényɔ̀ shí mìyɛ̀ nyɛ̀mí yòò (1)....... Kòfí jí ònúkpá nì éná áfíí nyɔ̀ŋmàí ényɔ̀ kɛ̀ énùmɔ̀, miǹyìɛ́ èsɛ̀ɛ̀ nì mì (2)...... míńa áfíí nyɔ̀ŋmàí ényɔ̀. Dora nyìɛ́ mísɛ̀ɛ̀ nì éyè áfíí nyɔ̀ŋmà kɛ̀ ékpàà nì nàògbèè mɔ̀ jí Felix nì éyè áfíí kpàwo (3)....... .

English translation: My name is Philomina and my family name is Abla. Our family belongs to the Nyɔŋmokɛwɛyɛ tribe. Our family consists of six people. My father's name is Christoph and my mother's name is Maria. I have two brothers but I have (1)..... sister. Kofi is the oldest one. He is twenty-one years old. I am the next one and I am (2)..... twenty-one. The next one is Dora, who is eighteen years old. Felix is the youngest one. He is (3)..... eight years old.

For illustration, consider gap (3). It is known from the context that Felix is Philomina's youngest brother, and that, in comparison with his siblings, he is pretty young. One might say in English that *he is only/merely eight years old*. By analogy, it is predicted that this gap can be filled in with a scalar exclusive particle in Ga.

The described tasks, i.e., translation tasks, production tasks, and cloze tasks, are handy at the initial stages of the research because they provide clues for further elicitations (Matthewson, 2004). However, they do not constitute linguistic evidence (see Tonhauser and Matthewson, 2015). In particular, they do not provide any negative evidence, which is necessary to analyze the data. In order to warrant conclusions regarding different semantic phenomena in Ga, I used acceptability judgment tasks and implication tasks.

An acceptability judgment task is exemplified in (11). In order to find out whether the construction in (11) requires direct evidence, I examined its compatibility with direct evidence context in (11-a) and indirect evidence context in (11-b). From the obser-

vations that Ga native speakers judged (11) to be acceptable in the context of (11-a) and unacceptable in the context of (11-b), I conclude that (11) requires a direct evidential context to be felicitously used.

(11) Anna nì sèlè-ɔ́   lɛ.
      Anna PRT swim-IMPF DET
      'It is Anna who is swimming.'

    a. Direct evidence context: Tom and his family (wife, two sons, and two daughters) are on the beach. Tom can see that his two sons and the youngest daughter are playing with sand, and his oldest daughter, Anna, is swimming. He says to his wife:
    ⇒ Tom can utter (11) in this context

    b. Indirect evidence context: Tom and his family (wife, two sons, and two daughters) are on the beach. Tom can see that his two sons and the youngest daughter are playing with sand. He cannot see his oldest daughter, but the younger one told him that she was in the process of swimming. Tom says to his wife:
    ⇒ Tom cannot utter (11) in this context

In the implication tasks, on the other hand, the language consultants were asked in an indirect way to judge whether from a given linguistic expression follows a given implication. Consider (12). This task checks whether the particle combination *kome pɛ* ('only one') gives rise to the meaning *only 1 NP* or *only NP* (of unknown cardinality). However, instead of being asked what *kome pɛ* means, the language consultants were asked to answer question (Q1). If *kome pɛ* gives rise to the meaning *only 1 NP*, a language consultant should answer with (a) to the question about the amount of potatoes eaten by Mary. By contrast, if the given combination does not put any constraints on the cardinality of the selected NP, the informants should answer the same question with (c).

(12) *Dialogue test*:

MOTHER Mary, I am going to work now. Here are three potatoes and six bananas. You can eat them while I'm at work.

(*Mary's mother has just come back home from work.*)

MOTHER Hello, Mary. What did you eat?

M: Mì-yè   àtómò kòmé pɛ́.
      1SG-eat potato INDF ONLY
      'I ate only one potato.'

(Q1) How many potatoes did Mary eat?

      a) 1

      b) more than 1

      c) one cannot say

To sum up, I have used three types of tasks at the early stages of the investigation, i.e., translation tasks, production tasks, and cloze tasks. Their results constituted clues for the analyses. Two further tasks were conducted at later stages of my research, i.e., acceptability judgment tasks and implications tasks. The results of these tests form linguistic evidence based on which the analyses are formulated.

2 The Ga language: a theoretically informed description of some relevant phenomena

In this chapter, I present a theoretically informed description of certain linguistic phenomena in the Ga language that will be helpful for understanding the chapters to follow. In section 2.1, I explicate the properties of different types of common nouns observed in Ga. They are important for understanding chapter 3, in which I analyze the interaction of common nouns with exclusive particles. Subsequently, section 2.2 lays out certain facts about different strategies of focus realization in Ga. This section is crucial for chapter 4, which deals with the semantics of the cleft construction in Ga. Finally, since chapter 5 explicates in detail the semantics of progressive aspect, section 2.3 discusses the temporal and aspectual reference in the Ga language.

2.1 Common nouns

As will be shown in chapter 3, the Ga exclusive particle *too* interacts with the denotation of common nouns. For that in this section I introduce briefly different types of common nouns observed in Ga: count nouns, which come in two variants, and mass nouns.

2.1.1 Properties of common nouns

Cross-linguistically, count nouns exhibit two characteristics. First, they can combine with numerals without the use of classifiers, as in (1). Second, they are often pluralized when they refer to the cumulation of NP-entities, as illustrated in (2):[1]

(1)   DIRECT COMBINATION WITH NUMERALS:

    a.   John bought one book yesterday.

---

[1]Note, however, that there are languages in which count nouns are not pluralized in order to refer to the cumulation of NP-entities, e.g., Dëne Sųłiné (Wilhelm, 2008).

    b.   John bought two book-s yesterday.

(2)   MORPHOLOGICAL PLURAL MARKER:

    a.   John bought two book-s yesterday.

    b.   *John bought two book yesterday.

Mass nouns, on the other hand, cannot combine with numerals in the absence of a classifier, as presented in (3), and they do not take a morphological plural marker when they refer to the cumulation of NP-entities, as in (4):

(3)   COMBINATION WITH NUMERALS MEDIATED BY CLASSIFIERS:

    a.   *John bought two flour yesterday.

    b.   John bought two bowls of flour yesterday.

(4)   LACK OF MORPHOLOGICAL PLURAL MARKER:

    a.   John bought a lot of flour yesterday.

    b.   *John bought a lot of flour-s yesterday.

In the next subsection, I examine the properties of common nouns in Ga using the properties of count and mass nouns presented above as diagnostics.

2.1.2 Common nouns in Ga

Count nouns   As in English, count nouns in Ga can combine with numerals without using classifiers and they must be pluralized when referring to a cumulation of NP-entities, as in (5):

(5)   a.   Kòfí yè sɛ́bɛ́-í   ényɔ̀ nyɛ̀.
            Kofi eat eggplant-PL two yesterday
            'Kofi ate two eggplants yesterday.'

    b.   *Kòfí yè sɛ́bɛ́   ényɔ̀ nyɛ̀.
            Kofi eat eggplant-SG two yesterday
            intended 'Kofi ate two eggplants yesterday.'

However, singular count nouns[2] in Ga are acceptable in contexts that establish a singular denotation for a noun, as in (6), and in contexts that establish a plural denotation for a noun, as shown in (7):

(6)   context: Kofi bought one book yesterday.

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[2]By singular count nouns I mean nouns which are not morphologically marked for being plural.

    a.   Kòfí hé   wòlò.
           Kofi buy book.SG
           'Kofi bought a book.'

    b.   #Kòfí hé   wò-jì.
           Kofi buy book-PL
           'Kofi bought books.'

(7)   context: Kofi went to the market and bought several books yesterday.

    a.   Kòfí hé   wòlò.
           Kofi buy book.SG
           'Kofi bought a book.'

    b.   Kòfí hé   wò-jì.
           Kofi buy book-PL
           'Kofi bought books.'

Moreover, the language consultants accept singular count nouns in contexts which do not specify the cardinality of the NP, as in (8):

(8)   context: Kofi bought books yesterday (we do not know how many: maybe one or maybe more than one).

    a.   Kòfí hé   wòlò.
           Kofi buy book.SG
           'Kofi bought a book.'

    b.   #Kòfí hé   wò-jì.
           Kofi buy book-PL
           'Kofi bought books.'

The language consultants commented that one cannot use the plural form *woji* in (8), because with *woji* one knows for sure that Kofi bought more than one book. This observation will be crucial for modeling the denotation of plural count nouns in chapter 3.

Next to standard count nouns, i.e., count nouns with a competing plural form, there is also a second type of count nouns in Ga, i.e., count nouns without a competing plural form. Like standard count nouns, they can combine with numerals without the use of classifiers. However, unlike standard count nouns, they do not take a morphological plural marker when referring to the cumulation of NP-entities. Compare the acceptability of combining *àtómó* 'potato' with the numeral *ényɔ̀* 'two' in (9) with the unacceptability of combining *sɛ́bɛ́* 'eggplant' with the same numeral in (5-b):

(9) Lisa yè àtómò ényɔ̀ nyɛ̀.
     Lisa eat potato.SG two yesterday
     'Lisa ate two potatoes yesterday.'

Mass nouns in Ga Mass nouns in Ga behave fully parallel to their English counterparts. First, they cannot combine with numerals without the use of classifiers, as presented in (10-a). Note, however, that (10-a) becomes acceptable when a classifier (e.g., *wii* 'seed') is added to the sentence, as in (10-b). Second, they are not pluralized when referring to the cumulation of NP-entities, as in (10-c):

(10) a. #Kòfí yè yɔ̀ɔ̀ ényɔ̀ nyɛ̀.
          Kofi eat bean two yesterday.
          'Kofi ate two beans yesterday.'
      b. Kòfí yè yɔ̀ɔ̀ wúì ényɔ̀ nyɛ̀.
          Kofi eat bean seed two yesterday
          'Kofi ate two seeds of beans yesterday.'
      c. Kòfí yè yɔ̀ɔ̀ pìì nyɛ̀.
          Kofi eat bean many yesterday.
          'Kofi ate a lot of beans yesterday.'

2.1.3 Summary

Summing up, it was shown that there are count nouns, which come in two variants, as well as mass nouns in Ga. The semantic analysis of the common nouns in Ga is presented in chapter 3.

2.2 Focus

This section lays out certain facts about focus realization in Ga. They are important for understanding chapter 4, in which I give a semantic and a syntactic analysis of the cleft structure, which also constitutes one of the strategies of focus marking.

2.2.1 What is focus?

There is a general agreement in the literature that focus is an information-structural notion that refers to the presence of a set of alternatives to an utterance (Rooth, 1985, 1992, 1996; Krifka, 2007; Beaver and Clark, 2008; Zimmermann, 2011, among many others). For example, Krifka (2007, p.18) defines focus as an indicator of the presence of alternatives which are relevant for the interpretation of linguistic expressions.

There are different types of focus described in the literature: new-information focus, corrective focus, selective focus, and contrastive focus, examples of which are given below:

(11)   A1: Who was liberated yesterday?
       B1: [Simona]$_F$ was liberated yesterday.   NEW-INFORMATION FOCUS

       A2: Peter bought a Mercedes yesterday.
       B2: No, he bought a [Toyota]$_F$.   CORRECTIVE FOCUS

       A3: Did you have a bagels or muffins for breakfast?
       B3: I had [bagels]$_F$ for breakfast.   SELECTIVE FOCUS

       A4: An American [linguist]$_F$ chided
            an American [politician]$_F$.   CONTRASTIVE FOCUS

                              (from Hartmann and Zimmermann, 2007b, p.366)

In this section, I examine only the new-information focus. This type of focus is typically identified in the semantic fieldwork situation with the help of wh-questions, i.e., an element which answers the question is in focus, cf. (11-A1) and (11-B1).

Various ways of marking new-information focus have been identified across languages. For example, languages like English or German mark focus by a pitch accent. African languages, in turn, very often employ morphological means to mark focus. At the same time, there are *in-situ* focus marking strategies in which the focused constituent is in its base-generated position and a sentence is in its canonical word order and *ex-situ* focus marking strategies in which the focused constituent is typically fronted and a sentence is no longer in its canonical word order. Focus realization in Ga is discussed in detail in the next subsection.

2.2.2 Focus realization in Ga

Ga, as many other West African languages (Fiedler et al., 2010), employs two strategies for expressing focus, i.e., *in-situ* and *ex-situ*.

2.2.2.1 In-situ focus

Focused constituents in Ga can stay *in-situ*, as demonstrated in (12). A sentence in (12-A), which is in its canonical SVO order, is a proper answer for all the questions listed in (12-Q1)–(12-Q5), which elicit Subject, DO, VP, V, and PP focus, respectively.

(12)   Q1: Námɔ̀ kánè-ɔ̀   àdèsáwòlò dáágbì?   SUBJECT FOCUS
              who   read-IMPF newspaper every.day
              'Who reads a newspaper every day?'

         Q2: Mɛ́nì Kòfí kánè-ɔ̀   dáágbì?   DO FOCUS
              what Kofi read-IMPF every.day
              'What does Kofi read every day?'

         Q3: Mɛ́nì Kòfí fé-ɔ̀   dáágbì?   VP FOCUS
              what Kofi do-IMPF every.day
              'What does Kofi do every day?'

         Q4: Mɛ́nì Kòfí kɛ̀ àdèsáwòlò fe-ɔ   dáágbì?   V FOCUS
              what Kofi and newspaper do-IMPF every.day
              'What does Kofi do with a newspaper every day?'

         Q5: Mɛ́ɛ̀bè Kòfí kánè-ɔ̀   àdèsáwòlò?   PP FOCUS
              when   Kofi read-IMPF newspaper
              'When does Kofi read a newspaper?'

         A: Kòfí kánè-ɔ̀   àdèsáwòlò dáágbì.
              Kofi read-IMPF newspaper every.day
              'Kofi reads a newspaper every day.'

In-situ focus in Ga is morphologically unmarked, as demonstrated in (12). This observation has been already described in Dakubu (1992). At the same time, Dakubu (2005) and Ameka (2010) claim that subjects in focus are obligatorily marked by the particle *ni*. However, it is shown above with (12) that focus on subject does not have to be morphologically or syntactically marked.

Now, the immediate question is whether Ga employs any prosodic means to mark *in-situ* focus. The results of a phonological pilot experiment conducted with eight Ga native speakers showed that there is no effect in F0, but there is an effect on duration and intensity in the DO *in-situ* focus (Genzel et al., 2015). In comparison to sentences with all-new focus, which served as a baseline, in sentences with DO focus the tonal patterns are maintained and the scaling relations of the terracing pattern are preserved. However, the high tones are overall higher in sentences with a focused DO. Moreover, in sentences with a focused DO, the second syllable of the subject and the first syllable of the DO are systematically lengthened in comparison to the sentences with broad focus. In addition, the relative intensity of the first syllable of the DO in sentences with a focused DO was systematically higher than in sentences with the broad focus.

Although there are differences in duration and intensity in sentences with focused DO in comparison to sentences with broad-focus, in order to warrant definite conclusions whether *in-situ* focus in Ga is prosodically marked, perceptual experiments must be conducted, which we hope to do in future work.

2.2.2.2 Ex-situ focus

Ga exploits two strategies for expressing *ex-situ* focus, i.e., the *ex-situ* focus construction with the focused constituent marked with the particle *ni* and the *ex-situ* focus construction with the morphologically unmarked focus constituent. Both strategies are demonstrated in below in (13) and (14) for subject and DO focus, respectively:

(13)   Q: Námɔ̀ kánè-ɔ̀ àdèsáwòlò?   SUBJECT FOCUS
             who read-IMPF newspaper
             'Who reads a newspaper?'

         A: Kòfí (**nì**) kánè-ɔ̀ àdèsẃòlò.
             Kofi PRT read-IMPF newspaper
             'Kofi reads a newspaper.'

(14)   Q: Mɛ́nì Kòfí kánè-ɔ̀?   DO FOCUS
             what Kofi read-IMPF
             'What does Kofi read?'

         A: Àdèsẃòlò (**ni**) Kòfí kánè-ɔ̀.
             newspaper PRT Kofi read-IMPF
             'Kofi reads a newspaper.'

Examples (13) – (14) show that fronted focused constituents can but do not have to be marked by the particle *ni*. The particle *ni* can also attach to wh-words. Because of question-answer congruence, when the particle *ni* is attached to a wh-word, the answer should also be marked by the particle *ni*:

(15)   Q: Námɔ̀ **nì** kánè-ɔ̀ àdèsáwòlò?   SUBJECT FOCUS
              who   PRT read-IMPF newspaper
             'Who is it that reads a newspaper?'

        A1: Kòfí **ni** kánè-ɔ̀ àdèsáwòlò.
             Kofi PRT read-IMPF newspaper
              'It is Kofi who reads a newspaper.'

        A2: ᶦKòfí kánè-ɔ̀   àdèsáwòlò.
             Kofi read-IMPF newspaper
             'Kofi reads a newspaper.'

(16)   Q: Mɛ́nì **nì** Kòfí kánè-ɔ̀?   DO FOCUS
              what PRT Kofi read-IMPF
             'What is it that Kofi reads?'

        A1: Àdèsẃòlò **nì** Kòfí kánè-ɔ̀.
              newspaper PRT Kofi read-IMPF
              'It is a newspaper that Kofi reads.'

A2: [?]Àdèsẃòlò Kòfí kánè-ɔ̀.
newspaper Kofi read-IMPF
'Kofi reads a newspaper.'

I postpone the detailed description of the information-structural properties of the marked *ex-situ* focus construction and the semantic analysis of the particle *ni* for later in chapter 4. A more detailed discussion of the unmarked *ex-situ* focus strategies, on the other hand, is postponed to future research.

2.2.3 Focus in Ga from a cross-linguistic perspective

Many West African languages, e.g., Hausa (Chadic, Afroasiatic), see Hartmann and Zimmermann (2007b), Buli, Dagbani (both Gur), see Fiedler and Schwarz (2005), exhibit a two-fold subject vs. non-subject focus realization asymmetry. They show a marking asymmetry, in which subject foci are obligatorily marked and non-subject foci are not, and a structural asymmetry, in which subject and non-subject foci are marked in different ways (Fiedler et al., 2010; Zimmermann, 2011).

Based on a sample of twenty-three West African languages from three language groups (Kwa, Gur, and Chadic), Fiedler et al. (2010) construct the following generalizations regarding the realization of subject and non-subject focus. Importantly, (17-b) concerns syntactic and/or morphological means of focus marking.

(17)   MARKING ASYMMETRY

    a.   Non-subject term focus (NSF) cannot or need not be marked syntactically.
        (i)   NSF is restricted to *in-situ* positions (Bole, Duwai, Bade, Ngamo (all Chadic))
        (ii)   NSF is not restricted to *in-situ* positions (Gur, Kwa, Hausa (Chadic))
    b.   Subject focus must be marked.

(from Fiedler et al., 2010, p.242–243)

The subject vs. non-subject term focus asymmetry can be illustrated by an example from Fɔn (Kwa, Gbe). Whereas (18) shows that subject term focus must be morphologically marked by the particle *wὲ*, (19) shows that the non-subject term focus can but does not have to be marked by this particle. Therefore, Fɔn exhibits the marking asymmetry presented in (17-b).

(18)   Q: Who ate the beans?   SUBJECT FOCUS

A: Nyɔ̀nú ɔ́ *(wɛ̀) ɖù àyìkún.
    woman DEF FM   eat bean
    '[The woman]*F* ate the beans.'   (from Fiedler et al., 2010, p.245)

(19) Q What did the woman eat?   DO FOCUS

A: Àyìkún (wɛ̀) nyɔ̀nú ɔ́ ɖù.
    bean   (FM) woman DEF eat
    'The woman ate [beans]*F*.'   (from Fiedler et al., 2010, p.245)

Looking at Ga, it appears that whereas non-subject term focus exhibits the focus re-alization strategy presented in (17-a-ii), i.e., it is not restricted to *in-situ* positions, the realization of subject focus in Ga does not fit the generalization in (17-b). As it was pre-sented in (13), repeated below in (20), subject focus does not have to be morphologically or syntactically marked:[3]

(20) Q: Námɔ̀ kánè-ɔ̀ àdèsáwòlò?   SUBJECT FOCUS
          who   read-IMPF newspaper
          'Who reads newspaper?'

A: Kòfí (**nì**) kánè-ɔ̀ àdèsáwòlò.
    Kofi PRT read-IMPF newspaper
    'Kofi reads a newspaper.'

(21) Q: Mɛ́nì Kòfí kánè-ɔ̀?   DO FOCUS
          what Kofi read-IMPF
          'What does Kofi read?'

A: Àdèsẃòlò (**nì**) Kòfí kánè-ɔ̀.
    newspaper PRT Kofi read-IMPF
    'Kofi reads a newspaper.'

Crucially, examples (20) and (21) also show that Ga does not exhibit a marking asym-metry, in which subject focus is obligatorily marked and non-subject focus is not. One reason for the non-obligatorily subject focus marking by the particle *ni* might be the exhaustivity effect triggered by this particle (see chapter 4). If subject foci in Ga were obligatorily marked by the particle *ni*, then they would be obligatorily interpreted as being exhaustive. Therefore, it would not be possible to express non-exhaustive sen-tences with subject foci.

Moreover, (20) and (21) show that Ga does not exhibit structural asymmetries either, i.e., both subject and non-subject term focus are marked with the use of the same means.

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[3]Malte Zimmermann (p.c.) pointed out to me that subject foci in Ga might be marked phonologically. I leave the experimental examination of this hypothesis for future research. Note, however, that the generalization in (17-b) is about syntactical and/or morphological marking.

2.2.4 Summary

In this section, I discussed the focus marking strategies exhibited in Ga. It was shown that subject and non-subject term focus can be realized both *in-situ* and *ex-situ* and in the latter case both can be additionally marked by the particle *ni*. Crucially, Ga exhibits neither a marking nor a structural asymmetry in subject and non-subject term focus realization strategies.

2.3 Temporal and aspectual reference

This section outlines some basic facts about the temporal and aspectual system of the Ga language, which will be helpful for understanding the material in chapter 5 on progressive aspect in Ga.

2.3.1 The semantics of tense and aspect

Following Reichenbach (1947); Klein (1994), i.a., I assume a threefold distinction between event time, i.e., the time at which an event takes place, topic time, i.e., the time the speaker talks about, and utterance time, i.e., the time at which the sentence is uttered. It is often proposed that the role of tense is to relate the utterance time and the topic time. Consider (22):

(22)   a.   John read a book.
       b.   John is reading a book.
       c.   John will read a book.

Past tense, as in (22-a), conveys the information that the topic time (the time I am talking about, i.e., the time of John reading a book) precedes the utterance time (now). Present tense, on the other hand, conveys the meaning that the topic time and the utterance time overlaps, as in (22-b). Finally, future tense, as in (22-c), states that the utterance time precedes the topic time.[4]

The role of aspect, on the other hand, is to relate the event time and the topic time. In particular, imperfective aspect locates the topic time within the running time of the event and therefore the described event is perceived as ongoing, not complete. Perfec-

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[4]There is an ongoing discussion whether English *will* in particular and future markers in general are temporal and/or aspectual/modal markers. For a discussion, see Abusch (1998); Bittner (2005); Copley (2002); Kaufmann (2005); Kissine (2008); Matthewson (2006); Tonhauser (2011a); Mucha (2015), among others.

tive aspect, in turn, locates the running time of the event within the topic time, which leads to the interpretation that the described event is completed (Klein, 1994; Kratzer, 1998). Consider (23) and (24):

(23)   PROGRESSIVE ASPECT:

    a.   John is reading a book right now.

    b.   Yesterday evening, John was reading a book.

(24)   PERFECTIVE ASPECT:

    a.   Yesterday evening, John read a book.

    b.   Tomorrow evening, John will read a book.

The progressive aspect in (23-a) and (23-b) conveys the meaning that the topic time (right now and yesterday evening in (23-a) and (23-b), respectively) is located within the running time of the event (reading a book by John). By contrast, the perfective aspect in (24-a) and (24-b) states that the running time of the event (reading a book by John) is located within the topic time (yesterday evening and tomorrow evening in (24-a) and (24-b), respectively).

2.3.2 Temporal and aspectual reference in Ga

Ga exploits morphological and tonal means in order to convey temporal and aspectual information. However, the tonal strategy is applied only when a subject (or a fronted DO) is a pronoun. Dakubu (2008) claims that in such a case tones can differentiate perfective from the unmarked form, as demonstrated below:[5],[6]

(25)   a.   ó-sèlè   PERFECT

           2SG-swim

           'You have swum.'

    b.   ò-sèlè   AORIST

           2SG-swim

           'You swam.'   (from Dakubu, 2008, p.98)

Moreover, she notes that tones mark subjunctive but again only when the subject is a pronoun.[7]

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[5]The unmarked form is discussed in subsection 2.3.3.1.

[6]In Dakubu's (2008) nomenclature 'perfective' is 'perfect' and the 'unmarked form' is called 'aorist.'

[7]Dakubu (2008) notices '(...) *the perfect, the aorist, and the subjunctive, which has a prefix with high tone and no floating one, are distinguished only by tone* if the subject is a pronoun prefix.' (emphasis is mine). She also notes that: '*A frequent source of confusion is the fact that a grammatical prefix to the verb generally consists of*

In this section, I do not discuss the tonal temporal and/or aspectual markers but I focus on the morphological markers instead. Since none of the claims to follow is based on the examples with pronominal subjects or fronted DOs, I assume that the semantics of the morphological markers do not interact with the tonal markers, at least in the presented examples.

2.3.3 Morphological aspectual markers in Ga

Ga has a rich system of aspectual morphological markers, whose paradigm is presented in Table 2.1.

Table 2.1: Paradigm of morphological aspectual markers in Ga and their (in)compatibility with different temporal references; '✓' means that a form is compatible with the given temporal reference, 'with statives' and 'modal' means that the given form is compatible with the given temporal reference but only with stative predicates or in some modal contexts, respectively, and finally '−' means that a form is not compatible with the given temporal reference.

	e- perfective	-ɔ imperfective	mii- progressive	baa- prospective	∅ unmarked form
PAST	✓	✓	✓	✓	✓
PRESENT	−	✓	✓	modal	with statives
FUTURE	✓	−	✓	✓	✓

I claim that the morphological markers in Table 2.1 are aspectual rather than temporal markers, based on two observations. First, as presented in Table 2.1 and motivated empirically in the sections to follow, they do not restrict the evaluation time, i.e., unlike temporal markers, they are compatible with past, present, and future temporal references. Second, the progressive prefix *mii-* and the imperfective suffix *-ɔ* are incompatible with stative eventualities, as illustrated in (26).[8] This follows directly on the assumption that only grammatical aspect, unlike temporal markers, can impose restrictions of the lexical aspect of the input eventualities (Tonhauser, 2006).

(26)   John knows French.

---

a segmental syllable when it is initial in the word, but when the prefix is preceded by another element of the verb word, namely an auxiliary pre-verb or a subject pronoun, the prefix is expressed only as the tone of the preceding syllable.'

[8]My language consultants gave mixed judgments regarding the (in)compatibility of stative predicates with the prospective prefix *bàá-* and the perfective prefix *e−*. I hope to explore this issue more in future research.

    a.   John lè   French.
         John know French.
    b.   *John lè-ɔ̀   French.
         John know-IMPF French
    c.   *John mìì-lè   French.
         John PROG-know French

Interestingly, in addition to the paradigm presented in Table 2.1, there is a syntactic configuration in Ga, namely the focus cleft construction with the definite determiner attached to the VP and the verb with imperfective morphology, which invariably obtains a progressive interpretation, as presented in (27). I call this construction the analytic progressive.[9]

(27)   Kòfí nì   sèlè-ɔ́   lɛ.
         Kofi PRT swim-IMPF DET
         'It is Kofi who is swimming.'

    a.   progressive context: Tom and his family (wife, two sons, and two daughters) are on the beach. Tom and his wife can see a swimming child.
        ⇒ (27) is acceptable in this context
    b.   habitual context: Tom's one son and two daughters do not like swimming and they do not do it, but his oldest son, Kofi, loves swimming and he does it regularly.
        ⇒ (27) is not acceptable in this context

Example (27) shows that the analytic progressive is compatible with progressive aspectual reference, as presented in (27-a), but not with habitual aspectual reference, as demonstrated in (27-b). I argue that the progressive interpretation of (27) is the result of an interaction between the imperfective suffix -ɔ, the cleft-introducing particle *ni*, and the definite determiner *lɛ*. I reserve the detailed discussion and the semantic compositional analysis of the Ga cleft construction for later in chapter 4 and the analytic progressive in chapter 5.

In the next subsections, I present a theoretically informed description of the morphological aspectual markers observed in Ga. I start with the characteristics of the most general form, i.e., the unmarked form. The semantics of two aspectual markers, i.e., the imperfective marker -ɔ and the progressive marker *mii-* will be treated in more detail in chapter 5.

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[9]*Lɛ* is tonally unspecified. However, it comes with a floating high tone which docks onto the preceding syllable (Dakubu, 1992), see chapter 5, section 5.3.3.

2.3.3.1 The unmarked form: ∅

In an earlier description of the Ga temporal/aspectual system (Dakubu, 2005), the unmarked form (or zero-marked form) has been described as an aorist. Dakubu (2005) notices that the verb *wo* 'to wear' in its unmarked form in different situations can mean 'wore, was wearing, wears, is wearing' suggesting an underspecification or neutral viewpoint aspect of verbs without overt morphological marking.[10] However, she neither motivates this observation empirically nor analyzes it.

I argue that verbs in their unmarked form are indeed unmarked with respect to their temporal and aspectual interpretation with the caveat that the unmarked form is not compatible with progressive aspectual reference.[11] The following data show that clauses with the unmarked form in Ga can refer to both bound and unbound events. Compare (28) which demonstrates the (im)possible continuations of English sentences in the simple past, which can refer only to bound events, and (29) which shows possible continuations of Ga sentences with the unmarked form:[12]

(28)　　Sarah wrote a dissertation in 2009.

　　　a.　It was completed in September.

　　　b.　#I think she is still working on it.

　　　c.　#She never finished it, for she died in September of that year.

　　　　　　　　　　　　　　　　　　　　　　　(from de Swart, 2012)

(29)　　Sara ŋmà è-PhD　lɛ́　yɛ̀ áfí　2009.
　　　　Sara write 3SG-PhD DET at year 2009
　　　　'Sara wrote her PhD in 2009.'

　　　a.　È-gbè　　　nàà　yɛ̀ Gbò nyɔ̀ɔ́ŋ lɛ́　mlì.
　　　　　3SG-finish finish at Gbo month DET in
　　　　　'It was completed in the Gbo season.'

　　　b.　È-fé-ɔ̀　　　　mì áké̀　èè-tsú　　　　níí yɛ̀ hè lóló.
　　　　　3SG-seem-IMPF 1SG COMPL 3SG.PROG-work sth at self still
　　　　　'It seems to me that she is still working on it.'

---

[10]Note, however, that the data presented later in this section in examples (36) – (38) go against the observation that the unmarked form is compatible with progressive aspectual reference.

[11]Note also that the unmarked form is not compatible with habitual activities in the present, as in (35). However, it is compatible with habitual activities in the past and in the future, as presented in (30) and (32), respectively.

[12]These examples were elicited in February 2013. When it is important for the elicited material, I provide the information when the elicitation took place.

   c.   È-gbè-èè   nàà éjàáké è-gbó yè Gbò nyɔ́ɔ̀ŋ lé   mlì nàkàí
      3SG-finish-IMPF.NEG finish because 3SG-die at Gbo month DET in   that
      áfí   lɛ́.
      year DET
      'She didn't finish it because she died in the Gbo season of that year.'

In addition, the unmarked form is compatible with past, present, and future temporal reference, as shown by the following examples:

- PAST TEMPORAL REFERENCE:

(30)   context: Lisa is not a student any longer.

       Bèmlì   ní Lisa jí   níkàsélɔ́ lɛ́, è-**hòó**   gbɛ́kɛ̀   níyéníí dáágbì.
       that.time PRT Lisa COP student DET 3SG-cook evening food   every.day
       'When Lisa was a student, she cooked a dinner every day.'

(31)   Tom **mà**   shíá lɛ́ yè áfí 2010. È-gbè   nàà   yè Mànyàwàlè nyɔ́ɔ̀ŋ lɛ́
       Tom build house DET AT year 2010 3SG-finish finish AT August   month DET
       mlì.
       in
       'Tom built a house in 2010. He finished it in August.'

       (elicitation took place in February 2013)

- FUTURE TEMPORAL REFERENCE:

(32)   context: A husband is telling his wife what he is going to do:

       Má-yà   Ghana kèkɛ́ lɛ́   mí-**hòò** gbɛ́kɛ̀   níyéníí dáágbì.
       1SG.PROSP-go Ghana PRT   DET 1SG-cook evening food   every.day
       'I will move to Ghana and then I will cook a dinner every day.'

(33)   context: We're arranging a meeting with my friend. I say:

       Má-hòò   gbɛ́kɛ̀   níyéníí kɛ̀kɛ́ lɛ́   mí-**bà**.
       1SG.PROSP-cook evening food   PRT DET 1SG-come
       'I will cook a dinner, then I will come.'

- PRESENT TEMPORAL REFERENCE:

(34)   A: I am looking for somebody who can speak French.
       B: John lè   French.
            John know French
            'John knows French.'

However, the unmarked form cannot be used to refer to habitual activities in the present, as illustrated in (35):

(35)   context: Every Sunday Anna goes to swim in the ocean.

   #Anna sèlè.
   Anna swim
   intended: 'Anna swims.'

The incompatibility of the unmarked form with habitual aspectual reference in present temporal contexts, as in (35), could be explained by the Blocking Principle. Namely, there is another more specialized way of expressing habitual aspectual reference in Ga, i.e., the suffix -ɔ, which blocks the use of the less specialized unmarked form. However, a question that one runs into immediately under this hypothesis is why the unmarked form can express habitual aspectual reference in past, as in (30), and in future temporal contexts, as in (32), even though there is a more specialized imperfective marker in Ga. I hope to explore this issue in more detail in future research.

Moreover, the unmarked form is incompatible with progressive aspectual reference irrespective of the temporal reference, as illustrated in (36), (37), and (38):

(36)   past context:

   Q: What was Deborah doing when I called you yesterday?

   A: #Nòmlí   lɛ́   Deborah káné níí.
      that.time DET Deborah read thing
      intended: 'Deborah was reading then.'

(37)   present context: Kofi's mother, Maria, was worried where Kofi was. Maria's cousin went to Kofi's room and she saw that Kofi was in the process of reading a book. She said to Kofi's mother:

   A: #Kòfí káné wòlò.
      Kofi read book
      intended: 'Kofi is reading a book.'

(38)   future context:

   Q: What will Ben be doing tomorrow at 16:00?

   A: #Nòmlí   lɛ́, Ben káné wòlò.
      that.time DET Ben read book
      intended: 'Ben will be reading a book then.'

The incompatibility of the unmarked form with progressive aspectual reference across different temporal categories can be explained by the Blocking Principle. Namely, there are two other means of conveying progressive aspectual reference in

Ga, i.e., the prefix *mii-* and the analytic progressive, which block the use of the more general unmarked form in progressive contexts leading to its unacceptability.

2.3.3.2 The imperfective marker -ɔ

I claim that the suffix -ɔ is a general imperfective marker, pace Dakubu (2008) who analyzes it as a habitual marker. Empirical support for this view comes from the compatibility of -ɔ-marked verbs with both habitual and progressive aspectual references, and their incompatibility with bound events interpretation, as shown by the following:

(39)   habitual context: Every Sunday Kofi goes to swim in the ocean.
        Kòfí sèlè-ɔ̀.
        Kofi swim-IMPF
        'Kofi swims.'

(40)   progressive context: Tom and his family (wife, two sons, and two daughters) are on the beach. Tom and his wife can see a swimming child. Tom's wife says:
        Kòfí nì sèlè-ɔ́   lɛ.
        Kofi PRT swim-IMPF DET
        'It is Kofi who is swimming.'

(41)   bound events context: Lisa started swimming 2 hours ago and she has finished 0,5 h ago.
        #Lisa sèlè-ɔ̀.
        Lisa swim-IMPF
        intended: 'Lisa has swum.'

Although the verbs marked with -ɔ are compatible with both progressive and habitual aspectual references, they tend to be interpreted habitually. Since there is another, more specialized way to convey progressive aspectual reference, the progressive interpretation of the -ɔ-marked verbs is normally blocked.

In addition, the suffix -ɔ is compatible with past and present but not with future temporal reference, as illustrated in (42), (43), and (44):

(42)   A: What did you do on Sundays when you were a child?
        B: Mí-kánè-ɔ̀   wòlò.
            1SG-read-IMPF book
            'I read a book.'

(43)   A: What do you do on Sundays?

> B: Mí-kánè-ɔ̀ wòlò.
> 1SG-read-IMPF book
> 'I read a book.'

(44) A: What will you do on Sundays over the Summer break?

> B: #Mí-kánè-ɔ̀ wòlò.
> 1SG-read-IMPF book
> intended: 'I will read a book.'

Verbs marked with the suffix -ɔ in subordinate clauses are also not acceptable in future time contexts, as illustrated in (45-a). Habits in the future must be expressed either with the use of the prefix *baa-*, which conveys prospective aspectual reference, or with the unmarked form, as presented in (45-b) and (45-c), respectively:[13]

(45) Anna is telling her friend about her plans.

> a. #Má-yà Accra kɛ̀kɛ́ lɛ mí-sèlè-ɔ̀ dáágbì.
>   1SG.PROSP-go Accra PRT DET 1SG-swim-IMPF every.day
> b. Má-yà Accra kɛ̀kɛ́ lɛ má-sèlè dáágbì.
>   1SG.PROSP-go Accra PRT DET 1SG.PROSP-swim every.day
> c. Má-yà Accra kɛ̀kɛ́ lɛ mí-sèlè dáágbì.
>   1SG.PROSP-go Accra PRT DET 1SG-swim every.day
>   'I will move to Accra, and then I will swim every day.'

The semantics of the suffix -ɔ is explicated formally in chapter 5. It plays an important role in understanding the semantics of the analytic progressive form presented in 2.3.3 and discussed in details in chapter 5.

2.3.3.3 The progressive marker *mii-*

Based on the data presented in this section, I follow Dakubu (2008) in arguing that the prefix *mii-* is a progressive aspectual marker. A first piece of evidence in favor of this view comes from its compatibility with progressive but not with habitual aspectual reference, as presented in (46) and (47):

(46) habitual context: Every Sunday Anna goes to swim in the ocean.

> #Anna mìì-sèlè.
> Anna PROG-swim
> intended: 'Anna swims.'

---

[13]The suffix *baa-* preceded by the first person singular pronoun *mi* is conjoined with the pronoun and obtains the form *ma-*.

(47)   progressive context: Tom and his family (wife, two sons, and two daughters) are on the beach. Tom and his wife can see that Kofi is in the process of swimming. Tom's wife says:

Kòfí mìì-sèlè.
Kofi PROG-swim
'Kofi is swimming.'

In addition, the prefix *mii-* is incompatible with the bounded events interpretation, as illustrated in (48):

(48)   bounded events context: Lisa started swimming 2 hours ago and she has finished 0,5 h ago.

#Lisa mìì-sèlè.
Lisa PROG-swim
intended: 'Lisa has swum.'

Another piece of data showing that *mii-* is an aspectual rather than a temporal marker is its compatibility with past, present, and future temporal references, as demonstrated in (49), (50), and (51), respectively:[14]

(49)   A: What were you doing yesterday, when I called you?
        B: Míí-káné   wòlò.
            1SG.PROG-read book
            'I was reading a book.'

(50)   A: What are you doing right now?
        B: Míí-káné   wòlò.
            1SG.PROG-read book
            'I am reading a book.'

(51)   A: What will you be doing tomorrow at 16:00?
        B: Béní à-bàá-tswà   ŋmὲjí 16:00 wɔ́   lε, míí-káné   wòlò.
            when 3SG-PROSP-ring bells 16:00 tomorrow DET 1SG.PROG-read book
            'Tomorrow at 16:00 I will be reading a book.'

---

[14]Note, however, that *mii-* is not acceptable in future temporal contexts without a clearly given topic time in the sentence with the *mii-* marker, as illustrated by the following:

(i)   A: What will you be doing tomorrow at 16:00?
       B: #Míí-káné   wòlò.
           1SG.PROG-read book
           intended: 'I will be reading a book.'

Note also that when the Agent is the second or the third person singular and it is expressed by a pronoun, progressive aspectual reference is conveyed by a vowel lengthening, as in (52):

(52)   Tom wants to talk to Anna, so he asks her father where he can find her. Anna's
       father says:
       È-è-sèlè.
       3SG-PROG-swim
       'She is swimming.'

2.3.3.4 The perfective marker *e-*

The prefix *e-* is a perfective marker, i.e., it marks the boundedness of the event. It is demonstrated by the possibility of continuing a perfective sentence, as in (53), with sentences that require a bound interpretation of the event, as (53-a), and the impossibility of continuing with sentences that require an unbound interpretation of the event, as (53-b) and (53-c).

(53)   Sara **è-**ŋmà   è-PhD   lɛ   yɛ̀ áfí   2009.
       Sara PFV-write 3SG-PhD DET at year 2009
       'Sara wrote her PhD in 2009.'

       a.   È-gbè   nàà   yɛ̀ Gbò nyɔ̀ɔ́ŋ lɛ   mlì.
            3SG-finish finish at Gbo month DET in
            'It was completed in the Gbo season.'

       b.   #È-fé-ɔ̀   mì ákɛ́   è-è-tsú   níí yɛ̀ hè lóló.
            3SG-seem-IMPF 1SG COMPL 3SG-PROG-work sth at self still
            'It seems to me that she is still working on it.'

       c.   #È-gbè-èè   nàà éjàákɛ́ è-gbó yɛ̀ Gbò nyɔ̀ɔ́ŋ lɛ́   mlì nàkàí
            3SG-finish-IMPF.NEG finish because 3SG-die at Gbo month DET in   that
            áfí   lɛ.
            year DET
            'She didn't finished it because she died in the Gbo season of that year.'

The prefix *e-* is compatible with past and future temporal references, as shown in (54) and (55), respectively, which suggests that it is an aspectual rather than a temporal marker:

(54)   Before I came here, John had already read this book.
       Dání mì-bà   bíɛ́ lɛ, John **è-**káné wòló lɛ́   mómó.
       before 1SG.come here DET John PFV-read book DET already

(55)   By 20:00 tomorrow, John will have read this book.

Béní   à-bàá-tswà   ŋmɛ̀jí kpàànyɔ́ lɛ,   John **è**-káné   wòló lɛ
When 3SG-PROSP-ring bells   eight   DET   John PFV-read book DET
(égbènàà).
(has.finished)

However, the prefix *e-* can never convey present temporal reference, as shown in (56):

(56)   a.   present habitual context: Lisa loves reading books. She does it every day.

#Lisa **è**-káné   wòlò dáágbì.
Lisa PFV-read book every.day
intended: 'Lisa reads books every day.'

b.   present progressive context: Lisa is in the process of swimming.

#Lisa **è**-sèlè.
Lisa PFV-swim
intended: 'Lisa is swimming.'

The incompatibility of the prefix *e-* with present temporal reference can be explained by the Bounded Event Constraint by Smith and Erbaugh (2005), which says that bounded events cannot be located in the present. If the prefix *e-* marks the boundedness of the events, then the constraint predicts verbs marked with *e-* to be compatible with past and future temporal references but not with present temporal reference and this prediction is borne out, as already shown in (54), (55), and (56).

Note also that Dakubu (2008) claims that in sentences with pronominal agents, perfective aspectual reference is conveyed by a tonal change, as already illustrated in subsection 2.3.2 in examples (25-a) and (25-b), repeated below in (57-a) and (57-b):

(57)   a.   ó-sèlè   PERFECT
2SG-swim
'You have swum.'

b.   ò-sèlè   AORIST
2SG-swim
'You swam.'   (from Dakubu, 2008, p.98)

A more detailed discussion of the perfective in Ga has to await future research.

2.3.3.5 The prospective marker *baa-*

In earlier literature (Dakubu, 2008), the prefix *baa-* has been analyzed as a future temporal marker.[15] This analysis is suggested by the observation that the suffix *baa-* is obligatory in sentences with the adverb *wɔ* 'tomorrow,' as illustrated by the following:

(58)   a. #Kòfí sèlè   wɔ́.
            Kofi swim tomorrow
        b. Kòfí bàá-sèlè   wɔ́.
            Kofi PROSP-swim tomorrow
            intended: 'Kofi will swim tomorrow.'

In addition, it appears that the prefix *baa-* is also obligatory in other future temporal contexts, at least in matrix clauses, as demonstrated in (59):

(59)   context: Kofi is telling his friend about his son's plans for the following day.

        a. #Felix sèlè.
            Felix swim
        b. Felix bàá-sèlè.
            Felix PROSP-swim
            intended: 'Felix will swim.'

Moreover, the data in (60)– (66) show that *baa-* in matrix clauses is incompatible with past and present temporal references, but it is compatible with future temporal reference. In addition, the data in (64) – (66) show that the prefix *baa-* is underspecified with respect to conveyed aspectual information, i.e., it is compatible with habitual, progressive, and perfective aspectual references.

- PAST TEMPORAL REFERENCE

(60)   A: What did you do on Sundays when you were a child?
        B: #Má-káné   wòlò.
            1SG.PROSP-read book
            intended: 'I read books.'

(61)   A: What were you doing when I called you yesterday?
        B: #Má-káné   wòlò.
            1SG.PROSP-read book
            intended: 'I was reading a book.'

---

[15]Note that the prefix *baa-* preceded by the first person singular pronoun *mi* is conjoined with the pronoun and obtains the form *ma-*.

- PRESENT TEMPORAL REFERENCE

(62) A: What do you do on Sundays?
      B: #Má-káné   wòlò.
          1SG.PROSP-read book
          intended: 'I read books.'

(63) A: What are you doing right now?
      B: #Má-káné   wòlò.
          1SG.PROSP-read book
          intended: 'I am reading a book.'

- FUTURE TEMPORAL REFERENCE

(64) A: What will you do on Sundays over the Summer break?
      B: Má-káné   wòlò.
          1SG.PROSP-read book
          'I will read books.'

(65) A: What will you be doing tomorrow at 16:00?
      B: Má-káné   wòlò.
          1SG.PROSP-read book
          'I will be reading a book.'

(66) context: By 20:00 tomorrow, John will have finished reading this book.
      Béní à-bàá-tswà   ŋmɛ̀jí kpàànyɔ́ lɛ, John bàá-káné   wòló lɛ.
      when 3SG-PROSP-ring bells eight   DET John PROSP-read book DET
      'By 20:00 tomorrow, John will read the book.'

A language consultant commented on (66) that it is possible that John will have finished reading the book by 20:00 but one cannot be sure whether he will really do it.

Data like (67), taken from Mucha (2013), suggest however that analyzing *baa-* as a future marker is not quite adequate. Crucially, the future temporal marker would inevitably locate the topic time after the utterance time, leading to the unacceptability of (67), contrary to fact. What (67) shows is that *baa-* locates the event time in the future of the reference time, which is characteristic for prospective aspect:

(67) Yɛ̀ 2003 mlí lɛ, mí-fɔ́lɔ̀ì   kpɛ̀lé áké   àmɛ̀ **bàá**-yà USA áfí ní
      at 2003 in DET 1SG-parents agree COMPL 3PL PROSP-go USA year REL
      bàá-bá   lɛ.
      PROSP-come DET
      'In 2003 my parents agreed that they would go to the USA the year after.'
      (the example was elicited in May 2012)

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Moreover, the prefix *baa-* occurs in some modal contexts, as demonstrated in (68).

(68) Lisa bàá-sùmɔ̀ ákɛ́ é-tswá è-màmí bíànɛ́.
     Lisa PROSP-like COMPL 3SG-phone 3SG-mother now
     'Lisa would like to call her mother (now).'

The data presented so far suggest the possibility of analyzing the prefix *baa-* as denoting prospective aspect in line with the Paraguayan Guaraní marker *-ta* (Tonhauser, 2011a). Another piece of evidence in favor of this analysis is the incompatibility of *baa-* with other aspectual markers, as illustrated in (69):

(69) *Kòfí míí-bàá-káné   wòlò.
     Kofi PROG-PROSP-read book
     intended: 'Kofi will be reading a book.'

Nevertheless, a more detailed analysis of future temporal reference in Ga has to await future research.

2.3.4 Morphological aspectual markers under negation

Ga exploits different aspectual markers in negative sentences than in affirmative ones. The suffix *-VV* (lengthening the final vowel) conveys imperfective aspectual reference, the suffix *-ko* expresses perfective aspectual reference, and the suffix -ŋ realizes prospective aspectual reference. The paradigm and the temporal properties of the discussed markers are summarized in Table 2.2.

Table 2.2: Paradigm of the morphological aspectual markers under negation

	-VV imperfective (negation)	-ŋ prospective (negation)	-ko perfective (negation)
PAST	✓	✓	✓
PRESENT	✓	—	—
FUTURE	✓	✓	✓

That *-VV* is compatible with both progressive and habitual aspectual references across different temporal contexts is demonstrated in examples (70) – (75). This suggests that *-VV*, unlike *-ko* and -ŋ, encodes imperfective aspectual reference. The suffix *-ko*, on the other hand, encodes perfective aspectual reference. The support for this view comes from the compatibility of the *-ko* marker with perfective aspectual reference in

past and future temporal contexts, as illustrated in examples (76) – (78) and its incompatibility with progressive and habitual aspectual reference, as presented in examples (70) – (75).

- PROGRESSIVE ASPECTUAL REFERENCE:

(70)   past context: When I came to the beach yesterday Kofi was not in the process of swimming, he was in the process of reading a book on the beach, and his friend told me that he had swum before.

    a.   Béní mí-bá   ŋ́shɔ́náá nyɛ́   lɛ, Kòfí sèlè-èè.
        when 1SG-come beach   yesterday DET Kofi swim-IMPF.NEG
    b. #Béní mì-bà   ŋ̀shɔ̀nàà nyɛ́   lɛ, Kòfí sèlé-kò.
        when 1SG-come beach   yesterday DET Kofi swim-PFV.NEG
    c. #Béní mì-bà   ŋ̀shɔ̀nàà nyɛ́   lɛ, Kòfí sèlé-ŋ́.
        when 1SG-come beach   yesterday DET Kofi swim-PROSP.NEG
        intended: 'When I came to the beach yesterday, Kofi was not swimming.'

(71)   present context: Tom wanted to talk to Anna. He went to her house and asked her father whether he could meet her on the beach, because it was the time when Anna normally swam. Anna's father knew that she was in the process of reading a book right then, so he replied:[16]

    a.   Anna sèlè-èè.
        Anna swim-IMPF.NEG
    b. #Anna sèlé-kò.
        Anna swim-PFV.NEG
    c.   ˀAnna sèlé-ŋ̀.
        Anna swim-PROSP.NEG
        intended: 'Anna is not swimming.'

(72)   future context: Tomorrow, there is a swimming competition in Accra. Mary is very sad because she has to stay longer at work and she will not be able to see her son swimming. She is telling her friend that when she comes to the beach tomorrow, Kofi will not be in the process of swimming (because by that time his race will be already over.)

    a.   Béní má-bá   ŋ̀shɔ̀nàà wɔ́   lɛ, Kòfí sèlè-èè.
        when 1SG.PROSP-come beach   tomorrow DET Kofi swim-IMPF.NEG
    b. #Béní má-bá   ŋ̀shɔ̀nàà wɔ́   lɛ, Kòfí sèlé-kò.
        when 1SG.PROSP-come beach   tomorrow DET Kofi swim-PFV.NEG

---

[16]Note that some of my language consultants accepted (71-c) in the context of (71). However, they gave additional comments in which they clarified that Anna's father was saying that Anna would not swim because she was in the process of reading.

    c.   ˀBéní má-bá   ŋshɔ̀nàà wɔ́   lɛ, Kòfí sèlé-ŋ́.
        when 1SG.PROSP-come beach   tomorrow DET Kofi swim-PROSP.NEG
        intended: 'When I come to the beach tomorrow, Kofi will not be swimming.'

- HABITUAL ASPECTUAL REFERENCE:

(73)   past context: When Kofi was a student, he did not swim every day.

    a.   Bemli Kòfí jí   níkàsélɔ́ lɛ́, è-sèlè-èè   dáágbì.
        When Kofi COP student DET 3SG-swim-IMPF.NEG every.day
    b. #Bemli Kòfí jí   níkàsélɔ́ lɛ́, e-sèlé-kò   dáágbì.
        When Kofi COP student DET 3SG-swim-PFV.NEG every.day
    c. #Bemli Kòfí jí   níkàsélɔ̀ lɛ́, e-sèlé-ŋ́   dáágbì.
        when Kofi COP student DET 3SG-swim-PROSP.NEG every.day
        intended: 'When Kofi was a student, he did not swim every day.'

(74)   present context: Anna never goes to swim in the ocean.

    a.   Anna sèlè-èè.
        Anna swim-IMPF.NEG
    b. #Anna sèlé-kò.
        Anna swim-PFV.NEG
    c. #Anna sèlé-ŋ́.
        Anna swim-PROSP.NEG
        intended: 'Anna does not swim'

(75)   future context: Anna is telling her friend about her plans.

    a.   Má-yà   Accra kɛ̀kɛ́ lɛ mí-sèlè-èè   dáágbì.
        1SG.PROSP-go Accra PRT DET 1SG-swim-IMPF.NEG every.day
    b. #Má-yà   Accra kɛ̀kɛ́ lɛ mí-sèlé-kò   dáágbì.
        1SG.PROSP-go Accra PRT DET 1SG-swim-PFV.NEG every.day
    c. Má-yà   Accra kɛ̀kɛ́ lɛ mí-sèlé-ŋ́   dáágbì.
        1SG.PROSP-go Accra PRT DET 1SG-swim-PROSP.NEG every.day
        intended: 'I will go to Accra, and then I will not swim every day.'

- PERFECTIVE ASPECTUAL REFERENCE:

(76)   past context: Lisa still has not swum today but she will swim later in the evening.

    a.   #Lisa sèlè-èè.
        Lisa swim-IMPF.NEG
    b. Lisa sèlé-kò.
        Lisa swim-PFV.NEG

    c. #Lisa sèlé-ŋ́.
       Lisa swim-PROSP.NEG
       intended: 'Lisa hasn't swum.'

(77)   past context:

    Q: Have you already bought bread?

    A1:#Mí hé-èè   blòòdò.
        1SG buy-IMPF.NEG bread

    A2: Mí hé-kò   blòòdò.
        1SG buy-PFV.NEG bread

    A3:#Mí hé-ŋ́   blòòdò.
        1SG buy-PROSP.NEG bread
        intended: 'I haven't bought bread.'

(78)   future context: By 20:00 tomorrow, John will not have finished reading this book.

    a. ˀBéní à-bàá-tswà   ŋmὲjí kpàànyɔ́ lɛ, John ègbὲ-èè   wòló lέ
       when 3SG-PROSP-ring bells eight   DET John finish-IMPF.NEG book DET
       kánè-mɔ̀ nàà.
       read-NOM finish

    b. Béní à-bàá-tswà   ŋmὲjí kpàànyɔ́ lɛ, John ègbé-kò   wòló lέ
       when 3SG-PROSP-ring bells eight   DET John finish-PFV.NEG book DET
       kánè-mɔ̀ nàà.
       read-NOM finish

    c. Béní à-bàá-tswà   ŋmὲjí kpàànyɔ́ lɛ, John ègbé-ŋ́   wòló lέ
       when 3SG-PROSP-ring bells eight   DET John finish-PROSP.NEG book DET
       kánè-mɔ̀ nàà.
       read-NOM finish
       'By 20:00 tomorrow, John will not have finished reading this book.'

Furthermore, the data suggest that the suffix -ŋ encodes the prospective aspect. This view is supported by the following observations. First, -ŋ is compatible with future temporal reference, as illustrated in (75-c) and (78-c). Second, it can also express the negation of the prospective events in past temporal contexts, as presented in (79).

(79)   In 2003 my parents agreed that they would not go to the USA the year after.

