Imperfective in Ga (Kwa)

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Abstract. This paper discusses the semantics of imperfective aspect in Ga focusing on its progressive interpretation. The data from Ga show the existence of the cross-categorial definite determiner that can attach either to the NP or to the VP. I argue that in order to account for the data one needs the same domain restriction mechanisms in the verbal domain as in the nominal domain. I claim that a progressive interpretation in Ga is the result of domain restriction mechanisms in the verbal domain which is modeled in terms of situation semantics in line with domain restriction mechanisms in the nominal domain.

Keywords: imperfective aspect, progressive, situation semantics, Ga language

1. Introduction

In this paper, I present a semantic analysis of the progressive in Ga, a Kwa language spoken by ca. 600.000 speakers in the Greater Accra Region of Ghana. Ga has a rich system of overt aspectual markers.[1] The general imperfective is marked by the suffix -ɔ, as illustrated by its compatibility with a habitual aspectual reference in (1) and a progressive aspectual reference in (3):[2]

(1) *context*: Every Sunday Kofi goes to swim in the ocean.
Kofi sele-ɔ.
Kofi swim-IMPF
'Kofi swims.'

Interestingly, there are two ways of expressing progressive interpretation in Ga. First, one can use the verbal prefix *mii-*:

(2) **Progressive 1**
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. Toms's wife says:

[1] Ga can be analyzed as a tensed language in the spirit of Matthewson (2006) or as a tenseless language in line with Tonhauser (2011). To decide which analysis is more adequate for Ga data is left for future research.

[2] The glosses used in this paper are as follows: DET = determiner; SG = singular; PL = plural; 1 = First person; 2 = Second person; 3 = Third person; FM = focus marker; IMPF = imperfective; PROG = progressive. An example marked with '#'/'$^{??}$' means that the example was judged to be unacceptable in the given context and 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 '#'. Examples without any diacritics were judged as acceptable in the given context.

Kofi mii-sele.
Kofi PROG-swim
'Kofi is swimming.'

Second, one can add to an imperfective sentence the focus marker *ni* and the final-clausal definite determiner *lɛ*, as in (3). Sentences of this form invariably obtain a progressive interpretation.

(3) **Progressive 2**
context: Tom and his family (wife, two sons, and two daughters) are on the beach. Tom and his wife can see a swimming child. Toms's wife says:

a. Kofi #(ni) sele-ɔ lɛ.
Kofi FM swim-IMPF DET

b. #Kofi ni seleɔ.
Kofi FM swim-IMPF
'It is Kofi who is swimming.'

Crucially, (3) without the focus marker *ni* is unacceptable. Moreover, (3) without the definite determiner *lɛ* obtains a habitual interpretation, as in (4):

(4) *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.

a. #Kofi ni seleɔ lɛ.
Kofi FM swim-IMPF DET

b. Kofi ni seleɔ.
Kofi FM swim-IMPF.
'It is Kofi who swimms.'

It follows that in Progr2, a progressive interpretation arises only when both the focus marker *ni* and the definite determiner *lɛ* are present in an imperfective sentence.

Even though both Progr1 and Progr2 express a progressive interpretation, their semantics is not alike. Whereas Progr1 is a general, unmarked form of progressive similar to the English one, the interpretation of Progr2 is restricted to the actual ongoing situation that the speaker has direct evidence for. I argue that the progressive interpretation in Progr2 is the result of a domain restriction mechanism in the verbal domain analogous to the one in the nominal domain modeled in the situation semantics terms.

The structure of the paper is as follows. In Section 2, I discuss the data illustrating the differences in the semantics of both types of progressive in Ga. In section 3, I present the semantic analysis of the particle *ni*, the general imperfective suffix -ɔ, and the definite particle *lɛ*. A short introduction to situation semantics is given in section 4. In section 5, I present the syntactic structure and the compositional derivation of Progr2. In section 6, I show how the analysis accounts for the data presented in section 2 and, finally, section 7 concludes.