    Yὲ 2003 mlí lɛ, mí-fɔ́lɔ̀ì   kpὲlέ ákέ   àmὲ yá-ŋ́   USA áfí ní
    AT 2003 in DET 1SG-parents decide COMPL 3PL go-PROSP.NEG USA year REL
    bàá-bá   lɛ.
    PROSP-come DET

Third, -ŋ is incompatible with present and past temporal references (without the prospective shift), as illustrated for example in (71-c), (73-c), and (76-c).

The description of the semantic properties of aspectual markers in negative sentences in Ga concludes the theoretically informed description of morphological aspectual markers in Ga. In the next subsection, I briefly discuss the Ga temporal and aspectual system from a cross-linguistic perspective.

2.3.5 Is Ga a tensed or a tenseless language?

Cross-linguistically, there are languages that use grammaticalized means to convey temporal information, e.g., English (e.g., Kusumoto, 1999), Gĩkũyũ (Cable, 2013), and languages without overt grammaticalized expressions that restrict the temporal location of the antecedent reference time, e.g., Mandarin (Smith and Erbaugh, 2005), Hausa (Mucha, 2013), St'át'imcets (Matthewson, 2006), Paraguayan Guaraní (Tonhauser, 2006, 2011b). The second type of languages are called tenseless languages (Tonhauser, 2011a). Since, as it was shown in previous sections, predicates in Ga are not inflected for tense and therefore there are no overt grammaticalized expressions restricting the temporal interpretation of sentences in Ga, Ga belongs to the second group of tenseless languages.

There is an ongoing debate in the temporal literature whether tenseless languages can obtain a genuinely tenseless analysis, in which a temporal interpretation is determined only by pragmatic factors and temporal adverbials, or they should obtain a tensed analysis, in which a temporal interpretation is restricted by covert temporal markers. Analyses along both lines were proposed, e.g., Smith and Erbaugh (2005) argued for a truly tenseless analysis for Mandarin and Mucha (2013) for Hausa. By contrast, Matthewson (2006), Lin (2002, 2003), among others, argued for a tensed analysis for St'át'imcets and Chinese, respectively. In addition, Tonhauser (2011b) showed that Paraguayan Guaraní in principle can be analyzed both as a tensed and a tenseless language. However, she concluded that the tenseless analysis is more parsimonious and comes closer to empirical adequacy.

Now the question is whether Ga should be analyzed as a tensed language for example in line with Matthewson (2006) or as a tenseless language for example in line with Tonhauser (2011b). Either type of approach is problematic. The tensed approach in line with Matthewson (2006) assumes a covert non-future temporal marker in all finite clauses which are not marked for future and for that it cannot account for the data demonstrated in (33), repeated below in (80). Since there is no future marker in the non-initial conjunct in (80), it is predicted that the covert non-future marker must be present

there. However, the presence of the covert non-future marker would be incompatible with the future temporal context stated in (80). As a consequence, (80-a) would not be acceptable in the context of (80), contrary to fact.

(80)   context: We're arranging a meeting with my friend. I say:

    a.   Má-hòó   gbɛ́kɛ̀   níyéníí kɛ̀kɛ́ lɛ   mí-**bà**.
        1SG.PROSP-cook evening food   PRT   DET 1SG-come
        'I will cook a dinner then I will come.'

A tenseless analysis in line with Tonhauser (2011b) also runs into troubles. In particular, since the genuinely tenseless analysis assumes that the temporal interpretation is only restricted by pragmatic factors (and temporal adverbials), it predicts aspectual markers to be compatible with all types of temporal references, i.e., past, present, and future. Hence, it cannot account for the incompatibility of the imperfective marker -ɔ with future temporal reference both in matrix and subordinate clauses, as presented in (44) and (45-a), repeated in (81) and (82), respectively:

(81)   Q: What will you do on Sundays over the Summer break?
    A: #Mí-kánè-ɔ̀   wòlò.
        1SG-read-IMPF book
        intended: 'I will read a book'

(82)   context: Anna is telling her friend about her plans.
    #Má-yà   Accra kɛ̀kɛ́ lɛ   mí-sèlè-ɔ̀   dáágbì.
    1SG.PROSP-go Accra PRT   DET 1SG-swim-IMPF every.day
    intended: 'I will move to Accra, and then I will swim every day.'

It seems that this incompatibility cannot be accounted for by the Blocking Principle. Blocking Principle would say that since there is a more specialized prospective marker *bàá-*, it blocks the compatibility of -ɔ with future temporal reference. The problem is that other aspectual markers, i.e., the unmarked form and the progressive marker *mii-*, are compatible with future temporal reference even though there is a dedicated prefix (*bàá-*) responsible for a future shift. Since more empirical work must be done in order to decide whether Ga should be analyzed as a tensed or a tenseless language, I leave this question for future research.

2.3.6 Summary

This section provided some basic information about the temporal and aspectual system of the Ga language. It was shown that whereas Ga exploits a wide range of aspectual

morphological markers, the temporal information is not conveyed by overt morphology. The semantics of the imperfective in Ga will be further explicated later in chapter 5. A more detailed analysis of other aspectual markers, in turn, is left for future research.

2.4 Summary

In this chapter, I presented a theoretically informed description of several phenomena in the Ga language that will be helpful for understanding the chapters to follow. In particular, the introduction to common nouns system is important for chapter 3, in which I discuss the interaction of different types of common nouns with exclusive particles. Background information on focus realization in Ga is important for chapter 4, in which the cleft construction in Ga is analyzed. Finally, basic facts on the temporal and aspectual system in Ga constitutes a background for chapter 5, in which I analyze the analytic progressive.

3 Exclusive particles

Exclusive particles, which have been attested in a wide range of languages, trigger an exhaustive interpretation. Based on novel data from Ga, I argue that the domain exhaustified by exclusive particles depends both on the choice of the particle (*pε* vs. *too*) and the presence or absence of the overt indefinite determiner *kome*. This chapter shows that the Ga exclusive particle *too* functions as Landman's (1989; 2010; 2013) group-forming operator and by that changes the denotation of the modified NP. The Ga data thus extend the typology of the exclusive particles and point to a previously unattested variation at their semantics in a cross-linguistic perspective.

3.1 Introduction

Exclusive particles trigger an exhaustive meaning, also called complement exclusion. It is an entailment that everything in the complement of the set of things described by the focus is excluded (Coppock and Beaver, 2014). Consider (1): it conveys the meaning that (a) John smokes and (b) nobody other than John smokes; the latter is an exhaustive meaning. The first meaning component is called the prejacent.

(1)   Only JOHN smokes.   [NP only]

      a.   PREJACENT: John smokes.

      b.   EXHAUSTIVE MEANING: Nobody other than John smokes.

The exclusive particle *only*, as other exclusive particles in numerous languages, e.g., in Polish (Tomaszewicz, 2012), German (Büring and Hartmann, 2001), Nłeʔkepmxcin (Koch and Zimmermann, 2010), can modify a range of expressions, each time contributing the exhaustive meaning, as exemplified below:

(2)   a.   Only 22% of the UK population smokes.   [quantifiers only]

      b.   John smokes only ON SATURDAYS.   [PP only]

      c.   These days, I am preparing for my final exams, so I am only STUDYING.

                                                            [VP only]

The chapter presents novel data from Ga which lead to the conclusion that the domain exhaustified by exclusive particles depends both on the choice of the exclusive particle and the presence of absence of the overt indefinite determiner. The chapter also identifies an exclusive that operates on the NP denotation allowing for example mass nouns to be combined with an indefinite determiner which encodes the cardinality 'one.' Therefore, the Ga data extend the typology of exclusive particles and point to a previously unattested variation in the semantics of exclusives in a cross-linguistic perspective.

The empirical focus of the chapter is put on two Ga exclusive particles, *pɛ* and *too*, which trigger an exhaustive meaning for their associate NPs, as presented in (3)

(3)   context:

> Kòfí káné wòlò **p**ɛ́/**tóó**   nyɛ̀.
> Kofi read book ONLY/ONLY yesterday
> 'Kofi read only a book yesterday.'
>
> #Nì è-káné   àdàfítswàwòlò **hú**   nyɛ̀.
> and 3SG-read newspaper   ALSO yesterday
> 'And he also read a newspaper yesterday.'

Interestingly, however, when the NP associate is marked overtly for indefiniteness by the indefinite *kome*, the exhaustive meaning of sentences with *too* is still observed but of sentences with *pɛ* it is not. Moreover, *kome, too* and *pɛ* often co-occur also giving rise to the exhaustive meaning.

(4)   context:

> John hé   àtómò **kòmé p**ɛ́.
> John buy potato INDF ONLY
> 'John bought only a potato yesterday.'
>
> Nì è-hé   lòò **hú**   nyɛ̀.
> and 3SG-buy fish ALSO yesterday.
> 'And he also bought fish yesterday.'

(5)   context:

> John hé   àtómò **kòmé tóó/tóó**   **p**ɛ́.
> John buy potato INDF ONLY/ONLY ONLY
> 'John bought only a potato yesterday.'
>
> #Nì è-hé   lòò **hú**   nyɛ̀.
> and 3SG-buy fish ALSO yesterday.
> 'And he also bought fish yesterday.'

I call this set of observations the exhaustivity puzzle. Second, when indefiniteness is marked overtly by *kome*, *too* can combine with both singular count nouns and mass nouns but *pέ* cannot combine with mass nouns.

(6)   *pε/too* AND SINGULAR COUNT NOUNS:

    Q: What did Kofi buy yesterday?

    A: Kòfí hé   wòlò   **kòmé pέ/tóó**   nyὲ.
          Kofi buy book.SG INDF ONLY/ONLY yesterday
          'Kofi bought only a book yesterday.

(7)   *pε/too* AND MASS NOUNS:

    Q: What did Kofi buy yesterday?

    A: Kòfí hé   yòò   **kòmé #pέ/tóó**   nyὲ.
          Kofi buy bean.SG INDF ONLY/ONLY yesterday
          'Kofi bought only beans yesterday.

I call this set of observations the atomicity puzzle. This chapter aims at accounting for the data in (3)–(7). To preview shortly the analysis to come, I argue that *kome* is a choice-functional indefinite of type $\langle\langle e, st\rangle, e\rangle$ that encodes the cardinality 'one.' The fact that *kome* with *too*, but not with *pε*, can combine with mass nouns (the atomicity puzzle) suggests that *too* changes the NP denotation. I propose analyzing *too* as an exclusive modifier of type $\langle\langle e, st\rangle, \langle e, st\rangle\rangle$ that denotes Landman's (1989; 2010; 2013) group forming operator, which maps all the elements from the NP denotation (atomic and plural individuals) onto atomic group individuals. Thus the NP denotation modified by *too* consists of atomic group individuals that can be picked up by the choice function denoted by *kome*. *Pε*, on the other hand, is a quantifier of type $\langle e, \langle\langle e, st\rangle, st\rangle\rangle$ and it does not change the NP denotation.

As for the exhaustivity puzzle, I argue that sentences with *kome pε* are not exhaustified with respect to the NP-denotation but with respect to the numeral denotation of *kome*. Recall that I analyze *pε* as a quantifying determiner of type $\langle e, \langle\langle e, st\rangle, st\rangle\rangle$. Therefore, when *pε* combines with bare NPs, the NP's denotation must be type-shifted by either overt or covert indefinite or definite determiner. The inserting of the overt indefinite *kome*, however, has the same effect as accented 'one' in English, i.e., it signals that the current question that is being answered is 'How many *x*?'

By contrast, sentences with *kome too pε* are interpreted exhaustively with respect to the NP denotation due to the semantics of *too* which neutralizes the pragmatic effect of type-shifting with overt *kome*. *Too* changes the NP denotation in such a way that it consists exclusively of the atomic group individuals of different size. Therefore, an

exhuastification with respect to the numeral denotation of *kome* would lead to the interpretation 'only ONE group of *x* of unknown size.' This effectively leads to a very weak interpretation: the one of the prejacent. Thus by a pragmatic reasoning, the hearer tends to interpret sentences with *kome too* and *kome too pɛ* as being exhaustified with respect to the NP denotation, which gives rise to the interpretation 'only ONE GROUP OF *x* of unknown size (and nothing else).'

The outline of this chapter is as follows. Section 3.2 discusses the semantics of *pɛ* and *too* in isolation, without *kome*. Subsequently, section 3.3 provides the necessary background in the semantics of *kome* and discusses in detail the two puzzles yielded by the interaction between *kome* and *pɛ/too*, i.e., the exhaustivity puzzle and the atomicity puzzle. The analysis of *too* and *pɛ* is couched in the framework of Coppock and Beaver (2014), which is presented in section 3.4. The analysis of *pɛ* and *too* is given in section 3.5. Subsequently, section 3.6 demonstrates the solutions to the puzzles and section 3.7 discusses the syntax of the particle combinations. Section 3.8 concludes.

3.2 Exclusive particles in Ga

Both *pɛ* and *too* give rise to an exhaustive interpretation (a complement exclusion interpretation), which is typical for exclusive particles across languages.[1,2] In particular, they can convey an exhaustive meaning for the associate NP, i.e., they state that all alternatives that are not entailed by the NP denotation are excluded, where the alternatives to *[Maria]$_F$ ate fish* are of the form *John ate fish, Bill ate fish, Maria and John ate fish, John and Bill ate fish, Maria and John and Bill ate fish* etc. (Rooth, 1985, 1992). That *pɛ* and *too* convey the exhaustive meaning is illustrated in (8) and (9). Whereas *pɛ* and *too* are acceptable in the context of (8), which states that Lisa bought fish and nothing else, they are not acceptable in the context of (9), which specifies that Lisa bought many other things besides fish. In addition, sentences without *pɛ/too* are acceptable in both contexts, suggesting that the exhaustive interpretation is indeed triggered by these particles.

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[1] I use the terms 'exhaustive meaning' and 'exhaustive interpretation' interchangeably.

[2] There are more exclusive particles in Ga than discussed in this chapter, e.g., *kɛkɛ* and *sɔɔ*. *Kɛkɛ* is an exclusive particle that can only be used in contexts licensing a ranked-order interpretation, such as *He is only a plumber*. In this respect, *kɛkɛ* resembles English *merely* (Beaver and Clark, 2008). *Sɔɔ*, on the other hand, can be paraphrased as *a lot of something but exclusively that*, and can be used, for example, in the situation in which Bill ate only bananas and the amount of bananas that Bill ate was huge (see Eckardt (2006) on German *lauter*, which gives rise to a similar interpretation). A precise account of the semantics of *kɛkɛ* and *sɔɔ* is left for future research.

(8)   context: Lisa bought only fish yesterday, and nothing else.

    a. Lisa hé lòò **pɛ́**/**tóó**   nyɛ̀.
       Lisa buy fish ONLY/ONLY yesterday
       'Lisa bought only fish yesterday.'

    b. Lisa hé lòò nyɛ̀.
       Lisa buy fish yesterday
       'Lisa bought fish yesterday.'

(9)   context: Lisa bought fish, oranges, bananas, and books yesterday.

    a. #Lisa hé lòò **pɛ́**/**tóó**   nyɛ̀.
       Lisa buy fish ONLY/ONLY yesterday
       'Lisa bought only fish yesterday.'

    b. Lisa hé lòò nyɛ̀.
       Lisa buy fish yesterday
       'Lisa bought fish yesterday.'

In addition, the exhaustive interpretation of sentences with *pɛ/too* is not cancellable, as presented in (10). If the exhaustive interpretation triggered by *too/pɛ* was cancellable, then it would be possible to add to a clause with these particles another clause with an additive particle which differs from the first clause in the NP-denotation but not in the VP-denotation, contrary to fact. The non-cancellability of the exhaustive interpretation shows that an exhaustive meaning is part of the conventional meaning of sentences with *pɛ/too*, instead of being a conversational implicature.

(10)   context:

        Kòfí káné wòlò **pɛ́**/**tóó**   nyɛ̀.
        Kofi read book ONLY/ONLY yesterday
        'Kofi read only a book yesterday.'

        #Nì è-káné   àdàfítswàwòlò **hú**   nyɛ̀.
        and 3SG-read newspaper   ALSO yesterday
        'And he also read a newspaper yesterday.'

In a cross-linguistic perspective, sentences with some exclusive particles can also obtain a rank-order interpretation, e.g., *merely*, *only* in English (Coppock and Beaver, 2014), *=nte* in Paraguayan Guaraní (Tonhauser, 2014), *yak'i* in Ngamo (Grubic, 2015). This interpretation is concerned with the position of the prejacent on the scale whose elements are ordered by rank. In that case, the negative meaning component is paraphrased as 'no more than' (Coppock and Beaver, 2014). Looking at Ga, it turns out that whereas *too* is dispreferred in contexts which require the rank-order interpretation, *pɛ* is

perfectly fine. This is demonstrated in (11), in which different kinds of students form a scale: PhD students are higher on the students-rank-order scale than Bachelor students.

(11)   context: At the faculty party: Who is this guy standing in the corner? Is he a PhD student?

        A: Dààbí, è-jí   bachelor student **p**ɛ́/**ʔtóó**.
            no   3SG-COP bachelor student ONLY/ONLY
            intended: 'No, he's only a bachelor student.'

Pɛ and *too* do not differ in which expressions can be their associates. They both can associate with Subject and Direct Object NPs, VPs, Vs, and PPs. For illustration, consider (12), which shows that both *pɛ* and *too* can associate with the VP:

(12)   context: Tom's mother went to the market. She told him to clean the kitchen, wash the dishes and cook beans. When Tom's mother came back home, she asked Tom: 'What did you do?' Tom replied:

        Mí hòó yɔ̀ɔ̀ **p**ɛ́/**tóó**.
        1SG cook bean ONLY/ONLY
        'I only COOKED BEANS.'

However, since the empirical and theoretical focus of this chapter is put on the interaction between exclusive particles and the indefinite *kome* as well as common nouns, throughout the chapter I concentrate on sentences in which *pɛ* and *too* associate with NPs. The analysis of the cases in which *pɛ* and *too* associate with Vs and VPs is left for future research.

To sum up, both *pɛ* and *too* convey a non-cancellable exhaustive meaning and they do not differ in which expressions they may associate with. However, whereas *pɛ* can convey both a complement exclusion interpretation and a rank-order interpretation, *too* is not compatible with latter.

3.3 Puzzles

Whereas complement-excluding *pɛ* and *too* exhibit alike properties while combining with bare nouns, one can observe various splits between their meanings in sentences where indefiniteness is marked overtly by *kome*. Let me briefly discuss its semantics, before I dive into the presentation of the puzzles.

3.3.1 Kome

3.3.1.1 *Kome* as an indefinite — empirical diagnostics

Kome is an indefinite. This view is based on the data presented in (13), (14), (15), and (16), taken from Matthewson (1999).[3] The result of the diagnostic demonstrated in (13) shows that *NP kome*, as English indefinite determiners, can refer to two different discourse referents in a sentence. By contrast, if they were definite, they would refer to the same entities in both clauses leading to a pragmatically odd structure:

(13)   context:

> Shìkátòòhé kòmé yὲ   Òsú...
> bank   INDF be.at Osu
> 'One bank is in Osu...'
>> ...nì shìkátòòhé kòmé yὲ   Jamestown.
>> and bank   INDF be.at Jamestown
>> '...and one bank is in Jamestown.'
>> #'The bank is in Osu and the bank is in Jamestown.'

In addition, same as English indefinites, *kome* can be used in a context in which the discourse referent is not unique, as in (14):

(14)   context: There are five children in the room. One of them is sleeping.

> Fèé-mɔ́   díŋ́ŋ́! Gbékέ kòmé mìì-wɔ̀.
> make-NOM quiet child   INDF PROG-sleep
> 'Be quiet! One child is sleeping!'
> #'Be quiet! The child is sleeping!'

By contrast, *kome* cannot be used in a context in which there is a unique discourse referent and the discourse referent is known to the speaker and hearer, as in (15):

(15)   context: Sampson's child is sleeping. He says to his mother, who just came to visit him:

> #Fèé-mɔ́   díŋ́ŋ́! Gbékέ kòmé mìì-wɔ̀.
> make-NOM quiet child   INDF PROG-sleep
> #'Be quiet! One child is sleeping!'
> intended: 'Be quiet! The child is sleeping!'

---

[3]One test for indefinites presented in Matthewson (1999) is based on the observation that English indefinites, unlike definites, are attested in existential constructions. This test, however, could not be conducted in Ga because of the lack of a *there is* construction (or similar) in which a DP would be clearly in the scope of the existential.

It appears that the familiarity of the discourse referent plays an important role in the semantics of (in)definites in Ga. The language consultants commented on (15) saying that it is highly probable that Sampson's mother knows the child and therefore another particle must be used in this context.

The novelty condition imposed by *kome* is also confirmed by the next test. As is well-known, NPs associated with the *wh*-remnant in sluicing constructions cannot be definite (see Matthewson, 1999, and the references there). If *kome* were definite, (16) should not be acceptable, contrary to fact:

(16)   John mìì-táwɔ   wòlò kòmé, shí mí-lé   ténɔ́níjí.
      John PROG-look.for book INDF   but 1SG-not.know which
      'John is looking for one book but I do not know which.'

      #'John is looking for the book but I do not know which.'

In addition, however, *kome* is an indefinite that is derived from the numeral *ekome* 'one' and I argue that the cardinality one forms part of its meaning. This view is supported by the observation that *kome*, like the English numeral *one* and the indefinite *a* and unlike the indefinite *some*, can modify singular count nouns, as in (17), but it cannot modify plural count nouns, as in (18), nor mass nouns, as in (19):[4]

(17)   SINGULAR COUNT NOUN:

      Q: What did Kofi read yesterday?
      A: Kòfí káné àdàfítswàwòlò kòmé nyɛ̀.
          Kofi read newspaper   INDF yesterday
          'Kofi read (one) newspaper yesterday.'

(18)   PLURAL COUNT NOUN:

      Q: What did Kofi buy yesterday?
      A: #Kòfí hé   àdàfítswàwò-jì kòmé nyɛ̀.
          Kofi buy newspaper-PL INDF yesterday
          'Kofi bought one newspapers yesterday.'

(19)   MASS NOUN:

      Q: What did Lisa buy yesterday?
      A: #Lisa hé   fɔ̀   kòmé nyɛ̀.
          Lisa buy oil INDF yesterday
          'Lisa bought (one) oil yesterday.'

---

[4]As in English, (19) is acceptable if by talking about oil one has in mind bottles of oil. Otherwise, the sentence is unacceptable.

3.3.1.2 Analysis: *kome* as denoting a restricted choice function

There are quantificational (e.g., Montague, 1973; Barwise and Cooper, 1981; Heim and Kratzer, 1998) and non-quantificational approaches to indefinites. For the latter, one can differentiate dynamic (e.g., Heim, 1982; Kamp and Reyle, 1993) and choice-functional approaches (e.g., Reinhart, 1997; Winter, 1997; Kratzer, 1998; Matthewson, 1999). Moreover, some theories claim that indefinites are ambiguous between a quantificational and a referential interpretation (Fodor and Sag, 1982), or between a quantificational and a choice-functional reading (Reinhart, 1997; Kratzer, 1998). For reasons presented below, I argue that the denotation of *kome* can be appropriately modeled using the choice-functional approach to indefinites.

A choice function (*CF*) is a function of type $\langle\langle e, st\rangle, e\rangle$ which takes a set as its argument and returns one element from that set:

(20)   A **choice function** is a function from sets of individuals that picks a unique individual from any non-empty set in its domain. (Kratzer, 1998)

The strongest evidence for analyzing indefinites as *CFs* comes from the availability of intermediate scope readings (Reinhart, 1997; Winter, 1997; Kratzer, 1998; Matthewson, 1999; Chierchia, 2001). For example, the intermediate scope interpretation of (21) is the one in which most linguists chose one problem to work on but the choice of the problem varies with the linguist.

(21)   context: Four linguists chose one linguistic problem to work on. Linguist 1 chose the syntax of Ga, linguist 2 chose the syntax of Akan, linguist 3 chose the phonology of Ewe, linguist 4 chose the morphology of Avatime. Linguists 1, 2, and 3, but not 4, read all the analyses solving the respective problem.

Òtsìámíí pìì   ékwɛ   súsùmɔ̀ì sàjì   fɛ́ɛ́   ní yè ̀ɔ bóà sànè
linguist most have.looked analysis analysis every REL help solve problem
kòmé nààbóàmɔ̀.
INDF solve
'Most linguist have looked at every analysis that solves some problem.'

In this case *kome* cannot obtain a quantificational interpretation because it would violate a syntactic constraint which says that quantifiers cannot move out of islands. It also cannot be referential because the linguists in (21) chose different problems to work on. Thus I propose analyzing *kome* as an indefinite denoting a *CF*. Because of the general problems with existentially bound *CFs* (Chierchia, 2001; Schwarz, 2001), following

Kratzer (1998) and Matthewson (2001), I will consider the *CF*s denoted by *kome* to be contextually bound:

(22) $[\![\text{kome}_i]\!]^g = \lambda P_{\langle e,p \rangle}.[g(i)](P)$ [to be revised]

g is an assignment function which determines which *CF* will be used in a particular context.

Kome, however, denotes a more restricted *CF* than a standard *CF*, as defined in (20). In particular, a *CF* denoted by *kome* only yields atomic elements as output and hence it cannot select plural count nouns and mass nouns, as it was illustrated in (18) and (19). The definition of a *CF* denoted by *kome* is given in (23) and its lexical entry in (24):

(23)   **CF denoted by *kome***:

   a.   It is a function from sets of individuals that picks a unique individual from any non-empty set in its domain. (Kratzer, 1998)

   b.   Its output must be an atomic element.

(24) $[\![\text{kome}_i]\!]^g = \lambda P_{\langle e,p \rangle} : ([g(i)](P))$ is atomic.$[g(i)](P)$ [final]

Having provided the semantic analysis of *kome*, I can now discuss the two puzzles which arise from the interaction between *kome* and the exclusive particles in Ga: the atomicity puzzle and the exhaustivity puzzle.

3.3.2 The atomicity puzzle

Kome pɛ/too behave in non-homogeneous ways when combining with different types of common nouns. Assuming that the meaning of *kome* does not change with the co-occurring particle, different interpretive effects while combining with different types of common nouns are due to the semantics of *pɛ* and *too*. First, whereas combining *kome pɛ́* with plural count nouns is not acceptable, it is acceptable with *kome too*, as illustrated in (25):

(25)   *kome pɛ/too* AND PLURAL COUNT NOUNS:

   Q: What did Kofi buy yesterday?

   A: Kòfí hé   wò-jì   kòmé #pɛ́/tóó   nyὲ.
        Kofi buy book-PL INDF ONLY/ONLY yesterday
        'Kofi bought only books yesterday.'

There are two questions that arise immediately with reference to (25). Why do *kome pɛ* and *kome too* give rise to different interpretive effects when combining with plural count nouns? And why can *kome too* combine with plural count nouns in the first place, if *kome* in isolation, i.e., without *too*, cannot combine with plural count nouns (see example (18))?

Second, it turns out that while combining *kome pɛ* with mass nouns is unacceptable, it is acceptable with *kome too*, as shown below:

(26)   *kome pɛ/too* AND MASS NOUNS:

Q: What did Kofi buy yesterday?

A: Kòfí hé   yɔ̀ɔ̀   kòmé #pɛ́/tóó   nyɛ̀.
     Kofi buy bean.SG INDF ONLY/ONLY yesterday
     'Kofi bought only beans yesterday.'

Again, the questions are: Why do *kome pɛ* and *kome too* behave in a non-homogeneous way? And why can *kome too* combine with mass nouns, if *kome* is an indefinite encoding the cardinality *one*?

Finally, both *kome pɛ/too* can combine with singular count nouns. However, they give rise to different semantic effects, i.e., in combination with a singular count noun, *kome pɛ* gives rise to the meaning 'only one NP,' whereas *kome too* gives rise to the meaning 'only NP' (of unknown cardinality). Consider (27). In this task, the language consultants were presented with a short dialogue between Mary and her mother. The story goes as follows: Mary's mother left her daughter three potatoes and six bananas to eat while she was at work. When the mother came back home, she asked Mary what she ate. Mary replies using a singular count noun, *atomo* 'potato,' and one of the particle combinations, *kome pɛ* or *kome too*. The informants were asked to answer questions about Mary's food choice.

Question (Q1) checks whether a particle combination gives rise to the meaning 'only one NP' or 'only NP' (of unknown cardinality). If the given combination gives rise to the meaning 'only one NP,' a language consultant should answer with (a) to the question about the amount of potatoes eaten by Mary. On the other hand, if the given combination does not put any constraints on the cardinality of the selected NP, the informants should answer the same question with (c) or with (a) and (b).[5]

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[5]It is perceived as not cooperative by Ga native speakers to give an answer like *one cannot say*. Therefore, some of the language consultants were reluctant to answer question (Q1) with (c). Instead they chose both (a) and (b). However, the comments made by them revealed that there is no difference in answering (a) and (b) together or (c): both mean that it does not follow from the given sentence how many potatoes Mary ate.

(27)   *Dialogue test*:

MOTHER   Mary, I am going to work now. Here are 3 potatoes and 6 bananas. You can
eat them while I'm at work.
(*Mary's mother has just come back home from work.*)
MOTHER   Hello, Mary. What did you eat?

M: Mì-yè   àtómò kòmé pέ/   kòmé tóó.
        1SG-eat potato INDF ONLY/ INDF ONLY
        'I ate only one/only potato(es).'

(Q1) How many potatoes did Mary eat?

    a) 1

    b) more than 1

    c) one cannot say

The predictions were borne out. When Mary replied to her mother using *kome pɛ*, all
the informants who participated in this task[6] answered the question about the cardinal-
ity of eaten potatoes (Q1) with (a). On the other hand, when Mary replied to her mother
using *kome too*, all the informants who did this task[7] answered the same question with
either (c) or with (a) and (b). Informants commented that she could have eaten one
potato, but she could have eaten three potatoes as well. The results suggest that singu-
lar count nouns and *kome pɛ* give rise to the meaning 'only one NP,' whereas singular
count nouns and *kome too* give rise to the meaning 'only NP' of unknown cardinality.

The dialogue test was repeated with the other Ga singular count nouns *loo* 'fish' and
amoo 'tomato,' leading to the same results as presented above. Furthermore, the test
was also repeated with the exclusive particles in isolation, i.e., *too* and *pɛ*, and the com-
bination *kome too pɛ*. Each time the design of the task was the same, i.e., as presented
in (27). The outcome of the test indicates that *too*, *pɛ*, and *kome too pɛ* do not single
out atomic elements giving rise to the meaning 'only NP.' For a summary of the dis-
tribution and interpretive effects of the different particles and their combinations, see
Table 3.1. The outcome of the empirical diagnostics presented above show that *kome pɛ*
cannot be combined with mass and plural count nouns, but it can be combined with
singular count nouns giving rise to the meaning 'only one NP.' On the other hand, *kome*

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[6]Three women and one man during the field trip in January 2013 and two women and two men during
the field trip in January 2014.
[7]The same participants as above. Only once in one of the items one language consultant gave an answer
which would suggest that *kome too* gives rise to the interpretation 'only one NP.'

too, as well as *kome too pɛ*, *too*, and *pɛ*, can be combined with plural count nouns, mass nouns, and singular count nouns giving rise to the meaning 'only NP' (of unknown cardinality).

Table 3.1: Particle combinations in Ga and their interaction with different types of common nouns. '−' means that the combination is not acceptable, whereas 'only'/'only one' means that the combination is acceptable and gives rise to the respective interpretation.

	kome pɛ	kome too	kome too pɛ	too	pɛ
1 plural count nouns	−	only	only	only	only
2 mass nouns	−	only	only	only	only
3 singular count nouns	only one	only	only	only	only

3.3.3 The exhaustive meaning puzzle

In section 3.2, it was shown that *pɛ* and *too* convey an exhaustive interpretation for the associate NP. Interestingly, it turns out that this effect disappears when *kome* is added to *pɛ* but not when *kome* is added to *too*. This is shown by the results of the empirical diagnostics presented below.

The dialogues in the dialogue test were also followed by a second question. Question (Q2) checked whether sentences with *kome pɛ/too* convey an exhaustive meaning for the associate NP.[8] If a sentence with the given particle is NP-exhaustive, a language consultant should answer with (b) to question (Q2); if it is not NP-exhaustive, a language consultant should answer the same question with (c).[9]

(28)   *Dialogue test*:

MOTHER   Mary, I am going to work now. Here are 3 potatoes and 6 bananas. You can eat them while I'm at work.

(*Mary's mother has just come back home from work.*)

MOTHER   Hello, Mary. What did you eat?

M: Mì-yè   àtómò kòmé pɛ́/   kòmé tóó.
       1SG-eat potato INDF only/ INDF ONLY
       'I ate only one/only potato(es).'

---

[8]Henceforth 'exhaustive interpretation for the associate NP' is simply abbreviated to 'NP-exhaustive.'

[9]Again, it is perceived as impolite to answer *one cannot say*. Therefore, some of the language consultants answered with (b) to question (Q2), giving an additional comment that in fact Mary could have eaten banana but she did not state it directly. In such cases, I have interpreted the given particle as not giving rise to an NP-exhaustive interpretation.

(Q2) Did Mary eat banana?

   a) yes

   b) no

   c) one cannot say

When Mary replied to her mother using *kome pɛ*, all the language consultants partici-
pated in this task[10] answered with (c)[11] to question (Q2) giving a comment that it is not
excluded that Mary ate banana. On the other hand, when Mary replied with *kome too*,
the language consultants answered with (b) to question (Q2) saying that they are sure
that Mary did not eat banana. The results of the dialogue test show that sentences with
kome pɛ do not obtain an NP-exhaustive interpretation, whereas sentences with *kome too*
do. The test was repeated with the use of *too*, *pɛ*, and *kome too pɛ*. The results show that
all of them give rise to an NP-exhaustive interpretation.

However, an observed NP-exhaustive interpretation of sentences with *kome too* and
kome too pɛ and its lack in sentences with *kome pɛ* is only a tendency. I have checked
the acceptability of sentences with *kome pɛ/too* and *kome too pɛ* in NP-exhaustive and
non-NP-exhaustive contexts, as in examples (29) and (30), respectively.[12]

(29)   an example of the NP-exhaustive context:
       Lisa ate one orange and nothing else yesterday.
        an example of a target sentence:
      #Lisa yè àkùtú kòmé pɛ́.
      Lisa eat orange INDF ONLY
      intended: 'Lisa ate only one orange yesterday.'

(30)   an example of the non-NP-exhaustive context:
       Philomina ate one orange, two bananas, one ball of banku and palm soup yes-
       terday.
        an example of a target sentence:
      Philomina yè àkùtú   kòmé pɛ́.
      Philomina eat orange INDF ONLY
      'Philomina ate only one orange yesterday.'

---

[10]Three women and one man during the field trip in January 2013 and two women and two men during
the field trip in January 2014

[11]Or with (b), but with the additional comment that it is not excluded that Mary ate banana.

[12]An exhaustivity effect of sentences with *kome too* and *kome too pɛ* were also checked in contexts, which do
not specify the cardinality of the NP and therefore there were more contexts checking for exhaustivity
of sentences with *kome too/kome too pɛ* than the ones checking for exhaustivity of sentences with *kome pɛ*,
which is reflected in Table 3.2.

For five NP-exhaustive contexts checking for exhaustivity of sentences with *kome pɛ*, only in one of them a sentence with *kome pɛ* was judged to be acceptable. In addition, for four non-NP-exhaustive contexts, in three of them sentences with *kome pɛ* were judged to be acceptable. By contrast, for ten NP-exhaustive contexts checking for the NP-exhaustive interpretation of sentences with *kome too/kome too pɛ*, in seven of them sentences with *kome too* and in nine of them sentences with *kome too pɛ* were acceptable. In addition, for four non-NP-exhaustive contexts, in two of them sentences with *kome too* and sentences with *kome too pɛ* were judged to be acceptable. The summary of the survey results is presented in Table 3.2. The data show that whereas sentences with *kome pɛ* are not interpreted NP-exhaustively, sentences with *kome too* and *kome too pɛ* tend to be interpreted NP-exhaustively.

Table 3.2: Acceptability of sentences with different particle combinations in NP-exhaustive and non-NP-exhaustive contexts. The second number in each cell signifies the total number of NP-exhaustive or non-NP-exhaustive contexts in which acceptability of sentences with the given combination was tested and the first number signifies the amount of contexts in which a sentence with the given particle was accepted, e.g., 1/5 in the first line of the table means that for five NP-exhaustive contexts, in one of them a sentence with *kome pɛ* was judged by Ga native speakers to be acceptable.

	NP-exhaustive contexts	non-NP-exhaustive contexts
kome pɛ	1/5	3/4
kome too	7/10	2/4
kome too pɛ	9/10	2/4

Summing up, any analysis of the exclusive particles *pɛ* and *too* has to tackle with the following empirical generalizations. First, an analysis should explain the non-cancellable exhaustivity effect triggered by *pɛ* and *too*. Second, it should account for different semantic effects triggered by *pɛ* and *too* while combining with different types of common nouns. In particular, it should give an answer to the question why *kome too* can combine with plural count nouns and mass nouns, although *kome* is an indefinite encoding the cardinality one. Finally, the analysis should provide an explanation for the lack of the NP-exhaustivity effect in sentences with *kome pɛ* and the tendency to interpret sentences with *kome too/kome too pɛ* as being NP-exhaustive.

3.4 Formal framework

The proposed analysis of exclusive particles in Ga is couched in the framework of Coppock and Beaver (2014), which is based on Beaver and Clark (2008). Coppock and Beaver (2014) put forward a unified analysis of a variety of English exclusive particles. They argue that exclusive particles are focus sensitive expressions whose function is to rule out alternative answers to the Current Question (CQ) under discussion (Roberts, 2014). Consider (31):

(31)   Only JOHN bought fish yesterday.

Focus indicates the CQ, i.e., Who bought fish yesterday? The possible answers to this question are *John bought fish, Bill bought fish, Marc bought fish, John and Bill bought fish, John and Marc bought fish, Marc and Bill bought fish, John and Bill and Marc bought fish*. The answers are ranked by strength specified in various ways depending on a scale an exclusive particle operates on (entailment vs. evaluative scales). In the case of entailment scales the answer *John and Bill and Marc bought fish* is stronger than *John and Bill bought fish*, which is stronger than *John bought fish*, so that they form a boolean semi-lattice structure, as illustrated in (32):

(32)
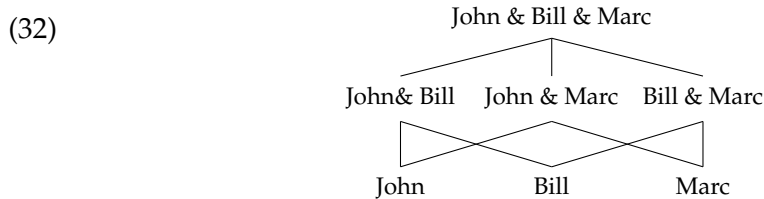
On Coppock and Beaver's (2014) account, the meaning of exclusive particles is characterized by two operators, MAX$_S$ ('at most p') and MIN$_S$ ('at least p'), defined in (33), where p is the prejacent and the subscript $_S$ indexed the current context. Crucially, context does not only give a common ground, a set of worlds/propositions, but also a CQ_S, a set of answers, and a strength ranking over the alternative answers $\geq_S$.

(33)   a.   MIN$_S(p) = \lambda w.\exists p' \in CQ_S[p'(w) \wedge (p' \geq_S p)]$
                'There's a true answer at least as strong as p.'
         b.   MAX$_S(p) = \lambda w.\forall p' \in CQ_S[p'(w) \rightarrow p \geq_S p']$
                'No true answer is stronger than p.'

(from Coppock and Beaver, 2014, p.394)

A core meaning for exclusive particles is given in (34), i.e., exclusive particles assert MAX and presuppose MIN.

(34) $[\![only]\!] = \lambda p.\lambda w : \text{MIN}_S(p)(w).\text{MAX}_S(p)(w)$

$\hspace{6cm}$ (from Coppock and Beaver, 2014, p.394)

For illustration, consider (35) and the diagram in (36):

(35)   Only JOHN AND BILL bought fish yesterday.

The presupposed MIN conveys the meaning that 'At least John and Bill bought fish yesterday.' In diagram (36), the answers which are delineated by MIN are written in boldface. The asserted MAX, on the other hand, conveys the meaning that 'At most John and Bill bought fish yesterday,' i.e., it excludes the alternative that John, Bill, and Marc bought fish yesterday. In diagram (36), the alternatives excluded by MAX are crossed out. The interaction between MIN and MAX meaning components yields the correct interpretation that John and Bill (and nobody else) bought fish yesterday.

(36)
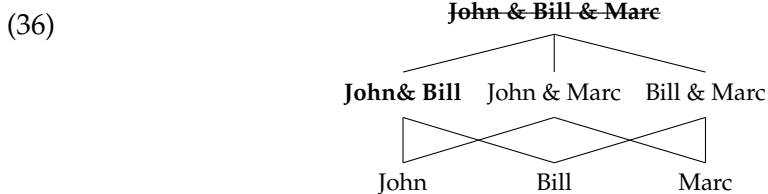
Coppock and Beaver (2014) claim that the presupposed MIN and the asserted MAX are core meanings of all exclusive particles. They differ, however, with respect to the three parameters: First, the semantic type parameter, which specifies their semantic type. Coppock and Beaver (2014) argue that all exclusives are modifiers of type $\langle \tau, \tau \rangle$.[13] A basic type is $\langle p, p \rangle$, where p is short for $\langle s, t \rangle$ and other types are derived from the basic type with the use of a sequence of the Geach rule.[14] Second, the question parameter, which specifies the constraints the exclusive particles put on the CQ, and third, the strength ranking parameter, which determines the constraints they put on the strength ranking over the answers to the CQ (entailment vs. evaluative scales). In the next subsection, I analyze $p\varepsilon$ and *too* in the presented framework.

---

[13]I use Greek letters as variables over types.

[14]The Geach rule converts a function f of type $\langle \beta, \theta \rangle$ into a function f' of type $\langle \langle \tau, \beta \rangle, \langle \tau, \theta \rangle \rangle$ of the form $\lambda R_{\langle \tau, \beta \rangle}.\lambda x_\theta.f(R(x))$. (Coppock and Beaver, 2014, p. 397)

3.4.1 min and max in Ga

I argue that both *pɛ* and *too*, like English exclusive particles, assert MAX and presuppose MIN. I defend this claim based on the results of the following diagnostics.

The test illustrated in (37) is based on the observation that presuppositions, unlike assertions, are not visible to negation, i.e., they project out of the scope of negation.[15] In this test, the language consultants were presented with a short context description followed by a negated target sentence with the particle *too* or *pɛ* along with two questions. Question 1 (Q1) is about the MIN meaning component, and question 2 (Q2) is about the MAX meaning component. Projection out of the scope of negation, i.e., 'invisibility' to negation (answer (a) in the case of (Q1) and answer (b) in the case of (Q2)), suggests that the given meaning component is presupposed. On the other hand, visibility to negation (answer (b) in the case of (Q1) and answer (a) in the case of (Q2)) suggests that the given meaning component is asserted. The answers chosen by the language consultants are written in boldface:

(37)   Dora tèè   jàànɔ̀   nyɛ̀.   Jèèè ànɔ̀kwálé ní   ákɛ́   Dora hé
       Dora go.PAST market.on yesterday. NEG truth   PRT COMPL Dora buy
       àkwàdú **p**ɛ́/**tóó**.
       orange   ONLY/ONLY
       'Dora went to the market yesterday. It's not the case that she bought only oranges.'

   (Q1) Àǹì   Dora hé   àkwàdú nyɛ̀?
        QPRT Dora buy orange   yesterday
        'Did Dora buy oranges yesterday?'

       (a) **hɛ̀ɛ́ ('yes')** ⇒ it follows that 'Dora bought <u>at least</u> oranges'

       (b) dààbí ('no')

       (c) ékólɛ́ ('maybe')

   (Q2) Àǹì   Dora hé   nɔ́krókrò?
        QPRT Dora buy something.else
        'Did Dora buy something else?'

       (a) **hɛ̀ɛ́ ('yes')** ⇒ it does not follow that 'Dora bought <u>at most</u> oranges'

       (b) dààbí ('no')

       (c) ékólɛ́ ('maybe')

---

[15]Simons et al. (2011); Tonhauser et al. (2013) argue that not everything that projects is a presupposition. The issue how to best characterize the semantic status of the MIN meaning component is left for future research.

The test was conducted with four Ga native speakers and included four items. The results presented in (37) show that whereas the MIN meaning component of *pɛ* and *too* projects out of the scope of negation and hence is presupposed, the MAX meaning component does not project out of the scope of negation and hence is asserted.

Following Coppock & Beaver's (2014) analysis of English exclusive particles, *pɛ* and *too* might be analyzed as modifiers of type $\langle\langle e, p\rangle, \langle e, p\rangle\rangle$, which assert MAX and presuppose MIN, as presented below:[16]

(38) $[\![\text{too/pɛ}]\!] = \lambda P.\lambda x : \text{MIN}(P(x)).\text{MAX}(P(x))$ \hfill [to be revised]

Consider (39), its structure in (40), and its derivation in (41):

(39) Q: What did Kofi read?
A: Kòfí káné WÒLÒ pέ/tóó.
Kofi read book ONLY/ONLY
'Kofi read only A BOOK.'

(40)
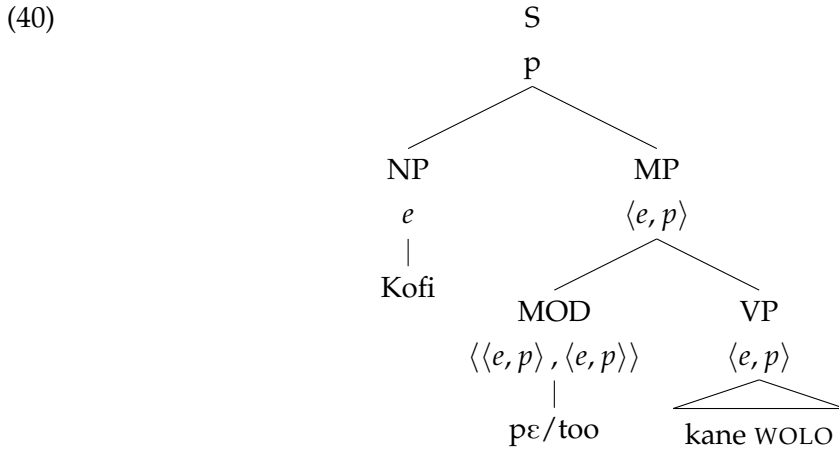
(41) a. $[\![\text{kane wolo}]\!] = \lambda x.\text{read.a.book}(x)$
b. $[\![\text{too/pɛ}]\!] = \lambda P.\lambda x.\text{MIN}(P(x)).\text{MAX}(P(x))$
c. $[\![\text{kane wolo pɛ/too}]\!] = [\lambda P.\lambda x.\text{MIN}(P(x)).\text{MAX}(P(x))](\lambda x.\text{read.a.book}(x))$
$= \lambda x : \text{MIN}(\text{read.a.book}(x)).\text{MAX}(\text{read.a.book}(x))$
d. $[\![\text{Kofi kane wolo pɛ/too}]\!] =$ is defined only if MIN(Kofi read a book),
if defined then 1 iff MAX(Kofi read a book)

---

[16]I argue that *too* and *pɛ* differ with respect to the strength ranking parameter, i.e., *too*, unlike *pɛ*, is only compatible with the complement exclusion interpretation but not with rank-order interpretation and thus it can only operate on entailment scales.

Since the CQ in the case of (39) is *What did Kofi read?*, (39)-A on its complement exclusion reading operates on the alternatives of the form *Kofi read a book, Kofi read a newspaper, Kofi read a letter, Kofi read a book and a newspaper, Kofi read a newspaper and a letter, Kofi read a book and a letter, Kofi read a book and a newspaper and a letter.*[17] (41-d) says that Kofi read at least a book and Kofi read at most a book and thereby it excludes the alternatives that Kofi read something else besides a book.

A wide range of data demonstrated in section 3.2 can be explained under the analysis of *pɛ* and *too* presented in (38). Specifically, it correctly predicts the non-cancellable exhaustive meaning of sentences with *pɛ* and *too*. However, the current analysis needs to be modified in order to account for the interaction of *kome too* and *kome pɛ* with different types of common nouns and for the scopal properties between *kome, too*, and *pɛ*. The analysis that captures these facts is presented in the next section.

3.5 Analysis: *too* and *pɛ*

3.5.1 *Too*

I follow the current analysis of *too* in arguing that it is an exclusive modifier of type $\langle\langle e, p\rangle, \langle e, p\rangle\rangle$. When *too* is accompanied by *kome*, it functions as an adjectival exclusive. By contrast, when it occurs in isolation, without *kome*, it functions as a complement excluding VP exclusive in Coppock & Beaver's (2014) taxonomy of exclusives.[18] A preliminary lexical entry of *too* is given in (42):

(42) $[\![\text{too}]\!] = \lambda P.\lambda x : \text{MIN}(P(x)).\text{MAX}(P(x))$ [to be revised]

3.5.1.1 *Too* as an adjectival exclusive

I argue that in sentences with *kome too*, *too* is necessarily interpreted as an NP-modifier and its basic semantic function, along with excluding alternatives, is to enable CF-denoting *kome* to combine with plural count nouns and mass nouns.

---

[17]*Pɛ*, unlike *too*, can also operate on evaluative scales giving rise to the rank-order interpretation. Under this reading, the alternatives to *Kofi read a book* forms a scale in which the things that are more difficult to read are higher on the scale and things that are easier to read are lower on the scale, e.g., *Kofi read a tabloid, Kofi read a comic book, Kofi read a book, Kofi read a technical report, Kofi read a law document.* In that case the MAX meaning component excludes the possibilities that Kofi read a technical report and a law document and the MIN meaning component presupposes that Kofi read a book.

[18]Note, however, that Coppock and Beaver's (2014) adjectival exclusives, unlike *too*, operate only on evaluative scales.

I claim that *too*, besides asserting MAX and presupposing MIN, denotes also Landman's (1989; 2010; 2013) group forming operator (↑). I assume that group formation is the same operation as packaging, i.e., an operation from mass entities to count entities (Landman, 2010). Moreover, I assume that group-forming operation applied to atoms is an identity function (Landman, 2010, 2013). Therefor, I define group forming-operator '↑' as a function from pure atoms and impure atoms, i.e., sums and mass individuals, to atomic group individuals. The lexical entry of *too* is given in (43).

(43) $[\![too]\!] = \lambda P.\lambda x : \text{MIN}(P(x)).\text{MAX}(P(x)) \wedge \exists z[P(z) \wedge x = \uparrow(z)]$ [final version]

As an illustration, consider *woji too* 'only books.'

(44) $[\![woji\ too]\!] = \lambda x : \text{MIN}(books(x)).\text{MAX}(books(x)) \wedge \exists z[books(z) \wedge x = \uparrow(z)] \approx$ groups consisting of books only

Too is a function of type $\langle\langle e, p\rangle, \langle e, p\rangle\rangle$ which asserts that '*x* is at most books' and presupposes that '*x* is at least books,' i.e., it excludes the possibility that *x* is something other than books. In addition, it takes all the elements from the NP denotation and maps them onto atomic group individuals. For example, *woji* 'books' is a plural count noun denoting a sub-lattice structure:

(45) $[\![wɔji]\!] =$

a⊕b⊕c

a⊕b   a⊕c   b⊕c

Too takes as its input all the elements from the denotation of *woji* (45) and maps them onto atomic group individuals:[19]

(46) $[\![woji\ too]\!] =$

↑(a⊕b⊕c)

↑(a⊕b)   ↑(a⊕c)   ↑(b⊕c)

As a result, the denotation of *woji too* is comprised of atomic individuals only, i.e., impure atoms (groups), which is crucial for the analysis of the interaction between *kome too* and different types of common nouns (see subsection 3.6.1). Crucially, since the denotation of *woji too* comprises atomic individuals, they can be picked up by the *CF* denoted by *kome*.

---

[19]Note, however, that since the denotation of *woji too* consists of atomic individuals only, technically it does not form a lattice structure anymore. I included the diagram in (46) for presentational reasons.

Note that the adjectival *too*, i.e., accompanied with *kome,* scopes only over the NP denotation. Consider the syntactic structure in (47) and the semantic derivation in (48):

(47)

```
                            DP
                            e
                  ┌─────────────────┐
                  D                  MP
            ⟨⟨e,p⟩,e⟩             ⟨e,p⟩
                  │            ┌──────────┐
                kome          MOD        NP
                         ⟨⟨e,p⟩,⟨e,p⟩⟩  ⟨e,p⟩
                              │           │
                             too        woji
```
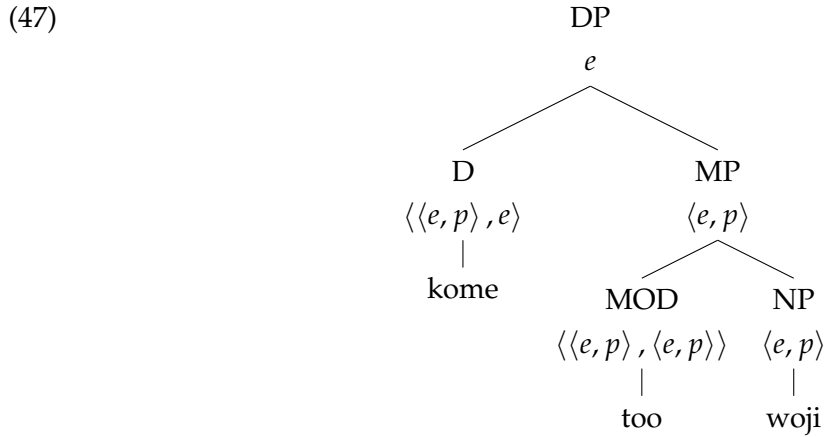
(48) a. $[\![\text{woji too}]\!]^g = \lambda x : \text{MIN}(\text{books}(x)).\text{MAX}(\text{books}(x)) \wedge \exists z[\text{books}(z) \wedge x = \uparrow(z)]$

b. $[\![\text{woji kome}_i \text{ too}]\!]^g = [\![\text{kome}_i]\!]^g([\![\text{books too}]\!])$
$= [\lambda P.[g(i)](P)](\lambda x : \text{MIN}(\text{books}(x)).\text{MAX}(\text{books}(x)) \wedge \exists z[\text{books}(z) \wedge x = \uparrow(z)])$
$= [g(i)](\lambda x : \text{MIN}(\text{books}(x)).\text{MAX}(\text{books}(x)) \wedge \exists z[\text{books}(z) \wedge x = \uparrow(z)])$
$\approx$ a group which consists of at least books and at most books

The last line of (48) says that *woji kome too* provides a group which consists of at least books and at most books. Therefore, sentences with *kome too* should not obtain the NP-exhaustive interpretation, contrary to fact (see subsection 3.3.3). The data in subsection 3.3.3 show that *kome too* tends, but it does not have to, be interpreted NP-exhaustively. I argue that the NP-exhaustive interpretation of sentences with *kome too* comes from covert *pɛ*, which can but does not have to be present in the structure. Thus it follows that *kome too pɛ* is sometimes a full spell out of *kome too*. For the analysis of *kome too pɛ*, see subsection 3.6.2.2.

3.5.1.2 *Too* as a complement excluding VP exclusive

Let me now illustrate how *too* functions in isolation, i.e., without *kome.* Since sentences with bare *too* invariably obtain the NP-exhaustive interpretation (see subsection 3.3.3), it cannot be analyzed as an adjectival exclusive.

I argue that bare *too*, without *kome,* functions as a complement excluding VP modifier of type $\langle\langle e,p\rangle,\langle e,p\rangle\rangle$. Consider (49) and its derivation in (50):

(49) Q: What did Lisa buy?

  A: Lisa hé LÒÒ tóó.
    Lisa buy fish ONLY
    'Lisa bought only FISH.'

(50) a. $[\![$he loo too$]\!] = \lambda x : \text{MIN}(\text{bought.fish}(x)).\text{MAX}(\text{bought.fish}(x)) \wedge$
    $\exists z[\text{bought.fish}(z) \wedge x = \uparrow (z)]$

  b. $[\![(49\text{-}A)]\!]$ = is defined only if MIN(Lisa bought fish), if defined then
    1 iff MAX(Lisa bought fish) $\wedge \exists z[\text{bought.fish}(z) \wedge \text{Lisa} = \uparrow (z)]$

Due to the CQ 'What did Lisa buy?,' *too* in the case of (49) operates on the alternatives of the form: *Lisa bought fish, Lisa bought potatoes, Lisa bought books, Lisa bought fish and potatoes, Lisa bought fish and books, Lisa bought fish and potatoes and books, etc.* Crucially, (50-b) gives the proper truth conditions asserting that Lisa bought at most fish and presupposing that Lisa bought at least fish and by that it excludes the possibility that Lisa bought something else besides fish. Hence, it properly predicts sentences with bare *too* to be NP-exhaustive, as presented in subsection 3.2.

Moreover, due to the semantics of *too*, *Lisa* in (49) is interpreted as the group noun. Since the group-forming operator applied to the atomic elements returns atomic elements, i.e., it is an identity function (Landman, 2013), the group-forming effect in the case of (49) is innocuous.

The proposed analysis of *too* is a unified analysis in the sense that in both cases, i.e., when *too* occurs with *kome* and when *too* occurs in isolation, *too* is a modifier of type $\langle \langle e, p \rangle, \langle e, p \rangle \rangle$ that denotes Landman's (1989; 2010; 2013) group-forming operator. However, it is not possible to analyze *too* uniformly as a VP-modifier. It is motivated empirically by the interaction between *kome too* and different types of common nouns. *Too* changes an NP-denotation in such a way that it enables a choice functional indefinite *kome* to combine with plural count nouns and mass nouns. Therefore *too* must have a local scope over the NP denotation and below *kome*. Crucially, it would not be possible if *too* was a VP-modifier also in cases in which *too* co-occurs with *kome*.

The question now is why bare *too*, i.e., without overt *kome*, is not interpreted as scoping below covert *kome* and thus functioning as an adjectival exclusive. The proposed analysis allows for this interpretation. However, it is ruled out by the Blocking Principle. Namely, there are two competing forms *kome too* and *too*. In principle, *too* can function as both an adjectival exclusive and as a complement excluding VP exclusive. By contrast, *kome too* can only function as an adjectival exclusive. Thus *kome too* is a more specialized form and rules out the interpretation of *too* as an adjectival modifier.

The Blocking Principle also rules out the possibility of interpreting *kome* in the scope of *too* functioning as a complement excluding VP modifier. Importantly, this interpretation would lead to the same semantic effects as *kome pɛ*.[20] As before, the existence of the more specialized form *kome pɛ* blocks the interpretation of *kome* in the scope of the VP modifier *too*.

3.5.2 Pɛ

I propose analyzing *pɛ* as a quantifying determiner of type $\langle e, \langle\langle e, p\rangle, p\rangle\rangle$ which asserts MAX and presupposes MIN.[21] I argue that it gives better results than analyzing *pɛ* as an exclusive modifier of type $\langle\langle e, p\rangle, \langle e, p\rangle\rangle$. In particular, in order to account for the data presented in section 3.3, i.e., the atomicity puzzle and the exhaustivity puzzle, *pɛ* has to invariably scope over *kome* and *too*. Importantly, the possibility of interpreting *pɛ* in the scope of *kome* is properly blocked by analyzing *pɛ* as a quantifying determiner of type $\langle e, \langle\langle e, p\rangle, p\rangle\rangle$. By contrast, analyzing *pɛ* as a modifier of type $\langle\langle e, p\rangle, \langle e, p\rangle\rangle$ would predict the possibility of both *pɛ* and *too* to be in the scope of the choice-functional indefinite *kome* of type $\langle\langle e, p\rangle, e\rangle$. This in turn would predict sentences with *kome too pɛ* to be invariably non-NP-exhaustive, contrary to fact as it was presented in subsection 3.3.3.

The standard account of generalized quantifiers goes back to Barwise and Cooper (1981). They claim that quantifying determiners are of type $\langle\langle e, p\rangle, \langle\langle e, p\rangle, p\rangle\rangle$. They take as an argument an NP of type $\langle e, p\rangle$ mapping it into a generalized quantifier of type $\langle\langle e, p\rangle, p\rangle$, as in (51):

(51)
$$
\begin{array}{c}
\text{QP} \\
\langle\langle e, p\rangle, p\rangle \\
\diagdown \\
\text{Q} \qquad\qquad \text{NP} \\
\langle\langle e, p\rangle, \langle\langle e, p\rangle, p\rangle\rangle \quad \langle e, p\rangle
\end{array}
$$
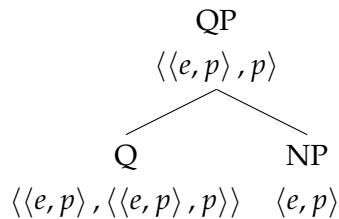
Matthewson (2001) proposes a modification of the standard view. Based on data from St'át'imcets (Salish), she argues that generalized quantifiers are formed in a two-step procedure. First, the domain of quantification is overtly restricted by a determiner.

---

[20] Note, however, that since *kome* cannot combine with plural count nouns and mass nouns, interpreting *kome* in the scope of *too* would only be possible with singular count nouns, contrary to fact.

[21] Analyzing *pɛ* as a quantifying determiner raises a question about its conservativity. I do not have data which would suggest either a conservative or a non-conservative analysis of *pɛ*. I leave this issue for future research.

Subsequently, quantifiers quantify over the atomic subparts of the resulting DP denotation. As a consequence, quantifying determiners in St'át'imcets are not of type $\langle\langle e,p\rangle,\langle\langle e,p\rangle,p\rangle\rangle$ but of type $\langle e,\langle\langle e,p\rangle,p\rangle\rangle$:

(52)

```
                        QP
                  ⟨⟨e,p⟩,p⟩
                 /          \
                Q            DP
        ⟨e,⟨⟨e,p⟩,p⟩⟩         e
                            /    \
                           D      NP
                      ⟨⟨e,p⟩,e⟩  ⟨e,p⟩
```
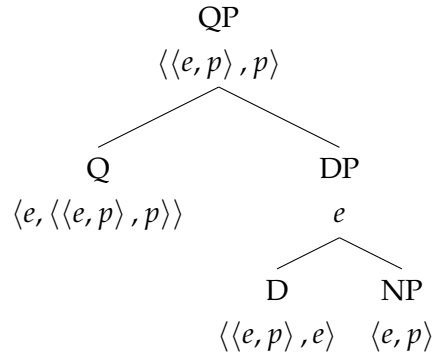
I argue that the same happens in Ga. First, the choice functional indefinite *kome* restricts the domain of quantification and subsequently a quantifier (*pɛ*) quantifies over a resulting DP.[22]

(53)

```
                        QP
                  ⟨⟨e,p⟩,p⟩
                 /          \
                Q            DP
        ⟨e,⟨⟨e,p⟩,p⟩⟩         e
                |           /    \
               pɛ         D       NP
                      ⟨⟨e,p⟩,e⟩   ⟨e,p⟩
                          |         |
                        kome      atomo
```
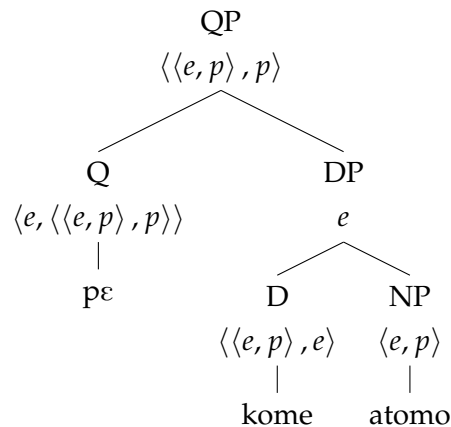
Therefore, the lexical entry of *pɛ* is given below:[23]

---

[22]Note, however, that there is one crucial difference between *CFs* denoted by determiners in St'át'imcets and a *CF* denoted by *kome* in Ga. Whereas the former are defined for plural individuals as an output, the latter is defined only for singular atomic individuals as an output. This predicts that *kome* and *kome pɛ* cannot modify plural count nouns and mass nouns and the prediction is borne out (see examples (18) and (19)). In order to be picked up by a *CF* denoted by *kome*, a plural or a mass individual has to be first mapped by *too* onto an atomic group individual (see subsection 3.5.1.1).

[23]The analysis stated in this chapter seems to predict that while *too* can combine with the VP, *pɛ* cannot. It is caused by the fact that *pɛ* needs an input of type *e*, whereas VPs are of type $\langle e,p\rangle$. Contrary to this prediction, *pɛ* can combine with the VP, as presented in subsection 3.2. I argue however that it is not a problem for the analysis, because the VP denotation can be type-shifted from $\langle e,p\rangle$ to *e*. This assumption is not without merit, because VPs can combine for example with the definite determiner *lɛ* (see chapter 5, subsection 5.3.3). The detailed analysis of the interaction between exclusive particles and different

(54) $[\![p\epsilon]\!] = \lambda x.\lambda Q : \text{MIN}(Q(x)).\text{MAX}(Q(x))$

I argue that in cases when *pɛ* combines with a common noun of type $\langle e, p \rangle$, the NP denotation is either type-shifted from $\langle e, p \rangle$ to e by the *iota* operator giving rise to a definite interpretation of the *NP* or by the covert indefinite giving rise to an indefinite interpretation.[24,25] Both type-shifting operations give rise to clear, testable empirical predictions. First, if an NP selected by *pɛ* is type-shifted by the *iota* operator, then it should be possible to interpret it in a definite way. This prediction is borne out, as illustrated in (55):

(55)   Q: What did you read: the book or the newspaper?
        A: Mì-káné wòlò pɛ́.
             1SG-read book ONLY
             'I only read the book.'

On the other hand, if an NP selected by *pɛ* is type-shifted by the covert indefinite, an *NP* should be able to obtain an indefinite interpretation. This prediction is also borne out. As is well-known, NPs associated with the wh-remnant in sluicing constructions cannot be definite (see Matthewson, 1999 and the references there). If *NP pɛ* were definite, then (56) should not be acceptable, contrary to fact:

(56)   John mìì-káné wòlò pɛ́, shí mí-lé   ténɔ́níjí.
        John PROG-read book ONLY but 1SG-not.know which
        'John is reading only a book but I do not know which.'
        # 'John is reading only the book but I do not know which.'

Note that the NP denotation can also be type-shifted by overt *kome*. However, it has a strong pragmatic effect. Namely, the choice of overt *kome* over the covert one has the same effect as the accented *one* in English sentences, such as 'I bought only ONE book yesterday.' It predicts that sentences with *kome pɛ* tend to be interpreted as answering the question 'How many x?' and this prediction is borne out, as presented in section

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types of eventualities (states, events, etc.) is left for future research. Thank you to Seth Cable for asking about it.

[24]There are three types of indefinites in Ga, bare NPs, *kome*, and *ko*. For the analysis, see Renans (2015)

[25]The analysis predicts that bare NPs in Ga allow for either definite or indefinite interpretations (thank you to Seth Cable for pointing it out to me). I can show that bare NPs obtain an indefinite interpretation, based on the tests for indefinites taken from Matthewson (1999). The definiteness, on the other hand, is marked in Ga by the definite determiner *lɛ* (see chapter 5, subsection 5.3.3). I am not sure whether bare NPs allow for a definite interpretation and it definitely should be check in my future research. Note, however, that the assumption that bare NPs allow for either definite or indefinite interpretations is not without merit, because *NP pɛ* can get the respective readings, as demonstrated in (55) and (56).

3.3.3. A detailed discussion of the exhaustivity effect triggered by *kome* is given in subsection 3.6.2.1.

3.6 Solutions to the puzzles

3.6.1 The atomicity puzzle — analysis

As shown in section 3.3.2, whereas *kome pɛ* cannot combine with plural count nouns and mass nouns, *kome too* can. Moreover, both *kome pɛ* and *kome too* can combine with singular count nouns but they give rise to different semantic effects: singular count nouns with *kome pɛ* give rise to the reading 'only one NP,' whereas the same nouns with *kome too* give rise to the interpretation 'only NP.' Before I provide an account for the interaction between *kome pɛ/too* and different types of common nouns, let me first briefly characterize the semantics of common nouns in Ga.

3.6.1.1 Common nouns in Ga — analysis

As it was shown in chapter 2, section 2.1, Ga exhibits a count — mass distinction. Moreover, it was shown that singular count nouns in Ga are acceptable either in a context that establishes a singular denotation or in a context that establishes a plural denotation for a noun. The language consultants accept also singular count nouns in a context which does not specify the cardinality of the NP denotation.

Based on these observations and following Farkas and de Swart (2010) and pace Krifka (1989) and Sauerland et al. (2005), I propose analyzing singular in Ga as semantically weak (it does not make a contribution to the semantic interpretation), and plural as semantically strong (it does make a contribution to the semantic interpretation). In particular, I argue that singular count nouns are number-neutral and their denotation can be modeled with the use of a full join-semilattice structure with underlying atomic entities, as in (57). This explains why Ga singular count nouns are acceptable in any context in which the cardinality of the NP is one, unknown, or more than one. For illustration, the denotation of the Ga singular count noun *sɛbɛ* 'eggplant' is represented below:

(57) $[\![$sɛbɛ$]\!]$ =

$$a \oplus b \oplus c$$

$$a \oplus b \qquad a \oplus c \qquad b \oplus c$$

$$a \qquad b \qquad c$$

Plural count nouns, on the other hand, denote a sublattice structure: the set of all plural individuals formed out of the underlying atomic entities. For example, the denotation of the Ga plural count noun *sɛbɛi* 'eggplants' can be represented as follows:

(58) $[\![\text{sɛbɛi}_{Pl}]\!]=$

$$
\begin{array}{ccc}
 & a \oplus b \oplus c & \\
a \oplus b & a \oplus c & b \oplus c \qquad \text{sɛbɛi} \\
 & & \\
a & b & c
\end{array}
$$
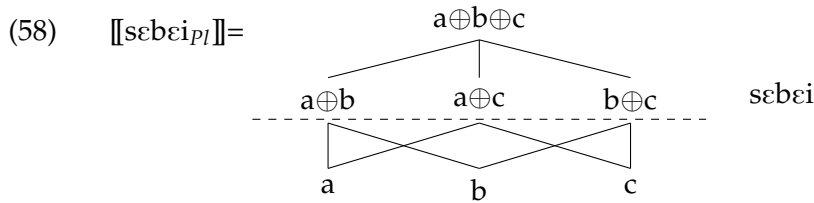
It occurs that pluralization in Ga effectively means removing the atomic entities out of the denotation. Therefore, I propose the following denotation for the Ga plural marker, where *P* is a number-neutral property:

(59) $[\![\text{PL}]\!] = \lambda P.\lambda x. \neg(\text{atomic}(x)) \wedge P(x)$

I argue that singular count nouns must be pluralized in order to combine with numerals due to the existence of the semantically strong plural form in the language, which blocks the semantically weak singular form.

As for mass nouns, it was presented in chapter 2, section 2.1 that mass nouns in Ga behave fully parallel to their English counterparts. Namely, they cannot combine with numerals without the use of classifiers and they are not pluralized when referring to the cumulation of NP-entities.

I argue that mass nouns denote a full join-semilattice structure without underlying atomic entities (Link, 1983; Krifka, 1995; Wilhelm, 2008). For illustration, the denotation of the Ga mass noun *yɔɔ* 'bean' is as in (60):

(60) $[\![\text{yɔɔ}]\!] =$

$$
\begin{array}{ccc}
 & f \oplus g \oplus h & \\
f \oplus g & f \oplus h & g \oplus h \\
\ldots & \ldots & \ldots
\end{array}
$$
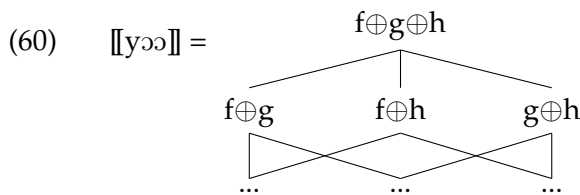
Summing up, the denotation of plural count nouns is modeled as a sublattice structure, the denotation of singular count nouns as a full join-semilattice structure with underlying atomic entities, and the denotation of mass nouns as a full join-semilattice structure without underlying atomic entities.

3.6.1.2 Interaction with plural count nouns

As shown in (25), repeated in (61), *kome pɛ* cannot combine with plural count nouns, whereas *kome too* can:

(61) Priscilla hé sɛ̀íí kòmé #pɛ́/tóó nyɛ̀.
      Priscilla buy chairs INDF ONLY/ONLY yesterday
      'Priscilla bought only chairs yesterday.'

I will now demonstrate how the proposed analysis accounts for this observation.

***Kome pɛ* and plural count nouns**   As discussed previously, *sɛii* 'chairs' as a plural count noun denotes the following sublattice structure:

(62)   [[sɛii]] =   a⊕b⊕c

             a⊕b   a⊕c   b⊕c

   Since *kome* is of type $\langle\langle e, p\rangle, e\rangle$ and *pɛ* is of type $\langle e, \langle\langle e, p\rangle, p\rangle\rangle$, the scopal dependencies in the denotation of *NP kome pɛ* are as in (63):

(63)   (NP kome) pɛ

Kome denotes a restricted *CF* that delivers only atomic individuals in its output. Since there are no atomic individuals in the denotation of plural count nouns that can be picked up by the *CF* denoted by *kome*, it is not defined for plural count nouns. Since *kome* is in the scope of *pɛ*, *kome pɛ* cannot combine with plural count nouns either. Thus, (61) with *kome pɛ* is not acceptable.

***Kome too* and plural count nouns**   The situation is different when plural count nouns are modified by *kome too*. As it was presented in subsection 3.5.1.1, the scopal dependencies in the denotation of *NP kome too* are as follows:

(64)   (NP too) kome

Too is a modifier that denotes Landman's (1989; 2010; 2013) group forming operator (↑). It maps all the (plural) individuals in the denotation of *sɛii* onto atomic group individuals, giving the denotation in (65):

(65) $[\![\text{sɛii too}]\!] =$ $\uparrow(a \oplus b \oplus c)$

          $\uparrow(a \oplus b)$ $\uparrow(a \oplus c)$ $\uparrow(b \oplus c)$

The denotation of *sɛii too* is composed only of atomic individuals which can be picked up by the *CF* denoted by *kome*. Therefore, the *CF* denoted by *kome* is defined for NP_{pl} *too*. Hence, plural count nouns can be selected by *kome too*. The syntactic structure of (61) with *kome too* is presented in (66) and its truth-conditions in (67):

(66)

```
                    TP
                  /    \
           Priscilla    VP
                      /    \
                    he      DP
                           /  \
                      sɛii kome too
```
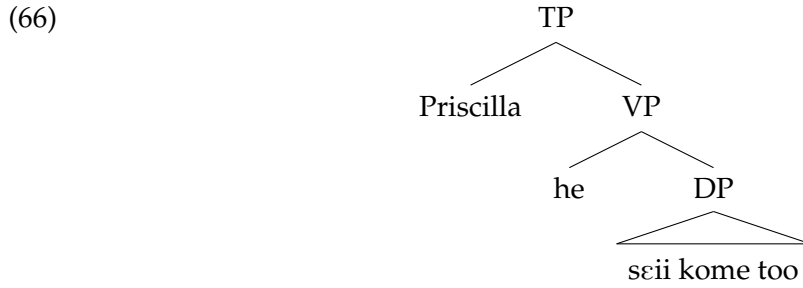
(67) $[\![\text{TP}]\!] = 1$ iff Priscilla bought$([g(i)](\lambda x : \text{MIN}(\text{chairs}(x)).\text{MAX}(\text{chairs}(x)) \wedge \exists z[\text{chairs}(z) \wedge x = \uparrow (z)]))$

(67) gives the proper truth conditions saying that Priscilla bought a group of unknown size that consists of at least chairs and at most chairs.

3.6.1.3 Interaction with mass nouns

As shown in (26), repeated in (68), *kome pɛ* cannot combine with mass nouns, whereas *kome too* can:

(68)   Kòfí hé   yɔ̀ɔ̀   kòmé #pɛ́/tóó   nyɛ̀.
          Kofi buy bean INDF ONLY/ONLY yesterday
          'Kofi bought only beans yesterday.'

The reason for this interaction is fully parallel to the reason for the interaction of plural count nouns and *kome pɛ/too* discussed above.

Kome pɛ and mass nouns   Mass nouns in Ga denote a full join-semilattice structure without the underlying atomic entities:

(69)   〚yɔɔ〛 =

$$a \oplus b \oplus c$$

$$a \oplus b \qquad a \oplus c \qquad b \oplus c$$

...   .
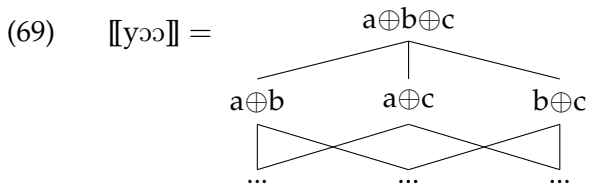
   Since there are no atomic individuals in the denotation of mass nouns that can be picked up by the *CF* denoted by *kome*, *kome* cannot combine with mass nouns. As *pɛ* scopes over *kome*, *kome pɛ* cannot combine with mass nouns either. Therefore, (68) with *kome pɛ* was judged as not acceptable by Ga native speakers.

***Kome too* and mass nouns**   In the case of *kome too*, *too* is in the scope of *kome*. *Too* maps all the mass individuals in the denotation of *yɔɔ* onto atomic group individuals. As a consequence, one obtains the denotation in (70), which comprises only atomic (group) individuals:

(70)   〚yɔɔ too〛 = $\uparrow(a \oplus b \oplus c)$

$$\uparrow(a \oplus b) \qquad \uparrow(a \oplus c) \qquad \uparrow(b \oplus c)$$

...   .
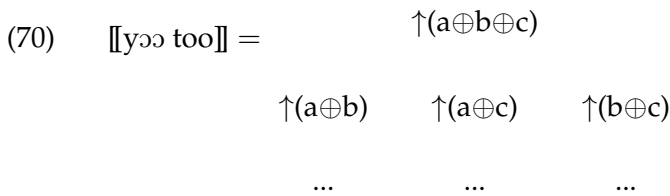
Since there are atomic individuals in (70) available to be picked up by a *CF* denoted by *kome*, it can combine with *yɔɔ too* and hence *kome too* can modify mass nouns. The syntactic structure of (68) with *kome too* is given in (71) and its truth-conditions are presented in (72):

(71)

TP

Kofi   VP

   he   DP

yɔɔ kome too
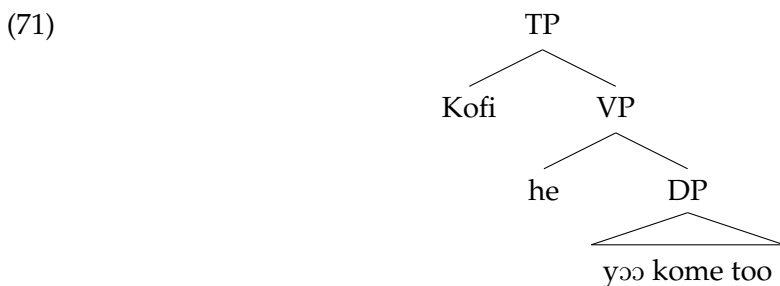
(72)   〚TP〛 =   1 iff Kofi bought$[g(i)](\lambda x$: $\text{MIN}(\text{beans}(x)).\text{MAX}(\text{beans}(x)) \wedge \exists z[\text{beans}(z) \wedge x = \uparrow (z)]$

   (72) correctly predicts that (71) is true if and only if Kofi bought a group of unknown size that consists of at least beans and at most beans.

3.6.1.4 Interaction with singular count nouns

Both *kome pɛ* and *kome too* can combine with singular nouns. However, they give rise to different semantic effects: singular count nouns with *kome pɛ* give rise to the meaning *only one NP*, whereas singular count nouns with *kome too* give rise to the meaning *only NP* (of unknown cardinality). This is illustrated by the results of the dialogue test (see example (27)). The target sentence from this test is repeated below.[26]

(73) Mary yè àtòmó kòmé pɛ́/   kòmé tóó.
      Mary eat potato INDF ONLY/ INDF ONLY
      'Mary ate only one/only potato(es).'

***Kome pɛ* and singular count nouns** Singular count nouns in Ga denote a full join-semilattice structure with the underlying atomic entities:

(74) ⟦atomo⟧ =

$$a{\oplus}b{\oplus}c$$

$$a \oplus b \qquad a{\oplus}c \qquad b{\oplus}c$$

$$a \qquad b \qquad c$$
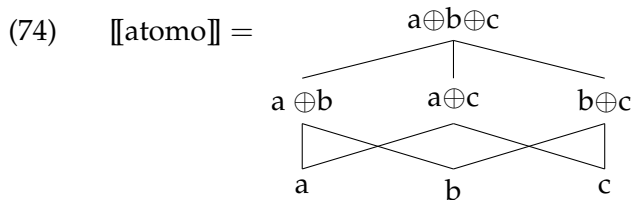
As there are atomic entities in the denotation of singular count nouns that can be picked up by the *CF* denoted by *kome*, singular count nouns can be selected by *kome*. Note, however, that a *CF* denoted by *kome* can pick up from the denotation of a singular count noun only an element from the bottom layer of the structure: a singular atomic entity. Therefore, by feeding the denotation of *atomo kome* (≈ one singular atomic entity of potato) into the denotation of *pɛ*, (73) with *kome pɛ* invariably obtains the interpretation that Mary ate at least one singular atomic potato and Mary ate at most one singular potato. Therefore, the only reading available for singular count NPs that are combined with *kome pɛ* is 'only one (singular atomic) NP.' The structure of (73) with *kome pɛ* is presented in (75) and its derivation in (76):

---

[26]For presentational reasons, I changed the personal pronoun from the original example to 'Mary.'

(75)

```
                              TP₃
                        ┌──────┴──────┐
                       QP            TP₂
                   ┌────┴────┐     ┌──┴──┐
              atomo kome pε   λ₁    TP₁
                                  ┌──┴──┐
                                Mary   VP
                                     ┌─┴─┐
                                    ye  t₁
```
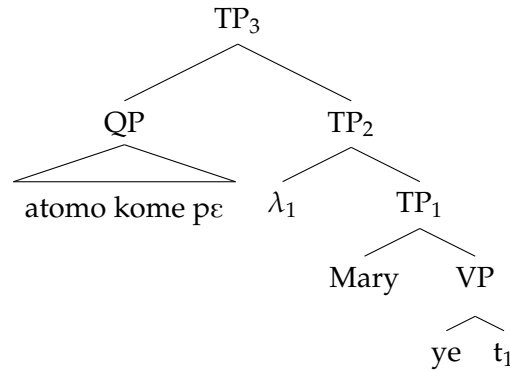
(76)   a. $[\![TP_2]\!] = \lambda x.\text{Mary ate } x$

   b. $[\![QP]\!] = \lambda Q : \text{MIN}(Q([g(i)](\lambda x.\text{potato}(x)))).\text{MAX}(Q([g(i)](\lambda x.\text{potato}(x))))$

   c. $[\![TP]\!]_3 = $ is defined only if $\text{MIN}(\text{Mary ate}([g(i)](\lambda x.\text{potato}(x))))$
        if defined then 1 iff $\text{MAX}(\text{Mary ate}([g(i)](\lambda x.\text{potato}(x))))$

(76-c) gives the correct truth conditions expressing that (75) presupposes that Mary ate at least one singular potato and asserts that Mary ate at most one singular potato.

***Kome too* and singular count nouns**   The situation is dramatically different when a singular count noun is modified by *kome too*. First *too*, which is in the scope of *kome*, maps all the individuals in the NP denotation onto atomic group individuals. As a consequence, one obtains the denotation in (77), which is composed of atomic individuals only: pure atoms and impure atoms (groups).

(77) $[\![\text{atomo too}]\!] =$

$$\uparrow(a\oplus b\oplus c)$$

$$\uparrow(a\oplus b) \qquad \uparrow(a\oplus c) \qquad \uparrow(b\oplus c)$$

$$a \qquad\qquad b \qquad\qquad c$$

Subsequently, from the denotation of *atomo too* given in (77) the *CF* denoted by *kome* can pick up any atomic individual: a pure atom (an atomic individual of cardinality *one* from the bottom layer of the structure) or an impure atom (an atomic group individual of any size from the upper layers of the structure). A *CF* denoted by *kome* chooses blindly. Therefore, it does not follow from (73) – with *kome too* – how many potatoes Mary ate. She could have eaten one potato but she could also have eaten a group of potatoes of an unknown cardinality. The structure of (73) with *kome too* is given in (78) and its derivation is presented in (79):

(78)

```
                    TP
                   /  \
               Mary    VP
                      /  \
                    ye    DP
                         /  \
                  atomo kome too
```
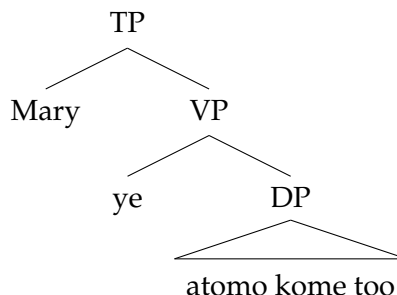
(79) $[\![TP]\!] = 1$ iff Mary ate$[g(i)](\lambda x : \text{MIN}(\text{potato}(x)).\text{MAX}(\text{potato}(x)) \land \exists z[\text{potato}(z) \land x =\uparrow (z))$

(79) correctly predicts that (78) is true if and only if Mary ate a group of unknown size that consists of at least potatoes and at most potatoes.

To sum up, *kome pɛ/too* interact in interesting ways with different types of common nouns in Ga. The proposed denotations for *pɛ, too* and *kome* on the one hand and for the common nouns on the other provide an account for the observed effects.

3.6.2 The exhaustive meaning puzzle — analysis

It was presented in subsection 3.2 that both *too* and *pɛ* trigger an NP-exhaustive interpretation. Subsequently, it was demonstrated in subsection 3.3.3 that the NP-exhaustive meaning of sentences with *pɛ* and *too* is lost when *kome* is added to *pɛ* but not when *kome* is added to *too*, see Table 3.2, repeated below:

Table 3.3: Acceptability of sentences with different particle combinations in NP-exhaustive and non-NP-exhaustive contexts. The second number in each cell signifies the total number of NP-exhaustive or non-NP-exhaustive contexts in which acceptability of sentences with the given combination was tested and the first number signifies the amount of contexts in which a sentence with the given particle was accepted.

	NP-exhaustive contexts	non-NP-exhaustive contexts
kome pɛ	1/5	3/4
kome too	7/10	2/4
kome too pɛ	9/10	2/4

In this subsection, I explain why this is so based on the following example:

(80) Kòfí yè àtómò kòmé pɛ́/ kòmé tóó/ kòmé tóó pɛ́
      Kofi eat potato INDF ONLY/ INDF ONLY/ INDF ONLY ONLY
      'Kofi ate only one potato/only potato/only potato.'

3.6.2.1 NP kome pɛ

As it was presented in section 3.3.3, although *pɛ* triggers an NP-exhaustive interpretation, sentences with *kome pɛ* are not interpreted NP-exhaustively. *Pɛ* which is a quantifying determiner of type $\langle e, \langle \langle e, p \rangle, p \rangle \rangle$ scopes over *kome* which is a choice-functional indefinite of type $\langle \langle e, p \rangle, e \rangle$, as presented below using as the example *atomo kome pɛ* ('only one potato').

(81)
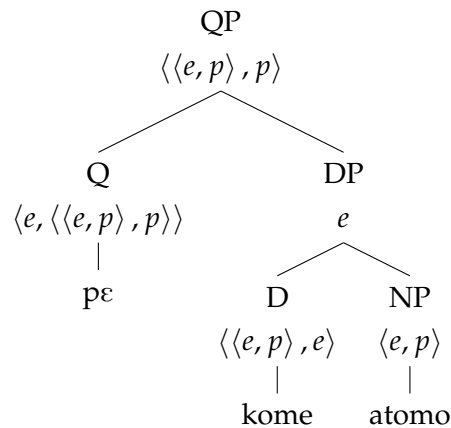
Consider (82):

(82) a. $\llbracket \text{atomo} \rrbracket = \lambda x.\text{potato}(x)$

  b. $\llbracket \text{atomo kome}_i \rrbracket^g = \llbracket \text{kome}_i \rrbracket^g (\llbracket \text{potato} \rrbracket) = [g(i)](\lambda x.\text{potato}(x))$

  c. $\llbracket \text{atomo kome}_i \, \text{pɛ} \rrbracket^g = \llbracket \text{pɛ} \rrbracket (\llbracket \text{potato kome}_i \rrbracket^g) =$
      $= [\lambda x.\lambda Q : \text{MIN}(Q(x)).\text{MAX}(Q(x))]([g(i)](\lambda x.\text{potato}(x)))$
      $= \lambda Q : \text{MIN}(Q([g(i)](\lambda x.\text{potato}(x)).\text{MAX}(Q([g(i)](\lambda x.\text{potato}(x)))$

The final line of (82) says that *atomo kome pɛ* takes a property and at least one atomic potato has this property and at most one atomic potato has this property. Since *kome* is in the scope of *pɛ*, the alternatives that *pɛ* operates on can be either of the form: *Kofi ate one potato, Kofi ate two potatoes, Kofi ate three potatoes* (focus on the numeral) or of the form: *Kofi ate one potato, Kofi ate one potato and a banana, Kofi ate one potato and a banana and an orange*, etc. (NP-focus). Whereas operating on the former type of alternatives would not give rise to an NP-exhaustivity effect, operating on the latter would. As it was presented in section 3.3.3, sentences with *kome pɛ* are interpreted as being not NP-exhaustive, which suggests that *pɛ* in sentences with *kome* tends to operate on the alternatives of the form *Kofi ate one potato, Kofi ate two potatoes, Kofi ate three potatoes, etc.*

I claim that it is a pragmatic effect triggered by inserting the indefinite *kome*. As it was written in subsection 3.5.2, in order to combine with *pɛ*, bare NPs denotation must be type-shifted from $\langle e, p \rangle$ to e by a covert or an overt indefinite. The choice of overt *kome*, however, has a strong pragmatic effect. It signals that the QUD that is being answered is 'How many?,' irrespective of the actual QUD, similar to Coppock and Beaver's (2014) adjectival complement excluders. Therefore, sentences with *kome pɛ* are not interpreted as being NP-exhaustive, but as being exhaustified with respect to the numeral denotation of *kome*.

3.6.2.2 NP kome too pɛ

As it was argued in subsection 3.5.1.1, the exhaustivity effect of sentences with *kome too* comes from the presence of covert *pɛ*. Therefore, *kome too pɛ* is sometimes a full spell out out *kome too*. The structure of *NP kome too pɛ* is demonstrated in (83):

(83)
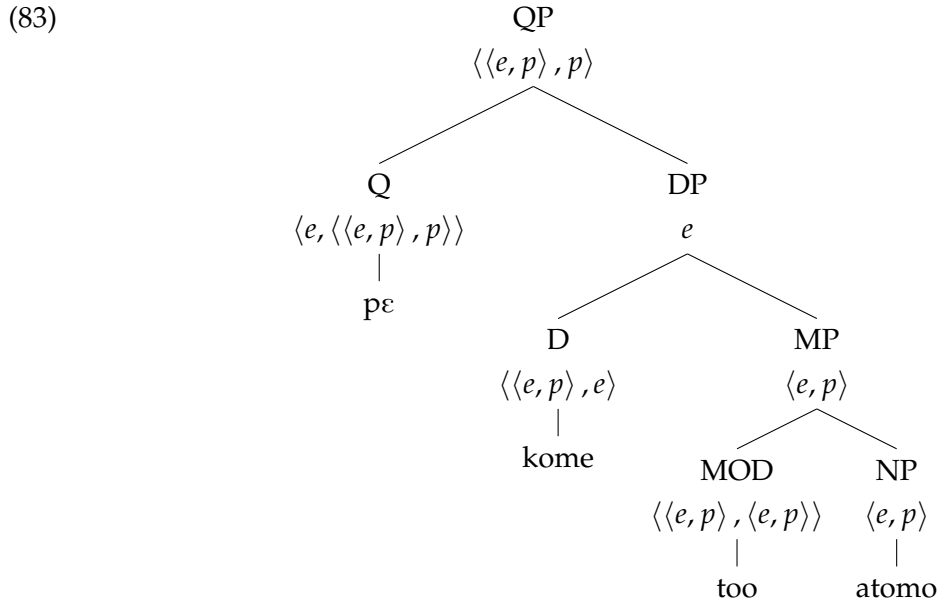
The derivation of *atomo kome too pɛ* is as in (84):

(84) $[\![\text{atomo kome}_i \text{ too p}\varepsilon]\!]^g = [\![\text{p}\varepsilon]\!]([\![\text{potato kome}_i \text{ too}]\!]^g) =$
     $= [\![\text{p}\varepsilon]\!]([g(i)](\lambda x : \text{MIN}(\text{potato}(x)).\text{MAX}(\text{potato}(x)) \wedge \exists z[\text{potato}(z) \wedge x = \uparrow (z)])$
     $= [\lambda y.\lambda Q : \text{MIN}(Q(y)).\text{MAX}(Q(y))]([g(i)](\lambda x : \text{MIN}(\text{potato}(x)).\text{MAX}(\text{potato}(x)) \wedge \exists z[\text{potato}(z) \wedge x = \uparrow (z)]))$

$$= \lambda Q : \text{MIN}(Q([g(i)](\lambda x : \text{MIN}(\text{potato}(x)).\text{MAX}(\text{potato}(x)) \wedge \exists z[\text{potato}(z) \wedge x = \uparrow(z)]))).\text{MAX}(Q([g(i)](\lambda x : \text{MIN}(\text{potato}(x)).\text{MAX}(\text{potato}(x)) \wedge \exists z[\text{potato}(z) \wedge x = \uparrow(z)])))$$

The final line of (84) says that *atomo kome too pɛ* takes a property and presupposes that at least one group of unknown size which consists of only potatoes has this property and asserts that at most one group of unknown size which consists of only potatoes has this property.

In sentences with *NP kome too pɛ*, *pɛ* can either operate on the alternatives of the form *Kofi ate one group of potatoes, Kofi ate two groups of potatoes, Kofi ate three groups of potatoes* leading to a non NP-exhaustive interpretation or *Kofi ate one group of potatoes, Kofi ate one group of potatoes and bananas, Kofi ate one group of potatoes and bananas and oranges*, etc. yielding an NP-exhaustive interpretation. As it was presented in subsection 3.3.3, both interpretations are possible, but the NP-exhaustive interpretation is preferred.

Again, I claim that it is for pragmatic reasons. I argue that the NP-exhaustive interpretation of *atomo kome too pɛ* is more informative than the non NP-exhaustive one and therefore the former is preferred. Saying that *Kofi ate one group of potatoes* (and no more groups of potatoes, where it is not known how big the group is) in fact equals the prejacent. i.e., the statement that *Kofi ate potatoes*. Therefore the non-NP-exhaustive interpretation of *atomo kome too pɛ* is much less informative than its NP-exhaustive interpretation, i.e., that *Kofi ate one groups of potatoes and nothing else*. Hence, a hearer by pragmatic reasoning tends to interpret sentences with *NP kome too pɛ* as being NP-exhaustive.

Importantly, this reasoning is not transferable to *kome pɛ*, which is a wanted result. Recall that non-NP-exhaustive *kome pɛ* operates on the alternatives of the form *Kofi ate one potato, Kofi ate two potatoes, Kofi ate three potatoes*. By contrast, NP-exhaustive *kome pɛ* operates on the alternatives of the form *Kofi ate a potato, Kofi ate a potato and a tomato, Kofi ate a potato and a tomato and a carrot*. Crucially, both interpretations are more informative than the prejacent, i.e., *Kofi ate potatoes.* and therefore none of them is preferred based on aforementioned reasoning.

3.7 Syntax of the particle combinations

The scopal dependencies between *pɛ, kome*, and *too* are presented schematically in (85):

(85)   pɛ (kome (too (NP)))

However, the surface order of *kome, too*, and *pɛ*, illustrated in (85), does not match the proposed semantic scopal dependencies. Note also that *NP kome too pɛ* is the only possible surface order of these three particles.

(86)   a.   Lisa hé   wòlò kòmé tóó   pέ.
            Lisa buy book INDF ONLY ONLY
            'Lisa bought only a book yesterday.'
       b.   *Lisa hé wòlò tóó kòmé pέ.
       c.   *Lisa hé wòlò tóó pέ kòmé.
       d.   *Lisa hé wòlò kòmé pέ tóó.
       e.   *Lisa hé wòlò pέ kòmé tóó.
       f.   *Lisa hé pέ tóó kòmé.

Crucially, the assumed scopal dependencies fall under Greenberg's (1963) Universal 20. It says that in the prenominal position Demonstratives, Numerals, and Adjectives (or a subset thereof) invariably have the scopal dependencies as in (87-a), in comparison to the postnominal position in (87-b):

(87)   a.   Dem [Num [Adj N]]
       b.   [[N Adj] Num] Dem or [[N Dem] Num] Adj

There are twenty four combinatorial possibilities in which these four elements can occur. However, only fourteen of them are attested. How to derive all fourteen possibilities from the structure in (87-a) and why other possibilities are not derivable was shown by Cinque (2005).

Crucial to the argument here, the scopal dependencies of the exclusive particles and the indefinite *kome* in Ga come under the schema presented in (87-a). A modifier *too* takes scope over the NP. Subsequently, a restricted *CF* (*kome*) takes scope over the MP, and the quantifying determiner *pɛ* scopes over the DP. Hence, I assume that *NP kome too pɛ* are merged in the following way:

(88)

```
                        QP
                    ╱        ╲
                  Q            DP
                  │          ╱    ╲
                  pε       D        MP
                           │      ╱    ╲
                        kome   MOD    NP
                                │      │
                               too     N
```
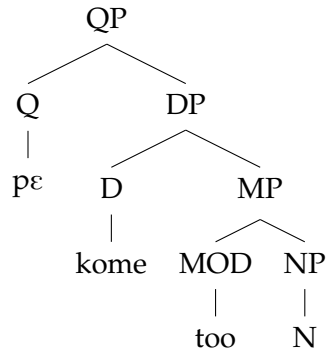
The order of *NP kome too pε*, i.e., N Dem MOD Q, is among the attested adnominal configurations. Thus, it can be derived from (88), as shown in (89):

(89)

```
                             QP
                      ╱              ╲
                  NP₂                  QP
                ╱     ╲              ╱
             NP        DP          Q    t_NP
             │       ╱    ╲        │
             N      D       MP     pε
                    │     ╱    ╲
                  kome  MOD    t_NP
                         │
                        too
```
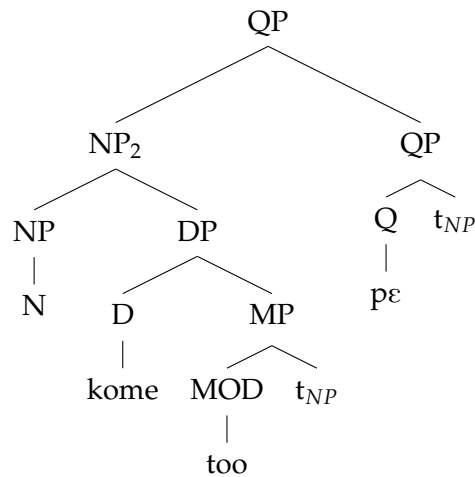
Following Cinque (2005), I assume that (89) is derived in two steps. First, the head NP is raised without pied-piping above both the modifier (*too*) and the determiner (*kome*). Subsequently, the complex NP [N kome too] is raised with pied-piping above the quantifying determiner (*pε*), giving rise to the structure in (89). The order of *NP kome too* is derived in the same way, i.e., by the NP-movement above the modifier (*too*) and the determiner *kome*. In the case of *NP too*, NP is moved to the edge of the MP.

(90)

```
                    NP₂
            ┌────────┴────────┐
           NP                 DP
            │          ┌───────┴───────┐
           N           D               MP
                       │          ┌─────┴─────┐
                     kome        MOD        t_NP
                                  │
                                 too
```
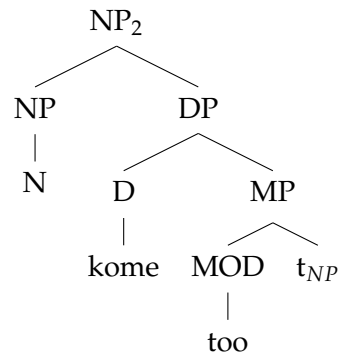
In a parallel way, one can derive also the order of *NP kome pɛ*. It is merged as in (91):

(91)

```
                    QP
            ┌────────┴────────┐
           Q                  DP
            │           ┌──────┴──────┐
           pɛ           D             NP
                        │             │
                      kome            N
```
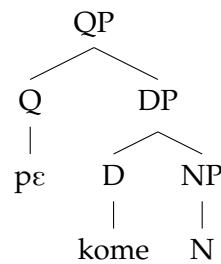
By raising the head NP above the determiner (*kome*) and the subsequent raising of the complex NP [NP kome too] above the quantifier (*pɛ*), the following structure is obtained:

(92)

```
                         QP
              ┌───────────┴───────────┐
             NP₂                      QP
        ┌─────┴─────┐            ┌─────┴─────┐
       NP          DP           Q         t_NP
        │       ┌───┴───┐        │
       N        D      t_NP      pɛ
                │
              kome
```
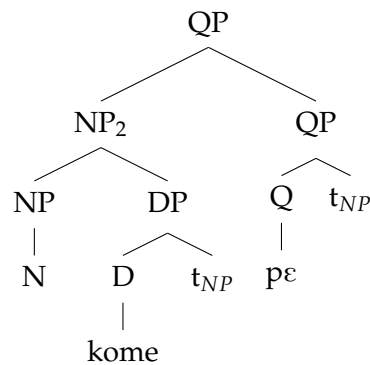
3.8 Summary

The chapter discussed the semantics of the two Ga exclusive particles *pɛ* and *too*. Their meaning were analyzed in Coppock and Beaver's (2014) framework. It was argued that both *pɛ* and *too* assert MAX ('at most') and presuppose MIN ('at least') meaning components. However, they differ with respect to their types. Whereas *pɛ* is a quantifier

of type $\langle e, \langle \langle e, p \rangle, p \rangle \rangle$, *too* is an exclusive modifier of type $\langle \langle e, p \rangle, \langle e, p \rangle \rangle$, where p is short for $\langle s, t \rangle$. Thus the Ga data pointed to a variation at the syntax-semantics interface in the cross-linguistic analysis of exclusive particles.

Furthermore, it was shown that in order to account for the interaction between *kome too* and different types of common nouns, *too* has to have a group-forming effect. Therefore, I argued that *too* denotes Landman's (1989; 2010; 2013) group-forming operator. Thereby it is yet another member of the family of exclusives, which has not been described nor analyzed so far. By that, data from Ga extends the typology of exclusive particles in a cross-linguistic perspective.

Data from Ga also give a methodological lesson. They show that it might be important to check an interaction of exclusive particles with common nouns in semantic fieldwork aimed at identifying properties of the exclusive particles.

4 Cleft structures

In this chapter, I present a syntactic and semantic analysis of the particle *nì*. It introduces a structural bi-partition in which the exhaustively interpreted focused constituent is to its left and the backgrounded part is to its right (*ni*-structure). I argue that the *ni*-structure can be properly analyzed as a cleft structure. Crucially, the Ga data pose challenges for existing semantic accounts for an exhaustivity inference generated by clefts. I argue that they can be properly modeled by the conditional exhaustivity (Büring, 2011) together with a pragmatic rescue strategy which postulates a reinterpretation of distributive predicates in clefts in a collective manner. The proposed analysis can account for clefts exhaustivity in a cross-linguistic perspective.

4.1 Introduction

The particle *ni* in Ga comes in two guises, i.e., namely as high tone *ní* and low tone *nì*.[1] Their distribution and semantic properties are not homogeneous. The high tone *ní* functions as a relativizer, as illustrated in (1):

(1)   a.   Mì-lè   nùù **ní**   nà bò.
           I-know man REL see you
           'I know the man that saw you.'   (from Dakubu, 2005, p.18)

      b.   Mì-nà   nùù **ní**   nà bó lɛ.
           1SG-SEE man REL see 2SG DET
           'I saw the man that saw you.'

Low tone *nì*, on the other hand, has two functions, i.e., as a conjunction and as introducing a cleft structure (*ni*-structure). Consider (2). Whereas the first *nì* attached to 'Kofi' and the last *nì* attached to 'Maria' introduce cleft structures, the middle *nì* functions as a conjunction between two propositions.

---

[1]Dakubu (2005) noted that *nì* can alternatively be analyzed as having an underspecified non-high-tone.

(2) Kòfí **nì** yè blòòdò **nì** Màríà **nì** yè bàǹkú.
     Kofi PRT eat bread   and Maria PRT eat banku
     'It was Kofi who ate bread and it was Maria who ate banku.'

Dakubu (2005) suggests that all *ni*s are incarnations of the same *ni*. At the same time, however, since the high tone *ní* and the low tone *nì* differ significantly in their distribution and semantics it is justified to assume three different *ni*s, i.e., the high-tone *ní* which functions as a complementizer and two low-tone *nì*s, where one functions as a conjunction and one introduces a cleft structure. In this chapter, I analyze only the low tone *nì* introducing cleft structures.

The outline of this chapter is as follows. Section 4.2 discusses the semantic properties of the cleft-introducing particle *ni*. In section 4.3, I examine three possible analyses of the particle *ni* and I argue that the approach analyzing *ni* as introducing a cleft structure (*ni*-structure) comes closest to empirical adequacy. The syntactic and semantic analysis of the *ni*-structure is given in section 4.4 and section 4.5 concludes.

4.2 Semantic properties of the particle *ni*

This section gives an overview of the semantic properties of the particle *ni*. Subsection 4.2.1 examines the information structural properties and the distribution of the particle *ni*. Subsection 4.2.2, in turn, demonstrates that the focused constituent is interpreted exhaustively and discusses the semantic nature of this effect. Finally, subsection 4.2.3 shows that the *ni*-structure triggers an existential presupposition.

4.2.1 Information structural properties and distribution of the particle *ni*

The particle *ni* induces a structural bi-partition in which the focused constituent is to its left (a so called 'pivot') and the backgrounded/presupposed material is to its right, as illustrated in (3):

(3) Q: Who ate bàǹkú yesterday?
     A: Kòfí **nì** yè bàǹkú nyὲ.
         Kofi PRT eat banku yesterday
         'It is Kofi who ate banku yesterday.'

The particle *ni* has a rigid syntactic position, i.e., it can only occur just after the ex-situ focused constituent. Therefore, it cannot associate with focus from a distance, as

demonstrated in (4) and (5), and it cannot attach to in-situ focused constituents, as shown in (6):

(4)   Q: Who read a book yesterday?
       A: Kòfí **nì**   káné (***nì**) wòlò (***nì**).
             Kofi PRT read PRT book PRT
             'It is Kofi who read a book.'

(5)   Q: What did Kofi eat yesterday?
       A: Bàǹkú **nì**   Kòfí (***nì**) yè nyὲ.
             bàǹkú PRT Kofi PRT   eat yesterday
             'It was banku that Kofi ate yesterday.'

(6)   Q: What did Kofi read yesterday?
       A1:*Kòfí káné àdèsáwòlò **nì**   nyὲ.
             Kofi read newspaper PRT yesterday
       A2: Àdèsáwòlò **nì**   Kòfí káné nyὲ.
             newspaper PRT Kofi read yesterday
             'It was a newspaper that Kofi read yesterday.'

A pivot is information structurally restricted to be a focus. It is indicated by the observation that an element out of the pivot cannot answer wh-questions, as illustrated by the unacceptability of (7-A) and (8-A) in the context of the questions given in (7-Q) and (8-Q), respectively:

(7)   Q: Námɔ̀ (nì) káné wòlò?   (8)   Q: Mὲnì (nì) Kòfí yè nyɛ̃?
             who   PRT read book   what PRT Kofi eat yesterday
             'Who read a book?'   'What did Kofi eat yesterday?'
       A: #Wòlò **nì**   Kòfí káné.   A: #Kòfí **nì**   yè àbèlé.
             book PRT Kofi read   Kofi PRT eat corn
             'It is a book that Kofi read.'   'It is Kofi who ate corn.'

Another piece of data suggesting that pivots are restricted to be in focus is an observation that they cannot express aboutness topics, as presented in (9):[2]

(9)   Tell me something about John.

       A1:#John **nì**   káné wòlò nyὲ.
             John PRT read book yesterday

---

[2]The semantics of the particle *lɛ*, which functions as a topic/background marker, is discussed in chapter 5. Since it is also a definite determiner, I gloss it DET.

> A2: John lɛ, è-káné wòlò nyɛ̀.
> John DET 3SG-read book yesterday
> 'As for John, he read a book yesterday.'

One of my language consultants gave a comment that whereas (9-A1) is a good answer to the question *Namɔ kane wolo nyɛ?* ('Who read a book yesterday') but it is not a good answer to (9), (9-A2) is a perfect answer to (9) but it is not a good answer to the question *Namɔ kane wolo nyɛ?* ('Who read a book yesterday').

Moreover, the particle *ni* is dispreferred in contexts such as (10), which regarding Büring (2003) typically elicit contrastive topics.[3]

(10)   Q: Who ate what?
        A1: Kòfí lɛ, è-yè bàǹkú nyɛ̀ nì Màríá lɛ, è-yè blòòdò nyɛ̀.
            Kofi DET 3SG-eat banku yesterday and Maria DET 3SG-eat bread yesterday
        A2: Kòfí yè bàǹkú nyɛ̀ nì Màríà yè blòòdò nyɛ̀.
            Kofi eat banku yesterday and Maria eat bread yesterday
        A3: ?Kòfí **nì** yè bàǹkú nyɛ̀ nì Màríà **nì** yè blòòdò nyɛ̀.
            Kofi PRT eat banku yesterday and Maria PRT eat bread yesterday
            intended: 'Kofi ate banku yesterday and Maria ate bread yesterday.'

There are no restrictions regarding the length of the focused constituent in the pivot, i.e., both single and multiple words can be the pivot, as demonstrated in (11):

(11)   Q: What did Kofi eat yesterday?
        A: Kɔ́mì kɛ̀ bàǹkú **nì** Kòfí yè nyɛ̃̀.
           kenkey and banku PRT Kofi eat yesterday
           'It was kenkey and banku that Kofi ate yesterday.'

VPs can also be the pivot but only in a nominalized form, accompanied either by a finite copy of the verb in its canonical position inside the VP, as in (12), or by *fèé*-support ('do'-support), as in (13):

(12)   Q: What did Kofi do yesterday?
        A1: Sèlè-mɔ̀ **nì** Kòfí **sèlè** nyɛ̀.
           swim-NOM PRT Kofi swim yesterday

---

[3]Note, however, that van Hoof (2003) and Wagner (2012) claim that constructions such as in (10) are not contrastive topic constructions but focus constructions. Wagner (2012) shows that contrastive topic constructions involve recursively nested focus operators and can be analyzed with the use of the focus semantic values only, i.e., without referring to contrastive topic values. Krifka (2007), on the other hand, claims that structures like in (10) are characterized by nested information structure, namely *Kofi* and *Maria* are focused constituents within topic constituents.

A2:*Sèlè   nì   Kòfí sèlè   nyὲ.
  swim PRT Kofi swim yesterday
  intended: 'It was swimming that Kofi did yesterday.'

(13)   Q: What did Kofi do yesterday?

   A: Wòlò kánè-mɔ̀   **nì**   Kòfí **fèé** nyὲ.
      book read-NOM PRT Kofi do yesterday
      'It is reading a book that Kofi did yesterday.'

A nominalization of Vs and VPs is a widely attested focus marking strategy across languages. For an overview see Zimmermann (2015) and the references there.

Although verbs and VPs in a nominalized form can be the pivot, focus projection from the focus pivot is not possible, i.e., sentences in which only a part of the focused constituent is the pivot are unacceptable. This observation is illustrated in (14), which shows that V in the pivot cannot be an answer to the question about the whole VP:

(14)   Q: What did Kofi do yesterday?

   A: *Kánè-mɔ̀   **nì**   Kòfí kὲ   wòlò fèé nyὲ.
      read-NOM PRT Kofi and book do yesterday
      intended: 'It was reading a book that Kofi did yesterday.'