2. Two types of progressive

In this section, I give a short overview of the semantic differences between two kinds of progressive in Ga. Subsection 2.1 discusses the evidential effects of both types of progressive. While Progr1 is acceptable in both direct and indirect evidential contexts, Progr2 is only acceptable in direct evidential contexts. Moreover, data in subsection 2.2 show that Progr1 can refer to *not-ongoing* events, unlike Progr2.[3]

2.1. Evidentiality

While Progr1 is acceptable in both direct and indirect evidential contexts, Progr2 is only acceptable in direct evidential contexts, as illustrated in (5) and (6):

(5) *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:

a. Anna **mii**-sele.
Anna PROG-swim

b. Anna **ni** sele-**ɔ** **lɛ**.
Anna FM swim-IMPF DET
'ANNA is swimming.'

(6) *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 **mii**-sele.
Anna PROG-swim

b. #Anna **ni** sele-**ɔ** **lɛ**.
Anna FM swim-IMPF DET
'ANNA is swimming.'

[3] By *not-ongoing* events I mean events that are literally not ongoing in the utterance time as in (7) and (8).

Moreover, Progr2 additionally emphasizes that it is Anna (and not anybody else) who is swimming right now.

2.2. *Not-ongoing* events

Whereas Progr1, as English progressive, can refer to *not-ongoing* events, Progr2 cannot, as shown in (7) and (8):

(7) Tom and John are jogging. They are talking about books. Tom asks John which books he is reading. John replies:

a. **Mii**-kane ‘Harry Potter’.
1SG.PROG-read ‘Harry Potter’

b. #‘Harry Potter’ **ni** mi kane-**ɔ** **lɛ**.
‘Harry Potter’ FM 1SG read-IMPF DET
‘I am reading ‘Harry Potter’.’

(8) One year ago John started building a new house for his family. He wants it to be ready by December 2014. Right now John is at work in his office.

a. John **mii**-ma shia.
John PROG-build house

b. ??John **ni** ma-**a** shia **lɛ**.
John FM build-IMPF house PRT
‘John is building a house.’

Table 1: Differences in the semantics of Progr1 and Progr2

	direct evident.	indirect evident.	*not-ongoing* events
Progr1 (mii-)	✓	✓	✓
Progr2 (ni, -ɔ, lɛ)	✓	–	–

The summary of the semantic differences between Progr1 and Progr2 is presented in Table 1. The data suggest that the interpretation of Progr2 is restricted to actual ongoing situations. I argue that this is the result of domain restriction in that a domain restriction on the VP can change an aspectual interpretation of a sentence. I propose modeling this in terms of situation semantics (Kratzer 1998, Schwarz 2009) on a par with domain restriction in the nominal domain.

3. Analysis

In this section, I present the semantic analysis of the particle *ni*, the suffix *-ɔ*, and the particle *lɛ*. Since the semantics of *ni* is a bit off the discussion of aspect and since the structure generated by

ni provides the basis for the subsequent considerations, I present its semantics at the beginning of this section, in subsection 3.1. In subsection 3.2, I discuss the basic assumptions regarding the semantics of aspect and in subsection 3.3 I discuss the semantics of the imperfective in Ga (suffix -ɔ). The analysis of the particle *lɛ* and its influence on the aspectual interpretation of sentences is presented in subsection 3.4.

3.1. Particle *ni*

The particle *ni* induces a structural bi-partition in which the focused constituent is to its left and backgrounded/presupposed material is to its right. This is illustrated in (9) which shows that *ni* cannot be attached to non-focus constituents:

(9) Namɔ (ni) kane wolo?
who FM read book
'Who read a book?'

a. Kofi (ni) kane wolo (#ni).
Kofi FM read book FM
'It is Kofi who read a book.'

b. #Wolo (ni) Kofi kane.
book FM Kofi read
'It is a book that Kofi read.'

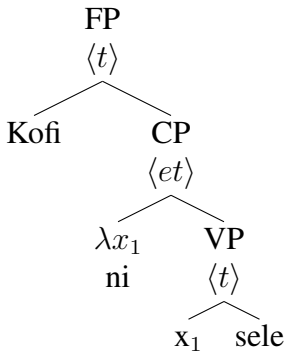
Crucially for the analysis, *ni* gives rise to an exhaustive interpretation.[4] If *ni* did not give rise to an exhaustive interpretation, then (10) would be acceptable, contrary to fact.