Also focus pied-piping, in which more material than a focused constituent is the pivot, is not possible with VPs, as illustrated in (15) and (16). However, it is acceptable with possessives, as presented in (17):[4]

(15)   Q: What did Kofi read yesterday?

   A1:   Àdèsáwòlò **nì**   Kòfí káné nyὲ.
      newspaper PRT Kofi read yesterday

   A2:   ?Àdèsáwòlò kánè-mɔ̀   **nì**   Kòfí fèé nyὲ.
      newspaper   read-NOM PRT Kofi do yesterday
      intended: 'It was a newspaper that Kofi read yesterday.'

(16)   Q: Mɛ́nì Kòfí kὲ   wòlò fèé nyὲ?
      what Kofi and book do yesterday
      'What did Kofi do with a book yesterday?'

   A: #Wòlò kánè-mɔ̀   **nì**   Kòfí fèé nyὲ.
      book read-NOM PRT Kofi do yesterday
      intended: 'Kofi READ a book yesterday.'

---

[4]See Hartmann and Zimmermann (2007b) for a discussion of focus projection and focus pied-piping in Hausa, German, and Hungarian. Note, however, that whereas Hartmann and Zimmermann (2007b) discuss the constraints of focus movement to the left-peripheral, ex-situ position, I argue that the pivot in Ga is base-generated in its left-peripheral position. For arguments supporting this view, see section 4.4.1.

(17)   Q: Whose book Kofi read yesterday?

        A1:*Lisa **nì**   Kòfí káné wòlò nyὲ.
            Lisa PRT Kofi read book yesterday

        A2: Lisa wòlò **nì**   Kòfí káné nyὲ.
             Lisa book PRT Kofi read yesterday
             intended: 'It was Lisa's book that Kofi read yesterday.'

Furthermore, whole sentential complements can also be the pivot but again only in a nominalized form, as shown by the following.

(18)   Q: What does Kofi know?

        A: *Deborah tὲὲ   Kùmásí nì   Kòfí lὲ.
            Doborah go.PAST Kumasi PRT Kofi know
            intended: 'That Deborah went to Kumasi Kofi knows.'

        A1: Deborah Kùmásí yà-àà   nì   Kòfí lὲ.
            Deborah Kumasi go-NOM PRT Kofi know
            'The going of Deborah to Kumasi is what Kofi knows about.'

        A2: Deborah sèlè-mɔ́   lɛ   nì   Kòfí lὲ.
            Deborah swim-NOM DET PRT Kofi know
            'The swimming of Deborah is what Kofi knows about.'

The fact that the finite verb can occur only once in the structure suggests that the *ni*-structure is monoclausal.[5] Anticipating the syntactic analysis to come, I argue that the particle *ni* introduces a monoclausal cleft structure in which the focused constituent is base-generated in its left-peripheral position (see subsection 4.4.1).

The particle *ni* can (but it does not have to) attach to wh-expressions, which is expected if wh-words are inherently in focus and if the particle *ni* introduces a structural bi-partition into focused and backgrounded material. This is illustrated in (19) and (20):[6]

---

[5]An alternative possibility would be to postulate a covert copula in the pivot.

[6]Note that there are two types of wh-expressions in Ga, i.e., number neutral, as in (i), and plural, as in (ii), and both of them can be marked by *ni*, as presented in (19) and (20) in the main text, respectively:

(i)   The speaker has no idea how many people ate corn yesterday:
        Námɔ̀ yè àbèlé nyὲ?
        who   eat corn yesterday
        'Who ate corn yesterday?

(ii)   The speaker expects more than 1 person to have eaten corn:
        Námὲí yè àbèlé nyὲ?
        who.PL eat corn yesterday
        'Who ate corn yesterday?'

(19) Námɔ̀ **nì** yè àbèlé nyɛ̀?
      who   PRT eat corn yesterday
      'Who was it that ate corn yesterday?'

(20) Námɛ̀í **nì** yè àbèlé nyɛ̀?
      who.PL PRT eat corn yesterday
      'Who ate corn yesterday?'

The question of whether there are any semantic differences between questions marked with the particle *ni* and unmarked ones has to await future research. However, it seems that the particle *ni* reinforces the exhaustivity effect generated by wh-words.

Taking stock, it was shown that the particle *ni* introduces a structural bi-partition in which the focused constituent is necessarily to its left and the backgrounded material is to its right, both in questions and statements. This view is confirmed by the observations that *ni* cannot attach to the in-situ foci and it cannot associate with focus from a distance. Moreover, it was shown that the pivot can be interpreted neither as aboutness nor contrastive topic. In the following subsections, I examine possible additional meaning components triggered by the particle *ni*, i.e., an exhaustivity and an existential inference.

4.2.2 Exhaustivity

In this subsection, I present the results of several empirical diagnostics which show that the particle *ni* gives rise to an exhaustivity effect, i.e., an element in the pivot is interpreted as the only element satisfying the backgrounded description (subsection 4.2.2.1). Subsequently, I discuss the semantic status of this effect showing that it is not-at-issue and non-cancellable (subsections 4.2.2.2 and 4.2.2.3).

4.2.2.1 The exhaustivity effect — empirical diagnostics

Test #1: Conjunction of two clauses containing *ni*   The test illustrated in (21) is based on the observation that one cannot conjoin two exhaustively interpreted clauses that differ only in the exhaustified constituent. If the particle *ni* does not give rise to the exhaustive interpretation, it should be possible to conjoin two sentences with the particle *ni* and the same VP-descriptions but with different elements in pivots, contrary to fact. Consider (21-a):

(21) a. #Felix **nì** kánè-ɔ̀ wòlò nì Kòfí **nì** kánè-ɔ̀   wòlò.
         Felix PRT read-IMPF book and Kofi PRT read-IMPF book
         'It is Felix who reads a book and it is Kofi who reads a book.'

b. Felix kánè-ɔ̀   wòlò nì   Kòfí kánè-ɔ̀   wòlò.
   Felix read-IMPF book and Kofi read-IMPF book
   'Felix reads a book and Kofi reads a book.'

Since (21-a) is not acceptable, it shows that a sentence with the particle *ni* is interpreted exhaustively. (21-b), on the other hand, is a version of (21-a) without the particle *ni* and it is acceptable. The contrast between (21-a) and (21-b) suggests that the exhaustivity effect is triggered by the particle *ni*.

Test #2: É. Kiss's (1998) test for exhaustivity   In this test, the language consultants were presented with a conversation between three people (A, B, and C). A asks a wh-question and B answers the question either with the use of the particle *ni* or an unmarked SVO word order. Finally, C negates B's answer using the additive particle *hu*.[7] The language consultants were asked to judge whether C's reaction for the B's answer is acceptable or not. Negation together with an additive particle in a sentence negates an exhaustive meaning. For example, (22-C) does not negate the meaning that Lisa bought a dress but that Lisa was the only person who bought a dress, i.e., Maria bought a dress as well. Therefore, if B's answer gives rise to an exhaustivity effect, C's response to B should be judged as acceptable. Otherwise, C's response should be judged as unacceptable. Consider (22)–(23):

(22)   A: Námɔ̀ hé   àtààdé nyɛ̀?
            who   buy dress   yesterday
            'Who bought a dress yesterday?'

        B: Lisa **nì**   hé   àtààdé nyɛ̀.
            Lisa PRT buy dress   yesterday
            'It was Lisa who bought a dress yesterday.'

        C: Dàà bí, Màríà hú   hé   àtààdé nyɛ̀.
            No   Maria also buy dress   yesterday
            'No, Maria also bought a dress yesterday.'

(23)   A: Mɛ́nì Kòfí yè nyɛ̀?
            what Kofi eat yesterday
            'What did Kofi eat yesterday?'

        B: Bàǹkú **nì**   Kòfí yè nyɛ̀.
            banku PRT Kofi eat yesterday
            'It was banku that Kofi ate yesterday.'

---

[7]Note, however, that whereas the original target sentences were presented in the context which states that the described situation took place, e.g, the context for (i) would be that Lisa bought a dress yesterday, the contexts for the target sentences in this paragraph constitute wh-questions.

C: Dàbí, Kòfí yè àmádàá hú nyè.
No Kofi eat plantain also yesterday
'No, Kofi ate also plantain yesterday.'

In both cases, the language consultants judged C's response to B's statement as acceptable. On the other hand, in cases when B replies with the use of an unmarked SVO order, C's response with the additive particle *hu* was judged as unacceptable, as presented in (24):[8]

(24) A: Námɔ̀ tèè jàrá lɛ́ nɔ̀ nyɛ̀?
who go.PAST market DET on yesterday
'Who went to the market yesterday?'

B: Mark tèè jàrá lɛ́ nɔ̀ nyɛ̀.
Mark go.PAST market DET on yesterday
'Mark went to the market yesterday.'

C: #Dàbí, Emmanuel hú tèè jàrá lɛ́ nɔ̀ nyɛ̀.
no Emmanuel also go.PAST market DET on yesterday
'No, Emmanuel also went to the market yesterday.'

Again, the contrast between (22)–(23) and (24) suggests that the particle *ni* gives rise to an exhaustivity effect.

Test #3: Szabolcsi's (1981a) test for exhaustivity This test consists of pairs of sentences. The 'a' sentence (context) in each pair contains a plural entity as the pivot and the 'b' sentence contains a singular entity as the pivot, i.e., a member of the plural entity from the 'a' sentence. The VP description in both sentences is the same. The language consultants were supposed to decide whether sentence 'b' is acceptable in the context of sentence 'a'. If the particle *ni* triggers an exhaustive interpretation, then 'b' sentence should not be acceptable in the context of sentence 'a'. Examples of the target pairs are presented in (25) and (26).

(25) a. context:
Dora kɛ̀ Lisa **nì** hé àtàdé nyɛ̀.
Dora and Lisa PRT buy dress yesterday
'It was Dora and Lisa who bought a dress yesterday.'

b. ?Lisa **nì** hé àtàdé nyɛ̀.
Lisa PRT buy dress yesterday
'It was Lisa who bought a dress yesterday.'

---

[8]The language consultants commented that in that case C's answer does not make sense in the context of A and B's conversation.

(26) a. context:

      Bàǹkú kɛ̀ àmádàá **nì** Kòfí yè nyɛ̀.
      banku and plantain PRT Kofi eat yesterday
      'It was banku and plantain that Kofi ate yesterday.'

    b. #Bàǹkú **nì** Kòfí yè nyɛ̀.
      banku PRT Kofi eat yesterday
      'It was banku that Kofi ate yesterday.'

(27) a. context:

      Dora kɛ̀ Lisa **nì** hé àtààdé nyɛ̀.
      Dora and Lisa PRT buy dress yesterday
      'It was Dora and Lisa who bought a dress yesterday.'

    b. Lisa hé àtààdé nyɛ̀.
      Lisa buy dress yesterday
      'Lisa bought a dress yesterday.'

Note the contrast between (25) and (27). (27-b) is acceptable in the context of (27-a), because 'Lisa' in (27-b) — due to the lack of the particle *ni* — is not interpreted exhaustively and therefore (27-b) is compatible with the scenario in which it was Dora and Lisa who bought a dress. By contrast, 'Lisa' in (25-b) is interpreted exhaustively and thus (25-b) is not compatible with the context in which it was Dora and Lisa who bought a dress. Therefore, (25-b) is unacceptable in the context of (25-a).

Even though the judgments regarding pairs of sentences with subjects as the pivot were not as clear as in the case of sentences with DOs as the pivot, the results still show that the *ni*-structure triggers an exhaustive interpretation.

Test #4: Hartmann and Zimmermann's (2007a) test for exhaustivity   In this test, the language consultants were presented with a context and a short dialogue between Kofi and his teacher. The language consultants were asked to judge whether Kofi could deduce from the teacher's statement, and the accompanying context, whether he had passed the exam or not. Consider (28), taken from Hartmann and Zimmermann (2007a):

(28) context: A student (Kofi) who is anxious that he might have failed a test approaches a teacher and asks: 'Can you tell me whether I have passed or not?' Unfortunately, teachers are by law forbidden to tell a student directly about his or her result. However, there is no law forbidding them to talk about other students' performances.

K: Ànì mì-páásì yὲ kàá lɛ́ mlì?
    QPRT 1SG-pass at exam DET in
    'Have I passed the exam'

T: Mí kɛ́ɛ́-ŋ́   bò shí Felix **nì** páásí-kò   yὲ kàá lɛ́ mlì.
    1SG tell-PROSP.NEG 2SG but Felix PRT pass-PFV.NEG at exam DET in
    'I cannot tell you but it is Felix who did not pass the exam.'

The language consultants decided that Kofi could deduce on the basis of the teacher's utterance (and the accompanying context) that he had passed the exam. Note that when the teacher uttered the same sentence without the particle *ni*, Kofi could not deduce anymore whether he had passed the exam or not. It suggests that the exhaustivity inference, which enables the deduction whether Kofi passed the exam or not, is induced by the particle *ni*.

Test #5: The particle *ni* in mention-some contexts (Hartmann and Zimmermann, 2012) It turns out that the particle *ni* cannot occur in mention-some contexts, as shown by the following:

(29)   Mì-lè   mὲì pìì ní hɔ́ɔ̀ àkwàdú yὲ jàànɔ̀.
        1SG-know people many REL sell banana at market.on
        'I know many people that sell banana at the market.'

  a.   #Kòfí **nì** hɔ́ɔ̀ àkwàdú .
        Kofi PRT sell banana
        'It is Kofi who sells banana.'

  b.   Kòfí hú hɔ́ɔ̀ àkwàdú .
        Kofi also sell banana
        'Kofi also sells banana.'

A sentence in (29-a), unlike (29-b), is not an acceptable continuation of (29) suggesting that *ni* gives rise to an exhaustivity effect. If the speaker knows a lot of people who sell banana, then Kofi cannot be the only person who sells banana. One of the language consultants gave a comment that (29-a) would be good as a corrective statement, meaning that not many people sell banana but Kofi.

Summary Summing up this subsection, the results of the presented tests show clearly that the *ni*-structure triggers an exhaustive interpretation. In the next subsection, I discuss the semantic status of the exhaustivity inference.

4.2.2.2 The exhaustivity effect is not-at-issue

The previous subsection has shown that sentences with *ni* obtain an exhaustive interpretation. This in turn strongly suggests that the meaning of sentences with the particle *ni* can be characterized by the two meaning components, i.e., the prejacent and the exhaustivity inference:

(30)   Fred **nì** è-kpèé.
       Fred PRT 3SG-invite
       'It was Fred she invited.'

     a.   *prejacent:* She invited Fred.

     b.   *exhaustivity:* She invited nobody other than Fred.

The question is which of the meaning components listed in (30) is at-issue and which is not-at-issue.[9] I compare the effects generated by the particle *ni* with the effects generated by the exclusive particle *pɛ* ('only'). A hypothesis, which comes from the behavior of *it*-clefts and exclusive particles in English (Büring, 2011; Büring and Križ, 2013; Horn, 1981; Velleman et al., 2012, among others),[10] is that the exhaustivity effect triggered by the particle *ni* is not-at-issue, in contrast to the exhaustivity effect triggered by the exclusive particle *pɛ* ('only'):

(31)   PARTICLE *ni*   (32)   PARTICLE *pɛ* ('ONLY')

     a.   *at-issue:* prejacent   a.   *at-issue:* exhaustivity

     b.   *not-at-issue:* exhaustivity   b.   *not-at-issue:* prejacent

The hypothesis is tested against the results of several tests aimed at identifying at-issue and not-at-issue meaning components. First, consider examples (33)– (35), taken from Büring and Križ (2013):[11,12]

(33)   a. #Bob lè   ákɛ́ è-kpèé   Fred shí è-lè-èè   ákɛ́ Fred **nì**
           Bob know that 3SG-invite Fred but 3SG-know-IMPF.NEG that Fred PRT
           è-kpèé.
           3SG-invite
           'Bob knew she invited Fred, but he didn't know it was Fred she invited.'

---

[9]I follow Roberts et al. (2009); Simons et al. (2011), among others, in the assumption that whereas at-issue content addresses the main point of the utterance, not-at-issue does not. In more formal terms, while at-issue content addresses the Question Under Discussion (QUD) or raises a new QUD, not-at-issue content neither addresses QUD nor raises a new QUD.

[10]In subsection 4.3.3, I argue that the particle *ni* can be properly analyzed as introducing a cleft structure.

[11]Büring and Križ's (2013) examples, in turn, are modeled after similar sentence pairs in Horn (1981).

[12]The ambiguity of the third person singular pronoun (he vs. she) in Ga examples was clarified during elicitation sessions.

b. Bob lè   ákɛ́ è-kpèé   Fred shí è-lè-èè   ákɛ́ Fred **p**ɛ́
   Bob know that 3SG-invite Fred but 3SG-know-IMPF.NEG that Fred only
   è-kpèé.
   3SG-invite
   'Bob knew she invited Fred, but he didn't know she invited only Fred.'

The unacceptability of (33-a) suggests that the prejacent ('Fred was invited') rather than the exhaustive meaning component ('Nobody other than Fred was invited') is the at-issue content of a sentence with the particle *ni*. If the prejacent is at-issue, then (33-a) says that Bob knew she invited Fred but he didn't know she invited Fred, which leads to a contradiction and explains its unacceptability. If the exhaustivity was at-issue, then the contradiction would not occur, which is the case in (33-b), a version of (33-a) with the particle *pɛ*. (33-b) states that Bob knew she invited Fred but he did not know that she invited Fred and nobody else and therefore it is acceptable. Consider now (34), which is modeled after an example in Szabolcsi (1994):

(34)   a. Jèèè Fred **nì** è-fɔ̀   nìnè è-tsɛ́   lɛ. È-tsɛ́   Gord (#hú).
           NEG Fred PRT 3SG-throw hand she-call PRT 3SG-call Gord ALSO
           'It wasn't Fred she invited. She invited Gord.'

        b. Jèèè Fred **p**ɛ́   è-fɔ̀   nìnè è-tsɛ́. È-tsɛ́   Gord #(hú).
           NEG Fred ONLY 3SG-throw hand 3SG-call 3SG-call Gord ALSO
           'She didn't only invite Fred. She also invite Gord.'

If the hypotheses in (31-b) and (32-b) are true, then in the case of (34-a) the prejacent is at-issue, and in the case of (34-b) the exhaustivity is at-issue. Since negation targets the at-issue meaning component, in (34-a) it is negated that Fred was invited. Thereby the additive particle *hu* in the second clause of (34-a) lacks the anaphoric antecedent which is required for its felicitous use and by that (34-a) is unacceptable. By contrast, in (34-b) the exhaustivity is negated; that is, (34-b) states that it is not the case that she invited Fred and nobody else and in that case the additive particle in the second clause is required.

The following examples provide further evidence that the exhaustivity inference triggered by the particle *ni* is not-at-issue and the exhaustivity effect triggered by the particle *pɛ* is at-issue:

(35)   a. #È̀-kpèé   Fred, shí jèèè Fred **nì**   è-kpèé.
           3SG-invite Fred but neg Fred PRT 3SG-invite
           'She invited Fred but it was not Fred she invited.'

    b.   È-kpèé   Fred, shí jèèè Fred **p**ɛ́   è-kpèé.
          3SG-invite Fred but NEG Fred ONLY 3SG-invite
          'She invited Fred, but she didn't only invite Fred.'

Negation in the second clause of (35-a) and (35-b) targets the at-issue meaning component, i.e., the prejacent and the exhaustive inference, respectively. Therefore (35-a) can be paraphrased as 'She invited Fred but she didn't invite Fred' which leads to a contradiction and thereby it is unacceptable. (35-b), on the other hand, states that she invited Fred but Fred was not the only person she invited which does not yield the contradiction and therefore (35-b) is acceptable.

    The observation that the exhaustivity triggered by the particle *ni* is not-at-issue and the one triggered by the particle *pɛ* is at-issue is confirmed by the results of the test presented below. Its design is based on the methodology presented in Onea and Beaver (2009).[13] The test consists of pictures and their descriptions. The descriptions included either the particle *ni* or the exclusive particle *pɛ*. The pictures, on the other hand, were designed to violate a potential exhaustive interpretation of the pictures descriptions. The language consultants were asked to correct the description if it does not correspond to what they can see in the picture. They could choose one out of three possible answers: 'Yes, ...,' 'Yes, but...,' or 'No, also x... .' Consider (36) and (37).[14,15]

(36)   picture: A girl (Dora) is holding an orange and a tomato.

    A: Àkwàdú **nì**   Dora hé.
        orange   PRT Dora buy
        'It was an orange that Dora bought.'
      (i)   Hɛ̀ɛ́ nì   Dora hé àmóò hú.
           yes and Dora buy tomato also
           'Yes and Dora also bought a tomato.'

---

[13]Note, however, that originally Onea and Beaver (2009) did not use this methodology to discuss the (not)-at-issueness of the exhaustivity effect generated by clefts and *only* but to show that the exhaustivity effect generated by exclusive particles is stronger than one generated by clefts (semantic vs. pragmatic effect). The results of this experiment are reinterpreted in Destruel et al. (2015) who claim that 'yes, but' answer does not check the source of the inference (pragmatics vs. semantics) but the status of the inference (at-issue vs. not-at-issue).

[14]Caption 'preferred answer' indicates answers chosen by the language consultants.

[15]Note that in the test presented in examples (22) and (23) the language consultants accepted 'No, x also' answer as the dissent of sentences with the *ni*-structure. I argue that it is due to the fact that while examples (22) and (23) constitute a categorial acceptability judgment test, example (36) is a multiple-choice task. In the first case, the language consultants accepted sentences with *ni*, because the *ni*-structure triggers an exhaustive interpretation. In the case of (36), on the other hand, they prefer 'yes, but' answer, because this effect is not-at-issue. Thank you to Malte Zimmerman (p.c.) for pointing this out to me.

(ii)   Hὲέ shí Dora hé àmóò hú.   ⇒ preferred answer
yes but Dora buy tomato also
'Yes, but Dora also bought a tomato.'

(iii) Dààbí, Dora hé àmóò hú.
no   Dora buy tomato also
'No, Dora bought also a tomato.'

(37)   picture: Two girls (Lisa and Eva) are eating oranges.

A: Lisa **p**ɛ́ yè-ɔ̀   àkwàdú bíànɛ́.
Lisa only eat-IMPF orange now
'Only Lisa is eating an orange now.'

(i)   Hὲέ nì Eva hú yè-ɔ̀   àkwàdú bíànɛ́.
yes and Eva also eat-IMPF orange now
'Yes and also Eva is eating an orange now.'

(ii) Hὲέ shí Eva hú àkwàdú yè-ɔ̀   bíànɛ́.
yes but Eva also orange eat-IMPF now
'Yes, but also Eva is eating an orange now.'

(iii) Dààbí, Eva hú yè-ɔ̀   àkwàdú bíànɛ́.   ⇒ preferred answer
no   Eva also eat-IMPF orange now
'No, Eva is also eating an orange now.'

While in the case of the description with the particle *ni*, example (36), the preferred answer is 'Yes, but,' in the case of the description containing the exclusive particle *pɛ*, example (37), the preferred answer is 'No, ...' The answers are in line with Tonhauser's (2012) claim that 'yes' and 'no' trigger an at-issue content. Moreover, Tonhauser (2012) uses assents/dissents with adversative continuation, such as example (37-ii), as one of the diagnostics for the at-issue content. 'The assumption is that utterances where adversative continuations convey the hypothesized at-issue content are contradictory, and hence unacceptable, while utterances where assent/dissent is followed by an adversative utterance that conveys hypothesized not-at-issue content are acceptable.' (Tonhauser, 2012, p.245).[16] In (36-ii), 'yes' confirms the at-issue content, i.e., the fact that Dora bought an orange and 'but' triggers a comment on the not-at-issue content, i.e., the exhaustivity inference. In sum, (36) can be paraphrased as 'Yes, Dora bought an orange but it was not the only thing she bought.' In (37), on the other hand, 'no' negates the at-issue content, i.e., the fact that nobody but Lisa is eating an orange. Hence, (37-iii) can be paraphrased as 'It's not the case that nobody but Lisa is eating an orange, Eva is also eating an orange.'

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[16]The results are also in line with Destruel et al. (2015), who claim that 'yes, but' answer diagnoses a (not)-at-issueness of the inference.

Problematic data   The data presented so far show that whereas the exhaustivity inference triggered by the particle *ni* is not-at-issue, the exhaustivity triggered by the exclusive particle *pɛ* is at-issue. However, the picture is not quite so simple. Consider (38) in which the exhaustivity effect triggered by the particles *ni* and *pɛ* seems to be of the same nature, which is problematic for the above generalization:

(38)   a.   Jèèè Fred **nì** è-fɔ̀   nìnè è-tsɛ́   lɛ. È-tsɛ́   Fred kɛ̀ Gord.
             neg Fred PRT 3SG-throw hand 3SG-call PRT 3SG-call Fred and Gord
             'It wasn't Fred she invited. She invited Fred and Gord.'

       b.   Jèèè Fred **p**ɛ́   è-fɔ̀   nìnè è-tsɛ́. È-tsɛ́   Fred kɛ̀ Gord.
             neg Fred only 3SG-throw hand 3SG-call 3SG-call Fred and Gord
             'She didn't only invite Fred. She invited Fred and Gord.'

At first sight, the acceptability of (38-a) appears to suggest that the exhaustivity effect generated by *ni* is at-issue, contrary to the evidence presented so far. Nonetheless, I claim that (38) is not a counterargument to the picture shown so far. The motivation for this view and the solution to the puzzle generated by (38) is explicated in section 4.4.3.

To sum up, examples (33) – (37) show that the exhaustivity effect generated by the particle *ni* is of a different kind than the exhaustivity effect triggered by the exclusive particle *pɛ*. Whereas the exhaustivity triggered by the particle *ni* is not-at-issue, the exhaustivity triggered by the exclusive particle *pɛ* is at-issue.

4.2.2.3 Non-cancellation of the exhaustivity effect

Based on the data in (39) and (40), I argue that the exhaustivity effect triggered by the particle *ni* is not-cancellable:

(39)   ?Felix **nì** káné wòlò nyɛ̀.   Nì Kòfí hú káné wòlò nyɛ̀.
       Felix PRT read book yesterday and Kofi also read book yesterday
       'It was Felix who read a book yesterday. And Kofi also read a book yesterday.'

(40)   #Bànkú **nì** Kòfí yè nyɛ̀.   Nì àmádàá hú Kofi yè nyɛ̀.
       banku PRT Kofi eat yesterday and plantain also Kofi eat yesterday
       'It was banku that Kofi ate yesterday. And Kofi ate also plantain yesterday.'

While the language consultants gave mixed acceptability judgments regarding cancellation of the exhaustivity effect with the subject as the pivot, they gave clear judgments when the DO was the pivot. All in all the data suggest that the exhaustivity generated by the particle *ni* is rather not cancellable.

4.2.3 Existential inference

The *ni*-structure triggers an existential inference, i.e., the inference that there is an entity that satisfies the backgrounded description. A first piece of data motivating empirically this view is the contrast in (41):

(41) a. ?Jèèè mòkò   mòkò   **nì** káné wòlò nyὲ.
          NEG somebody somebody PRT read book yesterday
          'It was nobody who read a book yesterday.'

      b. Jèèè mòkò   mòkò   káné wòlò nyὲ.
          NEG somebody somebody read book yesterday
          'Nobody read a book yesterday.'

It seems that (41-a) is dispreferred due to the contradiction between the existential inference triggered by the *ni*-structure that somebody read a book yesterday and the asserted information that nobody read a book yesterday.

Further evidence that the *ni*-structure triggers an existential inference comes from the results of the following test taken from Rooth (1999). Consider the context in (42) and two answers for Q's question, i.e., A1 and A2. Answer (42-A2) is infelicitous because of the clash between *ekolε jeeenakai* 'probably not' suggesting that probably nobody won and an existential presupposition triggered by the *ni*-structure that somebody won.

(42)   context: In my department, a football pool is held each week, where people bet on the outcomes of games. It is set up so that at most one person can win; if nobody wins the prize money is carried over to the next week:

   Q: Did anyone win the department football pool this week?
   A1: Ékólɛ́ jèèè-nàkàí éjàáḱɛ èfɔ̀ɔ̀kàà áḱɛ Màríà yè kùníḿ nì lὲ pɛ́
        perhaps NEG-that because unlikely COMP Maria win victory and 3SG only
        jí-mò-ní   yè-ɔ̀   kùníḿ.
        be-person-who win-IMPF victory
        'Probably not because it's unlikely that Mary won it and she is the only person who ever wins.'
   A2: ?Ékólɛ́ jèèè-nàkàí éjàáḱɛ èfɔ̀ɔ̀kàà áḱɛ Màríà **nì** yè kùníḿ nì lɛ́
        perhaps NEG-that because unlikely COMP Maria PRT win victory and 3SG
        pɛ́ jí-mò-ní   yè-ɔ̀   kùníḿ.
        only be-person-who win-IMPF victory
        'Probably not because it's unlikely that it was Maria who won it and she is the only person who ever wins.'

Note, however, that 'nobody' and 'nothing' are acceptable as answers to a question with the particle *ni*, as illustrated in (43):

(43) Q: Námɔ̀ **nì** káné wòlò nyɛ̀?
          Who PRT read book yesterday
          'Who is it that read a book yesterday?'

      A: Jèèè mòkò.
          neg somebody
          'Nobody.'

(44) Q: Mɛ́nì **nì** Kòfí káné nyɛ̀?
          What PRT Kofi read yesterday
          'What is it that Kofi read yesterday?'

      A: Jèèè nókó.
          neg something
          'Nothing.'

At first glance, the data like (43) and (44) appear to be a counterargument against the existential inference triggered by the *ni*-structure. At the same time, however, it was argued in the literature, e.g., by Velleman et al. (2012), that 'nobody/nothing' do not function as an answer to a question but rather indicates its rejection. Hence, it suggests that (43) and (44) are not conclusive evidence against triggering an existential presupposition by the *ni*-structure.

To sum up this whole section, the particle *ni* yields a structural bi-partition into the focused constituent to its left and the backgrounded material to its right. Moreover, it induces additional interpretive effects, i.e., it turns out that the pivot is interpreted exhaustively and the *ni*-structure triggers an existential inference.

4.3 Possible analyses of the particle *ni*

In this section, I discuss three possible analyses of the particle *ni*. First, in subsection 4.3.1, I review Dakubu's (2005) analysis of *ni* as a focus marker. Even though it captures the information structural properties of sentences with the particle *ni*, it does not say anything about other semantic properties of the particle *ni* and therefore it seems to be too general. Subsequently, in subsection 4.3.2, I show that the particle *ni*, regardless of many similarities, does not function as the Hausa particle *nee/cee* and therefore cannot be analyzed in line with Hartmann and Zimmermann's (2007a) analysis of *nee/cee*. Finally, in subsection 4.3.3, I present the third possible analysis of the particle *ni* as introducing a cleft structure (*ni*-structure). I argue that this analysis comes closest to empir-

ical adequacy and therefore the particle *ni* should be analyzed as inducing a structural bi-partition similar to clefts.

4.3.1 *Ni* as a focus marker (Dakubu, 2005)

On Dakubu's (2005) account, the particle *ni* is analyzed as a focus marker. In the previous sections, it was shown that *ni* induces a structural bi-partition in which the focused constituent is obligatorily to its left. Thereby, whenever there is a particle *ni*, there is a focus to its left and for that it can be treated as a focus marker. Note, however, that it is not an obligatory morphological focus marker unlike some obligatory morphological focus markers on subjects in other West African languages, e.g., the particle *wɛ̀* in Fɔn (Kwa, Gbe) or *yé* in Bole (West Chadic) (Fiedler et al., 2010).[17] In addition, the particle *ni* cannot mark in-situ focus, as it was presented in (6), repeated below:

(45)   Mɛ́nì (nì) Kòfí káné nyɛ̀?
       what PRT Kofi read yesterday
       'What did Kofi read yesterday?'

    a.   *Kòfí káné àdèsáwòlò **nì**   nyɛ̀.
           Kofi read newspaper PRT yesterday
           intended: 'Kofi read A NEWSPAPER yesterday.'

    b.   Àdèsáwòlò **nì**   Kòfí káné nyɛ̀.
           newspaper PRT Kofi read yesterday
           'It was a newspaper that Kofi read yesterday.'

The analysis of the particle *ni* as a focus marker should address the question in which configurations the focus particle is required and explain why.

4.3.2 *Ni* as equivalent of the Hausa particle *nee/cee* (Hartmann and Zimmermann, 2007a)

Hartmann and Zimmermann (2007a) describes in detail the syntactic distribution and the semantic properties of the Hausa particle *nee/cee*. They propose analyzing it as a focus-sensitive exhaustivity marker. Crucially, the particle *nee/cee* shows similar properties to the Ga particle *ni* suggesting the possibility of a parallel analysis. First, *nee/cee*, as the particle *ni*, tends to co-occur with the fronted ex-situ focus, as in (46):

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[17]For a detailed discussion on focus realization in Ga, see chapter 2, section 2.2.

(46)   a.   [Dèelu]*_F* (**cèe**) takèe   sôn àgoogo.
                Deelu   PRT   3SG.FEM.REL.CONT want watch
                'DEELU wants a watch.'

          b.   [Àgoogo]*_F* (**nèe**) Dèelu takèe   sô.
                watch   PRT   Deelu 3SG.FEM.REL.CONT want
                'Deelu wants A WATCH.'

                                  (from Hartmann and Zimmermann, 2007a, p.244)

Second, the particle *nee/cee*, as with *ni*, is not obligatory, i.e., (46-a)–(46-b) are also acceptable without the particle *nee/cee*.[18] Finally, the particle *nee/cee* same as the particle *ni* gives rise to the exhaustivity effect. Consider (47), which is the Hausa version of the Ga example presented in subsection 4.2.2.1.[19] It turns out that introducing *nee/cee* to the sentences yields the same effects as introducing the particle *ni*; see example (28).

(47)   context: A student *D′* (as in *daalìbii* 'student') who is anxious that he might have failed a test approaches teacher *M* (as in *maalàamii* 'teacher') and asks: 'Can you tell me whether I have passed or not?' Unfortunately, teachers are by law forbidden to tell a student directly about his or her result. However, there is no law forbidding them to talk about other students' performances.

        D′: (Koo) naa   ci jařřàbâwaa?
             Q   1SG.PERF eat exam
             'Have I passed the exam?'

        M: Bà zâ-n   gayà makà ba àmmaa Musà (**nee**) bà-i   ci jařřàbâwaa
             NEG FUT-1SG tell   you NEG but   Musa PRT NEG-3SG eat exam
             ba.
             NEG
             'I will not tell you, but MUSA (nee) has not passed the test.'

        (i)   with *nee*: D′ can assume that he has passed.

        (ii)   without *nee*: D′ cannot find out anything about himself.

                              (from Hartmann and Zimmermann, 2007a, p.255)

Despite the similarities, I argue that the particle *ni* cannot be properly analyzed in line with Hartmann and Zimmermann's (2007a) analysis of the particle *nee/cee*. First, *ni* has a rigid syntactic position: it introduces a bi-partition in which the focused constituent is to its left and the backgrounded material to its right. By contrast, the particle *nee/cee* does not have a rigid syntactic position and hence it does not induce a structural bi-

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[18]Note, however, that since the context is not provided, it is impossible to tell whether (46-a)–(46-b) have the same properties irrespective of the presence or absence of *nee/cee*.

[19]In fact, the Hausa example is the original one and the Ga example is based on it.

partition. In particular, unlike *ni*, *nee/cee* can occur with in-situ focus, as illustrated in (48-A1):

(48) Q: Mèenee nèe Tánko ya   sàyaa à kàasuwaa?
         what   PRT Tanko 3SG.REL.PERF buy   at market
         'What did Tanko buy at the market?'

     A1: Tankò yaa   sàyi kàazaa **nèe** à kàasuwaa.
         Tanko 3SG.ABS.PERF buy chicken PRT at market

     A2: Tankò yaa   sàyi kàazaa à kàasuwaa **nè**.
         Tanko 3SG.ABS.PERF buy chicken at market   PRT
         'Tanko bought CHICKEN at the market.'
                                    (from Hartmann and Zimmermann, 2007a, p.246–247)

Second, closer scrutiny shows also that *ni*, unlike *nee/cee*, cannot associate with focus from a distance, compare (48-A2) and (49-A).

(49) Q: Mɛ́nì (nì) Kòfí yè nyɛ̀?
         what Kofi PRT eat yesterday
         'What did Kofi eat yesterday?'

     A: *Àbèlé Kòfí yè **nì**.
         corn   Kofi eat PRT
         intended: 'It was corn that Kofi ate yesterday.'

For that reasons, I conclude that the particle *ni* does not function as the Hausa particle *nee/cee* and therefore cannot be analyzed in a fully parallel way.

4.3.3 *Ni* as introducing a cleft structure

Various different structures were analyzed as clefts across languages. What they have in common is a clear structural bi-partition into the focused constituent on the one hand and the backgrounded/presupposed material on the other. In that sense, cleft structures are treated as designated focus markers.[20] Moreover, clefts typically introduce additional meaning components in comparison to non-clefted focus structures,

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[20] It is a separate question how to differentiate clefting from reordering (e.g., focus fronting). Since clefts have had syntactic analyses both in terms of movement (e.g., Kayne, 1994; Kiss, 1998; Torrence, 2013) and base-generation (e.g., Hartmann and Zimmermann, 2012; Hole and Zimmermann, 2013) on the one hand and in terms of monoclausal (e.g., Meinunger, 1998; Skopeteas and Fanselow, 2010; Mathew, 2013) and biclausal structure (e.g., Akmajian, 1970; Percus, 1997; Hedberg, 2000) on the other, it suggests that structural criteria are insufficient in order to differentiate them. It seems that clefting requires additional morphological marking which is not always required by fronting. Moreover, it induces additional interpretive effects, typically exhaustive and existential inferences. A discussion on the semantic and syntactic differences between reordering and clefting in a cross-linguistic perspective is left for future research.

i.e., exhaustive and existential inferences.[21] For illustrative purposes, consider a German construction in (50-A):

(50)   Q: Wer hat gestern   'Schuld und Sühne'   gelesen?
             who have yesterday 'Crime and Punishment' read
             'Who read 'Crime and Punishment' yesterday?'
       A: **Es war** Klaus, **der** gestern   'Schuld und Sühne'   gelesen hat.
             it was Klaus that yesterday 'Crime and Punishment' read   have
             'It was Klaus who read 'Crime and Punishment' yesterday.'

There is a clear structural bi-partition in (50-A) into the focused constituent ('Klaus') and the backgrounded material. Moreover, the focused constituent is interpreted exhaustively, as demonstrated in (51):

(51)   #Es war Klaus, der gestern   'Schuld und Sühne'   gelesen hat und es war
        It was Klaus that yesterday 'Crime and Punishment' read   have and it was
        Helga, die gestern   'Schuld und Sühne'   gelesen hat.
        Helga that yesterday 'Crime and Punishment' read   have
        'It was Klaus who read 'Crime and Punishment' yesterday and it was Helga

        who read 'Crime and Punishment' yesterday.'

Finally, the German 'Es war... die'-construction triggers an existential inference, as illustrated by the unacceptability of *niemand* ('nobody') as the pivot:

(52)   [?] Es war niemand, der gestern   'Schuld und Sühne'   gelesen hat.
            It was nobody   that yesterday 'Crime and Punishment' read   have
            'It was nobody who read 'Crime and Punishment' yesterday.'

Therefore, I argue that German 'Es war... die'-construction is a cleft structure.

   Crucially, the Ga *ni*-structure behaves precisely like the German 'Es war... die'-construction. First, the particle *ni* introduces a clear bi-partition into the focused constituent to its left and the backgrounded material to its right. Second, it gives rise to an exhaustivity and an existential inference. Thus, I conclude that the *ni*-structure can be analyzed as a cleft structure.

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[21] For the opposite view, namely that clefts are not necessarily exhaustive, see among others Horn (1981); Davis et al. (2004); Dufter (2009) and for the view that clefts do not necessarily trigger an existential inference, see Büring and Križ (2013).

4.4 Analysis

In this section, I give a syntactic and a semantic analysis of the particle *ni*. First, in subsection 4.4.1, I provide a sketch of the syntactic analysis of the *ni*-structure. Subsequently, in subsection 4.4.2.2 I give a brief overview of the existing semantic theories of cleft structures available on the market. Finally, in subsection 4.4.3 I put forward a semantic analysis of the *ni*-structure.

4.4.1 The syntax of the *ni*-structure

In the previous literature, clefts were analyzed as both exhibiting a bi-clausal (e.g., Akmajian, 1970; Percus, 1997; Hedberg, 2000) and a monoclausal structure (e.g., Meinunger, 1998; Skopeteas and Fanselow, 2010; Hiraiwa and Ishihara, 2002; Mathew, 2013). For the *ni*-structure in Ga, I propose the following monoclausal structure with the clefted Subject and the Direct Object (DO) in (53) and (54), respectively:

(53) SUBJECT IN THE PIVOT

    A: Who ate banku?

    B: Kòfí **nì** yè bàǹkú.
       Kofi PRT eat banku.
       'It is Kofi who ate banku.'

(54) DO IN THE PIVOT

    A: What did Kofi eat?

    B: Bàǹkú **nì** Kòfí yè.
       banku PRT Kofi eat.
       'It was banku that Kofi ate.'

```
(53)                  FP                       (54)              FP
              ┌───────┴───────┐                         ┌────────┴────────┐
          Kofi₁             FP                       banku₂              FP
                      ┌──────┴──────┐                              ┌──────┴──────┐
                     ni            IP                             ni            IP
                            ┌──────┴──────┐                              ┌──────┴──────┐
                           e₁            VP                            Kofi           VP
                                   ┌──────┴──────┐                                ┌─────┴─────┐
                                  ye           banku                             ye          e₂
```
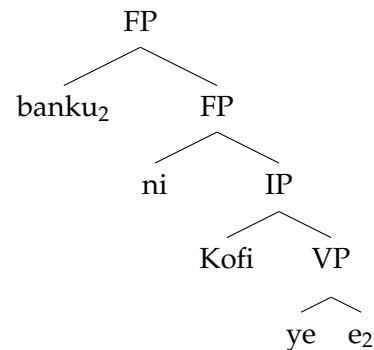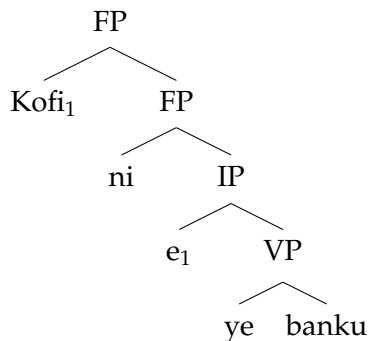
I defend the claim that the Ga *ni*-structure is a monoclausal cleft structure based on the following evidence. First, there is no overt relative morphology in (53) as well as in (54) that could suggest a bi-clausal structure. By contrast, relative clauses in Ga require the overt relativizer, as presented in (55):

(55) a. Mì-hé wòló lɛ *(ní) mì-káné.
        1SG-buy book DET REL 1SG-read
        'I bought the book that I read.'

    b.   nùú lɛ   *(ní) mì-lè
          man DET REL 1SG-know
          'the man that I know'

Moreover, inserting overt relative morphology to Ga cleft sentences leads to their un-acceptability, as shown in (56):

(56)   a.   Bàǹkú nì mì-yè nyɛ̀.
           banku PRT 1SG-eat yesterday
      b.   *Bàǹkú nì ní mì-yè nyɛ̀.
           banku PRT REL 1SG-eat yesterday
      c.   *Bàǹkú ní nì mì-yè nyɛ̀.
           banku REL PRT 1SG-eat yesterday
           intended: 'It was banku I ate yesterday.'

Second, sentences with the *ni*-structure can occur embedded inside relative clauses without violating complex NP-constraints (Ross, 1967), i.e., the *ni*-structure does not constitute an island for extraction, which would be expected if it involved a relative-like bi-clausal structure. Note first that relative clauses in Ga are derived by movement, which is suggested by the lack of the resumptive pronoun in the place of the gap, as presented in (57):

(57)   Mì-káné wòlò ní   Deborah ŋmà.
        1SG-read book REL Deborah write
        'I read a book that Deborah wrote.'

Subsequently, example (58) illustrates an object-extraction out of the *ni*-structure. Its acceptability suggests that the *ni*-structure does not constitute an island for extraction and hence it does not involve a relative-like bi-clausal structure.

(58)   context: This book is written by Deborah and I read it.
        Mì-káné wòlò ní   Deborah nì   ŋmà.
        1SG-read book REL Deborah PRT write
        'I read a book that it was Deborah who wrote.'

By contrast, English bi-clausal *it*-clefts (e.g., Percus, 1997) cannot occur embedded inside relative clauses without violating complex NP constraints, as shown by the following:

(59)   *I read the book that it was Deborah who wrote.

Now the question is whether the focused constituent in the Ga cleft structure is extracted from its canonical position by means of focus movement (e.g., Kayne, 1994; Kiss, 1998; Torrence, 2013) or if it is base-generated in the left-peripheral position (e.g., Hartmann and Zimmermann, 2012, Hole and Zimmermann, 2013 for Japanese and Burmese clefts with nominalizations).[22] I argue that focused constituents in *ni*-structures are base-generated in the left-peripheral positions and are co-indexed with a covert pronoun inside the VP. My view is motivated empirically by the results of the tests discussed below.

The first piece of evidence that the focused constituent is base-generated in its left-peripheral position comes from the availability of long distance focus dependencies in syntactic islands (Hartmann and Zimmermann, 2012). Since movement out of syntactic islands is impossible, the possibility of clefting into them suggests that a pivot is base-generated out of the island. It also shows that no movement is required.[23] I present two types of syntactic islands: relative clauses and if-clauses.

The impossibility of clefting into relative clauses in English was discussed in the literature as an argument against base-generation of the focused constituents in English clefts in their left-peripheral position (e.g., Krifka, 2006).[24] In Ga, however, unlike in English, clefting into relative clauses is possible, which provides evidence for the base-generation of the pivot in its left-peripheral position.

(60)   context: I saw the man that stole Lisa's book.

     a. Mì-nà   nùú lɛ   ní   jù   Lisa wòlò.
        1SG-see man DET REL steal Lisa book
        'I saw the man that stole Lisa's book.'

     b. **Lisa wòlò nì** mì-nà   nùú lɛ́   ní   jù   lɛ̀.
        Lisa book PRT 1SG-see man DET REL steal 3SG
        'It was Lisa's book that I saw the man who stole it.'

Examples (61) and (62), in turn, illustrate the possibility of clefting into another syntactic islands, i.e., if-clauses. This supports the view that the focused constituents are base-generated in the left-peripheral position, both with Subjects and DOs:

(61)   SUBJECT IN THE PIVOT:

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[22]Hartmann and Zimmermann (2012) analyze clefts in Bura as being generated in the left-peripheral position. However, they postulate a null-operator movement inside the CP in order to fully account for Bura data. I argue that Ga data can be analyzed without postulating a null-operator movement.

[23]In particular a null-operator movement assumed by Hartmann and Zimmermann (2012) for clefts in Bura.

[24]See also Rooth (1996) for a discussion on the focus extraction out of relative clauses.

    a. Kɛ́jí **Màríà wú** lɛ hé wùɔ́lòó lɛ, Màríà bàá-hòó gbɛ́kɛ̀
       If Maria husband DET buy chicken DET Maria PROSP-cook evening
       níyéníí.
       food
       'If Maria's husband buys a chicken, Maria will cook a dinner.'

    b. **Màríà wú** **lɛ** **nì** kɛ́jí *(è)-hé wùɔ́lòó lɛ, Màríà bàá-hòó
       Maria husband DET PRT if 3SG-buy chicken DET Maria PROSP-cook
       gbɛ́kɛ̀ níyéníí.
       evening food
       'It is Maria's husband, if he buys a chicken, Maria will cook a dinner.'

(62)   DO IN THE PIVOT:

    a. Kɛ́jí Màríà wú lɛ hé **wùɔ́lòó** lɛ, Màríà bàá-hòó gbɛ́kɛ̀
       if Maria husband DET buy chicken DET Maria PROSP-cook evening
       níyéníí.
       food
       'If Maria's husband buys a chicken, Maria will cook a dinner.'

    b. **Wùɔ́lòó !l**ɛ́ **nì** kɛ́jí Màríà wù hé lɛ, Màríà bàá-hòó gbɛ́kɛ̀
       chicken DET PRT if Maria husband buy DET, Maria PROSP-cook evening
       níyéníí.
       food
       'It is the chicken, if Maria's husband buys it, Maria will cook a dinner.'

Note that there is an obligatory resumptive pronoun in (61-b) but not in (62-b).[25] It is in line with the observation that there is a frequent pro drop in Ga with non-human referents (Dakubu, 2004a). Compare (63-a) and (63-b):

(63)   a. Kòfí nà lɛ̀.
       Kofi see 3SG
       'Kofi saw him/her.'

---

[25]Note that the second *lɛ* in (62-b) is not a resumptive pronoun. Compare (62-b) with (i-b) in which the extracted object is plural and therefore the resumptive pronoun also should be the 3rd person plural *'amɛ.'*

(i)   a. Kɛji Maria wu lɛ he **wo-ji** lɛ, Maria baa-kane amɛ.
       if Maria husband DET buy book-PL DET Maria PROSP-read 3PL
       'If Maria's husband buys books, Maria will read them.'

    b. **Wo-ji** **nì** kɛji Maria wu lɛ he lɛ, Maria baa-kane amɛ.
       book-PL PRT if Maria husband DET buy DET Maria PROSP-read 3PL
       'It is books, if Maria's husband buys them, Maria will read them.'

b. Kòfí nà (*lὲ).
    Kofi see
    'Kofi saw it.'(dog)   (from Dakubu, 2004a, p.5–6)

Further support for a base-generation of the focused constituent in its left-peripheral position comes from the unavailability of reconstruction effects with clefted reflexive pronouns and reciprocals. The movement analysis predicts that reflexive pronouns in the pivot are related to its base-generated position in the VP by a movement chain (Heycock, 1995; Fox, 2000, among others). Hence, the reflexive pronouns should be able to reconstruct in order to be locally bound by the DP-antecedent (without violation of Principle A), contrary to fact:

(64) a. Màríà jù **è-hè** nyὲ.
          Maria bath 3SG-REFL yesterday
          'Maria washed herself yesterday.'

      b. #**È-hè**   **nì** Màríà jù nyὲ.
          3SG-REFL PRT Maria bath yesterday
          intended: 'It was herself that Maria washed yesterday.'

(65) a. Màríà kὲ John wá **àm**ὲ **hè** nyὲ.
          Maria and John help 3PL REFL yesterday
          'Maria and John helped each other yesterday.'

      b. ***Àm**ὲ **hè** nì Màríà kὲ John wá.
          3PL REFL PRT Maria and John help
          intended:'It was each other that Maria and John helped.'

At the same time, pronouns can be the pivot, so the unacceptability of (64-b) and (65-b) cannot be due to the general impossibility of clefting pronouns, as presented in (66):

(66) Q: Who read a book yesterday?
      A1: Mì nì mì-káné wòlò nyὲ
          1SG PRT 1SG-read book yesterday
          'It was me who read a book yesterday'
      A2: Lὲ nì è-káné wòlò nyὲ
          3SG PRT 3SG-read book yesterday
          'It was she who read a book yesterday'
      A3: Àmὲ nì àmὲ káné wòlò nyὲ
          3PL PRT 3PL read book yesterday
          'It was they who read a book yesterday'

However, it still might be that (64-b) and (65-b) are unacceptable due to other reasons than the base-generation of pivots in the left-peripheral position. For example, it could be due to a weak or a strong crossover effect or a lack of reconstruction effect in general. For these reasons, I argue that the impossibility of clefting reflexive pronouns and reciprocals is just suggestive evidence against the movement analysis of clefts in Ga.

Yet another piece of evidence that focused constituents in Ga clefts are base-generated in the left-peripheral position comes from the clefting of idiomatic expressions. The impossibility of clefting part of the idiom preserving the idiomatic meaning suggests that the focused element is not base-generated inside the VP and it does not form a constituent with the V in any step of the derivation. Therefore, the element in the pivot cannot reconstruct and the idiomatic interpretation is blocked (e.g., Hartmann and Zimmermann, 2012; Torrence, 2013).[26] Consider (67):[27]

(67)   context: Kofi died five months ago.

         a.   Kòfí é-kííkí   glògá.
              Kofi PFV-kick bucket
         b.   *Glògá nì   Kòfí é-kììkì.
              bucket PRT Kofi PFV-kick
              intended: 'Kofi died.'

It turns out that *kiikii gloga* ('to kick the bucket') can get its idiomatic meaning ('to die') only when both elements of the idiomatic expression are in their canonical position inside the VP. A language consultant gave a comment that (67-b) means that Kofi didn't walk carefully and he literally kicked the bucket; it cannot mean or it will need a long explanation to make it clear that one actually wanted to say that Kofi is dead.

Compare (67) with Wolof idiomatic expressions whose meaning is preserved when the part of the idiom is clefted (Torrence, 2013). The non-clefted Wolof idiomatic expression is given in (68-a) and its clefted version in (68-b).

(68)   a.   Sa   jaan   wácc-na   WOLOF
              your snake descend-FIN
              'You have finished you work.'

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[26]See also Fanselow and Lenertová (2011) on the discussion of German idiomatic expressions and the possibilities of fronting part of them to the left-peripheral positions.

[27]This test was conducted with one Ga native speaker in Berlin. When asked for an example of the idiomatic expression in Ga, she gave *kiikii gloga* 'to kick the bucket.' It might be that it is a translation from English. Conducting this test with other idiomatic expressions is left for future research.

b. Sa   jaan   mu a   wácc
   your snake 3SG COP descend
   'You have finished your work'
   (literally: It is your snake that has descended)

(from Torrence, 2013, p.212)

Examples like (68) were given as arguments for a movement analysis of the clefted constituents in Wolof clefts.[28]

To summarize, I argued that the Ga *ni*-structure is a monoclausal cleft structure in which the focused constituent is base-generated in the left-peripheral position. The view that the *ni*-structure is monoclausal is supported by the lack of the overt relative morphology and occurring of the *ni*-structure embedded inside the restrictive relative clauses. I addition, I concluded that focused constituents in *ni*-structures are base-generated in the left-peripheral position, from where they are co-indexed with a covert pronoun inside the VP, based on the evidence coming from the possibility of clefting into syntactic islands (*if*-clauses and relative clauses) and from the reconstruction effect with reflexives, reciprocals, and idiomatic expressions. In the next subsection, I discuss the main issues in the semantics of clefts.

4.4.2 The semantics of cleft structures

It is often proposed that clefts trigger at-issue (assertion) and not-at-issue content, i.e., an existential and an exhaustivity inference, as illustrated in (69):

(69)   It was Kofi who swam.

   a. *at-issue*: swam(Kofi)

   b. *existential presupposition:* $\exists x[\text{swam}(x)]$

   c. *exhaustivity effect*: ?

While there is a general agreement that clefts do assert and do trigger an exhaustivity inference modeled in various ways,[29] several arguments have been given against the existential inference (Büring, 2011; Büring and Križ, 2013). In this section, I discuss

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[28]Radek Šimík (p.c.) pointed out to me that the unacceptability of (67) and the acceptability of (68) might be on independent grounds. Namely, it could be due to the fact that one tries to interpret "bucket" in (67) as the part of the idiom. At the same time, however, one is forced to compute alternatives to the pivot, which in the case of (67) are of the form *Kofi kicked a chair, Kofi kicked a table, Kofi kicked a sofa*, etc. This would be the case even if there was a movement dependency between the pivot and the trace inside the VP.

[29]cf. footnote 21.

the main semantic issues concerning the not-at-issue meaning components which are potentially triggered by clefts.

4.4.2.1 The existential presupposition

Percus (1997) and Rooth (1999), among others, claim that English cleft-constructions trigger the existential presupposition and they provide a number of evidence supporting their claim. One piece of evidence comes from the impossibility of clefting 'nobody' and 'nothing', as in (70), taken from Percus (1997):

(70)   Q: Who saw John?
        A: *It was nobody who saw John.

(70-A) is unacceptable because the existential presupposition triggered by the cleft contradicts the statement that nobody saw John.