(10) #Felix ni kane-ɔ wolo ni Kofi ni kane-ɔ wolo.
Felix FM read-IMPF book and Kofi FM read-IMPF book
'It is John who reads a book and it is Kofi who reads a book.'

I claim that *ni* introduces a cleft-like structure and indicates that an element attached to it should be interpreted exhaustively, i.e. it gives rise to the structure in (11):

[4]Data from Ga show that an exhaustivity effect generated by *ni* is not as strong as an exhaustivity effect generated by *only* but rather resembles an exhaustivity generated by English cleft constructions.

(11)



3.2. Aspect — background information

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 truth of the proposition is evaluated. The role of aspect 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 (Klein 1994, Kratzer 1998):

(12) $[\![\text{Imperfective}]\!] = \lambda P.\lambda t.\lambda w.\exists e[t \subseteq \tau(e) \wedge P(e)(w)]$ [from Kratzer (1998)]

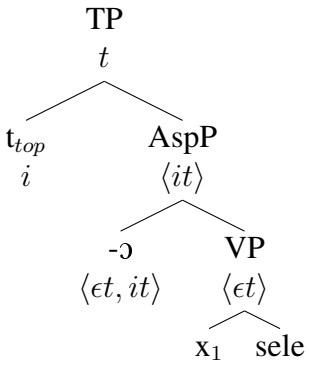
I argue that general imperfective in Ga is marked by the suffix -ɔ. The proposed lexical entry for -ɔ is given in (13) which is a modification of Kratzer's (1998) lexical entry presented in (12). The difference is that I do not assume that the imperfective takes a world argument:

(13) $[\![\text{-ɔ}]\!] = \lambda P.\lambda t.\exists e[t \subseteq \tau(e) \wedge P(e)]$

(14) Kofi sele-ɔ.
Kofi swim-IMPF
'Kofi swims.'

It follows that (14) is compatible with both habitual and progressive interpretation. However, due to the blocking principle it obtains by default a habitual interpretation. The structure of (14) up to the TP is in (15) and its interpretation is given in (16):

(15)



(16) $[\![\text{TP}]\!]^g = 1$ iff $\exists e[t_{top} \subseteq \tau(e) \wedge e = \text{swim} \wedge Ag(e) = g(1)] \approx$ There is an event of swimming, the running time of which ($\tau(e)$) includes the topic time (t_{top})

3.3. Habitual and Progressive

There is an ongoing discussion whether the imperfective and the 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 imperfective and progressive/habitual aspect. On the other hand, Boneh and Doron (2010) claim that the habitual cannot be reduced to the imperfective and propose an independent habitual operator. I advocate for the unified analysis for the imperfective and the habitual/progressive in Ga.

I build the analysis on Ferreira (2005) who claims that the habitual and the progressive have the same temporal (and modal) components, but they differ with respect to the number of events being quantified over. Whereas in the progressive a singular event is quantified over, thereby expressing the meaning that a singular event is ongoing (17-a), in the habitual plural events are quantified over, thereby expressing the meaning that a sequence of events is ongoing (17-b):

(17) a. $[\![\text{Imp}_{sg}]\!] = \lambda P_{sg}.\lambda t.\exists e[t \subseteq \tau(e) \& P(e) = 1] \rightarrow$ progressive interpretation
b. $[\![\text{Imp}_{pl}]\!] = \lambda P_{pl}.\lambda t.\exists e[t \subseteq \tau(e) \& P(e) = 1] \rightarrow$ habitual interpretation
(Ferreira 2005)

I argue that there is a quantification over a definite singular event in Progr2 in Ga. Nonetheless, unlike in Ferreira's (2005) account, the singular event in the denotation of Progr2 in Ga is not introduced by a covert singular determiner but by the interaction between the definite determiner *lɛ* and the exhaustive focus marker *ni*. In the next subsection, I discuss the semantic contribution of *lɛ*. The role of *ni* in the Progr2 construction, on the other hand, is explained in section 4.