   Another piece of data suggesting that clefts trigger an existential presupposition is the football pool example, given by Rooth (1999):

(71)   context: In my department, a football pool is held each week, where people bet on the outcomes of games. It is set up so that at most one person can win; if nobody wins, the prize money is carried over to the next week:

        Q: Did anyone win the department football pool this week?
        A1: Probably not because it's unlikely that Mary won it and she is the only person who ever wins.
        A2:#Probably not because it's unlikely that it is Mary who won it and she is the only person who ever wins.

(71-A2) is infelicitous because of the clash between 'probably not' suggesting that probably nobody won and the existential presupposition triggered by clefts suggesting that somebody won.

   On the contrary, Büring (2011) and Büring and Križ (2013) argue that the exhaustivity and existential inferences which are triggered by clefts[30] are independent from each other. Whereas the first one is always present, the latter can be ignored, as shown by the following.

(72)   Q: Did John call Mary, or Mary John?
        A: It was John who called Mary.

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[30]An exhaustivity effect triggered by clefts is discussed in subsection 4.4.2.2.

Büring (2011) and Büring and Križ (2013) claim that (72-A) cannot presuppose that someone called Mary, because this was precisely the point being asked. However, as noted by Velleman et al. (2012), (72-A) still presupposes that someone called someone and hence (72) cannot be perceived as a conclusive argument against the existential presupposition triggered by English cleft structures.

Another piece of data suggesting that clefts do not trigger the existential presupposition is its cancellation in appropriate contexts like the one in (73), given by Levinson (1983):

(73)   You say that someone in this room will betray you. Well maybe so. But it won't be Luke who will betray you, it won't be Paul, it won't be Matthew, and it certainly won't be John. Therefore no one in this room is actually going to betray you.

Velleman et al. (2012) claim however that (73) is an instance of a rhetorical strategy *reductio ad absurdum*. They argue that the speaker for the sake of argument seemingly accepts the possibility that somebody wants to betray her interlocutor in order to finally reject this possibility.

In conclusion, it seems that the given arguments against the existential presupposition of English clefts are not conclusive. Looking at Ga, it appears that also the *ni*-structure triggers the existential inference (see subsection 4.4.2.1).

4.4.2.2 The exhaustivity inference

Various proposals have been made on how to model clefts' exhaustivity inference. There have been proposals to model it as an assertion (Bolinger, 1972; Atlas and Levinson, 1981; Szabolcsi, 1981b), a conversational implicature (Horn, 1981), and a presupposition (Percus, 1997; Velleman et al., 2012; Büring and Križ, 2013). The assertion analysis cannot be sustained since an exhaustivity effect, both in English and in Ga, is not-at-issue, as demonstrated in subsection 4.2.2.2. As an example, consider the contrast given in (33), repeated below.

(74)   a. #Bob lè   ákɛ́ è-kpèé   Fred shí è-lè-èè   ákɛ́ Fred **nì**
           Bob know that 3SG-invite Fred but 3SG-know-IMPF.NEG that Fred PRT
           è-kpèé.
           3SG-invite
           #'Bob knew she invited Fred, but he didn't know it was Fred she invited.'

b. Bob lè   ákέ è-kpèé   Fred shí è-lè-èè   ákέ Fred **p**έ
Bob know that 3SG-invite Fred but 3SG-know-IMPF.NEG that Fred only
è-kpèé.
3SG-invite
'Bob knew she invited Fred, but he didn't know she invited only Fred.'

A conversational implicature analysis, on the other hand, cannot be maintained, because an exhaustivity effect generated by cleft structures is not cancellable, as illustrated by the unacceptability of (75) and (76) in English and Ga, respectively:[31]

(75)   #It was John who ate pizza yesterday and Kofi also ate pizza.

(76)   #Bàǹkú nì   Kòfí yè nyὲ.   Nì àmádàá hú Kòfí yè nyὲ.
banku PRT Kofi eat yesterday and plantain also Kofi eat yesterday
'It was banku that Kofi ate yesterday. And Kofi ate also plantain yesterday.'

It seems that the most empirically adequate so far is the presuppositional analysis of the exhaustivity effect generated by clefts. Therefore, based on the reasons presented above, I argue for the presuppositional exhaustivity triggered by the *ni*-structure. The individual approaches to modeling it are discussed below.

'Unworkable' presuppositional analysis (Velleman et al., 2012)   Since clefts trigger both an existential and an exhaustivity inference, it is conceivable to assume that they generate the following meaning components:[32,33]

(77)   It was Kofi who swam.

    a.   *assertion*: Kofi swam.
    b.   *existential presupposition:* $\exists x[\mathrm{swam}(x)]$
    c.   *exhaustivity presupposition:* $\forall x[\mathrm{swim}(x) \to x = \mathrm{Kofi}]$

(adapted from Velleman et al., 2012, p.446)

Example (77) illustrates how important it is to carefully model the exhaustivity effect triggered by clefts and shows the problems that any presuppositional analysis of the

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[31]See, however, DeVeaugh-Geiss et al. (2015) for a pragmatic analysis of German clefts and the experimental data supporting this view. In particular, they claim that exhaustivity of clefts is a focus-triggered scalar implicature.

[32]Velleman et al. (2012) discuss this approach and give arguments why it cannot be sustained.

[33]Percus (1997) argues that clefts trigger an exhaustivity and an existential inference, as presented in (77-b) and (77-c). In particular, his proposal was to analyze clefts in the same way as definite descriptions. He claims that the cleft 'It is Kofi who swam' has the same semantics as the definite description in the pseudocleft 'The person who swam is Kofi.'

clefts' exhaustivity will have to deal with. In particular, (77) cannot be sustained due to many of the familiar criticisms. First, the exhaustivity presupposition together with the assumed existential presupposition make the assertion redundant. Since clefts are informative, the approach predicting the redundancy of the asserted content seems to be not correct (Velleman et al., 2012).

A further problem comes from the fact that the exhaustivity presupposition together with the existential presupposition modeled in (77) give incorrect predictions regarding presupposition projection. Since exhaustivity and existential inferences are modeled as presuppositions, they should project out of the scope of negation. However, under (77) it is not predicted. Consider (78):

(78)   It was not Kofi who swam.

     a.   *assertion:* Kofi did not swim.

     b.   *existential presupposition:* $\exists x[\mathrm{swam}(x)]$

     c.   *exhaustivity presupposition:* $\forall x[\mathrm{swim}(x) \rightarrow x = \mathrm{Kofi}]$

The problem is that it follows from (78-b) and (78-c) that Kofi swam which contradicts an assertion that Kofi did not swim, thereby predicting that the presupposition should be interpreted in the scope of negation, i.e., it should not project.

Moreover, Velleman et al. (2012) notice that if the exhaustivity and existential presuppositions modeled in (78) project, then (79) is predicted to be infelicitous, contrary to fact:

(79)   It wasn't Mary who laughed; it was Bill.   (from Velleman et al., 2012, p.446)

Due to these reasons, the meaning components of the Ga *ni*-structure cannot be modeled as presented in (77).

Velleman et al.'s (2012) analysis   Velleman et al. (2012) argue that clefts are focus-sensitive inquiry-terminating operators. They propose modeling the semantics of cleft structures in line with the semantics of exclusive particles analyzed in Coppock and Beaver (2011, 2012, 2014). On their account, the meanings of both clefted sentences and sentences with exclusive particles are characterized by two focus-sensitive operators, MAX$_S$ and MIN$_S$, defined in (80), where the subscript $_S$ indexed the current context:

CQ_S means that the context S include the Current Question, and $>_S$ and $\geq_S$ are salient partial orderings over the alternatives in CQ_S:[34]

(80)   a. $\text{MIN}_S(p) = \lambda w.\exists q \in CQ_S[q(w) \wedge (q \geq_S p)]$
             'There's a true answer at least as strong as p.'
        b. $\text{MAX}_S(p) = \lambda w.\forall q \in CQ_S[(q >_S p) \to \neg q(w)]$
             'No true answer is strictly stronger than p.'   (Velleman et al., 2012, p.451)

The semantics of clefts and exclusive particles is modeled using the same MIN and MAX meaning components. They differ, however, in their semantic status. While clefts assert $\text{MIN}_S(p)(w)$ and presuppose $\text{MAX}_S(p)(w)$, exclusive particles assert $\text{MAX}_S(p)(w)$ and presuppose $\text{MIN}_S(p)(w)$, as illustrated in (81):[35]

(81)   a. $\text{CLEFT}_S = \lambda w.\lambda p : \text{MAX}_S(p)(w).\text{MIN}_S(p)(w)$
        b. $[\![only]\!] = \lambda w.\lambda p : \text{MIN}_S(p)(w).\text{MAX}_S(p)(w)$ (Velleman et al., 2012, p.452)

Consider (82) and the diagram in (83):

(82)   It was Fred and Gord who she invited.

The asserted MIN conveys the meaning that 'there is a true answer at least as strong as (82).' In diagram (83), the alternatives delineated by the MIN component are written in boldface. The presupposed MAX, on the other hand, conveys the meaning that 'no true answer is strictly stronger than (82)', i.e., it excludes the alternative that Fred, Gord, and Bill were invited. The alternatives excluded by MAX are crossed out. The interaction between MIN and MAX meaning components correctly predicts that (82) is true iff Fred and Gord were invited and nobody else was invited.

(83)

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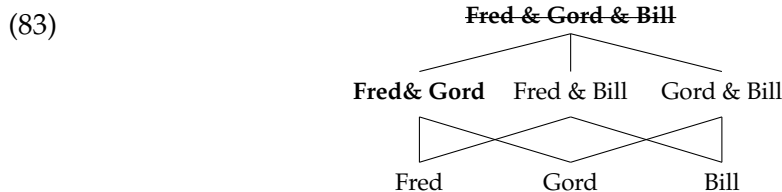
[34]Note that their formulation of the MAX meaning component differs from the one proposed by Coppock and Beaver (2014), see chapter 3, section 3.4.

[35]I follow Heim and Kratzer's (1998) convention in writing the presupposed material between the dot and the semicolon.

However, Velleman et al.'s (2012) approach also runs into trouble. Grubic (p.c.) noticed that Velleman et al. (2012) cannot account for clefted sentences with *only* in the pivot, as in (84):

(84)   It was only Kofi who swam.

Under their approach, *only* and clefts presuppose the MIN and the MAX content, respectively. Therefore, the asserted content is entailed by the presuppositions triggered by *only* and clefts, which makes it redundant. This in turn seems to give incorrect results, since sentences with exclusive particles in the pivot seem to be informative.

Looking at Ga, on the other hand, Velleman et al.'s (2012) approach predicts (85) to be unacceptable, contrary to fact:

(85)   Jèèè Fred nì è-fɔ̀   nìnè è-tsɛ́   lɛ. È-tsɛ́   Fred kɛ̀ Gord.
        NEG Fred PRT 3SG-throw hand 3SG-call PRT 3SG-call Fred and Gord
        'It wasn't Fred she invited. She invited Fred and Gord.'

The reason for that is as follows. Negation triggers the at-issue meaning component, which in the case of cleft structures is MIN. It says that there is no true answer at least as strong as the prejacent, which in the case of (85) equals to the statement that neither Fred was invited nor any plural entity containing Fred.

(86) $\neg\text{MIN}(\text{invite}(\text{Fred})) \vDash \neg\text{invite}(\text{Fred}) \wedge \neg\text{invite}(\text{Fred} \oplus \text{Gord}) \wedge \neg\text{invite}(\text{Fred} \oplus$
        $\text{Gord} \oplus \text{John})$

        (modeled after Velleman et al., 2012, p.454)

Importantly, since 'invite' is a distributive predicate,[36] (86) entails that Fred was not invited. Hence, $\neg\text{MIN}(\text{invite}(\text{Fred})) \vDash \neg\text{invite}(\text{Fred})$.

The MAX meaning component, on the other hand, presupposes a weaker statement that there is no true answer strictly stronger than 'Fred was invited', i.e., it states that every group containing Fred was not invited. However, Fred himself could have been. Hence, $\neg\text{MAX}(\text{invite}(\text{Fred})) \nvDash \neg\text{invite}(\text{Fred})$.

(87) $\neg\text{MAX}(\text{invite}(\text{Fred})) \vDash \neg\text{invite}(\text{Fred} \oplus \text{Gord}) \wedge \neg\text{invite}(\text{Fred} \oplus \text{Gord} \oplus \text{John})$

        (modeled after Velleman et al., 2012, p.455)

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[36]Distributive predicates predicate of the singular individuals that make up the plural individual; they have singular entities in their denotation. Collective predicates, on the other hand, predicate of plural individuals; they have only plural individuals in their denotation (e.g., Landman, 1989).

Since 'It wasn't Fred she invited' presupposes that any plural entity containing Fred was not invited, it cannot be continued with 'She invited Fred and Gord.' Therefore, it incorrectly predicts (85) to be infelicitous. Velleman et al. (2012) admit that they make this prediction.

Note, however, that if 'invite' is interpreted collectively, then they correctly predict (85) to be acceptable.[37] Since in the case of collective predicates there is no entailment relation between $P(a)$ and $P(a \oplus b)$, it is possible, under Velleman et al.'s (2012) formulation of MAX and MIN, that $P(a)$ is false and $P(a \oplus b)$ is true. Nevertheless, because of the problems with exclusive particles as the part of the pivot, I do not couch the analysis of the Ga *ni*-structure in Velleman et al.'s (2012) framework.

Büring's (2011) analysis   Büring (2011), as Percus (1997), assumes a parallelism between the semantics of cleft structures and definiteness. He argues that the exhaustivity effect generated by clefts and definite descriptions is presuppositional. To avoid the redundancy of the assertion, i.e., to keep it from being entailed by the presupposed content, Büring (2011) models the exhaustivity inference as a conditional:

(88)   It was Kofi who swam.

    a. *assertion:* Kofi swam.

    b. *presupposition:* If Kofi swam, then nobody else swam.
       if $P \in Q$, then $\{P\} = max(Q)$

Büring and Križ (2013) argue that Büring's (2011) theory makes the wrong predictions about the truth-value of sentences with collective predicates. Consider (89), taken from Büring and Križ (2013):

(89)   context: Bill and Fred carried the piano together, and neither of them did alone, nor did anyone else.

    T. #It was Bill who carried the piano.

    a. *assertion:* Bill carried the piano.

    b. *presupposition:* If Bill carried the piano, then nobody else carried the piano.

Their argumentation against the conditional exhaustivity is as follows: Since Bill is not in the extension of the collective predicate 'carry the piano' (its extension includes only the plural individual Bill $\oplus$ Fred), the antecedent of the conditional in (89-b) is false. Therefore, the presupposition (the whole conditional) should be true irrespective of the

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[37]This is also noted by Velleman et al. (2012).

truth value of the consequent. However, if Bill $\notin$ [[carry the piano]], then the assertion is false. Büring and Križ (2013) claim that this outcome is wrong because (89) is not false but neither true nor false, i.e., it suffers from the presupposition failure. In my opinion, however, given that it is very difficult to tear apart experimentally the presupposition failure from the falsity of the sentence (Abrusán and Szendrői, 2013) — naive native speakers seem to have no intuitions to distinguish one from the other — Büring and Križ's (2013) analysis predicting the presupposition failure in the case of (89) is not superior over the theory predicting the falsity of (89).

Looking at Ga, it turns out that this analysis cannot account for the data presented below:

(90)   Jèèè Fred nì   è-fɔ   nìnè è-tsɛ́   lɛ.   È-tsɛ́   Fred kɛ̀   Gord.
         NEG Fred PRT 3SG-throw hand 3SG-call PRT 3SG-call Fred and Gord
         'It wasn't Fred she invited. She invited Fred and Gord.'

The problem is at the assertion level. The assertion of the cleft sentence says that Fred was not invited (Fred $\notin$ [[invite]]). However, the second sentence states that Fred was invited (Fred $\in$ [[invite]]) leading to the contradiction.

To anticipate the analysis to come, in section 4.4.3 I propose a pragmatic rescue strategy which ameliorates Büring's (2011) analysis in such a way that it can account for the Ga data.

Büring and Križ's (2013) analysis   On Büring and Križ's (2013) theory of clefts, both an assertion and an exhaustivity presupposition of clefts as well as definite descriptions are defined in mereological terms, as given in (91), where $\oplus$ is a mereological sum operator (Link, 1983), and $\sqsubset$ is a proper mereological part-of-relation.[38]

(91)   It was *a* that *P*.

       a.   *assertion*: $\oplus[[P]] = [[a]]$

       b.   *presupposition*: $[[a]] \not\sqsubset \oplus[[P]]$ (from Büring and Križ, 2013, p.9)

(92), a variant of (91), is their final formulation of the assertion and the presupposition triggered by clefts:

(92)   It was *a* that *P*.

       a.   *assertion*: $[[P]]([[a]])$

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[38]$x \sqsubset y$ iff $x \sqsubseteq y \wedge x \neq y$, where $\sqsubseteq$ is a partial order relation, treated as a primitive relation; for an introduction to mereology, see Champollion (2010).

b. *presupposition*: $\forall x \in max(\llbracket P \rrbracket) : \llbracket a \rrbracket \not\sqsubset x$
    (where for any $P \in D_{\langle e,t \rangle}, max(P) = \{x \in P | \neg \exists y \in P(x \sqsubset y)\}$)

(from Büring and Križ, 2013, p.9)

Therefore, the sentence 'It was Kofi who swam' has the meaning components presented in (93). The presupposition of (93) predicts that either Kofi is the maximal swimmer or he did not swim at all.

(93)   It was Kofi who swam.

a. *assertion*: Kofi swam.
b. *presupposition*: Kofi is not a proper part of the sum of all people who swam.

Büring and Križ (2013) claim to make correct predictions for sentences with collective predicates, as in (89), repeated in (94).

(94)   context: Bill and Fred carried the piano together, and neither of them did alone, nor did anyone else.

T. #It was Bill who carried the piano.
a. *assertion:* Bill carried the piano. $\Rightarrow$?
b. *presupposition:* Bill is not a proper mereological part of the maximal piano-carrier. $\Rightarrow$ false

The presupposition of (94-T), given in (94-b), requires Bill not to be a part of the mereological sum of the maximal piano-carrier. However, Bill is a proper part of the maximal piano-carrier (Bill $\sqsubset$ Bill $\oplus$ Fred). Hence, their theory predicts a presupposition failure in the case of (94). This might give the correct results depending on the way the assertion is modeled. If the assertion generated by cleft structures is Bill $\sqsubset$ $\llbracket$carry the piano$\rrbracket$, i.e., Bill is the mereological part of the piano-carriers, then the assertion is true because Bill $\sqsubset$ (Bill $\oplus$ Fred). In that case modeling the exhaustivity presupposition following Büring and Križ (2013) can give proper results by predicting that (94-a) is true but suffers from the presupposition failure. However, if one models the assertion as Bill $\in$ $\llbracket$carry the piano$\rrbracket$, i.e., $\llbracket P \rrbracket(\llbracket a \rrbracket)$, then the assertion is false since Bill $\notin$ $\llbracket$carry the piano$\rrbracket$ but only the plural entity Bill and Fred, i.e. Bill $\oplus$ Fred $\in$ $\llbracket$carry the piano$\rrbracket$. However, there is a problem that one runs into imme-

diately under this assumption, i.e., what it means conceptually that a sentence is both false and suffers from a presupposition failure.[39]

It is difficult to tell which formulation of the assertion Büring and Križ (2013) postulate for English clefts. On the one hand, they give a formal formulation of the assertion as in (92-a), i.e., $[\![P]\!]([\![a]\!])$. A the same time, however, they claim to make correct predictions for (94-T), i.e., they suggest that under their assumptions (94-T) is not false but suffers from the presupposition failure. This, in turn, is impossible without assuming a different formulation of the assertion, namely $a \sqsubseteq \oplus[\![P]\!]$ and in fact they suggest this type of assertion in the text.

Looking at Ga, since the clefts' exhaustivity presupposition modeled by Büring and Križ (2013) requires the pivot not to be a mereological part of the predicate extension, it predicts (95) to be unacceptable, contrary to fact:

(95)   Jèèè Fred nì è-fɔ̀   nìnè è-tsɛ́   lɛ. È-tsɛ́   Fred kɛ̀ Gord.
         NEG Fred PRT 3SG-throw hand 3SG-call PRT 3SG-call Fred and Gord
         'It wasn't Fred she invited. She invited Fred and Gord.'

The presupposition of (95), defined as in (92-b), requires Fred not to be a proper part of the sum of invitees. However, since Fred and Gord were invited, Fred is indeed a proper part of the sum of invitees. Büring and Križ (2013) admit in a footnote that in some contexts sentences such as (95) can be felicitous.[40] They claim that in those cases negation targets a presupposed meaning component. If this is the case, then it should be explained why in (95) the negation targets the presupposed meaning component but in (96) it does not:[41]

(96)   #Jèèè Kòfí nì   Màríá fɔ́.   È-fɔ́   Kòfí kɛ̀ Emmanuel.
         NEG Kofi PRT Maria give.birth 3SG-give.birth Kofi and Emmanuel
         'It's not Kofi to whom Maria gave birth. She gave birth to Kofi and Emmanuel.'

The contrast between (95) and (96) should be accounted for by Büring and Križ (2013) if their theory should be further defended.

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[39]There is an ongoing discussion whether sentences with the presupposition failure are false or neither true nor false, see Frege (1892); Russell (1905, 1957); Strawson (1950, 1964); Reinhart (1981); Lasersohn (1993); von Fintel (2004); Abrusán and Szendrői (2013). If sentences with the presupposition failure are neither true nor false, then the described situation cannot arise, i.e, it cannot be that the same sentence is false and neither true nor false at the same time.

[40]Büring and Križ (2013) do not discuss in which contexts they are felicitous. To the best of my knowledge, there is no study which would discuss in detail when sentences like (95) are acceptable and when not, even for English.

[41]In fact, the prediction is that either (i) is not acceptable or Kofi and Emmanuel are twins.

Without any further assumptions, the acceptability of (95) cannot also be accounted for by an assumption that *jeee* is a metalinguistic negation. If it was the case, then (96) should also have been acceptable, contrary to fact.

Summing up, I argue that Büring and Križ (2013) cannot account for the Ga data. Moreover, I claim that their theory does not make better predictions for sentences with collective predicates than Büring (2011) does.

Yasavul's (2013) analysis Yasavul (2013) describes and gives a semantic analysis of two types of focus construction in K'iche' (Mayan), i.e., a focus construction marked with the particle *aree* which gives rise to exhaustivity and existential inferences and an unmarked focus realization which does not trigger those inferences.

Yasavul (2013) does not model the exhaustivity inference as part of the meaning of *aree* but derives it from its interaction with the semantics of questions. He argues that *aree P* is an anaphoric expression whose antecedent is provided by the meaning of questions. First, a question provides a discourse referent that denotes the maximal plurality of individuals with the property in question. Subsequently *aree* identifies the denotation of the focused expression with this plurality.[42]

Importantly, Yasavul's (2013) analysis can account for the data in (97). The assumption is that the question that (97) gives an answer to is 'Who did she invite?' The question provides a discourse referent which denotes the maximal invitees. Since clefts are anaphoric to the question, (97) states that Fred is not the maximal invitee. Subsequently, the second sentence in (97) specifies that Fred and Gord constitutes the maximal discourse referent that were invited.

(97) Jèèè Fred nì è-fɔ́   nìnè è-tsɛ́   lɛ. È-tsɛ́   Fred kɛ̀ Gord.
      neg Fred PRT 3SG-throw hand 3SG-call PRT 3SG-call Fred and Gord
      'It wasn't Fred she invited. She invited Fred and Gord.'

However, as far as I can see, in light what has been said so far this analysis has difficulties with accounting for the unacceptability of (98):

(98) #Jèèè Kòfí nì Màríà fɔ́.   È-fɔ́   Kòfí kɛ̀ Emmanuel.
      NEG Kofi PRT Maria give.birth 3SG-give.birth Kofi and Emmanuel
      'It's not Kofi to whom Maria gave birth. She gave birth to Kofi and Emmanuel.'

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[42]The analysis along these lines was also proposed by Pollard and Yasavul (2014) for English anaphoric it-clefts.

For the contrast between (97) and (98) together with the observation that the exhaustivity in Ga is presuppositional, I do not adopt this analysis for the *ni*-structure.

   To conclude this section, it turns out that the Ga data challenges the existing approaches to the exhaustivity inference triggered by cleft structures. In the next subsection, I propose an analysis which accounts for the discussed data.

4.4.3 The semantics of the Ga *ni*-structure

I propose modeling the semantics of the particle *ni* in line with the conditional exhaustivity proposed by Büring (2011), thereby arguing that the *ni*-structure has the following meaning components:

(99)   *ni*-STRUCTURE:

   a.   *assertion*: $P(x)$
   b.   *not-at-issue*: $P(x) \rightarrow x = max(P)$

The lexical entry of *ni* is presented in (100):

(100) $[\![ni]\!] = \lambda P.\lambda x : P(x) \rightarrow x = max(P).P(x)$

   For illustration, the assertion and the not-at-issue meaning component of (101) in informal terms are given in (102). Its syntactic structure is presented in (103) and its truth conditions in (104).

(101)   Kofi ni sele.

(102)   a.   *assertion:* Kofi swim.
   b.   *presupposition:* If Kofi swim, Kofi is a maximal swimmer.

(103)

```
                        FP
                      /    \
                  Kofi      FP
                          /    \
                        ni      CP
                              /    \
                          λx₁      VP
                                  /    \
                                x₁     sele
```
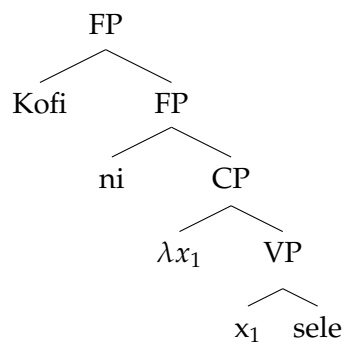
(104)   [[FP]] is defined only if $swim(Kofi) \rightarrow Kofi = max(\lambda x.swim(x))$, if defined
          then 1 iff Kofi swam

The conditional analysis of the particle *ni* can account for the data presented in section 4.2. First, it explains the exhaustivity effects triggered by *ni*. For example, why (21-a) repeated below as (105) is unacceptable. Namely, if Felix reads, then he is a maximal reader. Therefore, Kofi cannot be a maximal reader as well:

(105)   #Felix nì   kánè-ɔ̀   wòlò nì   Kòfí nì   kánè-ɔ̀   wòlò.
          Felix PRT read-IMPF book and Kofi PRT read-IMPF book
          'It is John who reads a book and it is Kofi who reads a book.'

It also explains why Kofi could deduce whether he had passed the exam or not. If Felix did not pass the exam, then Felix is the maximal student who did not pass the exam. Thus Kofi can deduce that he himself had passed the exam.

(106)   *Context*: A student (Kofi) who is anxious that he might have failed a test approaches teacher and asks: 'Can you tell me whether I have passed or not?' Unfortunately, teachers are by law forbidden to tell a student directly about his or her result. However, there is no law forbidding them to talk about other students performances.

          K: Ànì mì-páásí yɛ̀ kàá   lɛ́   mlì?
               QPRT I-pass   at exam DET in
               'Have I passed the exam?'

          T: Mí kɛ́ɛ́-ɩ́ŋ   bò shí Felix nì   páásí-kò   yɛ̀ kàá lɛ́   mlì.
               I   tell-cannot you but Felix PRT pass-PFV.NEG at exam PRT in
               'I cannot tell you but it is Felix who did not pass the exam.'

Second, since the exhaustivity inference is modeled as being not-at-issue, it accounts for the unacceptability of (35), repeated below as (107), and other data presented in subsection 4.2.2.2.

(107)   #E-kpèé   Fred, shí jèèè Fred **nì**   è-kpèé.
          3SG-invite Fred but neg Fred PRT 3SG-invite
          'She invited Fred but it was not Fred she invited.'

Moreover, as already discussed in subsection (87), I argue that the conditional presupposition does not make wrong predictions for sentences with collective predicates, pace Büring and Križ (2013).

Even though the analysis can account for a wide range of data, it needs to be ameliorated in order to account for the problematic data discussed throughout the chapter.

Problematic data   As it was discussed in subsection 4.4.2.2, the conditional analysis of the clefts' semantics (Büring, 2011) cannot explain the acceptability of the data in (108):

(108)   Jèèè Fred nì   è-fɔ   nìnè è-tsɛ́   lɛ. È-tsɛ́   Fred kɛ̀   Gord.
      neg   Fred PRT 3SG-throw hand 3SG-call PRT 3SG-call Fred and Gord
      'It wasn't Fred she invited. She invited Fred and Gord.'

Recall that the problem arises already at the assertion level. The cleft sentence in (108) asserts that Fred was not invited, i.e., Fred $\notin$ [[invite]]. Conversely, the second sentence in (108) asserts that Fred was invited, i.e., Fred $\in$ [[invite]], leading to the contradiction.

I postulate a rescue strategy that allows to solve these problems. I argue that cleft structures in general and the *ni*-structure in particular require re-interpreting distributive predicates in a collective manner. Distributive predicates predicate of the singular individuals that make up the plural individual (e.g., Landman, 1989). Therefore the following holds:

(109)   John and Bill shaved.

(110) $\text{shave}(\text{John} \oplus \text{Bill}) \rightarrow \text{shave}(\text{Bill})$

It follows that distributive predicates have singular entities in their denotation. By contrast, collective predicates predicate of plural individuals (e.g., Landman, 1989). Thus the following is valid:

(111)   John and Bill met.

(112) $\text{meet}(\text{John} \oplus \text{Bill}) \nrightarrow \text{meet}(\text{Bill})$

Collective predicates have only plural individuals in their denotation.

Now, if 'invite' is interpreted distributively, then in example (108) the contradiction arises. It is the case, because, as it was presented above, the assertion of the cleft is Fred $\notin$ [[invite]] and the second sentence asserts that Fred $\in$ [[invite]].

The situation is dramatically different, if 'invite' is re-interpreted in a collective manner. An informal paraphrase of (108) with the collective interpretation of 'invite' is given in (113).

(113)   She did not invite a singular entity called Fred. She has invited a plural entity
          called Fred and Gord.

If 'invite' is interpreted collectively, then 'Fred' is not in the extension of 'invite.' However, a plural entity Fred ⊕ Gord is, i.e., Fred ⊕ Gord ∈ [[invite]]. Therefore the rescue strategy can account for the contradiction which arises at the assertion level.

Consider now the presupposition triggered by the cleft structure in (108). It says that 'If Fred was invited, then he is a maximal invitee.' Since Fred is not invited, the antecedent of the conditional is false and thus the whole conditional presupposition is true, irrespective of the truth value of the consequent. This is a desired result, because it ensures that the presupposition can project out of the scope of negation without incurring a contradiction with information in the global context.

The postulated rescue strategy gives rise to clear, testable, empirical predictions. Namely, it predicts unacceptability of parallel examples with unambiguously distributive predicates which reinterpretation in the collective manner is impossible, as *to give birth*.[43] The prediction is borne out, as illustrated in (114):

(114)   #Jèèè Kòfí nì   Màríà fɔ́.   È-fɔ́   Kòfí kɛ̀   Emmanuel.
         NEG Kofi PRT Maria give.birth she-give.birth Kofi and Emmanuel
         'It's not Kofi to whom Maria gave birth. She gave birth to Kofi and Emmanuel.'

As it has already been argued in subsection 4.4.2.2, the fact that example (108) with the re-interpretable predicate is acceptable and a parallel example (114) with the unambiguously distributive predicate is unacceptable suggests that the data cannot be accounted for with a sole reference to metalinguistic negation. If the acceptability of (108) was due to metalinguistic negation then also the negation in (114) should be interpreted metalinguistically leading to the acceptability of (114), contrary to fact.

I postulate an existence of the same rescue strategy in other languages. It could be that the individual differences in applying the rescue strategy are the reasons for the noise in English examples parallel to (108) admitted in the literature (Büring, 2011; Velleman et al., 2012; Büring and Križ, 2013).

4.5 Summary

In this chapter, I discussed the syntax and semantics of the Ga *ni*-structure. First, I demonstrated that the particle *ni* introduces a structural bi-partition into the exhaus-

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[43]In fact, the prediction is that either (i) is unacceptable or Kofi and Emmanuel are twins.

tively interpreted focused constituent to its left and the backgrounded/presupposed material to its right. Subsequently, it was shown that of the three possible analyses of the particle *ni* discussed in subsection 4.3, the one treating the particle *ni* as introducing a cleft structure comes the closest to empirical adequacy. Having established this, I argued that the pivot in the *ni*-structure is base-generated in its left-peripheral position. On the semantic side, I showed that the conditional analysis of clefts (Büring, 2011) ameliorated with the postulated pragmatic rescue strategy can adequately account for the Ga data.

5 Clefts and temporality

This chapter discusses the semantics of the imperfective aspect in Ga, focusing on its progressive interpretation. I show how the progressive interpretation is derived compositionally from the meanings of the imperfective aspect, the cleft structure, and the particle *lɛ*, which is a cross-categorial definite determiner that attaches to a range of elements, e.g., NPs and VPs. I argue that the progressive interpretation in Ga is a result of the interaction between a definite description of events and the general imperfective aspect and thus it supports a unified analysis of the imperfective and progressive/habitual aspect (see for example Bonomi, 1997; Cipria and Roberts, 2000; Deo, 2009, among many others). Moreover, the data from Ga point to a previously unattested parallelism between the nominal and the verbal domain in the analysis of grammatical aspect.

5.1 Introduction

Ga has a rich system of overt aspectual markers (see chapter 2, section 2.3). General imperfective is marked by the suffix -ɔ, as shown by its compatibility with habitual aspectual reference in (1) and progressive aspectual reference in (2-b):

(1)   habitual context: Every Sunday Kofi goes to swim in the ocean.
        Kòfí sèlè-ɔ̀.
        Kofi swim-IMPF
        'Kofi swims.'

Interestingly, there are two ways of obtaining a progressive interpretation in Ga. One can use the verbal prefix *mii-*, as presented in (2-a), or a clefted imperfective sentence with the definite determiner *lɛ* attached to the VP, as in (2-b).[1] The former I call the synthetic progressive and the latter the analytic progressive.

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[1] The cleft structure in Ga is introduced by the particle *nì*, which I gloss PRT. For a detailed discussion of its semantic and syntactic properties, see chapter 4.

(2)   progressive context: Tom and his family (wife, two sons, and two daughters) are
        on the beach. Tom and his wife can see that Kofi is in the process of swimming.
        Tom's wife says:

      a. Kòfí **mìì**-sèlè.   SYNTHETIC PROGRESSIVE
          Kofi PROG-swim
          'Kofi is swimming.'

      b. Kofi *(**nì**) sèlè-ɔ́   lɛ.   ANALYTIC PROGRESSIVE
          Kofi PRT swim-IMPF DET
          'It is Kofi who is swimming.'

Crucially, (2-b) without the particle *ni* is unacceptable and without the definite deter-
miner *lɛ* attached to the VP obtains a habitual interpretation, as demonstrated in (3):

(3)   Kòfí **nì** sèlè-ɔ̀.
        Kofi PRT swim-IMPF
        'It is Kofi who swims.'

      a. progressive context: Tom and his family (wife, two sons, and two daugh-
          ters) are on the beach. Tom and his wife can see a swimming child.
          ⇒ Tom <u>cannot</u> utter (3) in this context

      b. habitual context: Tom's one son and daughters do not like swimming and
          they do not do it, but his oldest son, Kofi, loves swimming and he does it
          regularly.
          ⇒ Tom <u>can</u> utter (3) in this context

Likewise, the progressive interpretation of sentences with the analytic progressive
form arises with transitive verbs. Also when a DO is in its left-peripheral position
irrespective of the fact whether it is an indefinite NP, a definite NP, or a proper name,
as demonstrated in (4), (5), and (6), respectively.

(4)   context: Kofi's father can see that Kofi is reading something but he is not sure
        what it is, so he asked his wife. She answers:

      Wòlò kò   nì Kòfí kánè-ɔ́   lɛ.   INDEFINITE NP
      book INDF PRT Kofi read-IMPF DET
      'It's a book that Kofi is reading.'

(5)   context: Kofi's father can see that Kofi is reading a book they talked about yes-
        terday. He says to his wife, who was wandering what Kofi is reading.

      Wòló lɛ   nì Kòfí kánè-ɔ́   lɛ.   DEFINITE NP
      book DET PRT Kofi read-IMPF DET
      'It's the book that Kofi is reading.'

(6)   context: Kofi can see that his friend John is in the process of reading something. He wants to know what it is, John replies:

    'Harry Potter' nì mí-kánè-ɔ́   lɛ.   Proper Name
    Harry Potter PRT 1SG-read-IMPF DET
    'It's 'Harry Potter' that I am reading.'

I defend the view that both the synthetic and the analytic progressive entail progressive aspectual reference based on the following evidence. First, both of them are compatible with progressive aspectual reference, as for example in (2), and are incompatible with habitual aspectual reference, as illustrated in (7) and (8):

(7)   habitual context: Every Sunday Anna goes to swim in the ocean.

    #Anna **mìì**-sèlè.   SYNTHETIC PROGRESSIVE
    Anna PROG-swim
    intended: 'Anna swims.'

(8)   habitual context: Tom's one son and daughters do not like swimming and they do not do it, but his oldest son, Kofi, loves swimming and he does it regularly.

    #Kòfí **nì** sèlè-ɔ́   **lɛ**.   ANALYTIC PROGRESSIVE
    Kofi PRT swim-IMPF DET
    intended: 'It is Kofi who swims.'

Second, a compatibility with different temporal references suggests that the synthetic and the analytic progressive are aspectual rather than temporal markers. That both progressive forms are compatible with present temporal reference was shown above with (2). Examples (9) and (10), in turn, demonstrate that the synthetic progressive is also compatible with past and future temporal reference, respectively.

(9)   past temporal reference:

    A: What were you doing yesterday, when I called you?

    B: **Míí**-káne wòlò.
        PROG-read book
        'I was reading a book.'

(10)   future temporal reference:

    A: What will you be doing tomorrow at 16:00?

    B: Béní à-bàá-tswá   ŋmɛ̀jí 16:00 wɔ́   lɛ, **míí**-káne   wòlò.
        when 3SG-PROSP-ring bells 16:00 tomorrow DET 1SG.PROG-read book
        'Tomorrow at 16:00, I will be reading a book.'

By contrast, the analytic progressive is compatible with past but not with future temporal reference, as illustrated in (11) and (12), respectively. Note that the same observation was made in chapter 2 for the imperfective marker -ɔ, i.e., -ɔ is compatible with present and past but not with future temporal reference. The possible reasons for this incompatibility are discussed in subsection 5.3.2.

(11)   past temporal reference:
       Béní mì-bà   shía nyɛ́   lɛ, Kòfí **nì** kánè-ɔ̀   wòlò yɛ̀ tsú lɛ
       when 1SG-come home yesterday DET Kofi PRT read-IMPF book at room DET
       mlì **l**ɛ.
       in DET
       'When I came back home yesterday, it was Kofi who was reading a book.'

(12)   future temporal reference:
       #Béní má-bà   shía wɔ́   lɛ, Kòfí **nì** kánè-ɔ̀   wòlò yɛ̀ tsú
       when 1SG.PROSP-come home tomorrow DET Kofi PRT read-IMPF book at room
       lɛ   mlì **l**ɛ.
       DET in DET
       intended: 'When I come back home tomorrow, it will be Kofi who will be reading a book.'

Even though both the synthetic and the analytic progressive convey progressive aspectual reference, their semantics is not alike. For example, whereas the synthetic progressive is a general, unmarked form of progressive similar to the English one, the interpretation of the analytic progressive is restricted to ongoing events that the speaker has strong, usually direct, evidence for. The differences in semantics of the two progressive forms in Ga are discussed at length in subsection 5.2.

The chapter aims at accounting for the invariable progressive interpretation of sentences with the analytic progressive form, i.e., to explain how the progressive interpretation is derived compositionally from the interaction between the cleft structure (introduced by the particle *ni*), the imperfective aspectual marker -ɔ, and the definite determiner *lɛ* attached to the VP, and to account for its evidential and aspectual properties. The structure of the chapter is as follows. In section 5.2, I discuss the data illustrating the differences in the semantics of the two progressive forms in Ga. Section 5.3 presents the main ingredients of the analysis: the semantics of the imperfective marker -ɔ, the cleft structure, and the definite determiner *lɛ*. Subsequently, section 5.4 gives a short introduction to the framework in which the analysis of the analytic progressive is couched, i.e., situation semantics. Finally, section 5.5 puts all the ingredients together and presents the syntactic structure and the semantic compositional derivation of the

analytic progressive. Section 5.6 demonstrates how the proposed analysis accounts for the data presented in section 5.2 and section 5.7 concludes.
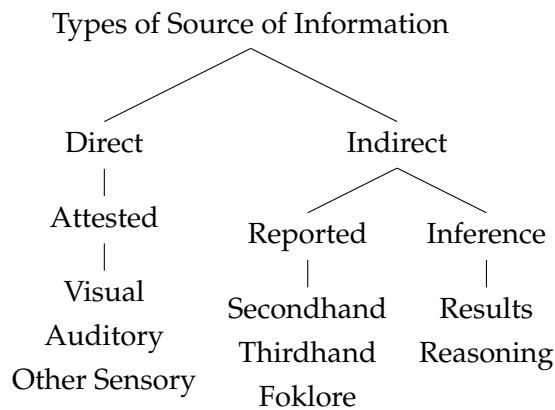
5.2 Two progressive forms in Ga

In this section, I give an overview of the semantic differences between the two progressive forms in Ga: (in)compatibility with different evidential contexts (subsection 5.2.1), (in)compatibility with events not-instantiated at the topic time (subsection 5.2.2), and their possible modal meaning components (subsection 5.2.3).

5.2.1 Evidentiality

Evidentiality is a linguistic category that marks the type of evidence (or source of information) that a proposition is based on (e.g., Faller, 2002).[2] The diagram in (13) presents Willett's (1988) taxonomy of types of source of information, adapted by Faller (2002).

(13)   Types of Source of Information

                    Direct   Indirect

                  Attested   Reported   Inference

                   Visual   Secondhand   Results
                  Auditory   Thirdhand   Reasoning
                Other Sensory   Foklore

                                          (from Faller, 2002, p.6)

Type of source of information can be encoded lexically or grammatically. For example, Polish exploits different syntactic structures and adverbials to convey various evidential meanings. Compare the contexts in (14) and (15) and the two Polish structures. Whereas the structure in 'a' is compatible with the direct evidence context in (14) and is incompatible with the indirect evidence context in (15), the structure in 'b' is incompatible with the direct evidence context in (14) and is compatible with the indirect evidence context in (15):

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[2]On a more general definition, evidentiality is a linguistic category that encodes two types of information, i.e., the type of evidence on which the proposition is based on, direct or indirect, and the speaker's commitment to their truth, e.g., belief/disbelief, agnostic, etc. (e.g., Izvorski, 1997).

(14) direct evidence context: I was at a concert yesterday and Jan was one of the soloists.

    a. Słyszał-am **jak** Jan wczoraj śpiewa-ł.
        hear-1SG.PAST as   Jan yesterday sing-3SG.PAST
        'I heard Jan singing yesterday.'

    b. #Słyszał-am, **że** Jan wczoraj śpiewa-ł.
        hear-1SG.PAST COMPL Jan yesterday sing-3SG.PAST
        intended: 'I heard Jan singing yesterday.'

(15) indirect evidence context: I heard the rumor that Jan was one of the soloists at the yesterdays concert. I am telling to my friend.

    a. #Słyszał-am **jak** Jan wczoraj śpiewa-ł.
        hear-1SG.PAST as   Jan yesterday sing-3SG.PAST
        intended: 'I heard that Jan sang yesterday.'

    b. Słyszał-am, **że** Jan wczoraj śpiewa-ł.
        hear-1SG.PAST COMPL Jan yesterday sing-3SG.PAST
        intended: 'I heard that Jan sang yesterday.'

By contrast, Gitksan exploits morphological evidentiality markers (Peterson, 2010). Peterson argues that whereas *nakw* encodes direct sensory evidence, as shown in (16), *=ima* encodes indirect evidence that comes from previous experience, as demonstrated in (17).[3]

(16) context: Now you decide to find out for yourself what John is up to, so you drive by his place: you see smoke coming out of the wilp sihon (smokehouse), and his truck in the driveway. Your friend exclaims:
    n'akw=hl   si-hon-s   John
    n'akw=cnd caus-fish-3sg=pnd John
    'John must be processing fish'; 'It looks like John's doing up fish.'

                                  (from Peterson, 2010, p.9)

(17) context: It's now August, and you and a friend need to ask John for another favor. You haven't seen John in a while, but because it's the end of summer — the time of year for smoking fish — your friend thinks he might be too busy to help because:
    si-hon=**ima**=t   John
    caus-fish=**ima**=pnd John
    'John might/must be doing up fish.'   (from Peterson, 2010, p.8)

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[3]There is also the third evidential marker in Gitksan, *=kat* that encodes indirect reportative evidence (Peterson, 2010).

Languages vary with respect to the source of information they encode grammatically. Whereas some languages encode only a direct vs. indirect evidence contrast (e.g., Turkish Johanson, 2003), some of them encode the source of information on a greater granularity level. For example, Gitksan encodes morphologically three types of source of information, i.e., reportative, inferential, and sensory (Peterson, 2010).

Evidential markers often also convey other meanings, e.g., epistemic modality, aspectual, or temporal. For example, it was observed that in various unrelated languages (e.g., Turkish, Norwegian, Izvorski, 1997) the perfective morphology is ambiguous between conveying an aspectual interpretation and an indirect evidential interpretation, as shown in (18):

(18) Gel -miş -im.   TURKISH
      come **PFV** 1SG
      'I have come' or 'I apparently came'   (from Izvorski, 1997, p.222)

Interestingly, data from Ga show that also progressive aspect can encode evidential restrictions, which to the best of my knowledge has not been observed so far. It turns out that whereas the synthetic progressive does not encode any evidential restrictions, the analytic progressive requires direct evidence.[4,5] This view is motivated empirically by the data presented below in (19) and (20). While the synthetic progressive is acceptable in both direct and indirect evidential contexts, the analytic one is only acceptable in direct evidential contexts.

(19)   Direct evidence context: Tom and his family (wife, two sons, and two daughters) are on the beach. Tom can see that his two sons and the youngest daughter are playing with sand and his oldest daughter, Anna, is swimming. He says to his wife:

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[4]I do not have data regarding the (in)compatibility of the analytic progressive with other types of evidence, e.g., reasoning. As for other direct evidence, such as auditory or other sensory, the language consultants commented on (i) that in this case the speaker can hear the birds singing:

(i)   Lòòfɔ́-jì nì lá-á   lɛ.
      birs-PL PRT sing-IMPF DET
      'Birds are singing.'

Based on this comment, I conjecture that the analytic progressive is compatible with any kind of direct evidentiality, not only visual one.

[5]In fact, the analytic progressive requires either direct evidence or a highly structured event, as for example sport competition context, as shown in footnote 6.

a. Anna **mìì**-sèlè.   SYNTHETIC PROGRESSIVE
   Anna PROG-swim
   'Anna is swimming.'

b. Anna **nì**   sèlè-ɔ́   lɛ.   ANALYTIC PROGRESSIVE
   Anna PRT swim-IMPF DET
   'It is Anna who is swimming.'

(20)   Indirect evidence context: Tom and his family (wife, two sons, and two daughters) are on the beach. Tom can see that his two sons and the youngest daughter are playing with sand. He cannot see his oldest daughter, but the younger one told him that she was in the process of swimming. Tom says to his wife:

a. Anna **mìì**-sèlè.   SYNTHETIC PROGRESSIVE
   Anna PROG-swim
   'Anna is swimming.'

b. #Anna **nì**   sèlè-ɔ́   lɛ.   ANALYTIC PROGRESSIVE
   Anna PRT swim-IMPF DET
   'It is Anna who is is swimming.'

Importantly, since (19) and (20) constitute a minimal pair, i.e., the only difference between both contexts is that in (19) Tom has direct evidence that Anna is swimming and in (20) he has not, I argue that the unacceptability of (20-b) is due to the differences in the evidential restrictions encoded by the two progressive forms. For that also I argue that the unacceptability of (20-b) is not caused by the fact that Anna is the pivot of the cleft, especially that the same sentence is acceptable in the context of (19).

   The contrast between (21) and (22) provides further evidence that the analytic progressive, unlike the synthetic one, encodes evidential restrictions. Both sentences with the analytic and the synthetic progressive forms are acceptable in the context in which the speaker and Màríà spent the whole day together, as demonstrated in (21). By contrast, in contexts which exclude the possibility that the statements are based on direct evidence, as in (22), sentences with the synthetic progressive form are still acceptable, but sentences with the analytic progressive form are not acceptable any longer.

(21)   context: I live with Maria. Yesterday, we spent the whole day together.

a. Bɛ́ní Lisa tswà nyɛ́   lɛ, Màríâ **mìì**-hòó   gbɛ́kɛ̀   níyéníí.
   when Lisa phone yesterday DET Maria PROG-cook evening food
   'When Lisa phoned yesterday, Maria was cooking dinner.'

b. Bɛ́ní Lisa tswà nyɛ́   lɛ, Màríâ **nì** hó-ɔ̀   gbɛ́kɛ̀   níyéníí lɛ.
   when Lisa phone yesterday DET Maria PRT cook-IMPF evening food   DET
   'When Lisa phoned yesterday, it was Maria who was cooking dinner.'

One of my language consultants commented that (21-b) is acceptable in the context of (21), because the speaker and Maria were together the whole day and therefore the speaker saw her cooking.

(22)   indirect evidence context: Yesterday, I was in Kumasi (the whole day) and
        Maria was in Accra (the whole day).

   a.   Béní Lisa tswà nyɛ́   lɛ, Màríà **mìì**-hòó   gbɛ́kɛ̀ níyéníí.
         when Lisa phone yesterday DET Maria PROG-cook evening food
         'When Lisa phoned yesterday, Maria was cooking dinner.'

   b.   #Béní Lisa tswà nyɛ́   lɛ, Màríà **nì** hó-ɔ̀   gbɛ́kɛ̀ níyéníí **l**ɛ.
         when Lisa phone yesterday DET Maria PRT cook-IMPF evening food   DET
         'When Lisa phoned yesterday, it was Maria who was cooking dinner.'

Note, however, that one of my language consultants accepted (21-b) and (22-b) in the context of (21) and (22), respectively, but she commented that in (22-b) the speaker is more certain that Lisa was cooking than in (22-a). She also said that using (22-b) requires having better evidence than using (22-a).[6]

   I argue that the direct evidential meaning is conveyed by the whole structure, i.e., the interaction between the imperfective marker -ɔ, the cleft structure introduced by the particle *ni*, and the definite determiner *lɛ*. I have found no evidence which would suggest that the evidential meaning is conveyed by any of these elements in isolation.

   Looking at Ga from a broader, cross-linguistic perspective, it turns out that in some languages, e.g., in Turkish, an indirect evidential interpretation is associated with the perfective aspect (e.g., Izvorski, 1997), while in others, e.g., in Ga, direct evidentiality is

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[6] This is in line with the observation that the analytic progressive can also be used in contexts with a rigidly structured program, e.g., in sport competition context. This observation is illustrated in (i):

(i)   Anna nì sèlè-ɔ́   lɛ.
       Anna PRT swim-IMPF DET
       'It is Anna who is swimming right now.'

   a.   beach context 1: Tom, Anna's father, is on the beach and he cannot see Anna swimming.
         ⇒ Tom <u>cannot</u> utter (i) in this context
   b.   beach context 2: Tom, Anna's father, is on the beach and he can see Anna swimming.
         ⇒ Tom <u>can</u> utter (i) in this context
   c.   swimming competition context: Anna participates in a swimming competition. Tom, Anna's father, knows that Anna's turn to swim is from 13:00–14:00. Tom cannot see Anna but it is 13:30 now.
         ⇒ Tom <u>can</u> utter (i) in this context

This leads to the following generalization: the analytic progressive can be used either in contexts with a rigidly structured program, as sport competition, or in direct evidence contexts.

associated with the imperfective aspect.[7] The question is what is the evidential status of perfective sentences in Ga and imperfective sentences in Turkish? Is the perfective aspect in Ga associated with indirect evidentiality and the imperfective aspect in Turkish with direct evidentiality? And if yes, is it a pragmatic or a semantic effect? I hope to explore these issues in future research.

5.2.2 Events *not-instantiated* at the topic time

Another way in which the two progressive forms in Ga are distinct is with respect to their (in)compatibility with contexts in which the event is not instantiated at the topic time, i.e., contexts in which the event is not actually ongoing at the topic time.[8] For illustration, consider (23). John might have started reading 'Harry Potter' before jogging and he might continue reading it afterwards. However, the event of reading 'Harry Potter' is not actually ongoing at the topic time in (23), because John is not reading 'Harry Potter' but jogging at the topic time. Events which are actually ongoing at the topic time I call instantiated at the topic time, events which are not actually ongoing at the topic time I call not-instantiated at the topic time.

It turns out that whereas the synthetic progressive, as the English one, is compatible with not-instantiated events, the analytic progressive is not, as demonstrated below:

(23)   Tom and John are jogging. They are talking about books. Tom asks John which books he is reading. John replies:

    a. **Míí**-káne   'Harry Potter.'   SYNTHETIC PROGRESSIVE
        1SG.PROG-read 'Harry Potter'
        'I am reading 'Harry Potter'.'

    b. #'Harry Potter' **nì** mí kánè-ɔ́ lɛ.   ANALYTIC PROGRESSIVE
        'Harry Potter' PRT 1.SG read-IMPF DET
        'It is 'Harry Potter' that I am reading.'

Whereas (23-a) is acceptable in the context of (23), (23-b) is not. One of my language consultants gave a comment that (23-b) could be used if the speaker was physically in the process of reading a book while uttering (23-b). Compare (23-b) with (6), which constitutes a minimal pair. The minimal pair together with the observation that clefts are

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[7]Note however that whereas Turkish perfective morphology is ambiguous between a temporal and an evidential interpretation, the Ga analytic progressive is not ambiguous and conveys both meanings at the same time.

[8]As already discussed in chapter 2, I assume a threefold distinction between event time, topic time, and utterance time (Reichenbach, 1947; Klein, 1994, among many others) . Importantly, in examples from this section the topic time coincides with the utterance time.

good answers for wh-questions (see chapter 4) strongly suggest that the unacceptability of (23-b) is not due to the fact that 'Harry Potter' is the pivot of the cleft.

5.2.3 Modality

Much of the literature on progressive (and habitual) aspectual reference is concerned with the question of how to model the modal meaning conveyed by the progressive aspect (Landman, 1992; Portner, 1998; Cipria and Roberts, 2000, among many others). I have checked whether both progressive forms in Ga give rise to the so-called imperfective paradox (i.a., Dowty, 1977; Landman, 1992; Deo, 2009). It states that whereas for activities the inference from the past progressive to simple past is valid, for accomplishments it is not. For illustration, consider (24) and (25). Whereas (24-b) follows from (24-a), (25-b) does not follow from (25-a).

(24)   a.   John was swimming.   ACTIVITY
          b.   → John swam.

(25)   a.   John was reading a book.   ACCOMPLISHMENT
          b.   ↛ John read a book.

The following data suggest that whereas the synthetic progressive might give rise to the imperfective paradox (it follows from (26-a) that Susan has swum, but it does not follow from (27-a) that Susan has read 'The Hobbit'), the analytic progressive seems not to give rise to the paradox ((26) and (27) do not follow from (26-b) and (27-b), respectively).[9]

(26)   Susan è-sèlè.
        Susan PFV-swim
        'Susan has swum.'

        a.   context 1 (synthetic progressive):
              Béní mì bà   ŋshɔnàà nyɛ́   lɛ, Susan mìì-sèlè.
              when 1SG come.past beach   yesterday DET Susan PROG-swim
              'When I came to the beach yesterday, Susan was swimming.'
              ⇒ (26) is <u>acceptable</u> in this context
        b.   context 2 (analytic progressive):

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[9]Since the unmarked form of verbs is compatible with both bound and unbound event contexts, to check the imperfective paradox, I used verbs in the perfective aspect.