3.4. Particle *lɛ*

The particle *lɛ* can attach to the NP or to the VP. When attached to the NP, *lɛ* functions as a definite determiner, as illustrated by the unacceptability of (18):

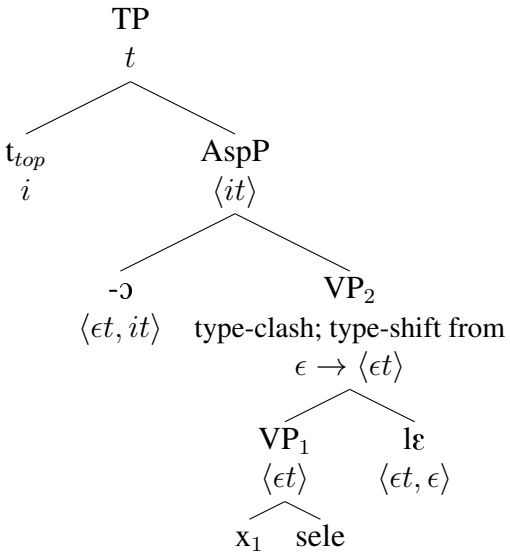
(18) #Shikatoohe lɛ yɛ Osu ni shikatoohe lɛ yɛ Jamestown.
bank DET TO.BE Osu and bank DET TO.BE Jamestown
'The bank is in Osu and the bank is in Jamestown.'

I argue for a full parallelism between the nominal and the verbal domain. Therefore, I claim that the particle *lɛ* functions as the definite determiner also when attached to the VP. It takes a property and says that the unique contextually salient event has that property, as in (19):

(19) $[\![\text{lɛ}]\!] = \lambda P.\iota e P(e)$ [preliminary]

Hence, the structure of the imperfective TP with *lɛ* is as in (20) and its denotation is given in (21):

(20)



(21) $[\![\text{TP}]\!]^g = 1$ iff $\exists e[t_{top} \subseteq \tau(e) \wedge e = \iota e' \wedge \text{swim}(e) \wedge Ag(e) = g(1)] \approx$ There is a unique event of swimming, the running time of which includes the topic time

Since there is a type-clash between VP_2 and -ɔ (aspect requires an input of type $\langle \epsilon, t \rangle$, whereas VP_1 modified by *lɛ* is of type ϵ), VP_2 must be type-shifted in a Partee-style (1987) from ϵ to $\langle \epsilon t \rangle$.

However, the *VP lɛ*, same as the *NP lɛ*, is usually not interpreted with respect to the whole world but with respect to a part of the world — a salient situation. Therefore, there is a need for a domain restriction mechanism which would constraint the interpretation of *NP lɛ* and *VP lɛ* to a given situation. I argue that the required domain restriction mechanism can be modeled in a situation semantic framework (Kratzer 2007, Schwarz 2009).

4. Situation semantics

This section discusses some basic assumptions of situation semantics (Kratzer 2007, Schwarz 2009). In this framework, a proposition is not a set of possible worlds but a set of possible situations. A situation itself is a part of the world with the world being the maximal situation.

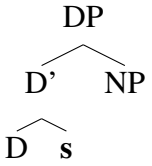
In subsection 4.1, I discuss situation pronouns. I assume a situation pronoun in the syntax (Percus 2010, Schwarz 2009; 2012) which restricts either the interpretation of the NP or the VP. Following Musan (1995), Keshet (2008), Büring (2004), Schwarz (2009), I argue that a situation pronoun is introduced in the syntax as the sister of a (strong) determiner. Subsequently, in subsection 4.2 I discuss the role of topic situations in domain restriction. Finally, in subsections 4.3 and 4.3.4 I explain the concept of exemplification (Kratzer 2007) and its role in the aspectual interpretation of a sentence.

4.1. Situation pronouns

In situation semantics, NPs are interpreted relative to a situation introduced by a covert situation pronoun present in the syntax. For that reason the meaning of an NP is constrained to entities within a given situation, i.e., within the given part of the world. I advocate for a full parallelism between domain restriction in the nominal and verbal domain. Therefore, I argue that the interpretation of a VP can also be restricted by a situation pronoun to the events within the given situation, i.e., within a certain part of the world.