> Béní mì bà   ŋ̀shɔ̀nàà nyɛ́   lɛ, Susan nì sèlèɔ   lɛ.
> when 1SG come.past beach   yesterday DET Susan PRT swim-IMPF DET
> 'When I came to the beach yesterday, it was Susan who was swimming.'
> ⇒ (26) is <u>not acceptable</u> in this context

(27) Lisa e-kane 'The Hobbit'.
Lia PFV-read 'The Hobbit'
'Lisa has read 'The Hobbit'.'

    a.   context 1 (synthetic progressive):

> Béní mì bóté tsú lɛ mlì nyɛ́   lɛ, Lisa mìì-káné
> when 1SG enter room DET inside yesterday DET Lisa PROG-read
> 'The Hobbit' yɛ̀ jɛ́mɛ́.
> The Hobbit be.at there
> 'When I entered the room yesterday, Lisa was reading 'The Hobbit'.'
> ⇒ (27) is <u>not acceptable</u> in this context

    b.   context 2 (analytic progressive):

> Béní mì bóté tsú lɛ mlì nyɛ́   lɛ, Lisa nì káné-ɔ̀
> when 1SG enter room DET inside yesterday DET Lisa PRT read-IMPF
> 'The Hobbit' yɛ̀ jɛ́mɛ́ lɛ.
> 'The Hobbit' be.at there PRT
> 'When I entered the room yesterday, it was Lisa who was reading 'The Hobbit'.'
> ⇒ (27) is <u>not acceptable</u> in this context

However, more empirical work must be done in order to warrant definite conclusions regarding the possible modal interpretation of imperfective and the two progressive forms in Ga. Especially, because it is often not easy to determine whether a given predicate in Ga is an accomplishment or not.[10] Thus at this point I would like to stay agnostic regarding the possible modal interpretation of sentences with the synthetic and the analytic progressive forms and leave this issue for future research.

5.2.4 Summary

In this section, I presented semantic differences between the two progressive forms in Ga. Whereas the use of the analytic progressive is restricted to events instantiated at the topic time for which the speaker has strong (direct) evidence, synthetic progressive does not impose any evidential or temporal constraints on its interpretation. A summary of

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[10]One way of checking it is to examine whether the predicate is compatible with the 'in an hour' or with the 'for an hour' adjunct. I could not do it, though, because I did not identify the adjuncts showing the relevant properties.

the semantic differences between the synthetic and the analytic progressive forms is presented in Table 5.1.

Table 5.1: Semantic properties of the synthetic and the analytic progressive in Ga

	synthetic progressive	analytic progressive
direct evidence	✓	✓
indirect evidence	✓	−
not-instantiated events	✓	−
instantiated events	✓	✓

It follows that any analysis of the analytic progressive in Ga will have to account for the following observations. First, it should explain how the progressive interpretation is derived compositionally from the meanings conveyed by the cleft structure (introduced by the particle *ni*), the imperfective marker -ɔ, and the definite determiner *lɛ*. Second, it should explain why the analytic progressive requires direct evidentiality. And third, it should account for the observation that the interpretation of the analytic progressive is restricted to events instantiated at the topic time. The next section aims at providing the basis for the analysis of the analytic progressive that fulfills the aforementioned desiderata.

5.3 Main ingredients of the analysis: clefts, imperfective, and definiteness

There are three main ingredients of the analysis: the semantics of the cleft structure introduced by the particle *ni*, which has already been discussed in detail in chapter 4 and is summarized in subsection 5.3.1, the analysis of the imperfective aspect introduced by the suffix -ɔ presented in subsection 5.3.2, and the semantics of the definite determiner *lɛ* discussed in subsection 5.3.3. They lay out the basis for the later compositional derivation of the obligatorily progressive interpretation in section 5.5 and for the account for the evidential meaning triggered by the analytic progressive in section 5.6.

5.3.1 The cleft-introducing particle *ni*

A detailed discussion of the syntax and semantics of clefts in Ga, introduced by the particle *ni*, was given in chapter 4. Let me, however, shortly recap the central findings which are crucial for the analysis of the analytic progressive to come.

I argue that the particle *ni* introduces a mono-clausal cleft structure in which the exhaustively interpreted element to its left (the pivot) is base generated in its left-peripheral position. For illustration, the proposed syntactic structure for (28) is presented in (29):

(28) A: Who swam?
      B: Kòfí **nì** sèlè.
          Kofi PRT swim
          'It is Kofi who swam.'

(29)
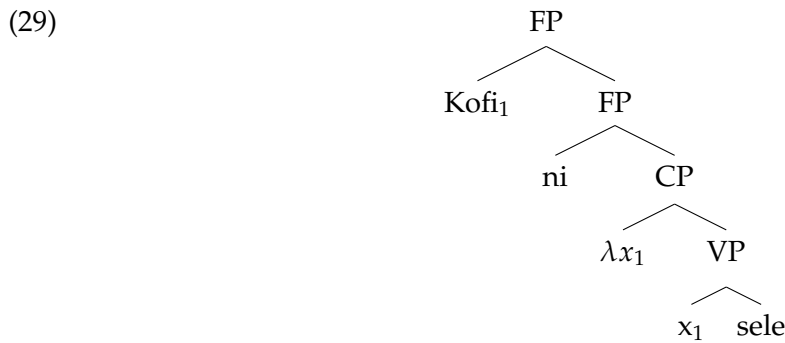
As for the semantics of this construction, it was shown in chapter 4 that focus in the *ni*-structure is invariably placed on the pivot. In addition, it was demonstrated that the pivot is interpreted exhaustively. Thus, sentences in *ni*-structure are always exhaustive answers to questions under discussion (QUD). This fact will be of central importance for the analysis of the analytic progressive developed in this chapter.

Following Büring (2011), I proposed modeling the exhaustivity effect triggered by the *ni*-structure as a conditional presupposition. The two meaning components of (28) are presented below in (30) and the lexical entry of *ni* is presented in (31).[11]

(30) *ni*-STRUCTURE:

      a. *assertion*: $P(x)$
          'Kofi swam'

      b. *not-at-issue*: $P(x) \rightarrow x = max(P)$
          'If Kofi swam, then Kofi was a maximal swimmer.'

(31) $[\![ni]\!] = \lambda P.\lambda x : P(x) \rightarrow x = max(P).P(x)$

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[11]I follow the convention of Heim and Kratzer (1998) to write the presupposed material between the semicolon and the dot.

For details of the analysis of the cleft structure triggered by *ni* and a discussion of other semantic effects generated by this structure, see chapter 4.

5.3.2 The imperfective marker -ɔ

5.3.2.1 Imperfective aspect

As already discussed in chapter 2, I assume a threefold distinction between event time, i.e., the time at which an event takes place, topic time, i.e., the time the speaker talks about, and utterance time, i.e., the time at which the sentence is uttered (Reichenbach, 1947; Klein, 1994, among many others). The role of aspect is to relate the event time and the topic time. Whereas imperfective aspect locates the topic time within the running time of the event ($\tau(e)$), perfective aspect locates the running time of the event time within the topic time (Klein, 1994; Kratzer, 1998, among others):

(32)   a. $[\![\text{Imperfective}]\!] = \lambda P.\lambda t.\lambda w.\exists e[t \subseteq \tau(e) \wedge P(e)(w)]$

        b. $[\![\text{Perfective}]\!] = \lambda P.\lambda t.\lambda w.\exists e[\tau(e) \subseteq t \wedge P(e)(w)]$

(adapted from Kratzer, 1998, p.107)

Deo (2009) observed that in a cross-linguistic perspective the imperfective aspect is associated with three different readings: the progressive or event-in-progress reading, the habitual or generic characterizing reading, and the continuous reading with lexically stative predicates.[12] The three readings are illustrated below, based on examples from Polish:

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[12]In addition, it appears that in various languages, e.g., in Gujarati (Deo, 2009) and English (Krifka et al., 1995; Boneh and Doron, 2010), habitual sentences can be true even if there is no single event instantiating the event description in the actual world (note that in this footnote I do not use the term 'instantiated in the actual world' in the same technical sense as defined in subsection 5.2.2.). Consider (i), taken from Krifka et al. (1995):

(i)   Mary handled the mail from Antarctica.

The claim is that (i) is true even if there was never any mail from Antarctica. This reading is called a dispositional reading and is often associated with professional occupations.

It seems that sentences with the prefix -ɔ cannot obtain the dispositional reading. (ii) shows that an event described by the -ɔ-marked verbs must be instantiated in the actual world in order for a sentence to be true. It is indicated by the observation that sentences with the -ɔ-marked verbs cannot be continued by another sentence which specifies that the event described by the -ɔ-marked verb was not instantiated in the actual world.

(ii)   context:

(33) Q: What is Natalia doing right now?

      A: Natalia czyt-a   książkę.   EVENT-IN-PROGRESS READING
           Natalia read-IMPF book.ACC
           'Natalia is reading a book.'

(34) Q: What does Natalia do on Sundays?

      A: Natalia czyt-a   książkę.   HABITUAL READING
           Natalia read-IMPF book.ACC
           'Natalia reads a book.'

(35) Q: Where does Natalia live?

      A: Natalia mieszk-a w Londynie.   CONTINUOUS READING
           Natalia live-IMPF in Londyn.LOC
           'Natalia lives in London.'

Looking at Ga, it appears that verbs marked with the suffix -ɔ are also associated with these three readings. That the suffix -ɔ expresses the event-in-progress and habitual readings was already presented in chapter 2. The critical data are repeated below:

(36) context: Every Sunday Kofi goes swimming in the ocean.

      Kòfí sèlè-ɔ̀.   HABITUAL READING
      Kofi swim-IMPF
      'Kofi swims.'

(37) context: Tom and his family (wife, two sons, and two daughters) are on the beach. Tom and his wife can see a swimming child. Tom's wife says:

      Kòfí nì   sèlè-ɔ́   lɛ.   EVENT-IN-PROGRESS READING
      Kofi PRT swim-IMPF DET
      'It is Kofi who is swimming.'

Example (38), in turn, shows that the imperfective marker -ɔ can also convey continuous reading with stative predicates:

(38) Bill sùmɔ̀-ɔ̀   Susan.
      Bill love-IMPF Susan
      'Bill loves Susan.'

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    a.   Bob died two years ago. È-hɔ̀-ɔ̀   àmóò.
                               3SG-sell-IMPF tomato
                'Bob died two years ago. He sold tomatoes.'
    b.   ...# Since there were no tomatoes on the island that he lived he had a lot of free time.

However, in order to warrant definite conclusions regarding the availability of the dispositional interpretation of sentences with verbs marked with the suffix -ɔ more empirical work must be done which has to await future research.

As I have already demonstrated in chapter 2, section 2.3, the suffix -ɔ is compatible with past and present temporal reference, but not with future temporal reference both in matrix and subordinate clauses. Habits in the future are expressed either by verbs in their unmarked form or by the prefix *baa-*, which conveys prospective aspectual reference.

There are at least two conceivable ways in which the incompatibility of the suffix -ɔ with future temporal reference could be accounted for. First, there might be a covert non-future tense marker in sentences without the prospective marker *baa-*, analyzed in line with Matthewson (2006). Second, it might be that the marker -ɔ conveys non-future temporal reference.[13] However, since more empirical work must be done in order to decide between the two aforementioned options and since this decision does not influence the analysis of the analytic progressive in Ga, I leave this question for future research.

Based on the data presented so far, I propose the following lexical entry for -ɔ, which is a modification of Kratzer's (1998) lexical entry for the imperfective aspect presented in (32-a). The difference is that I do not assume that imperfective takes a world argument:

(39) $[\![\text{-ɔ}]\!] = \lambda P_{\langle \epsilon, t \rangle}.\lambda t_i. \exists e[t \subseteq \tau(e) \wedge P(e)]$

Consider (40):

(40)   Kòfí sèlè-ɔ̀.
        Kofi swim-IMPF
        'Kofi swims'

Its structure up to the TP level is presented in (41), in which ϵ is a type of eventuality and t_{top} is the topic time. The interpretation of (40) is given in (42).

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[13]In fact, there is also the third option. Namely, it might be that the semantics of the imperfective marker -ɔ restricts the interpretation of imperfective sentences to events instantiated in the actual world, as it would be suggested by the unavailability of the dispositional interpretation. Since events in the future are still not instantiated in the actual world, it would explain the incompatibility of the suffix -ɔ with future temporal reference. This observation could be analyzed for example in line with Hacquard (2006), who claims that aspect is a quantifier over events, which has a world pronoun in its restriction.

(41)

$$
\begin{array}{c}
\text{TP} \\
t
\end{array}
$$
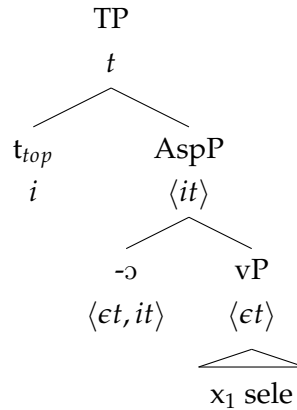
(42) $[\![\text{TP}]\!]^g = 1 \text{ iff } \exists e[t_{top} \subseteq \tau(e) \land e = \text{swim} \land Ag(e) = g(1)] \approx$ There is an event of swimming by the agent g(1), the running time of which ($\tau(e)$) includes the topic time (t_{top})

Summing up, the suffix -ɔ is a general imperfective marker, which can obtain the event-in-progress reading, habitual reading, and continuous reading for lexically stative predicates. In the next subsection, I briefly discuss differences between habitual and progressive that I assume.

5.3.2.2 Habitual and progressive aspect

There is an ongoing discussion whether imperfective and progressive/habitual can get a unified analysis. Bonomi (1997), Cipria and Roberts (2000), Ferreira (2005), Hacquard (2006), Deo (2009), Rivero and Arregui (2010) propose versions of a unified analysis of the imperfective and the progressive/habitual aspect. On the other hand, Boneh and Doron (2010) claim that the habitual cannot be reduced to imperfective and propose an independent habitual operator. In what follows, I will argue for a unified analysis of imperfective and progressive in Ga.

I assume neo-Davidsonian event semantics (Parsons, 1990; Schein, 1993) in which verbs denote relations between events and their arguments introduced by thematic roles. For illustration, the denotation of the verb *buy* is given below:[14]

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[14]There are several versions of event semantics available on the market. On the classical Davidsonian approach (Davidson, 1967) verbs denote a relation between events and their arguments, as presented in (i-a), and on the asymmetric view (Kratzer, 1996), verbs denote a relation between events and themes, as shown in (i-b):

(i)   a. $[\![\text{buy}]\!] = \lambda x.\lambda y.\lambda e.buy(x)(y)(e)$
        b. $[\![\text{buy}]\!] = \lambda y.\lambda e.buy(e) \land th(e) = (y)$

(43) $[\![\text{buy}]\!] = \lambda x.\lambda y.\lambda e.buy(e) \wedge Ag(e) = x \wedge Th(e) = y$

Moreover, following Krifka (1992); Landman (1997); Kratzer (2008), I assume that uninflected verbs denote the set of singular and plural events, i.e., they are number neutral. For example, the denotation of the verb *swim* is the set of all swimming events, singular and plural. Same as nouns, events form a mereological semi-lattice structure:

(44) $[\![\text{swim}]\!] =$

$$e_1 \oplus e_2 \oplus e_3$$

$$e_1 \oplus e_2 \qquad e_1 \oplus e_3 \qquad e_2 \oplus e_3$$

$$e_1 \qquad e_2 \qquad e_3$$

Now, Ferreira (2005) claims that habitual and progressive have the same temporal (and modal) components, but they differ with respect to the number of events being quantified over. Whereas in progressive a singular event is quantified over, thereby expressing the meaning that a singular event is ongoing (45-a), in habitual plural events are quantified over, thereby expressing the meaning that a sequence of events is ongoing (45-b):

(45)   a. $[\![\text{Impf}_{sg}]\!] = \lambda P_{sg}.\lambda t.\exists e[t \subseteq \tau(e) \wedge P(e)]$ PROGRESSIVE INTERPRET.
       b. $[\![\text{Impf}_{pl}]\!] = \lambda P_{pl}.\lambda t.\exists e[t \subseteq \tau(e) \wedge P(e)]$ HABITUAL INTERPRET.

(adapted from Ferreira, 2005, p.99)

In light of what has been said so far, it becomes clear why under the lexical entry for the Ga imperfective marker -ɔ given in (39), the verbs marked with -ɔ are compatible with both progressive and habitual aspectual references. Namely, the function of -ɔ is to provide the proper relation between the topic time and the running time of the event (the topic time is included in the running time of the event). If there is only one event in the VP denotation, the topic time is by force included in the running time of this event and hence a sentence with the ɔ-marked verb obtains a progressive interpretation. By contrast, if there is more than one event in the VP denotation, the topic time is included within a sequence of events and therefore sentences with -ɔ-marked verbs obtain a habitual interpretation. Since the denotation of uninflected verbs is number-neutral, the existential quantifier over events introduced by aspect can either quantify

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The choice of the particular approach is not substantial for the analysis of the analytic progressive form. For the sake of concreteness, I assume a neo-Davidsonian approach.

over singular events leading to the progressive interpretation or over the plural events leading to the habitual interpretation.

By that I do not want to say that the plurality of events being quantified over is the only difference between a habitual and a progressive interpretation. However, I do think that the assumption that uninflected verbs are number-neutral together with the observation that quantifying over a singular event invariably leads to the progressive interpretation allows us to compositionally derive the progressive interpretation conveyed by the analytic progressive in Ga.

On Ferreira's (2005) account, whether there is a singularity or a plurality of events in the denotation of the VP depends on the presence of a covert singular or plural determiner (Ferreira calls it a number morpheme). For example, the structure of the English sentence *John painted the house* is given in (46):

(46)   a.   [$_{TP}$ Past [$_{AspP}$ Impf [$_{VP\text{-}sg}$ [$_{VP}$ John paint the house]]]]
       b.   [$_{TP}$ Past [$_{AspP}$ Impf [$_{VP\text{-}pl}$ [$_{VP}$ John paint the house]]]]

<div align="right">(from Ferreira, 2005, p.97)</div>

By contrast, I argue that the singular event in the denotation of the analytic progressive is not introduced by a covert singular determiner but by the adverbial version of the definite determiner *lɛ* and the notion of exemplification, which will be explicated at length in subsection 5.4.4. In the next subsection, I discuss the semantics of *lɛ*.

5.3.3 The definite determiner *lɛ*

The particle *lɛ* comes in two guises, i.e., as low tone *lɛ̀* and tonally unspecified *lɛ* with a floating high tone which docks onto the preceding syllable (Dakubu, 1992).[15] Low tone *lɛ̀* functions as a third person singular pronoun, as presented in (47) and (48):

(47)   **L**ɛ̀ nì è-káne wòlò nyɛ̀ .
      3SG PRT 3SG-read book yesterday
      'It was (s)he who read a book yesterday.'

(48)   Lisa jí níkàsélɔ̀ kpètèǹkplé. **L**ɛ̀ pɛ́ è-páásí yɛ̀ kàá lɛ mlì nyɛ̀ .
      Lisa COP student great 3SG only 3SG-pass at exam DET in yesterday
      'Lisa is a great student. Only she passed the exam yesterday.'

---

[15]Tonally unspecified *lɛ* is frequently realized as a vowel preceded by a floating high tone: /a/ after /a/, /ɔ/ after /ɔ/, and /ɛ/ after any other vowel (Dakubu, 1992, p.5).

Often, however, the subject third person singular pronoun is realized in a shorter form *e*, as in (49):

(49)   **È**-yè-ɔ̀   lòò.
       3SG-eat-IMPF fish
       '(S)he/it eats fish.'

Lɛ̀ can also function as a Direct Object, as presented below, and then it can only occur in its full form:[16]

(50)   context: We are talking about Reggie. John wants to say that Kofi saw him yesterday.
       Kòfí nà lɛ̀/*è.
       Kofi see 3SG/3SG
       'Kofi saw him.'

Tonally unspecified *lɛ*, on the other hand, attaches to a range of expressions, in particular, NPs, VPs, and different kinds of subordinate clauses. The determiner *lɛ* can attach to all kinds of common noun NPs, i.e., singular and plural count nouns as well as mass nouns, as presented in (51):

(51)   a.   Kòfí hé àtómó lɛ nyɛ̀   .   SINGULAR COUNT NOUN
            Kofi buy potato DET yesterday
            'Kofi bought the potato yesterday.'

       b.   Kòfí hé wò-jí   lɛ nyɛ̀   .   PLURAL COUNT NOUN
            Kofi buy book-PL DET yesterday
            'Kofi bought the books yesterday.'

       c.   Kòfí hé nú   lɛ nyɛ̀   .   MASS NOUN
            Kofi buy water DET yesterday
            'Kofi bought the water yesterday.'

---

[16]Malte Zimmermann (p.c.) pointed out to me that whereas *lɛ* might be a strong pronominal form, which is required when a pronoun is in focus, *e-* can be a weak pronominal form. This view is supported by the data in (i):

(i)   Q: Who read a book yesterday?
       A1: #È-káne   wòlò nyɛ̀   .
            3SG-read book yesterday
       A2: Lɛ̀, è-káne   wòlò nyɛ̀   .
            3SG 3SG-read book yesterday
            'HE read a book yesterday.'

It seems, however, that when a pronoun is a DO, its strong, independent form is required, regardless of its information-structural status.

Usually, however, the determiner *lɛ* is not acceptable with proper names, as illustrated below:

(52) Q: Who does Kofi like?

A: Kòfí sùmɔ̀ Deborah (#lɛ).
Kofi like Doborah DET
intended: 'Kofi likes Deborah.'

(53) Q: What did Maria do yesterday?

A: Màríà bà   Accra (#lɛ) nyɛ̀   .
Maria go.PAST Accra DET yesterday
intended: 'Maria went to Accra yesterday.'

Moreover, *lɛ* cannot occur in generic contexts, as presented in (54):

(54) context: Dogs bark.
#Gbèé/gbè-í lɛ   bò-ɔ̀.
dog/dog-PL DET bark-IMPF

As already described in Dakubu (1992), the particle *lɛ* also attaches to non-nominal elements. For example, it is obligatory in *if*-clauses when they occur as the first clause in conditionals, as demonstrated for indicative and counterfactual conditionals in (55-a) and (56-a), respectively. However, the particle *lɛ* is not acceptable in *if*-clauses when the order of the clauses is reversed, as in (55-b) and (56-b).[17]

(55) context: Tom's mother says to her colleague:

a. Kéjí hùnú **lɛ** tsò   wɔ́   **lɛ**, Tom bàá-tswá   bɔ́ɔ̀lù.
if sun DET shine tomorrow DET Tom PROSP-play ball
'If there's good weather tomorrow, Tom will play football.'

b. Tom bàá-tswá   bɔ́ɔ̀lù, kéjí hùnú lɛ   tsɔ̀   wɔ́   (*lɛ).
Tom PROSP-play ball   if   sun DET shine tomorrow DET
'Tom will play football, if there's good weather tomorrow.'

(56) context: Mary had to choose whether she would marry a young fat man or a thin tall man. After visiting a fortune teller, Mary married the tall thin guy. A couple of years later, she read in the newspaper that the young fat man died in a car accident, so she went to the fortune teller again to find out what would

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[17]Malte Zimmermann (p.c.) suggested that the reason for that might be that the particle *lɛ* is licit on presupposed/backgrounded if-clauses, but not in focused if-clauses.

have happened, if she had married the young fat man. The fortune teller told her:[18]

a. Kéjí ò-kɛ̀   òblá-nùù àgbó lɛ yà-hì-shí   lɛ, kúlɛ́ mí-mììŋ
   IF 2SG-and young-man big DET go-live-marriage DET PRT me-inside
   bàá-fú   bò wàà díɛ̀ŋtsɛ̀.
   PROSP-be.angry 2SG really very
   'If you had married the young fat man, I would have been very, very angry at you.'

b. Kúlɛ́ mí-mììŋ   bàá-fú   bò wàà   díɛ̀ŋtsɛ̀, kéjí ò-kɛ̀
   PRT 1SG-inside PROSP-be.angry 2SG really very   if   2SG-and
   òblá-nùù   àgbó lɛ yà-hì-shi   (*lɛ).
   young-man big DET go-live-marriage DET
   'I would have been very, very angry at you, if you had married the young fat man.'

In addition, the particle *lɛ* attaches to subordinate temporal clauses, as presented in (57):

(57) a. Béní mì-bà   shía nyɛ́   lɛ, Kòfí mìì-káne wòlò yè tsú lɛ
         when 1SG-come home yesterday DET Kofi PROG-read book LOC room DET
         mlì.
         in
         'When I came back home yesterday, Kofi was reading a book in the room.'

      b. Béní má-bà   shía wɔ́   lɛ, Kòfí mìì-káne wòlò yè tsú   lɛ
         when 1SG-come home tomorrow DET Kofi PROG-read book be.at room DET
         mlì.
         in
         'When I come back home tomorrow, Kofi will be reading a book in the room.'

Moreover, Dakubu (1992) argues that *lɛ* can also occur in relative clauses:[19]

(58) mì-sùmɔ̀ɔ̀ àtàdé lɛ ní ò-hé   lɛ   (from Dakubu, 1992, p.8)
      1SG-like   dress DET REL 2SG-buy DET
      'I like the dress that you bought.'

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[18]The conditionals were elicited using a storyboard called 'A fortune teller' designed by TSF Working Group, http://www.totemfieldstoryboards.org/
[19]The glosses and tone marking are mine.

Lɛ can also attach to VPs[20] across all aspectual categories with the caveat that a sentence must be clefted, i.e., it must contain the particle *ni*.[21] Compare the unacceptable sentences in (59), which contain the VP *lɛ* but not the particle *ni*, with the same sentences with the particle *ni* in (60). Crucially, once the particle *ni* is present, the sentences with the VP *lɛ* become acceptable.[22]

(59)   a. *Kòfí sèlé **lɛ**.   UNMARKED FORM
             Kofi swim DET
             intended: 'Kofi swam.'

        b. *Kòfí sèlè-ɔ́   **lɛ**.   IMPERFECTIVE
             Kofi swim-IMPF DET
             intended: 'Kofi swims.'

        c. *Kòfí mìì-sèĺe   **lɛ**.   PROGRESSIVE
             Kofi PROG-swim DET
             intended: 'Kofi is swimming.'

        d. *Kòfí bàá-sèlé   **lɛ**.   PROSPECTIVE
              Kofi PROSP-swim DET
             intended: 'Kofi will swim.'

(60)   a. Kòfí **nì** sèlé lɛ.   UNMARKED FORM
             Kofi PRT swim DET
              'It is Kofi who swam.'

        b. Kòfí **nì** sèlè-ɔ́   lɛ.   IMPERFECTIVE
              Kofi PRT swim-IMPF DET
              'It is Kofi who is swimming.'

        c. Kòfí **nì** mìì-sèlé   lɛ.   PROGRESSIVE
              Kofi PRT PROG-swim DET
              'It is Kofi who is swimming.'

        d. Kòfí **nì** bàá-sèlé   lɛ.   PROSPECTIVE
              Kofi PRT PROSP-swim DET
              intended: 'It is Kofi who will swim.'

Furthermore, the determiner *lɛ* can also attach to VPs in interrogative sentences, as illustrated in (61) and (62):

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[20]see also Dakubu (2005)

[21]I do not present the data regarding the perfective aspect, because I am not sure whether in this test the language consultants interpreted the marker *e-* as the perfective marker or as a third person resumptive pronoun. This question should be answered in order to complete the paradigm.

[22]Note that clefts with the particle *nì* but without the final clausal particle *lɛ* are acceptable.

(61)   Mɛ́nì Kòfí káné lɛ?
       what Kofi read DET
       'What did Kofi read?'

(62)   Mɛ́ɛ̀bèì Kòfí sèlé   lɛ?
       when   Kofi swim DET
       'When did Kofi swim?'

Finally, the particle *lɛ* can also function as a topic marker. In these cases it can also attach to proper names, as demonstrated in (63):

(63)   A: Tell me something about John.
       B: John lɛ, è-káné   wòlò nyɛ̀.
           John PRT 3SG-read book yesterday
           'As for John, he read a book yesterday.'

In that case, however, there is a pause after *lɛ* and an obligatory resumptive pronoun attached to the verb.

Summing up, the fact that *lɛ* occurs in antecedents of conditionals, subordinate temporal clauses, relative clauses, and the backgrounded part of clefts together with the observation that the particle *lɛ* can also mark topics corroborates its semantic nature as some kind of background marker.[23] I believe that the unified analysis of *lɛ* as a background marker and a definite determiner is possible. It could be done, e.g., in line with Grubic's (2015) analysis of the Ngamo (West Chadic) =*i/ye* marker which, as the Ga particle *lɛ*, functions as a definite determiner, a background marker and marks antecedents of conditionals. Moreover, I think that low tone *lɛ̀*, i.e., a third person singular pronoun, and tonally unspecified *lɛ*, i.e., the definite determiner, might also obtain a unified analysis. For example, in line with Elbourne (2005), who gave a unified analysis of pronouns and the definite determiner in English. Yet these are another issues that have to await future research. In this chapter, I am only concerned with *lɛ*. Moreover, I concentrate only on the cases in which *lɛ* attaches either to NPs or to VPs; I will not discuss *lɛ* attached to subordinate clauses and *if*-clauses.

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[23]Interestingly, similar syntactic and semantic properties are exhibited by the definite determiner *nʊ* in Akan, a Ga language relative. However, since the systematic comparison of *lɛ* and *nʊ* is beyond the scope of this chapter, it is left for future research. For an analysis of *nʊ*, see for example Arkoh and Matthewson (2013).

5.3.3.1 The particle *lɛ* is a definite determiner

It has been proposed in the literature that definite determiners encode uniqueness of the discourse referent, its existence, and its familiarity or a subset of thereof. Researchers following a Fregean (1892) approach analyze definite determiners as encoding both uniqueness and existence inferences as presuppositions (e.g., Heim and Kratzer, 1998; Schwarz, 2009; Elbourne, 2013). On the approach labeled as Weak-Fregean by Coppock and Beaver (2015), uniqueness is presupposed but existence inference is not encoded by definite determiners. Finally, under a Russellian (1905) approach, both uniqueness and existence are asserted. By contrast, Heim (1982); Szabó (2000, 2003), and Roberts (2003) propose analyzing definite determiners in terms of familiarity defined in various ways.[24] Moreover, Barlew (2014) argues that the Bulu definite determiner *te* encodes along with the uniqueness, the salience of the discourse referent, defined in terms of attention capture: 'What is salient to a given individual is what she is paying attention to' (Barlew, 2014, p.5).

Looking at Ga, I claim that *lɛ* encodes that a discourse referent is familiar and unique in bearing the property in question. In (64), I present Robert's (2003) taxonomy of familiarity:

(64)   Taxonomy of familiarity:

      a.   strong familiarity: the NP has as antecedent a discourse referent introduced via the utterance of a (usually) preceding NP

      b.   weak familiarity:

          (i)   the entity referred to is perceptually accessible to the interlocutors

          (ii)   the entity referred to is globally familiar in the general culture or at least among the participants in the discourse, although not mentioned in the immediate discourse

          (iii)   introduction of the NP's discourse referent is licensed solely by contextual existence entailments

          (iv)   weak familiarity is guaranteed by giving a functional interpretation to the definite description (which function may have to be accommodated) with the intended argument(s) both familiar and highly salient (Bridging)

                                          (from Roberts, 2003, p.304)

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[24]Note, however, that Roberts (2003) proposes that definites encode both familiarity and the informational uniqueness of the discourse referent.

In what follows, I argue that *lɛ* requires a weakly or a strongly familiar discourse referent in order to be felicitously used. In particular, the fact that perceptual accessibility can also license the use of the familiar definite determiners is of special importance for the analysis of the analytic progressive.

NP lɛ   Example (65) shows that *lɛ* cannot be used at the beginning of a conversation. Example (66), in turn, demonstrates that *lɛ* is acceptable in the second sentence, when the NP antecedent is present. These two observations taken together suggest that *lɛ* requires a strongly familiar discourse referent.

(65)   context: beginning of the conversation

Mì-tèè   shìkátòòhe (#lɛ) nyɛ̀.
1SG-go.past bank   DET yesterday.
intended: 'I went to a bank yesterday.'

(66)   context: beginning of the conversation

Mì-káne wòlo (#lɛ) nyɛ̀.   Wòlo #(lɛ) è-ŋɔ́ɔ́   wàà.
1SG-read book DET yesterday book DET 3SG-be.tasty very
intended: 'I read a book yesterday. The book was interesting.'

Furthermore, example (67) demonstrates that *lɛ* is unacceptable in contexts in which the interlocutors are not familiar with the discourse referent picked up by *lɛ*, corroborating the analysis of *lɛ* as encoding familiarity:

(67)   context: Kofi went to the market and bought several books we've never talked about.

Kòfí hé   wò-ji   (#lɛ).
Kofi buy book-PL DET
intended: 'Kofi bought books.'

A language consultant gave a comment that (67) means that we spoke about the books before and we know them. By contrast, the particle *lɛ* is acceptable in contexts in which a discourse referent was discussed before and hence it is familiar, as in (68):

(68)   context: We have talked about a bank in Osu. I said that I was there yesterday, then Kofi says:

Mì-hú   mì-tèè   shìkátòòhé lɛ   nyɛ̀   .
1SG-also 1SG-go.past bank   DET yesterday
'I also went to the bank yesterday.'

The data presented so far show that *lɛ* is acceptable in contexts in which a discourse referent is strongly familiar. The following data show in turn that *lɛ* is also acceptable in contexts in which a discourse referent is weakly familiar. For example, *lɛ* is acceptable in contexts in which the discourse referent is perceptually accessible to the interlocutors (example (69)) or familiar due to general knowledge (example (70)):

(69)   context: I can see that a boy is kicking John. I say:
         Gbékɛ nùú lɛ   mìì-bútu   John.
         child   man DET PROG-kick John
         'The boy is kicking John.'

(70)   There was a Ghanaian national day yesterday and there was a big celebration
         ceremony in Accra which was visited by the Ghanaian president and town el-
         ders. I met my friend. We talked about how beautiful the celebration was (but
         we didn't talk about who there was). He asked me, whether I saw any famous
         person. I reply:
         Mì-nà   màŋhíɛnyìɛlɔ lɛ.
         1SG-see governor   DET
         'I saw the president.'

The determiner *lɛ* also exhibits bridging uses of definites in which the discourse referent has not been previously mentioned but it is familiar due to the relation between the discourse referent picked up by the definite and the previously mentioned discourse referent, as in (71), where the first sentence sets the scene for the second one:

(71)   Kòfí hé wòlò nyɛ̀.   Wòlòŋmàlɔ lɛ jɛ̀   Akan.
         Kofi buy book yesterday author   DET be.from Akan
         'Kofi bought a book yesterday. The author is Akan.'

Moreover, examples (72) and (73), taken from Barlew (2014), show also that *lɛ* does not encode salience, understood as the attention capture (Barlew, 2014). (72) illustrates the bottom-up strategy, which is driven by the perceptual prominence of the discourse referent. (73), on the other hand, comprises the top-down strategy of attention capture, which is triggered by the relevance for the interlocutors' tasks or goals. The Ga definite determiner *lɛ*, unlike the Bulu definite determiner *te*, is acceptable in both (a) and (b) contexts, indicating that *lɛ* can be used regardless of the fact whether the antecedent

discourse referent is salient, i.e., whether the addressee's attention is captured by the antecedent or not.[25]

(72)   a.   context 2: Kofi is sitting on a bus when a man he does not know sits down beside him. The stranger opens the window shade on the bus, letting in sunlight and says (72-i).

       b.   context 1: Kofi is sitting on a bus when a man he does not know sits down beside him. The stranger says (72-i).

           (i)   Hùlú lɛ   mìì-kpɛ́   wàà   ŋmɛ́nɛ́.
               sun   DET PROG-shine strongly today
               'The sun is bright today.'
               ⇒ The stranger can utter (72-i) in both contexts

(73)   a.   context 1: Kofi and his wife Dede are interested in family's genealogy and they have a special book that is a family heirloom passed down from Dede's mother. It has family genealogy written inside it. They always keep it on the nightstand beside their bed. One day when they come home, they find their house has been broken into. When they come to the nightstand, they see that the book is gone. They exchange a glance, and then Kofi says (73-i).

       b.   context 2: The same as in (73-a), except that this time sad Kofi says (73-i) to his teenage son, who does not care about genealogy or family heirlooms.

           (i)   Wòló lɛ   é-làájé.
               book   DET PFV-get.lost
               'The book got lost.'
               ⇒ Kofi can utter (73-i) in both contexts

I argue that the use of the determiner *lɛ* in example (72-b) is licensed by the general knowledge, i.e., it is generally known that there is sun. On the other hand, *lɛ* is licensed in (73-b) because the book is weakly familiar. It seems that the language consultant accommodated the information that since the book is so important for the family, it must be weakly familiar for the family members (even though Kofi's teenage son does not care about genealogy).

    Turning to the uniqueness inference, I argue that the determiner *lɛ* encodes that a discourse referent is both familiar and unique in bearing the property in question, which comes down to Robert's (2003) notion of informational uniqueness. Consider (74). The

---

[25]Barlew writes that in order to use *te* the speaker 'needs to have (accurate) evidence that the addressee is attending to that antecedent' (Barlew, 2014, p.625).

particle *lɛ* is acceptable in (74-a), in which case there is a familiar discourse referent which is unique in bearing the property in question, and it is not acceptable in (74-b), in which case the discourse referent is neither familiar nor unique in bearing the property in question.

(74)   context: There was a Ghanaian national day yesterday and there were a lot of celebrations in Accra which were visited by one president and many town elders.

    a.   Mì-nà   màŋhíɛ̀nyìɛ́lɔ́ lɛ.
           1SG-see president   DET
           'I saw the president.'

    b. #Mì-nà   màŋ ònúkpá lɛ.
           1SG-see town elder   DET
           'I saw the town elder.'

Importantly, (74-b) becomes acceptable, if one of the town elders was discussed before, ergo is familiar, as presented in (75). It confirms the observation that *lɛ* encodes that a discourse referent is familiar and unique in bearing the property in question. If *lɛ* had encoded the absolute uniqueness inference, then *maŋ onukpa lɛ* ('the town elder') would have implied that there is only one town elder at the ceremony. Hence (75) would have been unacceptable, contrary to fact. By contrast, if *lɛ* encodes that a discourse referent is both familiar and unique in bearing the property in question, then (75) is predicted to be acceptable and this prediction is borne out, as presented below:

(75)   context: There were five town elders at the celebrations. We've talked about one of them. I say:

    Mì-nà   màŋ ònúkpá lɛ.
    1SG-see town elder   DET
    'I saw the town elder.'

The same holds for (76). The particle *lɛ* is acceptable in (76) even though there is more than one book on the table. A language consultant gave a comment that (76) is good in the provided context, because *lɛ* clarifies what Mary is searching for.

(76)   There are five books on the table. Mary started reading 'Anna Karenina' yesterday but she hasn't finished it and I know it. Mary asks me where this book ('Anna Karenina') is. I answer:

> Wòló lɛ   ká òkpɔlɔ́ lɛ   nɔ̀.
> book DET lie table   DET on
> 'The book is on the table.'

Crucially, however, *lɛ* becomes unacceptable if the interlocutors talked about more than one town elder and there is more than one familiar book on the table, respectively. This corroborates the generalization that *lɛ* encodes both that a discourse referent is familiar and unique in bearing the property in question:

(77)   context: There were five town elders at the celebrations. We've talked about two of them. I say:

> #Mì-nà   màɨ̀ ònúkpá lɛ.
> 1SG-see town elder   DET
> 'I saw the town elder.'

(78)   context: There are five books on the table. We've talked about two of them. I say:

> #Wòló lɛ   ká òkpɔlɔ́ lɛ   nɔ̀.
> book DET lie table   DET on
> 'The book is on the table.'

Further support for the view that *lɛ* encodes that a discourse referent is familiar and unique in bearing the property in question comes from example (79). It turns out that (79-C1) is unacceptable as the continuation of (79) suggesting that the discourse referent picked up by *lɛ* must be informationally unique. Note that the same sentence with the indefinite determiner *kome* in (79-C2) was judged as an acceptable continuation of (79).

(79)   context:

> Mì-káne wò-jì   ényɔ̀ nyɛ̀.
> 1SG-read book-PL two   yesterday
> 'I read two books yesterday.'

> C1:#Wòló lɛ   è-ŋɔ́ɔ   wàà.
> book DET 3SG-be.teasty very
> 'The book was interesting.'

> C2: Wòlò kòmé è-ŋɔ́ɔ   wàà.
> book INDF 3SG-be.teasty very
> 'A book was interesting.'

VP lɛ   The particle *lɛ* also functions as a definite determiner when it attaches to the VP. The observation that languages can have definite descriptions of categories other

than NPs is not new. For example, Baker and Travis (1997) claim that mood prefixes in Mohawk mark the verbal equivalent of (in)definiteness and by that are analogous to the English article system rather than to the English temporal system. Larson (2003) analyzes final clausal definite determiners in Fɔn and Haitian Creole as definite adverbs and Iatridou (2014) argues that *since* adverbial is a singular definite determiner functioning on events. Moreover, Grubic and Zimmermann (2011) propose analyzing the Ngamo background marker *i/=ye* as a definiteness marker of events and Hole (2011) argues that Chinese *shì...de* clefts encode a uniqueness and a familiarity presupposition of events. However, there are at least two important points that make *lɛ* interesting from a theoretical point of view. First, it has the same overt form in both the nominal and the verbal domain. And second, it influences the aspectual interpretation of the sentence. Consider (80) and (81). Whereas the clefted sentence with VP *lɛ* invariably obtains a progressive interpretation, the same sentence without *lɛ* obtains a habitual interpretation:

(80)   progressive context: Tom and his family (wife, two sons, and two daughters) are on the beach. Tom and his wife can see a swimming child. Tom's wife says:

   a.   Kòfí nì   sèlè-ɔ́   lɛ.
        Kofi PRT swim-IMPF DET
   b.   #Kòfí nì   sèlèɔ̀.
        Kofi PRT swim-IMPF
        intended: 'It is Kofi who is swimming.'

(81)   habitual context: Tom's one son and daughters do not like swimming and they do not do it, but his oldest son, Kofi, loves swimming and he does it regularly.

   a.   #Kòfí nì   sèlè-ɔ́   lɛ.
        Kofi PRT swim-IMPF DET
   b.   Kòfí nì   sèlèɔ̀.
        Kofi PRT swim-IMPF.
        intended: 'It is Kofi who swims.'

The particle *lɛ* attached to the VP was already discussed in Dakubu (2005). She refers to Boadi (1974), who claims that the definite determiner in Akan, when used in the same way as in (82), suggests 'not merely that the event in the proposition occurred, but that it has been referred to earlier in the discourse.' (Dakubu, 2005, p.19)

(82)   Kòfí (nì) è-ýi   lɛ.
       Kofi PRT 3sg-beat DET
       'He indeed beat KOFI.'   (from Dakubu, 2005, p.19)

Dakubu (2005) claims that Boadi's (1974) observation is also valid for Ga. She notes that Ga native speakers comment that in sentences like (82) 'the event is expected, or otherwise known to the hearer.' Importantly, my data are in line with these observations. As in the case of NP *lɛ*, the discourse referent picked up by VP *lɛ* (an event described by the VP denotation) can be strongly or weakly familiar. Empirical support for this view comes from the data presented below.

Compare (83) with (84). The determiner *lɛ* attached to the VP is unacceptable in contexts in which the interlocutors are not familiar with the VP discourse referent, as in (83), and it is acceptable in contexts in which the VP discourse referent is known to the interlocutors, as in (84).[26]

(83)   We didn't talk about swimming before. Suddenly, I have decided to tell my friend who was swimming yesterday.

    a. #Kòfí nì   sèlé lɛ.
       Kofi PRT swim DET
    b. Kòfí nì   sèlè.
       Kofi PRT swim
    c. Kòfí sèlè.
       Kofi swim
       intended: 'Kofi swam.'

A language consultant gave a comment that in the case of (83-a) we must have talked about swimming before and the speaker is putting emphasis that it was Kofi who did it.

(84)   We talked about swimming before and we are arguing who swam yesterday. I say:

    a. Kòfí nì   sèlé lɛ.
       Kofi PRT swim DET

---

[26]In fact, (83) and (84) do not constitute a minimal pair, because they differ in two respects, i.e., whether the interlocutors talked about the swimming before or not and whether they are quarreling about who was swimming yesterday (thank you to Judith Tonhauser for pointing this out to me). One might be worried that the unacceptability of (83-a) does not come from the fact that swimming was not discussed before but from the fact that the use of clefts is not really licensed in (83). Note, however, that (83-b) is acceptable, supposedly due to the accommodation effect. Moreover, a language consultant commented on (83-a) that in that case the interlocutors need to talk about swimming before in order to use it. At the same time, it seems that the fact that the interlocutors quarrels in (ii) just reinforces the statement that the interlocutors talked about the swimming before. The elicitation of more data regarding the (un)acceptability of the particle *lɛ* attached to the VP in contexts in which the given event was either discussed before or not is left for future research.

    b.   Kòfí nì   sèlè.
            Kofi PRT swim

    c.   Kòfí sèÌe.
            Kofi swim
            intended: 'Kofi swam.'

Moreover, one can use VP *lɛ* when the discourse referent is not previously mentioned in the conversation but just known to the interlocutors, as in (85):

(85)   There is a long-distance swimming competition in Accra today. Tom knows that Anna's turn to swim is scheduled for 13:00-14:00. It is 13:30 now. Tom says:

        Anna nì   sèlè-ɔ́   lɛ.
        Anna PRT swim-IMPF DET
        'It is Anna who is swimming.'

In addition, (85) can also be used in contexts in which swimming by Anna was not mentioned before but Tom has a direct perceptual evidence that Anna is swimming, as in (86):

(86)   context: Tom and Anna are on the beach. Tom can see that Anna is swimming. He says:

        Anna nì   sèlè-ɔ́   lɛ.
        Anna PRT swim-IMPF DET
        'It is Anna who is swimming.'

Turning to the uniqueness inference, since the particle *lɛ* can be attached to the VP only when the cleft-introducing particle *ni* is present in the sentence as well, it is difficult to find an independent piece of evidence that *lɛ* triggers the uniqueness inference also in these cases. Consider (87) and (88):

(87)   context: John, Tom, and Maria are in the process of swimming.

        #John nì   sèlè-ɔ́   lɛ.
        John PRT swim-IMPF DET
        'It is John who is swimming.'

(88)   Anne, Bill, and Maria are reading.

        #Anne nì   kánè-ɔ̀   níí   lɛ.
        Anne PRT read-IMPF thing DET
        'It is Anne who is reading.'

That (87) and (88) are not acceptable in their respective contexts could be attributed to the fact that *lɛ* triggers the uniqueness presupposition and therefore it is infelicitous in contexts in which there is more than one event of the given kind. However, since *ni* triggers the exhaustive interpretation of the pivot (see chapter 4 for a detailed discussion), namely that John and nobody else is swimming or Anne and nobody else is reading, the same effect is expected without the VP *lɛ*. Therefore, it is difficult to tell whether the observed exhaustivity effect is triggered by *ni* or the uniqueness inference triggered by *lɛ*.

A good test for the uniqueness inference triggered by *lɛ* is to check its acceptability in contexts in which the same agent performs more than one activity of the same kind, for example in a context in which Kofi swam several times. In that case the exhaustivity triggered by the particle *ni*, i.e., that only Kofi and nobody else swims, should not interact with the uniqueness triggered by the particle *lɛ*, i.e., that there is a unique event of the given kind. It means that one would expect *lɛ* to be unacceptable in habitual contexts (in which for example Kofi swims regularly) and acceptable in progressive contexts (in which there is an ongoing unique event of swimming by Kofi). And this is precisely the initial observation from this chapter, i.e., sentences with the analytic progressive form are only acceptable in progressive contexts:[27],[28]

---

[27]In light of what has been said so far, one would expect (i-a) with the unmarked form *sele* to be unacceptable in the context of (i), contrary to fact:

(i) context: Last year, John swam every day.

  a. John nì sèlè lɛ.
      John PRT swim DET
      'It was John who swam last year.'

  b. #John nì sèlè-ɔ́ lɛ.
      John PRT swim-IMPF DET
      intended: 'It was John who swam last year.'

One possible analysis of (i) would be to say that there is a quantification over the minimal situation in (i-a) containing only a swimming event by John and nothing else and hence *lɛ* could still be analyzed as invoking the uniqueness inference. Since the interaction between the definite determiner *lɛ* and the unmarked form is beyond the scope of this chapter, I am leaving it for future research. Note also that, as expected, the same sentence with the imperfective form *seleɔ* is unacceptable in the context of (i).

[28]By that I do not want to say that the progressive interpretation of sentences with the analytic progressive form is triggered solely by the definite determiner *lɛ*. Quite to the contrary, I argue that it is the effect of the interaction between the imperfective marker -ɔ, the definite determiner *lɛ*, and the semantics of clefts introduced by the particle *ni*.

(89) Kòfí nì sèlè-ɔ́ lɛ.
      Kofi PRT swim-IMPF DET
      'It is Kofi who is swimming.'

    a.   progressive context: Tom and his family (wife, two sons, and two daughters) are on the beach. Tom and his wife can see a swimming child. ⇒ (89) is <u>acceptable</u> in this context

    b.   habitual context: Tom's one son and daughters do not like swimming and they do not do it, but his oldest son, Kofi, loves swimming and he does it regularly. ⇒ (89) is <u>unacceptable</u> in this context
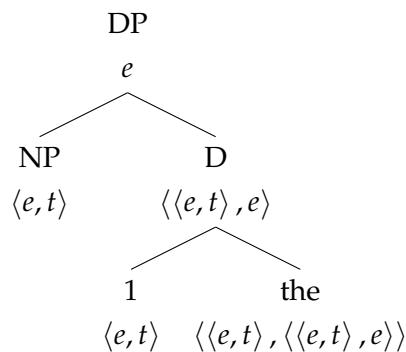
To conclude this subsection, it was shown that both in the nominal and the verbal domain the definite determiner *lɛ* encodes the information that a discourse referent is familiar and unique in bearing the property in question which is typical for definite determiners in a cross-linguistic perspective. In the next subsection, I propose a formal semantic analysis of *lɛ* which captures these empirical generalizations.

5.3.3.2 A formal analysis of the definite determiner *lɛ*

Various proposals haven been made to model the semantics of definite determiners, e.g., Frege (1892); Russell (1905); Heim (1982); Roberts (2003); Elbourne (2005); Schwarz (2009); Neale (2004), among many others. I propose formalizing the familiarity and uniqueness of *lɛ* in Elbourne's (2005) system, extending his analysis to the VP domain.

Elbourne (2005) argues that definite determiners, at least in English, take two arguments, i.e., an NP and a covert pronominal index of type $\langle e, t \rangle$.[29,30]

(90)

$$
\begin{array}{c}
\text{DP} \\
e \\
\diagup \quad \diagdown \\
\begin{array}{cc}
\text{NP} & \text{D} \\
\langle e, t \rangle & \langle \langle e, t \rangle, e \rangle \\
& \diagup \quad \diagdown \\
& \begin{array}{cc} 1 & \text{the} \end{array} \\
& \langle e, t \rangle \quad \langle \langle e, t \rangle, \langle \langle e, t \rangle, e \rangle \rangle
\end{array}
\end{array}
$$

---

[29]See Elbourne (2013) for a competing view that the English definite determiner *the* takes two arguments, i.e., an NP and a situation but not an index.

[30]Following Elbourne (2005), Schwarz (2009) and Arkoh and Matthewson (2013) argue that German strong definite determiners and the Akan definite determiner *nʊ*, respectively, also take two arguments: an NP and a covert pronominal index.

The index can be either bound or interpreted with respect to the assignment function g which maps variables to familiar entities. With the latter, the definite description obtains a referential interpretation and it does not give rise to the inference that the NP is unique. For example, (91) says that there is a unique murderer such that the murderer is g(1), but crucially it does not say that there is a unique murderer in general.

(91) $[\![[[the\ 1]\ murderer]]\!]^g$ = the unique individual x such that x is a murderer and $x = g(1)$ (from Elbourne, 2005, p.154)

In order to neutralize the referential interpretation effect of interpreting the covert pronominal index with respect to the assignment function, Elbourne (2005) introduces a special dummy index 0, interpreted as $\lambda x : x_e.x_e$. Its presence in the structure triggers a unique, attributive, i.e., not referential, interpretation of the NP. Consider (92):

(92) $[\![[[the\ 0]\ murderer]]\!]^g$ = the unique individual x such that x is a murderer

(from Elbourne, 2005, p.154)

Turning to Ga, I claim that the definite determiner $l\varepsilon$ also takes two arguments: the NP and the pronominal index, which I formally analyze as a variable of type e.[31] The lexical entry for $l\varepsilon$ is given in (93):

(93) $[\![l\varepsilon]\!] = \lambda y.\lambda P : \exists!x[P(x) \wedge x = y].\iota x[P(x) \wedge x = y]$ [to be revised]

For illustration, the structure of *wolo lɛ* ('the book') is presented in (94) and its derivation in (95):[32]

(94)

DP
e

wolo   D
$\langle e,t\rangle$ $\langle\langle e,t\rangle,e\rangle$

              3   lɛ
              e $\langle e,\langle\langle e,t\rangle,e\rangle\rangle$

---
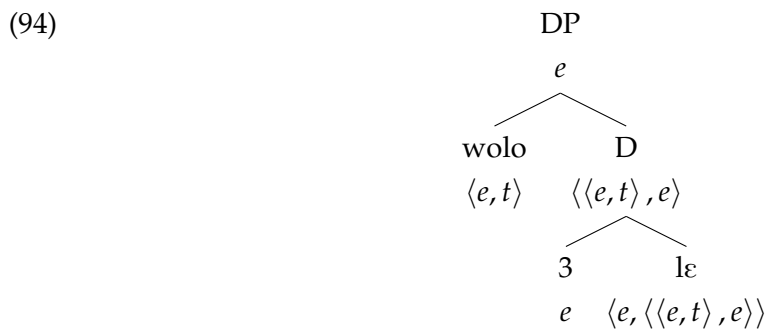
[31] In this respect, I am following Schwarz's (2009) and Arkoh and Matthewson's (2013) analyses in which the pronominal index is also of type e.
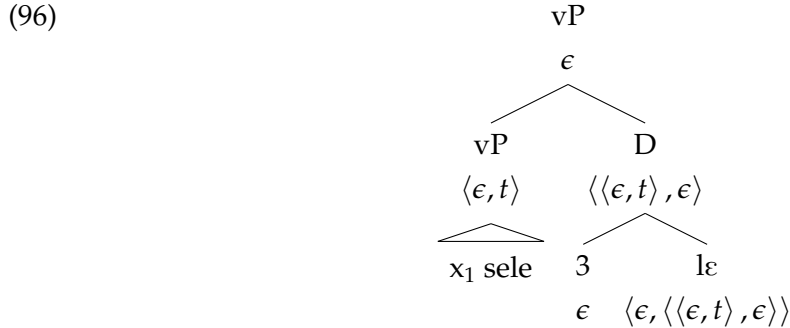
[32] For presentational reasons, I omit the presupposed material.

(95) a. $[\![D]\!]^g = \lambda y.\lambda P.\iota x[P(x) \wedge x = y](g(3))$
          $= \lambda P.\iota x[P(x) \wedge x = g(3)]$

      b. $[\![DP]\!]^g = [\![D]\!]^g([\![\text{wolo}]\!])^g = \iota x[\text{wolo}(x) \wedge x = g(3)] \approx$ the unique individual x such that x is a book and x is identical to $g(3)$

This analysis can account for the data presented in subsection 5.3.3.1. The assignment function maps the covert index to familiar entities and thus it accounts for strongly and weakly familiar uses of *lɛ*. In addition, the data presented in subsection 5.3.3.1 suggest that *lɛ* never triggers the interpretation that a discourse referent is unique in general but that a familiar discourse referent is unique in bearing the property in question. Therefore, I do not assume any special index which would neutralize the interpretive effects of analyzing the covert index with respect to the assignment function.