There is an ongoing discussion, where the situation pronoun can be present in the syntax. I am following Musan (1995), Büring (2004), Keshet (2008), Schwarz (2009) in saying that the situation pronoun is introduced in the syntax by a strong determiner, as in (22):

(22)



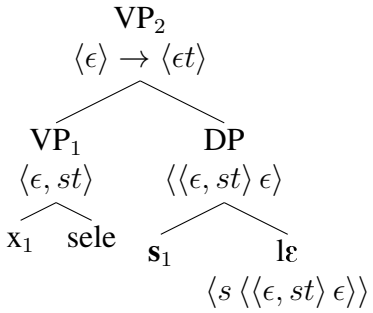
Looking at Ga, I argue that the situation pronoun is also introduced by a strong determiner, namely

the definite determiner *lɛ*. It can be attached either to the NP or to the VP introducing the situation pronoun which restricts the interpretation of the respective element.

Therefore, the lexical entry of *lɛ* given in (19) must be revised as in (23):

(23) [[lɛ]] $= \lambda s.\lambda P.\iota e P(e)(s)$ [final]

(24)



The situation pronoun, as other pronouns, can be either bound or interpreted with respect to an assignment function. I argue that in Progr2, the situation pronoun is bound by a topic situation.

4.2. Topic situation

In situation semantics, each sentence is interpreted with respect to a topic situation (Kratzer 2007, Schwarz 2009), i.e., the situation a sentence is about. Consider (25):

(25) A: What was Maria doing yesterday at 17:00?
B: Maria was swimming.

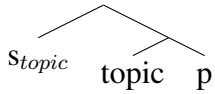
The topic situation of (25) is a Maria-swimming situation that took place yesterday at 17:00. Formally, the topic situation can be indicated by a topic time or/and by a question under discussion (QUD). Following Kratzer (2007) and Schwarz (2009), I claim that the topic situation is provided by a QUD, where the question extension is the one proposed by Groenendijk and Stokhof (1984):[5]

(26) topic situation:
$s_{topic} = \iota s.EX(\text{question extension})(s) \wedge s \leq w_0$

Topic situations are introduced in the syntax as arguments of a topic operator, defined in (27):

[5]EX stands for *exemplification* which will be discussed in subsection 4.3.

(27) [[topic]] $= \lambda p.\lambda s'.\lambda s.s \approx s' \wedge p(s)$ (Schwarz 2009)



Crucially for the analysis, I argue that in Progr2 the situation pronoun – introduced by the definite determiner $l\varepsilon$ attached to the VP – is bound by the topic situation. This restricts the VP interpretation to events within the topic situation, the situation a sentence is about. In the same way the interpretation of the NP denotation can be restricted to entities within the topic situation when $l\varepsilon$ attaches to an NP.

However, it seems that the notion of the topic situation should be more restrictive, i.e., the possibility that the topic situation of (25) includes Maria and other people, or Maria swimming and doing other things should be excluded, at least in some cases. It occurs that topic situations should be in some sense minimal. The concept of minimality I adopt is provided by the notion of exemplification (Kratzer 2007), discussed in the next subsection.

4.3. Exemplification

4.3.1. Exemplification in the nominal domain

The simple notion of minimality which says that a situation is a minimal situation in which a proposition p is true iff it has no proper parts in which p is true, cf. (28-b), causes problems for mass nouns in the nominal domain and for the states and progressive events in the verbal domain. For example, it makes it impossible to detect the minimal situation of a sitting event. Kratzer (2007) defines a notion of *exemplification* which provides a concept of minimality also for the problematic cases:

(28) 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)

The definiens in (28-a) has the form of implication: $p \rightarrow q$, which equals $\neg p \vee q$. It follows that a situation s exemplifies a proposition p if either p is true in all subparts of s or s is a minimal situation in which p is true. Intuitively, exemplification assures that there is nothing in a situation that is not needed to evaluate the truth of a sentence. Consider situation M and the proposition in (29):

Situation$_M$: mud

(29) λs. there is mud in s

The proposition in (29) is not only true in s_M but since it is true in all subsituations of s, it is also exemplified by s_M. Now, consider situation 1, situation 2, and the proposition in (30):

Situation 1: three turtles Situation 2: one turtle

(30) λs. there is a turtle in s

The proposition in (30) is true in s_1. However, since there are two turtles in s_1 that are not needed to evaluate the truth of (30), s_1 is not a minimal situation in which (30) is true. Hence, (30) is not exemplified by s_1. By contrast, there is nothing in s_2 that is redundant to evaluate the truth of (30), i.e., s_2 is a minimal situation in which (30) is true. Therefore, (30) is not only true in s_2 but also exemplified by s_2.

4.3.2. Exemplification in the verbal domain

There is an analogous mechanism of exemplification in the verbal domain as in the nominal domain, presented above. Consider the proposition in (31):

(31) λs.Kofi swim in s

The proposition in (31) is true in a situation with a multitude of swimming events but it is not exemplified by this situation. On the other hand, (31) is not only true in a situation with a single event but also exemplified by this situation.

I claim that it is encoded syntactically whether exemplification proceeds with respect to the NP or the VP denotation. As already discussed in subsection 4.1, I assume a covert situation pronoun in the syntax that restricts either the interpretation of the NP or the VP, depending on its position in the structure. Since I argue that the situation pronoun is introduced as the sister of the definite determiner *lɛ*, the syntactic position of *lɛ* determines with respect to which element the exemplification proceeds. When *lɛ* attaches to the NP, then the NP denotation is exemplified, when it attaches to the VP, then the VP denotation is exemplified.

In the next subsection, I discuss in which case a proposition is exemplified by a topic situation and when not.

4.3.3. Exemplification and exhaustivity

Crucially for the analysis, there is an intimate connection between an exhaustive answer to a QUD (which in Ga is morphologically marked by the exhaustive focus marker *ni*) and exemplification. Kratzer (2007) advocates that exhaustive answers are necessarily exemplified by topic situations, whereas non-exhaustive answers are merely true in topic situations. Therefore, the presence of *ni*, the exhaustive focus marker, assures that a proposition expressed by a sentence is exemplified by a topic situation. Hence, the following generalization holds:

- **+ni** $\rightarrow$ a proposition is necessarily exemplified by a topic situation
- **-ni** $\rightarrow$ a proposition is true in a topic situation

In the next subsection, I discuss informally how the combination of the focus marker *ni*, the definite determiner *lɛ*, and the general imperfective -ɔ invariably give rise to a progressive interpretation.

4.3.4. Aspectual interpretation of a sentence in situation semantics

Exhaustive answers to QUDs are exemplified by a topic situation and non-exhaustive answers are merely true in a topic situation. Hence, the presence of the exhaustive focus marker *ni* assures that the proposition denoted by a sentence is exemplified by a topic situation. On the other hand, a situation pronoun is introduced in the syntax as the sister of the definite determiner *lɛ*. Hence the syntactic position of *lɛ* determines whether the NP or the VP denotation is interpreted with respect to the topic situation. When *lɛ* attaches to the VP, the *iota* operator denoted by *lɛ* and exemplification introduced by *ni* assure that there is only one event of the given type in the topic situation. Therefore, an imperfective sentence with *lɛ* attached to the VP and *ni* expresses the meaning that one event is ongoing which invariably leads to a progressive interpretation. On the other hand, when there is no *lɛ* attached to the VP, the VP denotation is not exemplified by the topic situation. Hence the sentence can express the meaning that the plural events are ongoing, thereby leading to a habitual interpretation.