Extending the analysis to the verbal domain, I claim that the particle *lɛ* also functions as a definite determiner when it attaches to the VP. Importantly, I propose for VP *lɛ* the same lexical entry as for NP *lɛ* (see the lexical entry in (93)). Recall that I assume neo-Davidsonian event semantics in which verbs denote relations between events and their arguments introduced by thematic roles. When *lɛ* attaches to the VP, it takes a property (a set of events) and says that there is a unique (singular or plural) familiar event which has this property. As an example, the structure of *sele lɛ* ('the swimming event') is given in (96) and its derivation in (97):[33],[34],[35]

(96)

$$
\begin{array}{c}
\text{vP} \\
\epsilon \\
\diagup\diagdown \\
\end{array}
$$

vP $\langle \epsilon, t \rangle$ — D $\langle \langle \epsilon, t \rangle, \epsilon \rangle$

x_1 sele — 3 ϵ — lɛ $\langle \epsilon, \langle \langle \epsilon, t \rangle, \epsilon \rangle \rangle$

(97) a. $[\![l\varepsilon]\!]^g = \lambda y.\lambda P.\iota e P(e) \wedge e = y$

---

[33] Note that x_1 also receives a value via the the assignment function. However, in order to increase the readability of the formulas, I do not mark it.

[34] Note also that this is not the final version of the derivation, the lexical entry for *lɛ* will be revised in subsection 5.4.3 and the derivation in subsection 5.5

[35] The structure in (i) is unusual in that D takes vP as its argument and it does not project its properties. It might be that both NP *lɛ* and VP *lɛ* have the same semantics, but they are not of the same syntactic category. For the presentational reasons, however, I am labeling VP *lɛ* and NP *lɛ* in a uniform way. A more detailed explication of this issue has to await future research. Thank you to Marta Wierzba for discussing this with me.

b. $[\![D]\!]^g = [\![l\varepsilon]\!](g(3)) = [\lambda y.\lambda P.\iota e[P(e) \wedge e = y]](g(3)) = \lambda P.\iota e[P(e) \wedge e = g(3)]$

c. $[\![vP]\!] = \lambda e.\text{swim}(e) \wedge Ag(e) = x_1$

d. $[\![VP]\!]^g = [\![D]\!]^g([\![vP]\!])$
    $= [\lambda P.\iota e P(e) \wedge e = g(3)](\lambda e.\text{swim}(e) \wedge Ag(e) = x_1)$
    $= \iota e[\text{swim}(e) \wedge Ag(e) = x_1 \wedge e = g(3)]$
    $\approx$ the unique event e such that e is a swimming event, whose agent is x_1 and e is $g(3)$

5.3.4 The definite determiner in the analytic progressive

I argue that *VP lɛ* syntactically still behaves like a verb, i.e, it can be labeled as a verbal projection, and therefore it can be taken as an argument by aspect. Consider (98) and its structure given in (99):

(98)   Kòfí nì   sèlè-ɔ́   lɛ.
       Kofi PRT swim-IMPF DET
       'It is Kofi who is swimming.'

(99)
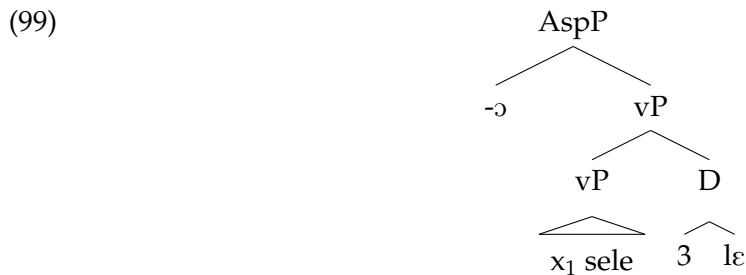
A question that arises immediately according to the way I have set things up is why *seleɔ* is not analyzed as the nominalized form of *sele* ('swim') and why *lɛ* is not claimed to operate on such a nominalized form. A first piece of evidence that 'seleɔ' is not nominalized comes from the cleft structure in Ga. As I have already shown in chapter 4, VPs in Ga can be clefted only in their nominalized form. Therefore, the prediction is that if *seleɔ* were a nominalized form of *sele*, it should be acceptable as the focus pivot, contrary to fact:

(100)   Q: What is Tom doing right now?
        A1:*Sèlè-ɔ̀   nì Tom fé-ɔ́   lɛ.
            swim-IMPF PRT Tom do-IMPF DET

> A2: Sèlè-mɔ̀   nì   Tom fé-ɔ́   lɛ.
> swim-NOM PRT Tom do-IMPF DET
> intended: 'It is swimming that John is doing right now.'

A language consultant commented on (100-A1) that it is not a good sentence, it means something like 'It is swim that Tom is doing right now.' By contrast, she said that (100-A2) means 'It is swimming that Tom is doing right now' and it is fine.

Another piece of evidence that -ɔ is not a nominalized form comes from associative NPs. The test presented in (101) is based on the observation that associative complements within NPs are nominal. The fact that the -ɔ marker is not acceptable in this construction suggests that it is not a nominalization marker.

(101)   Priscilla and Dede are talking about yesterday's swimming competition. Priscilla says:

      a.   Kòfí sèlè-mɔ́   lɛ   sà   mí-híɛ̀.
           Kofi swim-NOM DET be.agreeable 1SG-self
           'The swimming of Kofi pleases me.'

      b.   *Kòfí sèlè-ɔ̀   lɛ   sà   mí-híɛ̀.
           Kofi swim-IMPF DET be.agreeable 1SG-self
           intended: 'The swimming of Kofi pleases me.'

Moreover, verbs marked with -ɔ cannot be taken as an argument by intransitive verbs. Since nominalized verbs should be of the proper type to be an argument of intransitive verbs, the unacceptability of the marker -ɔ in this construction serves as further evidence against the analysis of -ɔ as a nominalizer.

(102)   Kofi and Dede are talking about their favorite sports. Kofi says:

      a.   Mí-sùmò-ɔ̀   sèlè-mɔ̀.
           1SG-like-IMPF swim-NOM
           'I like swimming'

      b.   *Mí-sùmò-ɔ̀   sèlè-ɔ̀.
           1SG-like-IMPF swim-IMPF
           intended: 'I like swimming.'

Based on the data presented above, I conclude that the suffix -ɔ is not a nominalization marker. Example (104) demonstrates the syntactic structure of (98), repeated below in (103), up to the TP level and (105) presents its formal derivation:[36]

---

[36] Again, note that all the pronominal elements receive a value via the assignment function. However, in order to increase the readability of the formulas, I do not mark it.

(103) Kòfí nì sèlè-ɔ́   lɛ.
       Kofi PRT swim-IMPF DET
       'It is Kofi who is swimming.'

(104)

$$
\begin{array}{c}
\text{TP} \\
t
\end{array}
$$

TP (t)
- t$_{top}$ (i)
- AspP ⟨i, t⟩
  - -ɔ ⟨⟨ϵ, t⟩, ⟨i, t⟩⟩
  - vP — type clash; type-shift from ϵ → ⟨ϵ, t⟩
    - vP ⟨ϵ, t⟩
      - x$_1$ sele (ϵ)
    - D ⟨⟨ϵ, t⟩, ϵ⟩
      - 3 — ϵ
      - lɛ — ⟨ϵ, ⟨⟨ϵ, t⟩, ϵ⟩⟩
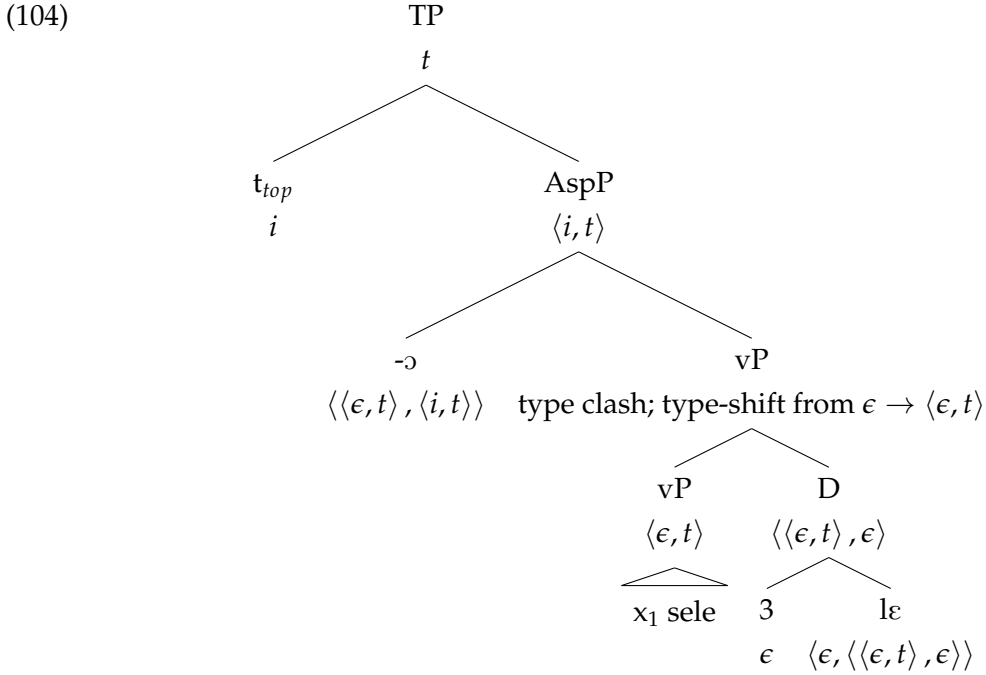
(105) a. $[\![\text{vP}]\!]^g = \iota e[\text{swim}(e) \wedge Ag(e) = x_1 \wedge e = g(3)]$
           type clash with Impfv, type-shift form ϵ to ⟨ϵ, t⟩:
           $= \lambda e.e = \iota e'[\text{swim}(e') \wedge Ag(e') = x_1 \wedge e' = g(3)]$

       b. $[\![\text{-ɔ}]\!] = \lambda P.\lambda t.\exists e[t \subseteq \tau(e) \wedge P(e)]$

       c. $[\![\text{Asp}]\!]^g = [\![\text{-ɔ}]\!]([\![\text{VP}_2]\!]^g)$
           $= [\lambda P.\lambda t.\exists e[t \subseteq \tau(e) \wedge P(e)]](\lambda e.e = \iota e'(\text{swim}(e') \wedge Ag(e') = x_1 \wedge e' = g(3)))$
           $= \lambda t.\exists e[t \subseteq \tau(e) \wedge [\lambda e.e = \iota e'(\text{swim}(e') \wedge Ag(e') = x_1 \wedge e' = g(3))](e)]$
           $= \lambda t.\exists e[t \subseteq \tau(e) \wedge e = \iota e'(\text{swim}(e') \wedge Ag(e') = x_1 \wedge e' = g(3))]$

       d. $[\![\text{TP}]\!]^g = \lambda t.\exists e[t \subseteq \tau(e) \wedge e = \iota e'(\text{swim}(e') \wedge Ag(e') = x_1 \wedge e' = g(3))](t_{top})$
           $= \exists e[t_{top} \subseteq \tau(e) \wedge e = \iota e'(\text{swim}(e') \wedge Ag(e') = x_1 \wedge e' = g(3))] \approx$ there is
           a unique swimming event $g(3)$ (singular or plural) whose agent is x_1 and
           the running time of which includes the topic time

Recall that following Landman (1997); Kratzer (2008); Krifka (1992), I assume that the
denotation of verbs consists of both singular and plural events. In addition, the *iota* in
the denotation of the definite determiner *lɛ* is compatible with both singular and plural

individuals.[37] Therefore, (105-d) can convey both the meaning that the singular event is ongoing, leading to the progressive interpretation, and that the plural event is ongoing, leading to the habitual interpretation.

Importantly, *lɛ* is compatible with both singular and plural individuals. It is demonstrated in (106) by the acceptability of *lɛ* in all the three contexts provided. Since I argue for a unified analysis of NP *lɛ* and VP *lɛ*, the data in (106) suggest that the singularity of the event in the VP denotation (in the analytic progressive) is not due to the semantics of *lɛ* alone.[38],[39]

(106) a. context 1: Kofi ate eggplants yesterday (we do not know how many: maybe one or maybe more than one).

  b. context 2: Kofi ate one eggplant yesterday.

  c. context 3: Kofi ate several eggplants yesterday.

   Kòfí yè sɛ́bɛ́ lɛ.
   Kofi eat eggplant DET
   'Kofi ate the eggplant(s) yesterday.'

I argue that in order to exclude a possible habitual interpretation for sentences with the analytic progressive form, a bit more formal machinery is needed. Namely, the notion of exemplification from situation semantics (Kratzer, 2007).

5.4 Situation semantics

Situation semantics is built on the observation, which goes back to Austin (1950), that the truth of a sentence is evaluated with respect to the situation that the speaker talks about (note, however, that Austin does not specify what a situation is).

Barwise and Perry (1983) define a situation as 'individuals having properties and standing in relations at various spatiotemporal locations.' (Barwise and Perry, 1983, p. 7). They distinguish two kinds of situations, i.e., real situations, which are parts of the world, and abstract situations, which are abstract mathematical objects representing the real situations. A set of abstract situations constitutes a meaning of the utterance.

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[37]The assumption that *ι* can apply to plural NPs is not uncontroversial. It seems that the plural entity should first be shifted to the maximal plural entity satisfying the NP denotation before being combined with *ι*, see for example Schwarz (2009); Elbourne (2013). Since the definite determiner *lɛ* is compatible with singular and plural individuals, I am making a simplified assumption that *ι* is compatible with both singular and plural entities. Thanks to Radek Šimík for discussing this issue with me.

[38]The language consultants gave a comment that each time Kofi ate definite eggplant(s).

[39]Note also that singular count nouns in Ga, as the denotation of verbs, are number-neutral (see chapter 3, section 3.6.1).

In this dissertation, I am following Kratzer's (1989; 2007) version of situation semantics which comprises only situations that are part of some possible world (real situations in Barwise and Perry's (1983) classification) with a world being a maximal situation. Consequently, in the situation semantics framework, a proposition is not a set of possible worlds but a set of possible situations.

5.4.1 Topic and resource situations

There are two types of situations in situation semantics (Kratzer, 2007; Schwarz, 2009; Elbourne, 2013): topic situations, i.e., a situation a whole sentence is about, and resource situations, i.e., situations that parts of the sentence are about.

The meaning of a whole sentence is evaluated with respect to a topic situation, also called Austinian topic situation. Consider (107):

(107)   A: What was Maria doing yesterday at 17:00?
           B: Maria was swimming.

The topic situation of (107-B) is a Maria-swimming situation that took place yesterday at 17:00.

To define the notion of the topic situation, I take the definition of situations (states-of-affair) given by Kratzer (1989) as a starting point. Her version of the ontology of situation semantics is built on Armstrong's (1978) theory of universals. Since ancient history, there is a philosophical discussion whether general terms (universals) exist in the world (realism) or whether they are only linguistic terms (nominalism). Armstrong was a universal realist, i.e., he claimed that universals (relations and properties) do exist in the world being instantiated by individuals (particulars). He distinguished two types of particulars: thin and thick ones. Thin particulars are particulars stripped off all their properties and relations. Thick particulars, on the other hand, are particulars with all their non-relational properties.

Now, a situation is constituted by one or more thin particular(s) that instantiates one or more propert(ies) or stands in one or more relation(s) (Kratzer, 1989, p.614).[40] This definition allows one to treat the situations of Mary being thirsty and Mary reading a book (at the same time) as two different situations, i.e., one situation consisting of Mary's thin particular and the property of being thirsty (instantiated by the thin partic-

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[40]Note, however, that by 'property' and 'relation' Kratzer (1989) means a universal corresponding to the given property or relation.

ular) and the second consisting of Mary's thin particular and the property of reading a book (again, instantiated by the thin particular).

I argue that a topic situation s is fully determined by three dimensions: the time of s, the thin particulars in s, and their properties. The time the speaker is talking about, the topic time, is determined contextually. The thin particulars and their properties, on the other hand, are determined by the event description provided by an assertion or a question.[41] Consider (108):

(108)   Yesterday at 17:00, Maria was swimming.

In the case of (108), the topic time is yesterday, 17:00, the thin particular is Maria, and its property is swimming. Thus the topic situation of (108) determined by the three aforementioned parameters is a Maria swimming situation yesterday at 17:00. The same holds for questions:

(109)   Who swam yesterday at 17:00?

The topic situation of (109) contains thin particulars (that the speaker asks about) who were swimming yesterday at 17:00.

Besides a topic situation, i.e., a situation that a whole sentence is about, there are also resource situations, also called restrictor or described situations, i.e., situations that parts of the sentence are about. The need for resource situations is motivated empirically for instance by an example given by Soames (1986):

(110)   Everyone is asleep and is being monitored by a research assistant.

Example (110) is an argument against a sole interpretation of a sentence with respect to the topic situation because it cannot be the case that everybody is asleep in the given situation and at the same time one person is not sleeping, namely the research assistant who is monitoring the sleeping people. The solution is to assume the presence of resource situations. As before, the whole sentence is interpreted with respect to the topic situation, a situation which includes all the people who are sleeping and the research assistant, but the generalized quantifier *everyone* is interpreted with respect to the resource situation, a part of the topic situation which include only the people who are sleeping.

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[41]This view partly follows Kratzer's (2007) and Schwarz's (2009) claim that formally the topic situation can be derived from the topic time and/or a question under discussion (QUD), see for example Schwarz (2009, ch.4).

5.4.2 Situations and events

As it was already discussed in subsection 5.3.2.2, I assume neo-Davidsonian event semantics. At the same time, I propose couching the analysis of the analytic progressive in Ga in the situation semantics framework. This gives rise to the question of the ontological status of events and situations.

Kratzer (2007) argues that one does not need both events and situations. She claims that events are types of situations with the following two properties: First, events are always minimal, i.e., the event of swimming by Kofi does not include biking by Kofi, reading by Kofi, etc. Second, events are self-connected, i.e., the event of swimming by Kofi on Monday and the event of swimming by Kofi on Wednesday is not the same swimming event.

I agree that in some cases situations are events, but I argue that they are not the same. First, situations are parts of worlds, with a world being a maximal situation. By contrast, worlds are not maximal events. Whereas situations are *containers* in which things happen, events are entities, like individuals, which occur in situations. The same as one can say that there are three turtles in a given situation, one can say that there are two events of swimming by Kofi in a given situation. Second, whereas individuals are situations, they are not events. Mary (with at least one of her properties) is a situation but she is not an event.

5.4.3 Situation pronouns

Topic and resource situations are present in the syntax in form of situation pronouns. I follow Musan (1995); Büring (2004); Keshet (2008); Schwarz (2009); Elbourne (2013) in claiming that (resource) situation pronouns are introduced to the syntax by strong determiners, as in (111).[42]
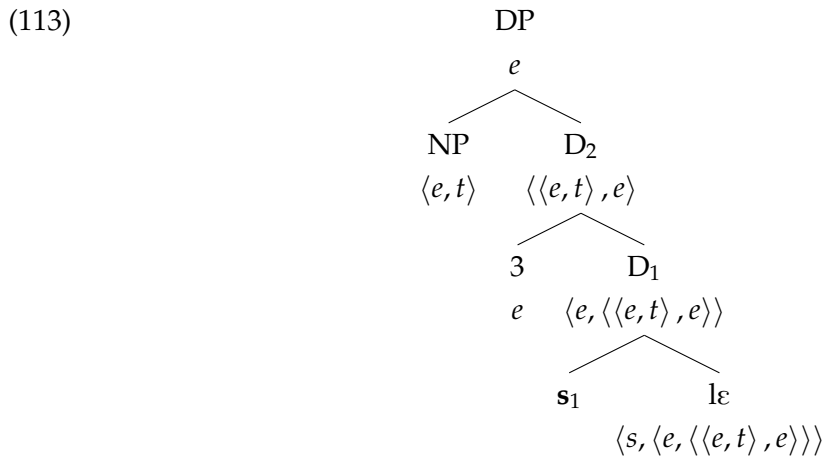
(111)

```
            DP
           ╱╲
        D′    NP
       ╱╲
      D    s
```

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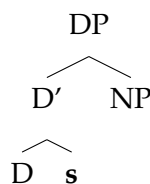
[42]In fact, following von Fintel and Heim (2010), I assume that there are two types of situation pronouns: *s-pro* and *s-*PRO. The former behave like standard pronouns, i.e., they can be bound or its value can be assigned by the the assignment function. The latter, on the other hand, behave like PRO. PROs are vacuous, i.e., they are not interpreted. However, they can move leaving a trace of type *s* which then can bound by a lambda binder underneath its landing position. In the dissertation, however, I only discuss *s-pro*.

Since *lɛ* is a strong determiner, I claim that it also introduces a situation pronoun. The final lexical entry for *lɛ* is given in (112), which is a revision of the lexical entry presented in (93):

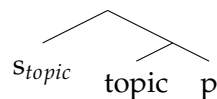(112) $[\![l\varepsilon]\!] = \lambda s.\lambda y.\lambda P : \exists!x[x \text{ is in } s \wedge P(x) \wedge x = y].\iota x[x \text{ is in } s \wedge P(x) \wedge x = y]$ [final]

The structure of *NP lɛ* is demonstrated in (113). The variable *s* is a syntactically represented situation pronoun introducing the situation with reference to which the NP denotation is interpreted. As other pronouns, it can be either bound or receive its value from the context via the assignment function. The index 3 is an additional pronominal argument taken by the definite determiner which is mapped by the assignment function to a familiar entity.

(113)

$$
\begin{array}{c}
\text{DP} \\
e \\
\diagup \quad \diagdown \\
\text{NP} \qquad \text{D}_2 \\
\langle e,t\rangle \quad \langle\langle e,t\rangle ,e\rangle \\
\diagup \quad \diagdown \\
3 \qquad \text{D}_1 \\
e \quad \langle e,\langle\langle e,t\rangle ,e\rangle\rangle \\
\diagup \quad \diagdown \\
\mathbf{s}_1 \qquad l\varepsilon \\
\langle s,\langle e,\langle\langle e,t\rangle ,e\rangle\rangle\rangle
\end{array}
$$

Topic situations, on the other hand, are introduced to the syntax as arguments of a topic operator (Schwarz, 2009) whose definition is given in (114). The symbol '≈' stands for the counterpart relation. On Kratzer's (2007) account of situation semantics, individuals and situations can be part of one world only; they are represented in different possible worlds by their counterparts (see Lewis, 1986).

(114) $[\![\text{topic}]\!] = \lambda p.\lambda s'.\lambda s.s \approx s' \wedge p(s)$ (from Schwarz, 2009, p.93)

$$
\begin{array}{c}
\diagup \quad \diagdown \\
s_{topic} \quad \begin{array}{c} \diagup \ \diagdown \\ \text{topic} \ \ p \end{array}
\end{array}
$$

The topic operator takes a proposition *p* and the topic situation s_{topic} and returns the set of all the counterparts of the topic situation in which *p* is true.

Now, all the individual pieces concerning the compositional derivation of the analytic progressive are here, except for one. Namely, the notion of exemplification.

5.4.4 Exemplification

It seems that in some cases the notion of topic situation should be more restrictive. The possibility that the topic situation of (108), repeated below in (115), includes Maria and other people, or Maria swimming and doing other things should be excluded.

(115)   Yesterday at 17:00, Maria was swimming.

It occurs that often topic situations should be in some sense minimal. A definition of the notion of minimal situation is presented in (116):[43]

(116)   A situation is a minimal situation in which a proposition p is true iff it has no
         proper part in which p is true.   (from Kratzer, 2007, p.15)

For illustration, consider situations s_{ch1} and s_{ch2}:

      situation s_{ch1}: chair   situation s_{ch2}: two chairs

(117) λs. there is a chair in s

Situation s_{ch1} is a minimal situation in which (117) is true, because it has no proper part in which (117) is true (the proposition in (117) is not true in a subpart of s_{ch1} which for instance consists of the legs of the chair only). By contrast, s_{ch2} is not a minimal situation in which (117) is true, because there is a subpart of s_{ch2} in which (117) is true, namely a sub-situation which consists of one chair only.

However, the notion of minimality defined in (116) causes problems for mass nouns in the nominal domain and for states and progressive events in the verbal domain.[44] For example, it makes it impossible to detect the minimal situation of the mud situation presented below:

      situation s_M: mud

(118) λs. there is mud in s

---

[43]Such a definition of the minimal situation originally stems from Berman (1987).
[44]See also von Fintel (1994) and Kratzer (2007) for further problems with the definition of the minimal situation presented in (116).

Even though intuitively s_M is a minimal situation in which (118) is true, under the definition in (116) it is not. The definition says that a minimal situation in which p is true has no proper parts in which p is true. However, s_M has plenty of subparts in which (118) is true. Take s_M: (118) is true in this situation. Now take a subpart of s_M which consists of the half of mud in s_M. (118) is still true. Now take the half of the rest of mud. (118) is still true. The same holds for states and progressive events. Consider situation s_{sw} and the proposition in (119).

> situation s_{sw}: Maria is swimming

(119) $\lambda s.$ Maria swim in s

The proposition in (119) is true in s_{sw}. Now take the subpart of this situation. (119) is still true.

   Kratzer (2007) defines a notion of exemplification which provides a concept of minimality also for the problematic cases:

(120)   a.   A situation s exemplifies a proposition p iff whenever there is a part of s in which p is not true, then s is a minimal situation in which p is true.
          b.   A situation is a minimal situation in which a proposition p is true iff it has no proper parts in which p is true.   (Kratzer, 2007; Schwarz, 2009, p.130)

   The definiens in (120-a) has the form of implication: $m \rightarrow o$, where m is 'there is a part of s in which p is not true', and o is 's is a minimal situation in which p is true.' The material implication $m \rightarrow o$ equals $\neg m \vee o$.[45] Thus it follows that a situation s will exemplify a proposition p if and only if either (i) there is no part of s in which p is not true, i.e., p is true in all subparts of s or (ii) s is a minimal situation in which p is true.

   For presentational reasons, I discuss first the second conjunct of the definition. It says that a situation s exemplifies a proposition p iff a situation s is a minimal situation in which p is true, i.e., there is no proper part of the situation s in which p is true, see (120-b).

> situation s_1: three turtles   situation s_2: one turtle

(121) $\lambda s.$ there is a turtle in s

   The proposition in (121) is true in s_1. However, since there are proper subparts of s_1 in which proposition (121) is true as well (e.g., a subpart of s_1 which consists of two

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[45]In classical logic, $m \rightarrow o$ is logically equivalent to $\neg(m \wedge \neg o)$, which by De Morgan's Law equals $\neg m \vee o$.

turtles or a subpart of s_1 which consists of just one turtle), s_1 does not exemplify the proposition in (121). By contrast, there is no subpart of s_2 in which the proposition in (121) is true as well. For example, proposition (121) is not true in the subpart of s_2, which consists of legs of the turtle. Therefore, (121) is not only true in s_2 but also exemplified by s_2.

Consider now situations s_3 and s_4 and the proposition in (122):

<blockquote>
situation s_3: two turtles   situation s_4: three turtles
</blockquote>

(122) $\lambda s.$ there are turtles in s

Again, a situation exemplifies a proposition if there is no proper part of the situation in which the proposition is true. Since there is no subpart of situation s_3 in which the proposition (122) is true, i.e., the proposition that there are turtles is not true in a situation in which there is only one turtle, s_3 exemplifies the proposition in (122). By contrast, since there are subparts of s_4 in which (122) is true, namely sub-situations in which there are two turtles, s_4 does not exemplify the proposition in (122). I argue that a parallel observation can be made for number-neutral nouns, i.e., nouns whose denotation comprises both singular and plural entities. An example of a number-neutral noun is *atomo* 'potato.'[46]

<blockquote>
situation s_5: one potato   situation s_6: two potatoes
</blockquote>

(123) $\lambda s.$ there is atomo ('potato') in s

A situation which contains only one potato, as for example s_5, exemplifies the proposition in (123), because there is no subpart of this situation in which (123) would be true. Conversely, s_6 does not exemplify (123), because there is a part of s_6, i.e., a situation in which there is one potato, in which (123) is true.

Consider now the first conjunct of the definition of exemplification presented in (120). It specifies what it means to be a minimal situation for example for non-quantized entities (mass nouns, stative predicates, progressive events, etc.). It says that there is no sub-situation in which p is not true, i.e., p is true in all sub-situations of s. For illustration, consider situation s_M and the proposition in (124):

<blockquote>
Situation$_M$: mud
</blockquote>

(124) $\lambda s.$ there is mud in s

---

[46]see chapter 3, subsection 3.6.1.1

The proposition in (124) is true in s_M. Moreover, since (124) is true in all sub-situations of s_M (there is no part of mud which would not be mud), (124) is also exemplified by s_M. For the sake of completeness, consider also situation s_7 and the proposition in (125):

situation s_7: two turtles and mud

(125) λs. there are two turtles in s

The proposition (125) is true in s_7 but it is not exemplified by s_7. In order to do so there should be no proper parts of s_7 in which proposition (125) is true. However, one can find a proper sub-situation of s_7 in which the proposition (125) is true, namely the part of s_7 that contains just two turtles and nothing else.

I argue that there is an analogous mechanism of exemplification in the verbal domain as in the nominal domain. Consider the proposition in (126):

(126) λs. Kofi swim in s

Recall that I assume, following Krifka (1992); Landman (1997); Kratzer (2008), that there are both singular and plural events in the denotation of uninflected verbs and therefore they are number-neutral. Thus analogously to number-neutral nouns, whose behavior with respect to exemplification was illustrated by s_5, s_6, and the proposition in (123), the proposition in (126) is true in a situation with a multitude of swimming events but it is not exemplified by this situation. On the other hand, (126) is not only true in a situation with a single swimming event but also exemplified by this situation.

Kratzer (2007) claims that propositions that are exhaustive answers to the QUD are necessarily exemplified by topic situations, whereas non-exhaustive answers are merely true in topic situations.[47] For illustration, consider the party-situation in which John, Bill, and Kate came to the party. The speaker 'A' wants to know who was at the party.

(127) s_8: John, Bill, and Kate came to the party.   THE PARTY-SITUATION
          s_9: John came to the party.   THE SAD-PARTY-SITUATION

          A: Who came to the party?
          B: JOHN came.

---

[47]The question is whether exemplification is caused by exhaustivity or exhaustivity by exemplification. Since the derivation of the progressive interpretation in the analytic progressive form does not hinges on the answer to this question, I leave it for future research. Thank you to Malte Zimmermann for asking me about it.

The speaker B's reply is not an exhaustive answer to (127-A). However, it is a true answer, because John was among the people who came to the party. Moreover, since there are sub-situations in which the proposition (127-B) is not true, e.g., a sub-situation in which Kate came or a sub-situation in which Bill and Kate came, (127-B) is not exemplified by the party-situation s_8.

By contrast, in the sad-party-situation in which only John came to the party, (127-B) is an exhaustive answer to (127-A). Since it is the case that John came to the party, (127-B) is true in the sad-party-situation. In addition, since there is no proper part of the sad-party-situation in which (127-B) is true, (127-B) is exemplified by the sad-party-situation.

Turning to Ga, I presented in chapter 4 that sentences with the *ni*-structure are exhaustive answers to the QUD. Therefore, the presence of *ni* ensures that a proposition expressed by a sentence is exemplified by the topic situation. Consequently, the following generalizations hold:

- +**ni** → a proposition is **necessarily** exemplified by a topic situation

- -**ni** → a proposition is true in a topic situation and it **can**, but it does not have to, be exemplified by a topic situation

Thus since (128) is an exhaustive answer to the question 'Who swims?,' what is signaled by the particle *ni*, the topic situation exemplifies the proposition in (128-A).

(128)   Q: Who swims?
   A: Kòfí nì   sèlè-ɔ̀.
       Kofi PRT swim-IMPF.
       'It is Kofi who swims.'

Due to the exemplification, the topic situation of (128) consists of Kofi (and nobody else) and an unspecified amount of swimming events.

I argue that situations exemplify propositions, but always with respect to their parts. First, building on Kratzer (2007), I argue that with respect to which part a proposition is exemplified can be identified with the help of the QUD. Namely, the proposition is exemplified with respect to the element which constitutes an answer to the QUD, i.e., the focus in current approaches (e.g., Roberts, 2014; Beaver and Clark, 2008). For example, in (129) the proposition is exemplified with respect to the people who swim

(not swimming events), in (130) to the places where Joe goes every morning, and in (131) to the amount of swimming events by John.[48]

(129)   Q: Who swims?
         A: A TEACHER swims.
              → the topic situation which exemplifies (129-A) contains one teacher and an unspecified amount of swimming events

(130)   Q: Where does Joe go every morning?
         A: Joe goes TO SCHOOL.
              → the topic situation that exemplifies (130-A) contains one school and an unspecified amount of children going to school and events of going to school

(131)   Q: How many times did John swim yesterday?
         A: He swam TWICE.
              → the topic situation which exemplifies (131-A) contains exactly two swimming events

Second, a proposition is also exemplified with respect to elements whose interpretation is restricted to the topic situation. Recall that strong definite determiners introduce situation pronouns to the syntax. Hence, it follows that when the situation pronoun is bound by the topic situation, then the proposition is exemplified also with respect to the denotation of the strong determiners' sisters. Consider (132):

(132)   Q: Who is swimming?

---

[48]In light of what has been said so far, the prediction is that when (i-A) is an exhaustive answer to (i-Q), then there are invariably two turtles in the topic situation:

(i)   Q: Who came?
        A: TURTLES came.

This prediction should definitely be checked. Thank you to Mira Grubic (p.c.) for pointing this out to me.

It might be that the domain of exemplification is determined by the context. If one talks about the situation that consists of turtles, then the situation exemplifies this proposition when there are two turtles in the situation. However, when one talks about the situation which consists of turtles in general (e.g., in opposition to the situation which consists of turtles and birds), then the proposition would be exemplified if there are only turtles and no birds in the situation. I leave the question of how the domain of exemplification is determined for future research.

A: Kòfí nì sèlè-ɔ́ lɛ.
   Kofi PRT swim-IMPF DET.
   'It is Kofi who is swimming.'

The presence of *ni* indicates that (132-A) is an exhaustive answer to the QUD. Since (132-A) is an exhaustive answer, the proposition expressed by (132-A) is exemplified by the topic situation. Because of the fact that Kofi is in focus, the proposition is exemplified with respect to its denotation. Moreover, I argue that in the analytic progressive, the situation pronoun introduced by the particle *lɛ* is bound by the topic situation and thus the interpretation of its sister is restricted to the topic situation (see subsection 5.5).[49] Therefore, it follows that the proposition is also exemplified with respect to the VP denotation, the sister of *lɛ*. Hence, the topic situation of (132-A) consists of Kofi (and nobody else) and one swimming event. Crucially, if there was more than one swimming event in the topic situation then the proposition would not be exemplified by the topic situation.

This view is motivated empirically by the (in)compatibility of (132) with different aspectual references. Recall that I am following Ferreira (2005) in assuming that whereas in progressive a singular event is quantified over, in habitual plural events are quantified over. I argue that the invariable progressive interpretation of sentences with the analytic progressive form is an effect of the VP denotation being exemplified by the topic situation. The exemplification of the VP denotation ('swim' in the case of (132)) ensures that there is only one swimming event in the topic situation. Now, if there is only one event in the situation and the topic time is included in the running time of this event, then it invariably obtains an ongoing, progressive interpretation. If the VP denotation weren't exemplified, then (132) could obtain a habitual interpretation, contrary to fact.

To sum up, the particle *ni* signals that the proposition expressed by a cleft is an exhaustive answer to the QUD. Since it is the exhaustive answer, the topic situation exemplifies this proposition. Now, the proposition is exemplified with respect to two elements: a focused constituent and all the elements which are interpreted with respect to the topic situation. Since *lɛ* is a strong determiner, it introduces a situation pronoun which then can be bound by the topic situation. When this is the case, then the proposition is also exemplified with respect to the denotation of the sister of *lɛ* .

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[49]The issue whether the situation pronoun introduced by *lɛ* can obtain its value via the assignment function or whether it can be bound by other situation binders is left for future research.

5.5 The analytic progressive: analysis

Now, a semantics for all the components of the analytic progressive form has been proposed and I can present the compositional derivation of the progressive interpretation. For illustration, consider (133). Its syntactic structure is presented in (133) and its derivation is given in (134).[50] 'topic' is a topic operator which introduces a topic situation variable s_{topic} to the syntax (see subsection 5.4.1) and *FP* stands for a functional projection.[51][52]
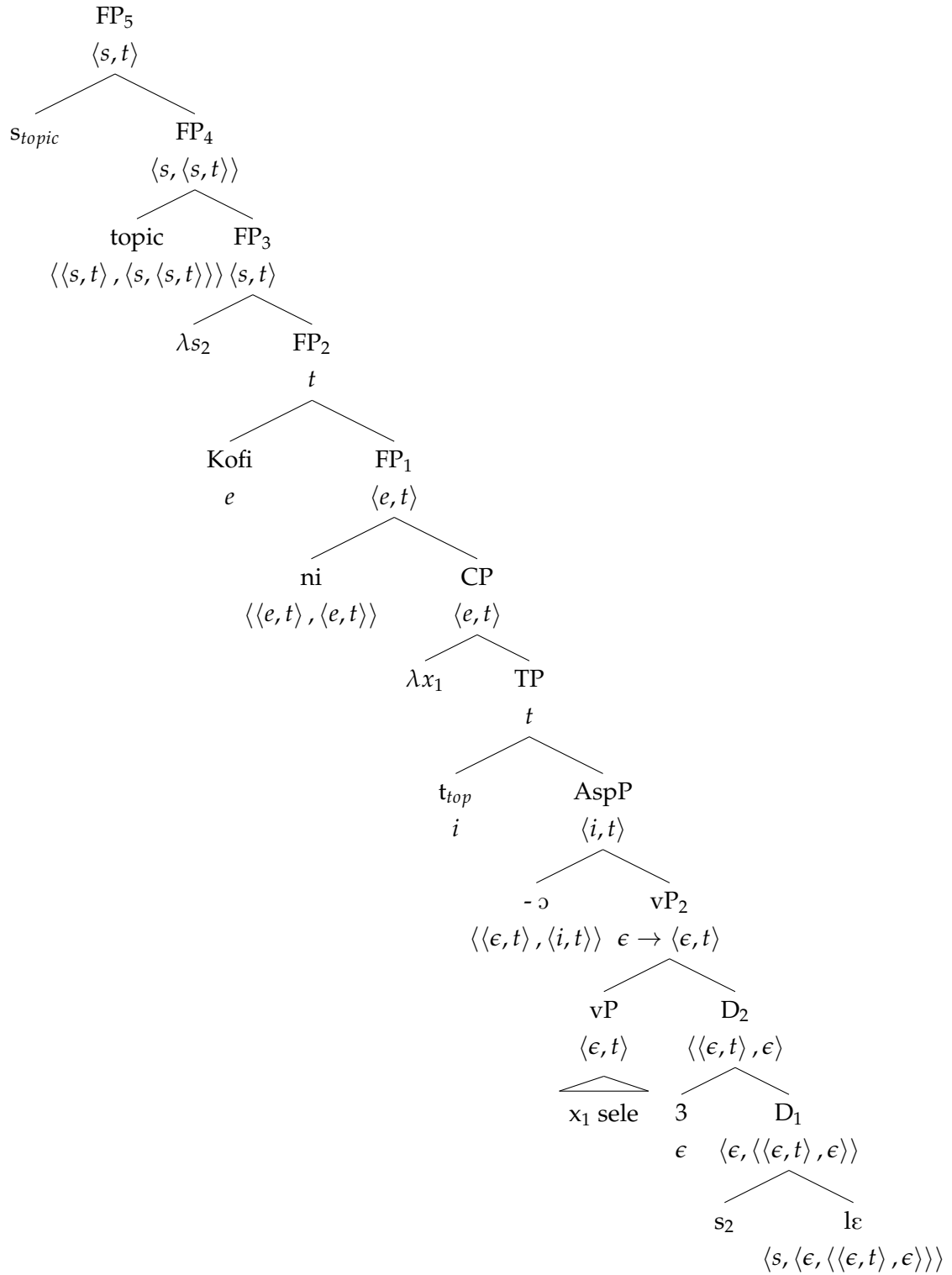
(133) Kòfí nì sèlè-ɔ́   lɛ.
       Kofi PRT swim-IMPF DET
       'It is Kofi who is swimming.'

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[50]Note that a similar structure in which a cleft-introducing element (the particle *ni* in the case of Ga) intervenes between the index and the pivot was proposed by Hole (2011) for Chinese *shì...de* clefts. Thank you to Mira Grubic (p.c.) for this reference.

[51]The labeling FP_1, FP_2, etc. is in order to refer to the nodes in derivations and it is not intended to have theoretical implications.

[52]Even though all the pronominal elements receive a value via the assignment function, I do not mark it in order to increase the readability of the formulas.

(134)

FP_5
$\langle s,t \rangle$

s_{topic} — FP_4
$\langle s, \langle s,t \rangle \rangle$

topic — FP_3
$\langle \langle s,t \rangle , \langle s, \langle s,t \rangle \rangle \rangle$ $\langle s,t \rangle$

λs_2 — FP_2
t

Kofi — FP_1
e $\langle e,t \rangle$

ni — CP
$\langle \langle e,t \rangle , \langle e,t \rangle \rangle$ $\langle e,t \rangle$

λx_1 — TP
t

t_{top} — AspP
i $\langle i,t \rangle$

-ɔ — vP_2
$\langle \langle \epsilon,t \rangle , \langle i,t \rangle \rangle$ $\epsilon \to \langle \epsilon,t \rangle$

vP — D_2
$\langle \epsilon,t \rangle$ $\langle \langle \epsilon,t \rangle , \epsilon \rangle$

x_1 sele — 3 — D_1
ϵ $\langle \epsilon, \langle \langle \epsilon,t \rangle , \epsilon \rangle \rangle$

s_2 — lɛ
$\langle s, \langle \epsilon, \langle \langle \epsilon,t \rangle , \epsilon \rangle \rangle \rangle$

The sentence in (133) is a cleft. The presence of the particle *ni* in the structure signals that it is the exhaustive answer to the QUD. Therefore, the topic situation exemplifies the proposition expressed by (133). In particular, the proposition is exemplified with respect to the focused constituent[53] and all the elements that are interpreted with respect to the topic situation. Since the definite determiner *lɛ* introduces the situation pronoun, which then is bound by the topic situation, the proposition is exemplified with respect to the denotation of the sister of *lɛ*; the VP denotation in the case of (133). The denotation of uninflected verbs is number-neutral, i.e., it comprises both singular and plural events. Recall that when the VP denotation is exemplified, there is only one event of the given kind in its denotation. Therefore, the exemplification ensures that there is only one singular event of swimming in the topic situation of (133). In addition, the definite determiner takes as its argument not only the situation pronoun and the VP denotation, but also an individual pronoun ('3' in the case of (134)). The assignment function maps it to familiar entities, i.e., swimming events. Therefore the meaning of the definite determiner *lɛ* together with the exemplification ensures that there is a unique singular familiar event of swimming in the topic situation. Subsequently, the imperfective aspect conveyed by the marker -ɔ locates the topic time within the running time of the event. Since there is only one familiar event of swimming in the topic situation, the imperfective aspect locates the topic time within the running time of this familiar event. Therefore, (133) can only obtain a progressive interpretation. The formal derivation of (133) is given in (135):[54]

(135)   a. $[\![l\varepsilon]\!]^g = \lambda s.\lambda y.\lambda P.\iota e.e$ is in $s \wedge P(e) \wedge e = y$

   b. $[\![D_1]\!]^g = [\![l\varepsilon]\!]^g(s_2)$
   $= [\lambda s.\lambda y.\lambda P.\iota e.$ is in $s \wedge P(e) \wedge e = y](s_2)$
   $= \lambda y.\lambda P.\iota e.$ is in $s_2 \wedge P(e) \wedge e = y$

   c. $[\![D_2]\!]^g = [\![D_1]\!](g(3))$
   $= [\lambda y.\lambda P.\iota e[e$ is in $s_2 \wedge P(e) \wedge e = y]](g(3))$
   $= \lambda P.\iota e[e$ is in $s_2 \wedge P(e) \wedge e = g(3)]$

   d. $[\![vP]\!] = \lambda e.\mathrm{swim}(e) \wedge Ag(e) = x_1$

   e. $[\![vP_2]\!]^g = [\![D_2]\!]^g([\![vP]\!])$
   $= [\lambda P.\iota e[e$ is in $s_2 \wedge P(e) \wedge e = g(3)]](\lambda e.\mathrm{swim}(e) \wedge Ag(e) = x_1)$
   $= \iota e[e$ is in $s_2 \wedge [\lambda e.\mathrm{swim}(e) \wedge Ag(e) = x_1](e) \wedge e = g(3)]$

---

[53]For presentational reasons, in the following discussion of how the progressive interpretation arises in the analytic progressive form, I am not discussing further the fact that the proposition is also exemplified with respect to the denotation of the focused constituent.

[54]For presentational reasons, I omit the presupposed material.

$= \iota e[e \text{ is in } s_2 \wedge \text{swim}(e) \wedge Ag(e) = x_1 \wedge e = g(3)]$

type clash with Impfv, type-shift form ϵ to $\langle \epsilon, t \rangle$:

$= \lambda e.e = \iota e'[e' \text{ is in } s_2 \wedge \text{swim}(e') \wedge Ag(e') = x_1 \wedge e' = g(3)]$

f. $[\![\text{-ɔ}]\!] = \lambda P.\lambda t.\exists e[t \subseteq \tau(e) \wedge P(e)]$

g. $[\![\text{Asp}]\!]^g = [\![\text{-ɔ}]\!]([\![\text{vP}_2]\!]^g)$

$= [\lambda P.\lambda t.\exists e[t \subseteq \tau(e) \wedge P(e)]](\lambda e.e = \iota e'[e' \text{ is in } s_2 \wedge \text{swim}(e') \wedge Ag(e') = x_1 \wedge e' = g(3)])$

$= \lambda t.\exists e[t \subseteq \tau(e) \wedge [\lambda e.e = \iota e'[e' \text{ is in } s_2 \wedge \text{swim}(e') \wedge Ag(e') = x_1 \wedge e' = g(3)]](e)]$

$= \lambda t.\exists e[t \subseteq \tau(e) \wedge e = \iota e'(e' \text{ is in } s_2 \wedge \text{swim}(e') \wedge Ag(e') = x_1 \wedge e' = g(3))]$

h. $[\![\text{TP}]\!]^g = \lambda t.\exists e[t \subseteq \tau(e) \wedge e = \iota e'[e' \text{ is in } s_2 \wedge \text{swim}(e') \wedge Ag(e') = x_1 \wedge e' = g(3)]](t_{top})$

$= \exists e[t_{top} \subseteq \tau(e) \wedge e = \iota e'[e' \text{ is in } s_2 \wedge \text{swim}(e') \wedge Ag(e') = x_1 \wedge e' = g(3)]]$

i. $[\![\text{CP}]\!]^g = \lambda x_1.\exists e[t_{top} \subseteq \tau(e) \wedge e = \iota e'[e' \text{ is in } s_2 \wedge \text{swim}(e') \wedge Ag(e') = x_1 \wedge e' = g(3)]]$

j. $[\![\text{ni}]\!] = \lambda P.\lambda x.P(x)$

k. $[\![\text{FP}_1]\!]^g = [\![\text{ni}]\!]([\![\text{CP}]\!]^g)$

$= [\lambda P.\lambda x.P(x)](\lambda x_1.\exists e[t_{top} \subseteq \tau(e) \wedge e = \iota e'[e' \text{ is in } s_2 \wedge \text{swim}(e') \wedge Ag(e') = x_1 \wedge e' = g(3)]])$

$= \lambda x.\exists e[t_{top} \subseteq \tau(e) \wedge e = \iota e'[e' \text{ is in } s_2 \wedge \text{swim}(e') \wedge Ag(e') = x \wedge e' = g(3)]]$

l. $[\![\text{FP}_2]\!]^g = [\lambda x.\exists e[t_{top} \subseteq \tau(e) \wedge e = \iota e'[e' \text{ is in } s_2 \wedge \text{swim}(e') \wedge Ag(e') = x \wedge e' = g(3)]]](\text{Kofi})$

$= \exists e[t_{top} \subseteq \tau(e) \wedge e = \iota e'[e' \text{ is in } s_2 \wedge \text{swim}(e') \wedge Ag(e') = \text{Kofi} \wedge e' = g(3)]]$

m. $[\![\text{FP}_3]\!]^g = \lambda s_2.\exists e[t_{top} \subseteq \tau(e) \wedge e = \iota e'[e' \text{ is in } s_2 \wedge \text{swim}(e') \wedge Ag(e') = \text{Kofi} \wedge e' = g(3)]]$

n. $[\![\text{topic}]\!] = \lambda p.\lambda s''.\lambda s'.s' \approx s'' \wedge p(s')$

o. $[\![\text{FP}_4]\!]^g = [\![\text{topic}]\!]([\![\text{FP}_3]\!]^g)$

$= [\lambda p.\lambda s''.\lambda s'.s' \approx s'' \wedge p(s')](\lambda s_2.\exists e[t_{top} \subseteq \tau(e) \wedge e = \iota e'[e' \text{ is in } s_2 \wedge \text{swim}(e') \wedge Ag(e') = \text{Kofi} \wedge e' = g(3)]])$

$= \lambda s''.\lambda s'.s' \approx s'' \wedge [\lambda s_2.\exists e[t_{top} \subseteq \tau(e) \wedge e = \iota e'[e' \text{ is in } s_2 \wedge \text{swim}(e') \wedge Ag(e') = \text{Kofi} \wedge e' = g(3)]]](s')$

$= \lambda s''.\lambda s'.s' \approx s'' \wedge \exists e[t_{top} \subseteq \tau(e) \wedge e = \iota e'[e' \text{ is in } s' \wedge \text{swim}(e') \wedge Ag(e') = \text{Kofi} \wedge e' = g(3)]]$

p. $[\![\text{FP}_5]\!]^g = [\![\text{FP}_4]\!]^g(s_{topic})$

$= [\lambda s''.\lambda s'.s' \approx s'' \wedge \exists e[t_{top} \subseteq \tau(e) \wedge e = \iota e'[e' \text{ is in } s' \wedge \text{swim}(e') \wedge Ag(e') = \text{Kofi} \wedge e' = g(3)]]](s_{topic})$

$= \lambda s'.s' \approx s_{topic} \wedge \exists e[t_{top} \subseteq \tau(e) \wedge e = \iota e'[e' \text{ is in } s' \wedge \text{swim}(e') \wedge Ag(e') = \text{Kofi} \wedge e' = g(3)]]$

$\approx$ the set of counterparts of the topic situation in which there is a unique (singular) event[55] of swimming by Kofi (and nobody else), the running time of which includes the topic time

Now, I will discuss what happens when either the definite determiner *lɛ* or the particle *ni* is not present in a sentence. Consider (136). Importantly, it is compatible with habitual but not with progressive aspectual reference:

(136)   Kòfí nì   sèlè-ɔ̀.
         Kofi PRT swim-IMPF
         'It is Kofi who swims.'

   a.   progressive context: Tom and his family (wife, two sons, and two daughters) are on the beach. Tom and his wife can see a swimming child.
        ⇒ Tom <u>cannot</u> utter (136) in this context

   b.   habitual context: Tom's two sons and daughters do not like swimming and they do not do it, but his oldest son, Kofi, loves swimming and he does it regularly.
        ⇒ Tom <u>can</u> utter (136) in this context

The structure of (136) is presented in (137):

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[55]Note that the singularity of the event in the VP denotation is caused by the exemplification of the VP denotation.

(137)

$$FP_4$$
$$\langle s,t \rangle$$

s_{topic}

$$FP_3$$
$$\langle s, \langle s,t \rangle \rangle$$

topic
$$\langle \langle s,t \rangle, \langle s, \langle s,t \rangle \rangle \rangle$$

$$FP_2$$
$$t$$

Kofi
$$e$$

$$FP_1$$
$$\langle e,t \rangle$$

ni
$$\langle \langle e,t \rangle, \langle e,t \rangle \rangle$$

CP
$$\langle e,t \rangle$$

λx_1

TP
$$t$$

t_{top}
$$i$$

AspP
$$\langle i,t \rangle$$

- ɔ
$$\langle \langle \epsilon,t \rangle, \langle i,t \rangle \rangle$$

vP
$$\langle \epsilon,t \rangle$$

x_1 sele
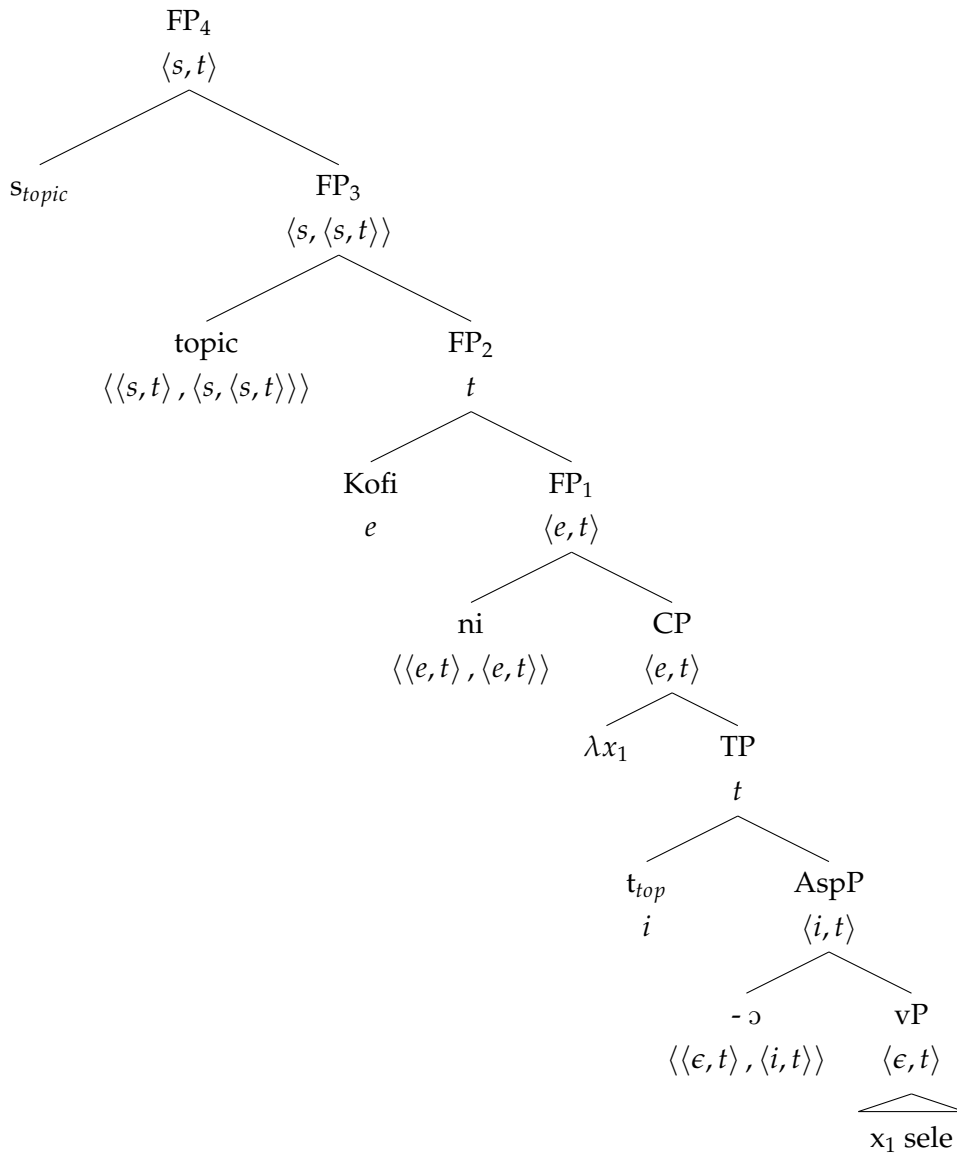
Lε introduces the situation pronoun with respect to which the denotation of its sister is interpreted. Because there is no *lε* attached to the VP in (137), the VP denotation is not interpreted with respect to the topic situation and thus the proposition is not exemplified with respect to the VP denotation. Since the denotation of uninflected verbs consists of singular and plural events and the proposition is not exemplified with respect to its denotation, there can be more than one swimming event in the topic situation. Hence, (136) is compatible with both progressive and habitual aspectual reference. However, the progressive interpretation of (136) is ruled out by the Blocking Principle.

Namely, there is another more specialized way to covey the progressive interpretation which blocks the progressive interpretation of (136).[56]

(138) a. $[\![vP]\!] = \lambda e.\text{swim}(e) \wedge Ag(e) = x_1$

   b. $[\![\text{-ɔ}]\!] = \lambda P.\lambda t.\exists e[t \subseteq \tau(e) \wedge P(e)]$

   c. $[\![\text{Asp}]\!]^g = [\![\text{-ɔ}]\!]([\![vP]\!]^g)$
   $= [\lambda P.\lambda t.\exists e[t \subseteq \tau(e) \wedge P(e)]](\lambda e.\text{swim}(e) \wedge Ag(e) = x_1)$
   $= \lambda t.\exists e[t \subseteq \tau(e) \wedge [\lambda e.\text{swim}(e) \wedge Ag(e) = x_1](e)]$
   $= \lambda t.\exists e[t \subseteq \tau(e) \wedge \text{swim}(e) \wedge Ag(e) = x_1)]$

   d. $[\![\text{TP}]\!]^g = [\lambda t.\exists e[t \subseteq \tau(e) \wedge \text{swim}(e) \wedge Ag(e) = x_1]](t_{top})$
   $= \exists e[t_{top} \subseteq \tau(e) \wedge \text{swim}(e) \wedge Ag(e) = x_1]$

   e. $[\![\text{CP}]\!]^g = \lambda x_1.\exists e[t_{top} \subseteq \tau(e) \wedge \text{swim}(e) \wedge Ag(e) = x_1]$

   f. $[\![\text{ni}]\!] = \lambda P.\lambda x.P(x)$

   g. $[\![\text{FP}_1]\!]^g = [\![\text{ni}]\!]([\![\text{CP}]\!]^g)$
   $= [\lambda P.\lambda x.P(x)](\lambda x_1.\exists e[t_{top} \subseteq \tau(e) \wedge \text{swim}(e) \wedge Ag(e) = x_1])$
   $= \lambda x.\exists e[t_{top} \subseteq \tau(e) \wedge \text{swim}(e) \wedge Ag(e) = x]$

   h. $[\![\text{FP}_2]\!]^g = [\lambda x.\exists e[t_{top} \subseteq \tau(e) \wedge \text{swim}(e) \wedge Ag(e) = x]](\text{Kofi})$
   $= \exists e[t_{top} \subseteq \tau(e) \wedge \text{swim}(e) \wedge Ag(e) = \text{Kofi}]$

   i. $[\![\text{topic}]\!] = \lambda p.\lambda s''.\lambda s'.s' \approx s'' \wedge p(s')$

   j. $[\![\text{FP}_3]\!]^g = [\![\text{topic}]\!]([\![\text{FP}_2]\!]^g)$
   type clash; I use IFA
   $= [\![\text{topic}]\!]^{s,g}([\![\text{FP}_2]\!]^g_{\cancel{C}})$
   $= [\![\text{topic}]\!]^{s,g}(\lambda s.\exists e[t_{top} \subseteq \tau(e) \wedge \text{swim}(e) \wedge Ag(e) = \text{Kofi}] \text{ in s})$
   $= [\lambda p.\lambda s''.\lambda s'.s' \approx s'' \wedge p(s')](\lambda s.\exists e[t_{top} \subseteq \tau(e) \wedge \text{swim}(e) \wedge Ag(e) = \text{Kofi}] \text{ in s})$
   $= \lambda s''.\lambda s'.s' \approx s'' \wedge \exists e[t_{top} \subseteq \tau(e) \wedge \text{swim}(e) \wedge Ag(e) = \text{Kofi}] \text{ in s}'$

   k. $[\![\text{FP}_4]\!]^g = [\![\text{FP}_3]\!]^g(s_{topic})$
   $= [\lambda s''.\lambda s'.s' \approx s'' \wedge \exists e[t_{top} \subseteq \tau(e) \wedge \text{swim}(e) \wedge Ag(e) = \text{Kofi}] \text{ in s}'](s_{topic})$

---

[56]In order to combine the node of type t with the node of type $\langle s,t \rangle$, I will use the Intensional Functional Application (von Fintel and Heim, 2010). Its definition is given below:

(i) INTENSIONAL FUNCTIONAL APPLICATION (IFA)
   If α is a branching node and $\{\beta, \gamma\}$ the set of its daughters, then, for any world w and assignment g: if $[\![\beta]\!]^{w,g}$ is a function whose domain contains $[\![\gamma]\!]^g_{\cancel{C}}$, then $[\![\alpha]\!]^{w,g} = [\![\beta]\!]^{w,g}([\![\gamma]\!]^g_{\cancel{C}})$.

   (from von Fintel and Heim, 2010, p.11)

(ii) $[\![\lambda]\!]^g_{\cancel{C}} = \lambda w.[\![\alpha]\!]^{w,g}$ (from von Fintel and Heim, 2010, p.9)

Note, also, that in this chapter the interpretation is not relativized to worlds but to situations. Thank you to Mira Grubic (p.c.) for a discussion.
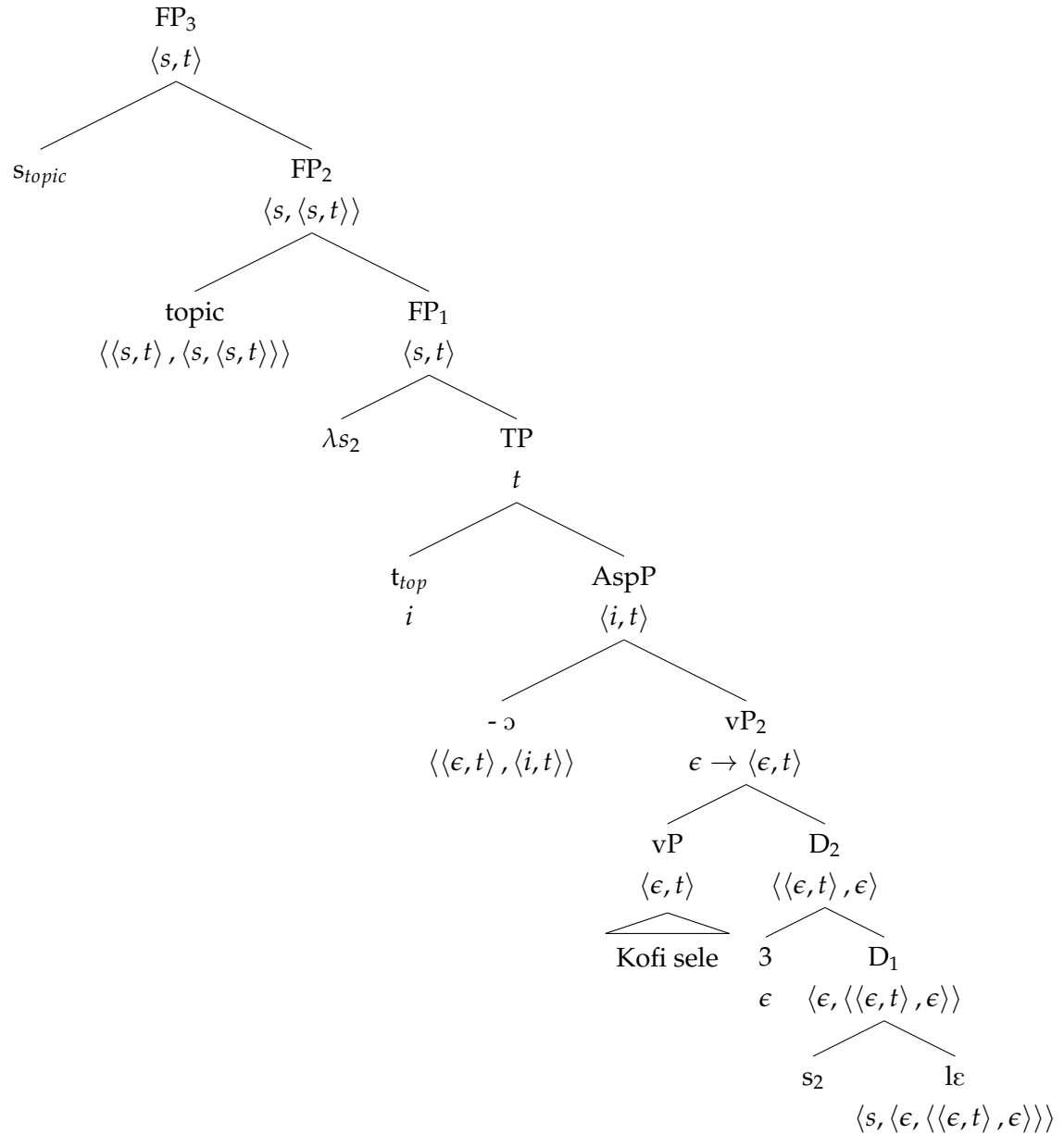
$$= \lambda s'.s' \approx s_{topic} \wedge \exists e[t_{top} \subseteq \tau(e) \wedge \text{swim}(e) \wedge Ag(e) = \text{Kofi in } s']$$

$\approx$ the set of counterparts of the topic situation in which there are event(s) of swimming by Kofi (and nobody else), the running time of which includes the topic time

Sentences with the analytic progressive form also require the presence of the particle *ni* in the structure, as illustrated by (139).

(139)   Kòfí #(ni) sèlè-ɔ́   lɛ.
        Kofi PRT   swim-IMPF PART
        'Kofi swims.'

I argue that (139) is judged as being unacceptable for pragmatic reasons. Crucially, the derivation of (139) does not collapse if *ni* is not present in a sentence, as presented in (141) with its structure demonstrated in (140). This is a desired result as there are environments in which *lɛ* can occur without *ni*, e.g., in antecedents of conditionals.

(140)

FP$_3$
$\langle s,t\rangle$

s$_{topic}$ FP$_2$
$\langle s,\langle s,t\rangle\rangle$

topic   FP$_1$
$\langle\langle s,t\rangle,\langle s,\langle s,t\rangle\rangle\rangle$ $\langle s,t\rangle$

λs_2 TP
t

t$_{top}$ AspP
i $\langle i,t\rangle$

-ɔ   vP$_2$
$\langle\langle\epsilon,t\rangle,\langle i,t\rangle\rangle$ $\epsilon\rightarrow\langle\epsilon,t\rangle$

vP   D$_2$
$\langle\epsilon,t\rangle$ $\langle\langle\epsilon,t\rangle,\epsilon\rangle$

Kofi sele   3   D$_1$
ϵ $\langle\epsilon,\langle\langle\epsilon,t\rangle,\epsilon\rangle\rangle$

s$_2$ lɛ
$\langle s,\langle\epsilon,\langle\langle\epsilon,t\rangle,\epsilon\rangle\rangle\rangle$

(141) a. $[\![l\epsilon]\!]^g = \lambda s.\lambda y.\lambda P.\iota e[e \text{ is in } s \wedge P(e) \wedge e = y]$

b. $[\![D_1]\!]^g = [\![l\epsilon]\!]^g(s_2) = \lambda y.\lambda P.\iota e[e \text{ is in } s_2 \wedge P(e) \wedge e = y]$

c. $[\![D_2]\!]^g = [\![D_1]\!](g(3)) = \lambda P.\iota e[e \text{ is in } s_2 \wedge P(e) \wedge e = g(3)]$

d. $[\![vP]\!] = \lambda e.\text{swim}(e) \wedge Ag(e) = \text{Kofi}$

e. $[\![vP_2]\!]^g = [\![D_2]\!]^g([\![vP]\!])$
$= [\lambda P.\iota e[e \text{ is in } s_2 \wedge P(e) \wedge e = g(3)]](\lambda e.\text{swim}(e) \wedge Ag(e) = \text{Kofi})$
$= \iota e[e \text{ is in } s_2 \wedge \text{swim}(e) \wedge Ag(e) = \text{Kofi} \wedge e = g(3)]$

type clash with Impfv, type-shift form ϵ to $\langle \epsilon, t \rangle$:
$= \lambda e.e = \iota e'[e \text{ is in } s_2 \wedge \text{swim}(e') \wedge Ag(e') = \text{Kofi} \wedge e' = g(3)]$

f. $[\![\text{-ɔ}]\!] = \lambda P.\lambda t.\exists e[t \subseteq \tau(e) \wedge P(e)]$

g. $[\![\text{Asp}]\!]^g = [\![\text{-ɔ}]\!]([\![vP_2]\!]^g)$
$= [\lambda P.\lambda t.\exists e[t \subseteq \tau(e) \wedge P(e)]](\lambda e.e = \iota e'[e \text{ is in } s_2 \wedge \text{swim}(e') \wedge Ag(e') = \text{Kofi} \wedge e' = g(3)])$
$= \lambda t.\exists e[t \subseteq \tau(e) \wedge e = \iota e'[e \text{ is in } s_2 \wedge \text{swim}(e') \wedge Ag(e') = \text{Kofi} \wedge e' = g(3)]]$

h. $[\![\text{TP}]\!]^g = [\![\text{AsP}]\!](t_{top}) = \exists e[t_{top} \subseteq \tau(e) \wedge e = \iota e'[e' \text{ is in } s_2 \wedge \text{swim}(e') \wedge Ag(e') = \text{Kofi} \wedge e' = g(3)]]$

i. $[\![\text{FP}_1]\!]^g = \lambda s_2.\exists e[t_{top} \subseteq \tau(e) \wedge e = \iota e'[e \text{ is in } s_2 \wedge \text{swim}(e') \wedge Ag(e') = \text{Kofi} \wedge e' = g(3)]]$

j. $[\![\text{topic}]\!] = \lambda p.\lambda s''.\lambda s'.s' \approx s'' \wedge p(s')$

k. $[\![\text{FP}_2]\!]^g = [\![\text{topic}]\!]([\![\text{FP}_1]\!]^g)$
$= [\lambda p.\lambda s''.\lambda s'.s' \approx s'' \wedge p(s')](\lambda s_2.\exists e[t_{top} \subseteq \tau(e) \wedge e = \iota e'[e \text{ is in } s_2 \wedge \text{swim}(e') \wedge Ag(e') = \text{Kofi} \wedge e' = g(3)]])$
$= \lambda s''.\lambda s'.s' \approx s'' \wedge \exists e[t_{top} \subseteq \tau(e) \wedge e = \iota e'[e \text{ is in } s' \wedge \text{swim}(e') \wedge Ag(e') = \text{Kofi} \wedge e' = g(3)]]$

l. $[\![\text{FP}_3]\!]^g = [\![\text{FP}_2]\!]^g(s_{topic})$
$= \lambda s'.s' \approx s_{topic} \wedge \exists e[t_{top} \subseteq \tau(e) \wedge e = \iota e'[e \text{ is in } s' \wedge \text{swim}(e') \wedge Ag(e') = \text{Kofi} \wedge e' = g(3)]]$
$\approx$ the set of counterparts of the topic situation in which there is a unique (singular) event[57] of Kofi swimming, the running time of which includes the topic time

I argue that (139) without *ni* is judged as being unacceptable, because it violates Maximize Presupposition (Heim, 1991):

(142)   Maximize presupposition:
Among a set of alternatives, use the felicitous sentence with the strongest presupposition.   (from Chemla, 2008, p.142)

The Maximize presupposition can be illustrated based on the contrast in (143):

(143)   a. #A sun is shining.

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[57] Again, the singularity of the events in the VP denotation is caused by the exemplification of the VP denotation.

      b.   The sun is shining.   (from Singh, 2011, p.150)

Examples (143-a) and (143-b) do not differ in their asserted content. However, (143-b) carries a stronger presupposition than (143-a), i.e., it presupposes that there is a unique sun. In addition, this presupposition is fulfilled in the context. Therefore, because of Maximize Presupposition, it is infelicitous to use (143-a).

The reason for the unacceptability of (139) without *ni* is parallel to the reason for the unacceptability of (143-a). Consider two alternative constructions, i.e., (144) and (145):

(144)	Kòfí nì sèlè-ɔ́ lɛ.		(145)	#Kòfí sèlè-ɔ́ lɛ.	
	Kofi PRT swim-IMPF DET			Kofi swim-IMPF DET	
	'It is Kofi who is swimming'			'Kofi who is swimming'	

Importantly, events are ontologically different from individuals, i.e., they are instantiated in a world by individuals. Conceptually, it is impossible to identify a swimming event without knowing its agent or a stealing event without being familiar with its agents or themes. However, one is able to identify a swimming event by Kofi or a stealing-a-ring event.[58] (145) says that there is a unique familiar event of swimming by Kofi. Now, if Bill is swimming as well, then it is not an event of swimming by Kofi but an event of swimming by Kofi and Bill. The construction in (144) triggers a stronger presupposition in comparison to the structure in (145), i.e., it triggers the exhaustive interpretation that Kofi and nobody else is swimming and thus it unambiguously identifies the swimming event by Kofi. Therefore, due to the Maximize Presupposition principle, (145) becomes unacceptable.

Having demonstrated the compositional derivation of the progressive interpretation conveyed by the analytic progressive, let me explain where the evidential meaning comes from.

5.6 Events *not-instantiated* at the utterance time and evidentiality

As it was presented in section 5.2.2, the analytic progressive cannot refer to events not instantiated at the utterance time. For convenience, one of the examples is repeated in (146):

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[58]Note that when *lɛ* attaches to NPs, the particle *ni* does not have to be present in the sentence. I claim that it is due to the fact that unique NPs do not require a unique event in order to be unambiguously identified.

(146) Tom and John are jogging. They are talking about books. Tom asks John which books he is reading. John replies:

    a. **Míí**-káne 'Harry Potter'.
        PROG-read 'Harry Potter'
    b. #'Harry Potter' **nì** mí kánè-ɔ̀   lɛ.
        'Harry Potter' PRT 1.SG read-IMPF DET
        'I am reading 'Harry Potter'.'

Recall that the interpretation of a sentence with the analytic progressive form is restricted to the unique familiar event which is ongoing at the topic time (which in the case of (146) is the utterance time). I argue that (146-b) is not acceptable in the context of (146), because the event of reading *Harry Potter* by John is not an ongoing, actual event. The topic time, which coincides with the utterance time in (146), cannot be included in the running time of the event of John reading *Harry Potter*, because at the topic time of (146), John is not reading anything but running.

In addition, as illustrated in subsection 5.2.1, the analytic progressive is acceptable in direct evidence contexts but it is unacceptable in indirect evidence contexts, as repeated for convenience below:

(147) #Anna **nì** sèlè-ɔ́   lɛ.
      Anna PRT swim-IMPF DET
      'Anna is swimming.'

    a. Indirect evidence context: Tom and his family (wife, two sons, and two daughters) are on the beach. Tom can see that his two sons and the youngest daughter are playing with sand. He cannot see his oldest daughter, but the younger one told him that she was in the process of swimming. ⇒ Tom <u>cannot</u> utter (147) in this context

    b. Direct evidence context: Tom and his family (wife, two sons, and two daughters) are on the beach. Tom can see that his two sons and the youngest daughter are playing with sand and his oldest daughter, Anna, is swimming. ⇒ Tom <u>can</u> utter (147) in this context

I claim that the direct evidentiality required by the analytic progressive is an effect of the interaction between the semantics of the definite determiner *lɛ* and the aspectual (ongoing) interpretation. Recall that *lɛ* conveys the meaning that the discourse referent picked up by *lɛ* is weakly or strongly familiar. Furthermore, in the analytic progressive, the event must be instantiated at the utterance time.

In subsection 5.3.3.1, I have presented Roberts's (2003) taxonomy of familiarity. She claims that a discourse referent is familiar if it is introduced by preceding linguistic material or it is salient in the utterance situation. The latter conforms to having perceptual evidence or knowing the program of the given event. However, being introduced by linguistic material is not enough to license the use of a sentence with the analytic progressive form. It is due to the fact that the analytic progressive requires an event to be actually ongoing at the utterance time. If the speaker heard from somebody else that for example Kofi is swimming, i.e, the event was introduced by the linguistic material, she cannot be sure whether Kofi is still in the process of swimming at the time of speaking (unless somebody informed the speaker about the program of the sport event or other kind of highly structured event). To sum up, an event for which the speaker has reportative evidence is familiar. However, it might be not ongoing at the time of speaking and therefore it cannot license the use of sentences with the analytic progressive form.

5.7 Summary

In this chapter, I have presented a compositional derivation of the progressive interpretation of sentences with the analytic progressive form. It was shown that it arises as a result of the interaction between the imperfective aspect, the exhaustivity effect triggered by clefts, and the definite description of events. Thus the Ga data empirically support unified approaches to imperfective as well as habitual and progressive (Bonomi, 1997; Cipria and Roberts, 2000; Hacquard, 2006; Deo, 2009, among others). Moreover, the definite description of events is marked by the overt definite determiner *lɛ* which attaches to both NPs and VPs. Therefore, the Ga data demonstrate that not only lexical aspect but also grammatical aspect shows extensive similarities to the nominal domain.

6 Conclusions

6.1 Summary

The dissertation presented a semantic analysis of various exhaustivity-related phenomena, i.e., exclusive particles, the cleft structure, and the progressive aspect in Ga, an under-researched language spoken in the Greater Accra Region of Ghana. The main theoretical claims are listed below.

EXCLUSIVE PARTICLES. I showed that the exclusive particle *pɛ* is a quantifying determiner of type $\langle e, \langle \langle e, st \rangle, st \rangle \rangle$. *Too*, on the other hand, is an exclusive modifier of type $\langle \langle e, st \rangle, \langle e, st \rangle \rangle$ which denotes Landman's (1989; 2010; 2013) group-forming operator and by that changes the denotation of the modified NP. Moreover, it turned out that the domain exhaustified by the exclusive particles depends both on the choice of the exclusive particle (*pɛ* vs. *too*) and the presence or absence of the overt indefinite determiner *kome*. Thus, the data from Ga extends the typology of the exclusive particles and point to the previously unattested variation at their semantics in a cross-linguistic perspective.

CLEFT STRUCTURE. I demonstrated that the particle *ni* in Ga induces a structural bi-partition in which the exhaustively interpreted focused constituent is to its left and the backgrounded part is to its right (*ni*-structure). I proposed its analysis in terms of Büring's (2011) conditional exhaustivity of clefts:

(1) CLEFT:

    a. *assertion*: $(P(x))$
    b. *presupposition*: $P(x) \rightarrow max(P(x))$

In addition, I argued for a pragmatic rescue strategy which says that distributive predicates in clefts are reinterpreted in a collective manner. The observation that collective vs. distributive interpretation of the predicates interplays with the exhaustivity effect triggered by clefts sheds a new light on the cross-linguistic semantics of clefts.

CLEFTS AND TEMPORALITY. The semantics of the imperfective aspect is subject to ongoing discussion about whether it can obtain a unified analysis with progressive and habitual. In this chapter, I have shown that the progressive interpretation of sentences with the analytic progressive form is an effect of the interplay between the cleft's semantics (in particular, its exhaustive interpretation), the general imperfective aspect, and the definite description of events. Thus the data from Ga confirm empirically a unified approach. Moreover, I presented empirical evidence which show that:

- The analytic progressive form requires a direct evidential context in order to be felicitously used. This is a new observation which relates interestingly to the claim that in some languages, e.g., in Turkish (Izvorski, 1997), perfective aspect is associated with direct evidentiality.

- The overt definite determiner *lɛ* in Ga attaches to NPs and VPs leading to the definite description of NPs and VPs, which to the best of my knowledge has been neither observed nor analyzed in the literature so far. Crucially, I showed that *VP lɛ* interacts with the aspectual interpretation of a sentence, which has consequences for the theories of definite determiners, aspect, and clefts (for example, for the theories which assume a definite description of events in cleft constructions, e.g., Hole, 2011).

Importantly, the Ga data show that not only lexical aspect but also grammatical aspect demonstrates significant parallelisms with the nominal domain.

6.2 Directions for future research

Throughout the dissertation, I have identified numerous issues for future research.

EXCLUSIVE PARTICLES. As for the semantics of exclusive particles, it would be interesting to examine, whether also in other languages an interaction between indefinites and selected NPs can influence a domain of exhaustification affected by exclusive particles. Moreover, it appears that exclusives in Ga not only interact with different types of common nouns but also with different types of eventualities and accounting for this interaction is a next logical step in the investigation of these particles in Ga.

CLEFTS. As for cleft structures, it would be interesting to check the proposed analysis of clefts by conducting a quantitative experimental study on the exhaustive interpretation of pivots. On the other hand, it would be important to check the possible exhaustive effects of morphologically unmarked focus constructions in Ga, in which a

focused constituent is moved to its left-peripheral position but in which the particle *ni* is not present, and compare it with the exhaustivity effect triggered by the cleft structure introduced by the particle *ni*.

TEMPORAL AND ASPECTUAL REFERENCE. I have only scratched the surface of the aspectual and temporal reference in Ga and it definitely should be further researched. Especially interesting is an answer to the question whether Ga is a genuinely tenseless language and whether the imperfective marker -ɔ encodes any temporal reference. Moreover, it would be interesting to account for the interaction between an aspectual and an evidential information conveyed by a sentence.

DEFINITE DETERMINERS. It is important to check the role of the cross-categorial definite determiner *lɛ* in antecedents of conditionals and topic constructions. Especially interesting is to examine whether the data from Ga can shed new light on the view that *if*-clauses are definite descriptions over possible world (Schein, 2003; Schlenker, 2004).

Bibliography

Abrusán, M. and Szendrői, K. (2013). Experimenting with the king of France: topic, verifiablity and definite descriptions. *Semantics and Pragmatics*, 6:1–43.

Abusch, D. (1998). Generalizing tense semantics for future contexts. In Rothstein, S., editor, *Events and Grammar*, pages 13–33. Dordrecht: Kluwer.

Akmajian, A. (1970). On deriving cleft sentences from pseudo-cleft sentences. *Linguistic Inquiry*, 1:149–168.

Ameka, F. K. (2010). Information packaging constructions in Kwa: Micro-variation and typology. In Aboh, E. and Essegbey, J., editors, *Topics in Kwa Syntax*, number 78 in Studies in Natural Language and Linguistic Theory, pages 141–176. Springer.

Arkoh, R. and Matthewson, L. (2013). A familiar definite article in Akan. *Lingua*, 123:1–30.

Armstrong, D. M. (1978). *Nominalism and Realism*. Cambridge University Press.

Atlas, J. D. (1993). The importance of being 'only': Testing the neo-Gricean versus neo-entailment paradigms. *Journal of Semantics*, 10:301–318.

Atlas, J. D. and Levinson, S. C. (1981). It-clefts, informativeness and logical form: radical pragmatics. In Cole, P., editor, *Radical pragmatics*. New York: Aacdemic Press.

Austin, J. L. (1950). Truth. *Proceedings of the Aristotelian Society, Supplementary volumes*, 24:111–128.

Bach, E. (1986). The algebra of events. *Linguistics and Philosophy*, 9:5–16.

Baker, M. and Travis, L. (1997). Mood as verbal definiteness in a 'tenseless' language. *Natural Language Semantics*, 5:213–269.

Barlew, J. (2014). Salience, uniqueness, and the definite determiner -tè in Bulu. In Snider, T., D'Antonio, S., and Weigand, M., editors, *The Proceedings of Semantics and Linguistic Theory (SALT) 24*, pages 619–639.

Bibliography

Barwise, J. and Cooper, R. (1981). Generalized quantifiers and natural language. *Linguistics and Philosophy*, 4:159–219.

Barwise, J. and Perry, J. (1983). *Situations and attitudes*. MIT Press.

Beaver, D. and Clark, B. (2008). *Sense and Sensitivity: How Focus Determines Meaning*. Blackwell, Oxford.

Berman, S. (1987). Situation-based semantics of adverbs of quantification. In Blevins, J. and Vainikka, A., editors, *University of Massachusetts Occasional Papers*, number 12, pages 45–68.

Bittner, M. (2005). Future discourse in a tenseless language. *Journal of Semantics*, 22:339–387.

Boadi, L. (1974). Focus-marking in Akan. *Linguistics*, 140:5–57.

Bolinger, D. (1972). A look at questions and cleft sentences. In Firchow, E., editor, *Studies for Einar Haugen*, pages 96–114. Tha Hague: Moton de Gruyter.

Boneh, N. and Doron, E. (2010). Modal and temporal aspects of habituality. In Hovaw, M. R., Doron, E., and Sichel, I., editors, *Syntax, Lexical Semantics, and Event Structure*, pages 338–363. Oxford University Press.

Bonomi, A. (1997). Aspect, quantification and when-clauses in Italian. *Linguistics and Philosophy*, 20:469–514.

Büring, D. (2003). On D-trees, beans, and B-accents. *Linguistics and Philosophy*, 26(5):511–545.

Büring, D. (2004). Crossover situations. *Natural Language Semantics*, 12:23–62.

Büring, D. (2011). Conditional exhaustivity presuppositions in clefts (and definites). Msc.

Büring, D. and Hartmann, K. (2001). The syntax and semantics of focus-sensitive particles in German. *Natural Language and Linguistic Theory*, 19:229–281.

Büring, D. and Križ, M. (2013). It's that, and that's it! Exhaustivity and homogeneity in clefts (and definites). *Semantics and Pragmatics*, 6(6):1–29.

Cable, S. (2013). Beyond the past, present, and future: Towards the semantics of 'graded' tense in Gĩkũyũ. *Natural Language Semantics*, 21:219–276.

Champollion, L. (2010). *Distributivity as a bridge between aspect and measurement*. PhD thesis, University of Pennsylvania.

Chemla, E. (2008). An epistemic step for anti-presuppositions. *Journal of Semantics*, 25:141–173.

Chierchia, G. (1998). Reference to kinds across languages. *Natural Language Semantics*, 6:339–405.

Chierchia, G. (2001). A puzzle about indefinites. In Cecchetto, C., Chierchia, G., and Guasti, M., editors, *Semantic Interfaces*, pages 51–89. CSLI, Stanford.

Cinque, G. (2005). Deriving Greenberg's Universal 20 and its exceptions. *Linguistic Inquiry*, 36(3):315–332.

Cipria, A. and Roberts, C. (2000). Spanish imperfecto and preterito: Truth conditions and Aktionsart effects in a situation semantics. *Natural Language Semantics*, 8:297–347.

Copley, B. L. (2002). *The semantics of the future*. PhD thesis, Massachusetts Institute of Technology.

Coppock, E. and Beaver, D. (2011). Sole sisters. In Ashton, N., Chereches, A., and Lutz, D., editors, *Proceedings of Semantics and Linguistic Theory (SALT) 21*, pages 197–217.

Coppock, E. and Beaver, D. (2012). Exclusive updates. In Aloni, M., Roelofsen, F., Sassoon, G. W., Schulz, K., and Westera, M., editors, *Logic, Language and Meaning: 18th Amsterdam Colloquium*, pages 291–300. Springer.

Coppock, E. and Beaver, D. (2014). Principles of the exclusive muddle. *Journal of Semantics*, 31:371–432.

Coppock, E. and Beaver, D. (2015). Definiteness and determinacy. *Linguistics and Philosophy*, 38(5):377–435.

Dakubu, M. E. K. (1970). The categories of the Ga verbal group. *Journal of West African Languages*, 9:70–76.

Dakubu, M. E. K. (1992). Contrast in context: Topic, focus, and definiteness in Ga. *Journal of West African Languages*, 22(2):3–16.

Dakubu, M. E. K., editor (1999). *Ga-English dictionary with English-Ga index*. Black Mask Ltd, Accra - Ghana, second edition.

Dakubu, M. E. K. (2002). *Ga phonology*. Language Monographs No. 6. Legon: Institute of African Studies.

Dakubu, M. E. K. (2004a). Ga clauses without syntactic subjects. *Journal of African Languages and Linguistics*, 24:1–40.

Dakubu, M. E. K. (2004b). The Ga pre-verb auxiliary 'kɛ' revisited. In Dakubu, M. E. E. K. and Osam, E., editors, *Studies in the Languages of Volta Basin 2*, Proceedings of the Annual Colloquium of the Legon-Trondheim Linguistics Project, pages 113–134.

Dakubu, M. E. K. (2005). The syntax of focus in Ga and the significance of related constructions. In *The Conference on Focus in African Languages, Humboldt University*, Berlin.

Dakubu, M. E. K. (2008). Ga verb features. In Ameka, F. K. and Dakubu, M. E. K., editors, *Aspect and Modality in Kwa Languages*, pages 91–134. John Benjamis Publishing Company.

Davidson, D. (1967). The logical form of action sentences. In Rescher, N., editor, *The Logic of Decision and Action*, pages 81–95. University of Pittsburgh Press.

Davis, H., Matthewson, L., and Shank, S. (2004). Clefts vs. nominal predicates in two Salish languages. In Gerdts, D. B. and Matthewson, L., editors, *Studies in Salish Linguistics in Honor of Dale Kinkade*, pages 110–117. University of Montana Occasional Papers in Linguistics.

de Swart, H. (2012). Fuzzy borders of aspectual categories. talk given at TRAIT worskhop, January 2012.

Deo, A. (2009). Unifying the imperfective and the progressive: Partitions as quantification domains. *Linguistics and Philosophy*, 32:475–521.

Destruel, E., Velleman, D., Onea, E., Bumford, D., Xue, J., and Beaver, D. (2015). A cross-linguistic study of the non-at-issueness of exhaustive inferences. In Schwarz, F., editor, *Experimental Perspectives on Presuppositions*, volume 45 of *Studies in Theoretical Psycholinguistics*. Springer International Publishing.

DeVeaugh-Geiss, J. P., Zimmermann, M., Onea, E., and Boell, A.-C. (2015). Contradicting (not)-at-issueness in exclusives and clefts: An empirical study. In D'Antonio, S., Moroney, M., and Little, C. R., editors, *Proceedings of the 25th Semantics and Linguistic Theory (SALT) 25*.

Dowty, D. R. (1977). Toward a semantic analysis of verb aspect and the English 'imperfective' progressive. *Linguistics and Philosophy*, 1:45–77.

Dufter, A. (2009). Clefting and discourse organization: Comparing Germanic and Romance. In Dufter, A. and Jacob, D., editors, *Focus and Background in Romance Languages*, pages 83–122. John Benjamis Publishing Company.

Eckardt, R. (2006). *Meaning Change in Grammaticalization: an Enquiry into Semantic Reanalysis.* Oxford University Press, Oxford.

Elbourne, P. (2005). *Situations and Individuals*. MIT Press.

Elbourne, P. (2013). *Definite Descriptions*. Oxford University Press.

Faller, M. T. (2002). *Semantics and Pragmatics of Evidentials in Cuzco Quechua*. PhD thesis, Stanford University.

Fanselow, G. and Lenertová, D. (2011). Left peripheral focus: Mismatches between syntax and information structure. *Natural Language and Linguistic Theory*, 29(1):169–209.

Farkas, D. F. and de Swart, H. (2010). The semantics and pragmatics of plurals. *Semantics and Pragmatics*, 3:1–54.

Ferreira, M. (2005). *Event Quantification and Plurality*. PhD thesis, Massachusetts Institute of Technology.

Fiedler, I., Hartmann, K., Reineke, B., Schwarz, A., and Zimmermann, M. (2010). Subject focus in West African languages. In Zimmermann, M. and Féry, C., editors, *Information Structure. Theoretical, Typological, and Experimental Perspectives.*, pages 234–257. Oxford University Press.

Fiedler, I. and Schwarz, A. (2005). Out-of-focus encoding in Gur and Kwa. In Ishihara, S., Schmitz, M., and Schwarz, A., editors, *Interdisciplinary Studies in Information Structure*, volume 3, pages 111–142. Universtitätsverlag Potsdam.

Fodor, J. D. and Sag, I. A. (1982). Referential and quantificational indefinites. *Linguistics and Philosophy*, 5:355–398.

Fox, D. (2000). *Economy and semantic interpretation*, volume 35 of *Linguistic inquiry monographs*. Massachusetts Institute of Technology.

Frege, G. (1892). Über Sinn und Bedeutung. *Zeitschrift für Philosophie und philosophische Kritik*, pages 25–50.

Genzel, S., Grubic, M., and Renans, A. (2015). Focus marking strategies in selected African languages. handout of the talk given at SFB 632 Final Conference.

Greenberg, J. (1963). Some universals of grammar with particular reference to the order of meaningful elements. In Greenberg, J., editor, *Universals of language*, pages 73–113. MIT Press, Cambridge, Mass.

Grubic, M. (2015). *Focus and Alternative Sensitivity in Ngamo (West Chadic)*. PhD thesis, University of Potsdam.

Grubic, M. and Zimmermann, M. (2011). Conventional and free association with focus in Ngamo (West Chadic). In Reich, I., Horch, E., and Pauly, D., editors, *Proceedings of Sinn und Bedeutung (SuB) 15*, pages 291–305.

Hacquard, V. (2006). *Aspects of Modality*. PhD thesis, Massachusetts Institute of Technology.

Hartmann, K. and Zimmermann, M. (2007a). Exhaustivity marking in Hausa: A re-evaluation of the particle nee/cee. In Aboh, E., Hartmann, K., and Zimmermann, M., editors, *Focus Strategies in African Languages: On the interaction of focus and grammar in Niger-Congo and Afro-Asiatic*. Mouton de Gruyter, Berlin.

Hartmann, K. and Zimmermann, M. (2007b). In place — out of place: Focus in Hausa. In Schwabe, K. and Winkler, S., editors, *On Information Structure, Meaning and Form: Generalizing Across Languages*, pages 365–403. Benjamins, Amsterdam.

Hartmann, K. and Zimmermann, M. (2012). Focus marking in Bura: Semantic uniformity matches syntactic heterogeneity. *Natural Language and Linguistic Theory*, 30(4):1061–1108.

Hedberg, N. (2000). The referential status of clefts. *Langua*, 76:891–920.

Heim, I. (1982). *The semantics of definite and indefinite Noun Phrases*. PhD thesis, University of Massachusetts, Amherst.

Heim, I. (1991). Artikel und Definitheit. In von Stechow, A. and Wunderlich, D., editors, *Semantik: ein internationales Handbuch der Zeitgenössischen Forschung*, pages 487– 535. de Gruyter, Berlin.

Heim, I. and Kratzer, A. (1998). *Semantics in Generative Grammar*. Oxford: Blackwell.

Hellan, L. and Dakubu, M. E. K. (2010). Identifying verb constructions cross-linguistically. In Hellan, L. and Dakubu, M. E. K., editors, *Studies in the languages of the Volta Basin 6*, Proceedings of the Annual Colloquium of the Legon-Trondheim Linguistics Project, pages 3–101.

Heycock, C. (1995). Asymmetries in reconstruction. *Linguistic Inquiry*, 26:547–570.

Hiraiwa, K. and Ishihara, S. (2002). *Missing links: cleft, sluicing and 'no da' construction in Japanese*, volume 43. MIT Working Papers in Linguistics.

Hole, D. (2011). The deconstruction of Chinese shì ... de clefts revisited. *Lingua*, 121:1707–1733.

Hole, D. and Zimmermann, M. (2013). Cleft partitionings in Japanese, Burmese, and Chinese. In Hartmann, K. and Veenstra, T., editors, *Cleft Structures*, pages 285–317. John Benjamis Publishing Company.

Horn, L. (1981). Exhaustiveness and the semantics of clefts. In Burke, V. and Pustojevsky, J., editors, *Papers from 11th Annual Meeting of the North Eastern Linguistic Society*, pages 125–142.

Horn, L. R. (1969). A presuppositional analysis of 'only' and 'even'. In *Proceedings of the Annual Meeting of the Chicago Linguistic Society*, University of Chicago.

Horn, L. R. (1996). Exclusive company: 'only' and the dynamics of vertical inference. *Journal of Semantics*, 10:1–40.

Iatridou, S. (2014). About determiners on event descriptions, about time being like space (when we talk), and about one particularly strange construction. *Natural Language Semantics*, 22:219–263.

Ippolito, M. (2008). On the meaning of 'only'. *Journal of Semantics*, 25:45–91.

Izvorski, R. (1997). The present perfect as an epistemic modal. In Lawson, A., editor, *Proceedings of Semantics and Linguistic Theory (SALT) 7*, pages 222–239.

Johanson, L. (2003). Evidentiality in Turkic. In Aikhenvald, A. Y. and Dixon, R., editors, *Studies in Evidentiality*. John Benjamis Publishing Company.

Kamp, H. and Reyle, U. (1993). *From Discourse to Logic*. Dordrecht: Kluwer.

Bibliography

Kaufmann, S. (2005). Conditional truth and future reference. *Journal of Semantics*, 22:231–280.

Kayne, R. (1994). *The antisymmetry of syntax*. MIT Press, Cambridge.

Keshet, E. (2008). *Good Intensions: Paving Two Roads to a Theory of the De re/ De dicto Distinction*. PhD thesis, Massachusetts Institute of Technology.

Kiss, K. E. (1998). Identificational focus versus information focus. *Language*, 75(2):245–273.

Kissine, M. (2008). Why *will* is not a modal. *Natural Language Semantics*, 16:129–155.

Klein, W. (1994). *Time in Language*. London: Routledge.

Koch, K. and Zimmermann, M. (2010). Focus-sensitive operators in Nłe?kempxcin. In Prinzhorn, M., Schmitt, V., and Zobel, S., editors, *Proceedings of Sinn und Bedeutung 14*, pages 237–255.

Kratzer, A. (1989). An investigation of the lumps of thoughts. *Linguistics and Philosophy*, 12:607–653.

Kratzer, A. (1996). Severing the external argument from its verb. In Rooryck, J. and Zaring, L., editors, *Phrase Structure and the lexicon*, pages 109–137. Kluwer Academic Publishers.

Kratzer, A. (1998). Scope or pseudoscope? Are there wide-scope indefinites? In Rothstein, S., editor, *Events and Grammar*, pages 163–196. Kluwer Academic Publishers.

Kratzer, A. (2007). Situation semantics in natural language semantics. The Stanford Encyclopedia of Philosophy.

Kratzer, A. (2008). On the plurality of verbs. In Dölling, J., Heyde-Zybatow, T., and Schäfer, M., editors, *Language context and cognition*, pages 269–299. Walter de Gruyter.

Krifka, M. (1989). Nominal reference, temporal constitution, and quantification in event semantics. In van Benthem, J., van Emde Boas, P., and Bartsch, R., editors, *Semantics and Contextual Expression*, pages 75–115. Foris, Dodrecht.

Krifka, M. (1992). Thematic relations as links between nominal reference and temporal constitution. In Sag, I. A. and Szabolcsi, A., editors, *Lexical Matters*, pages 29–53. CSLI.

Krifka, M. (1995). Common nouns: a contrastive analysis of Chinese and English. In Carlson, G. N. and Pelletier, F. J., editors, *The Generic Book*, pages 398–411. The University of Chicago Press, Chicago.

Krifka, M. (2006). Association with focus phrases. In Molnár, V. and Winkler, S., editors, *The architecture of focus*, number 105–136. Mouton de Gruyter.

Krifka, M. (2007). Basic notions of information structure. In Féry, C., Fanselow, G., and Krifka, M., editors, *Working papers of the SFB 632: The notions of information structure*, volume 6, pages 13–56. Universitätsverlag Potsdam.

Krifka, M., Pelletier, F. J., Carlson, G. N., ter Meulen, A., Chierchia, G., and Link, G. (1995). Genericity: an introduction. In Carlson, G. N. and Pelletier, F. J., editors, *The Generic Book*. The University of Chicago Press.

Kusumoto, K. (1999). *Tense in embedded contexts*. PhD thesis, University of Massachusetts Amherst.

Landman, F. (1989). Groups I. *Linguistics and Philosophy*, 12:559–605.

Landman, F. (1992). The progressive. *Natural Language Semantics*, 1:1–32.

Landman, F. (1997). Plurality. In Lappin, S., editor, *The Handbook of Contemporary Semantic Theory*, number 425–457. Blackwell.

Landman, F. (2010). Count nouns-mass nouns-neat nouns-mess nouns. In Glanzberg, M., Partee, B. H., and Škilters, J., editors, *Formal Semantics and Pragmatics: Discourse, Context and Models*, volume 6. The Baltic International Yearbook of Cognition, Logic and Communication.

Landman, F. (2013). Iceberg semantics. talk presented at Countabilility Workshop, Düsseldorf.

Larson, R. K. (2003). Event descriptions in Fòn and Haitian Creole. In Adon, D., editor, *Recent development in Creole Studies*, pages 67–90. Walter de Gruyter.

Lasersohn, P. (1993). Existence presuppositions and background knowledge. *Journal of Semantics*, 2:113–122.

Levinson, S. C. (1983). *Pragmatics*. Cambridge University Press.

Lewis, D. (1986). *On the plurality of worlds*. Blackwell.

Lin, J. (2002). Selectional restrictions of tenses and temporal reference of Chinese bare sentences. *Lingua*, 113:271–302.

Lin, J. (2003). Temporal reference in Mandarin. *Journal of East Asian Linguistics*, 12:259–311.

Link, G. (1983). The logical analysis of plurals and mass terms: a lattice-theoretic approach. In Bäuerle, R., Schwarze, C., and von Stechow, A., editors, *Meaning, Use, and the Interpretation of Language*, pages 303–323. de Gruyter, Berlin.

Mathew, R. (2013). Recursion of FocP in Malaylam. In Hartmann, K. and Veenstra, T., editors, *Cleft Structures*, pages 251–268. John Benjamis Publishing Company.

Matthewson, L. (1999). On the interpretation of wide-scope indefinites. *Natural Language Semantics*, 7:79–134.

Matthewson, L. (2001). Quantification and the nature of crosslinguistic variation. *Natural Language Semantics*, 9:145–189.

Matthewson, L. (2004). On the methodology of semantic fieldwork. *International Journal of American Linguistics*, 70:369–415.

Matthewson, L. (2006). Temporal semantics in a superficially tenseless language. *Linguistics and Philosophy*, 29:673–713.

McCawley, J. (1981). *Everything that Linguists Have Always Wanted to Know about Logic But Were Ashamed to Ask.* University of Chicago Press.

Meinunger, A. (1998). A monoclausal structure for (pseudo)-cleft sentences. In *Proceedings of the annual meeting of the North East Linguistic Society (NELS) 28*, pages 282–298.

Montague, R. (1973). The proper treatment of quantification in ordinary English. In Hintikka, J., Moravcsik, J., and Suppes, P., editors, *Approaches to Natural Language*, pages 221–242. Dordrecht: Reidel.

Mucha, A. (2013). Temporal interpretation in Hausa. *Linguistics and Philosophy*, 36:371–415.

Mucha, A. (2015). *Temporal interpretation and cross-linguistic variation.* PhD thesis, Universität Potsdam.

Musan, R. (1995). *On the Temporal Interpretation of Nouns Phrases.* PhD thesis, Massachusetts Institute of Technology.

Neale, S. (2004). This, that, and the other. In Bazuidenhout, A. and Reimer, M., editors, *Descriptions and beyond*, pages 68–182. Oxford University Press.

Onea, E. and Beaver, D. (2009). Hungarian focus is not exhausted. In Cormany, E., Ito, S., and Lutz, D., editors, *Proceedings of Semantics and Linguistic Theory (SALT) 19*, pages 342–359.

Parsons, T. (1990). *Events in the Semantics of English*. MIT Press.

Paster, M. (2003). Floating tones in Gã. *Studies in African Linguistics*, 32(1):17–39.

Percus, O. (1997). Prying open the cleft. In Kusumoto, K., editor, *Proceedings of The annual meeting of the North East Linguistic Society (NELS) 27*, pages 337–351.

Peterson, T. R. G. (2010). *Epistemic Modality and Evidentiality in Gitksan at the Semantics-Pragmatics Interface*. PhD thesis, University of British Columbia.

Pollard, C. and Yasavul, M. (2014). Anaphoric it-clefts: The myth of exhaustivity. In *Proceedings of Chicago Linguistic Society (CLS)*, volume 50.

Portner, P. (1998). The progressive in modal semantics. *Language*, 74:760–787.

Quine, W. V. O. (1939). Designation and existence. *Journal of Philosophy*, 36:701–709.

Reichenbach, H. (1947). *Elements of Symbolic Logic*. New York: Dover.

Reinhart, T. (1981). An analysis of sentence topics. *Philosophica*, 1:53–94.

Reinhart, T. (1997). Quantifier scope: how labor is divided between QR and choice functions. *Linguistics and Philosophy*, 20:335–397.

Renans, A. (2015). Three types of indefinites: Evidence from Ga (Kwa). In Borchhagen, T., Roelofsen, F., and Theiler, N., editors, *Proceedings of the 20th Amsterdam Colloquium*, pages 343–352.

Rivero, M. L. and Arregui, A. (2010). Aspectual microvariation: the case of Slavic imperfectives. In Heijl, M., editor, *Proceedings of the 2010 annual conference of the Canadian Linguistic Association*.

Roberts, C. (1996/2014). Information structure in discourse: Towards an integrated formal theory of pragmatics. In Yoon, J.-H. and Kathol, A., editors, *OSU Working Papers in Linguistics 49: Papers in Semantics*. The Ohio State University.

Roberts, C. (2003). Uniqueness and definite noun phrases. *Linguistics and Philosophy*, 26:287–350.

Roberts, C. (2006). 'Only', presupposition and implicature. *Journal of Semantics*, accepted with revisions.

Roberts, C., Simons, M., Beaver, D., and Tonhauser, J. (2009). Presupposition, conventional implicature, and beyond: A unified account of projection. In Klinedist, N. and Rotschild, D., editors, *Proceedings of Workshop on New Directions in the Theory of Presuppositions*, ESSLLI 2009.

Rooth, M. (1985). *Association with Focus*. PhD thesis, University of Massachusetts, Amherst.

Rooth, M. (1992). A theory of focus interpretation. *Natural Language Semantics*, 1:75–116.

Rooth, M. (1996). Focus. In Lappin, S., editor, *The handbook of contemporary semantic theory*, pages 271–297. Blackwell.

Rooth, M. (1999). Association with focus or association with presupposition. In *Focus. Linguistic, Cognitive, and Computational Perspectives*, pages 232–244. Cambridge University Press.

Ross, J. (1967). *Constraints on variables in syntax*. PhD thesis, Massachusetts Institute of Technology.

Russell, B. (1905). On denoting. *Mind*, 4:479–493.

Russell, B. (1957). Mr Strawson on referring. *Mind*, 66(263):385–389.

Sauerland, U., Anderssen, J., and Yatsushiro, K. (2005). The plural is semantically unmarked. In Kepser, S. and Reis, M., editors, *Linguistic evidence: empirical, theoretical and computational perspectives*. Mouton de Gruyter.

Schein, B. (1993). *Plurals and Events*. MIT Press.

Schwarz, B. (2001). Two kinds of long-distance indefinites. In van Rooij, R. and Stokhof, M., editors, *Proceedings of the 13th Amsterdam Colloquium*, pages 192–197, Amsterdam: ICCL.

Schwarz, F. (2009). *Two types of Definites in Natural Language*. PhD thesis, University of Massachusetts, Amherst.

Simons, M., Tonhauser, J., Beaver, D., and Roberts, C. (2011). What projects and why. In Ashton, N., Chereches, A., and Lutz, D., editors, *Proceedings of Semantics and Linguistic Theory (SALT) 21*.

Singh, R. (2011). *Maximize Presupposition!* and local contexts. *Natural Language Semantics*, 19:149–168.

Skopeteas, S. and Fanselow, G. (2010). Focus types and argument asymmetries: A cross-linguistic study in language production. In Breul, C. and Göbbel, E., editors, *Comparative and Contrastive Studies of Information Structure*, pages 169–199. John Benjamis Publishing Company.

Smith, C. S. and Erbaugh, M. S. (2005). Temporal interpretation in Mandarin Chinese. *Linguistics*, 43:713–756.

Soames, S. (1986). Incomplete definite descriptions. *Notre Dame Journal of Formal Logic*, 27:349–375.

Strawson, P. F. (1950). On referring. *Mind*, 59(235):320–344.

Strawson, P. F. (1964). Identifying reference and truth-values. *Theoria*, 30(2):96–118.

Szabó, Z. G. (2000). Descriptions and uniqueness. *Philosophical Studies*, 101:29–57.

Szabó, Z. G. (2003). Definite descriptions without uniqueness: a reply to Abbott. *Philosophical Studies*, 114:279–297.

Szabolcsi, A. (1981a). Compositionality in focus. *Folia Linguistica*, XV(1–2):141–161.

Szabolcsi, A. (1981b). The semantics of topic-focus articulation. In Groenedijk, J., Jansen, T., and Stokhof, M. B., editors, *Formal Methods in the Study of Language*.

Szabolcsi, A. (1994). All quantifiers are not equal: the case of focus. In *5th Symposium on Logic and Language. Special issue of Acta Linguistica Hungarica*, volume 42–43, pages 171–187.

Tomaszewicz, B. (2012). A family of exclusives in Polish. GLOW 35 Association with focus workshop, University of Potsdam.

Tonhauser, J. (2006). *The Temporal Semantics of Noun Phrases: Evidence from Guaraní*. PhD thesis, Stanford University.

Tonhauser, J. (2011a). The Paraguayan Guaraní future marker -ta: formal semantics and cross-linguistic comparison. In Monika and Musan, R., editors, *Tense Across Languages*, pages 207–231. Tübingen: Niemeyer.

Tonhauser, J. (2011b). Temporal reference in Paraguayan Guaraní, a tenseless language. *Linguistics and Philosophy*, 34:257–303.

Tonhauser, J. (2012). Diagnosing (not)-at-issue content. In *Proceedings of Semantics of Under-represented Languages of Americas (SULA) 6*, pages 239–254.

Tonhauser, J. (2014). Focus sensitivity in Paraguayan Guaraní. talk presented at the Workshop on Focus Sensitive Expressions From a Cross-Linguistic Perspective. Bar Ilan University, Tel Aviv.

Tonhauser, J., Beaver, D., Roberts, C., and Simons, M. (2013). Towards a taxonomy of projective content. *Language*, 89(1):66–109.

Tonhauser, J. and Matthewson, L. (2015). Empirical evidence in research on meaning. Msc.

Torrence, H. (2013). The morphosyntax of Wolof clefts: structure and movement. In Hartmann, K. and Veenstra, T., editors, *Cleft structures*, pages 187–223. John Benjamis Publishing Company.

van Hoof, H. (2003). The rise in the rise-fall contour: Does it evoke a contrastive topic or a contrastive focus? *Linguistics*, 41(3):515–563.

van Rooij, R. and Schulz, K. (2005). Only: Meaning and implicatures. In Maier, E., Bary, C., and Huitink, J., editors, *Proceedings of Sinn und Bedeutung 9*.

Velleman, D. B., Beaver, D., Destruel, E., Bumford, D., Onea, E., and Coppock, L. (2012). It-clefts are IT (inquiry terminating constructions). In Chereches, A., editor, *Proceedings of Semantics and Linguistic Theory (SALT) 22*, pages 441–460.

von Fintel, K. (1994). *Restrictions on Quantifier Domains*. PhD thesis, University of Massachusetts.

von Fintel, K. (2004). Would you believe it? The king of France is back! Presuppositions and truth-value intuitions. In Bezuidenhout, A. and Reimer, M., editors, *Descriptions and beyond: An interdisciplinary collection of essays on definite and indefinite descriptions and other related phenomena*. Oxford University Press.

von Fintel, K. and Heim, I. (2010). *Intensional Semantics*. MIT, spring 2010 edition.

Wagner, M. (2012). Contrastive topics decomposed. *Semantics and Pragmatics*, 5(8):1–54.

Wilhelm, A. (2008). Bare nouns and number in Dëne Sųłiné. *Natural Language Semantics*, 16:39–68.

Willett, T. (1988). A cross-linguistic survey of the grammaticization of evidentiality. *Studies in Language*, 12(1):51–97.

Winter, Y. (1997). Choice functions and the scopal semantics of indefinites. *Linguistics and Philosophy*, 20:399–467.

Yasavul, M. (2013). Two kinds of focus constructions in K'iche'. In Snider, T., editor, *Proceedings of Semantics and Linguistic Theory (SALT) 23*, pages 611–632.

Zimmermann, M. (2011). The grammatical expression of focus in West Chadic: Variation and uniformity in and across languages. *Linguistics*, 49(5):1161–1211.

Zimmermann, M. (2015). *Predicate Focus*. Ms., University of Potsdam.