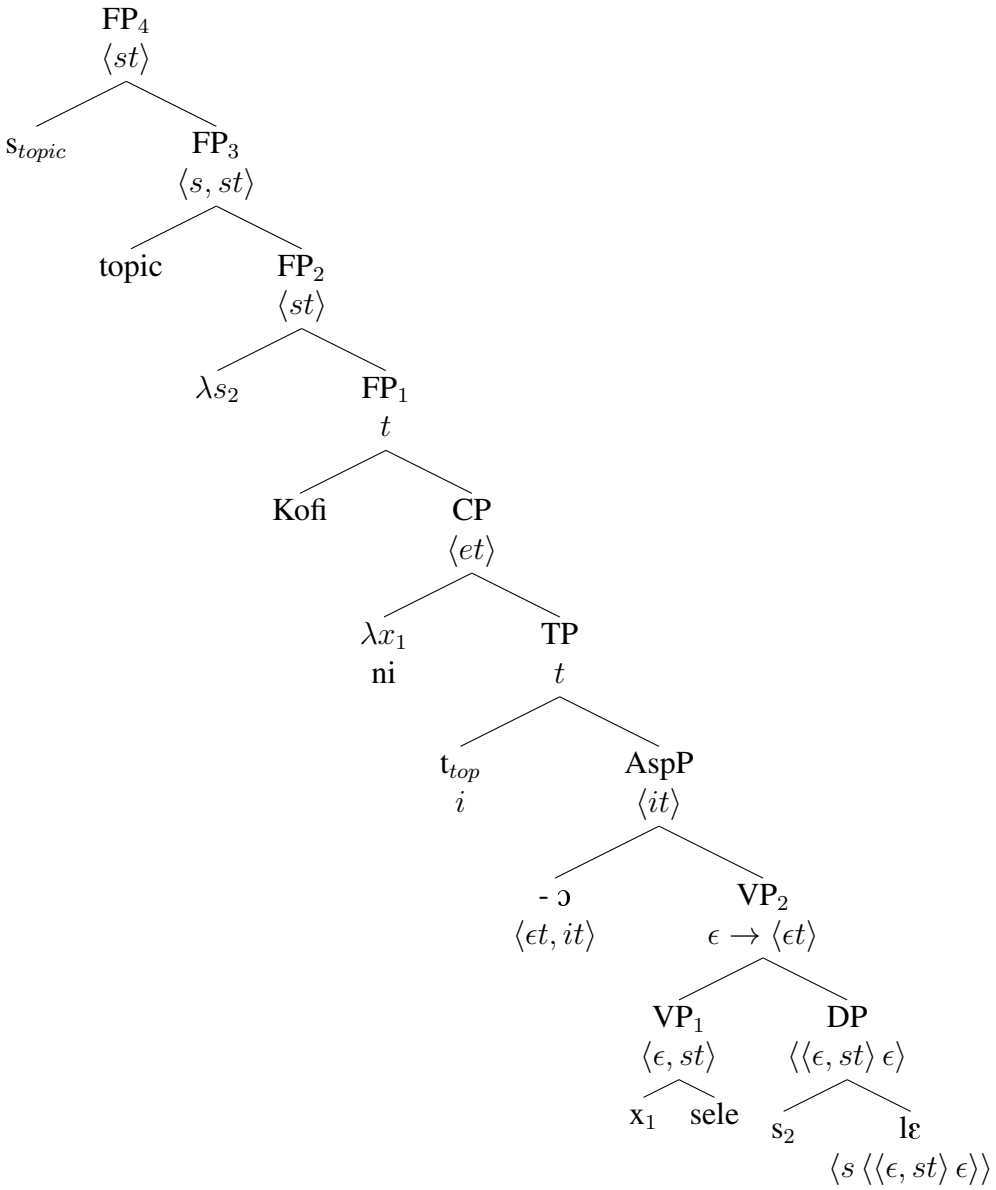
In the next section, I present the formal compositional implementation of the informal ideas presented so far.

5. Structure and derivation

In this section, I present the compositional derivation of (3), repeated in (32). Its syntactic structure is given in (33) and its derivation in (34).

(32) Kofi ni sele-ɔ lɛ.
Kofi FM swim-IMPF DET
'It is Kofi who is swimming.'

(33)



The situation pronoun, introduced in the syntax as the sister of the definite determiner *lɛ* and bound by the topic situation, restricts the interpretation of the VP to the events within the topic situation. The presence of the exhaustive focus marker *ni* assures that the proposition denoted by (32) is exemplified by the topic situation. The exhaustive focus marker *ni* and the *iota* operator denoted by *lɛ* assure that there is only one swimming event in the topic situation.

The imperfective marker -ɔ relates the topic time and the event time, i.e., it locates the topic time within the running time of the event. Since *ni* and *lɛ* assure that there is only one event in the VP denotation, (32) necessarily obtains the interpretation that there is one event of swimming by Kofi, the running time of which is included in the running time of the event leading invariably to the progressive interpretation. Therefore, an imperfective sentence (marked by -ɔ) with the focus marker *ni* and the definite determiner *lɛ* attached to the VP always obtain an ongoing, progressive interpretation. The formal derivation of (32) is presented in (34):

(34)
a. $[\![\text{lɛ}]\!] = \lambda s.\lambda P.\iota e P(e)(s)$
b. $[\![\text{DP}]\!] = [\![\text{lɛ}]\!](s_2) = [\lambda s.\lambda P.\iota e P(e)(s)](s_2) = \lambda P.\iota e P(e)(s_2)$
c. $[\![\text{VP}_1]\!] = \lambda e.\lambda s.\text{swim}(e)(s) \wedge Ag(e)(s) = x_1$
d. $[\![\text{VP}_2]\!] = [\![\text{DP}]\!]([\![\text{VP}_1]\!]) = [\lambda P.\iota e P(e)(s_2)](\lambda e.\lambda s.\text{swim}(e)(s) \wedge Ag(e)(s) = x_1)$
$= \iota e[\text{swim}(e)(s_2) \wedge Ag(e)(s_2) = x_1]$; type clash with Imp, type-shift form ϵ to $\langle \epsilon, t\rangle$:
$= \lambda e.e = \iota e'[\text{swim}(e')(s_2) \wedge Ag(e')(s_2) = x_1]$
e. $[\![\text{-ɔ}]\!] = \lambda P.\lambda t.\exists e[t \subseteq \tau(e) \wedge P(e)]$
f. $[\![\text{Asp}]\!] = [\![\text{-ɔ}]\!]([\![\text{VP}_2]\!])$
$= [\lambda P.\lambda t.\exists e[t \subseteq \tau(e) \wedge P(e)]](\lambda e.e = \iota e'(\text{swim}(e')(s_2) \wedge Ag(e')(s_2) = x_1))$
$= \lambda t.\exists e[t \subseteq \tau(e) \wedge e = \iota e'(\text{swim}(e')(s_2) \wedge Ag(e')(s_2) = x_1)]$
g. $[\![\text{TP}]\!] = \lambda t.\exists e[t \subseteq \tau(e) \wedge e = \iota e'(\text{swim}(e')(s_2) \wedge Ag(e')(s_2) = x_1](t_{top})$
$= \exists e[t_{top} \subseteq \tau(e) \wedge e = \iota e'(\text{swim}(e')(s_2) \wedge Ag(e')(s_2) = x_1)]$
h. $[\![\text{CP}]\!] = \lambda x.\exists e[t_{top} \subseteq \tau(e) \wedge e = \iota e'(\text{swim}(e')(s_2) \wedge Ag(e')(s_2) = x)]$
i. $[\![\text{FP}_1]\!] = \lambda x.\exists e[t_{top} \subseteq \tau(e) \wedge e = \iota e'(\text{swim}(e')(s_2) \wedge Ag(e')(s_2) = x_1)](\text{Kofi})$
$= \exists e[t_{top} \subseteq \tau(e) \wedge e = \iota e'(\text{swim}(e')(s_2) \wedge Ag(e')(s_2) = \text{Kofi})]$
j. $[\![\text{FP}_2]\!] = \lambda s_2.\exists e[t_{top} \subseteq \tau(e) \wedge e = \iota e'(\text{swim}(e')(s_2) \wedge Ag(e')(s_2) = \text{Kofi})]$
k. $[\![\text{topic}]\!] = \lambda p.\lambda s''.\lambda s'.s' \approx s'' \wedge p(s')$
l. $[\![\text{FP}_3]\!] = [\![\text{topic}]\!]([\![\text{FP}_2]\!]) = [\lambda p.\lambda s''.\lambda s'.s' \approx s'' \wedge p(s')](\lambda s_2.\exists e[t_{top} \subseteq \tau(e) \wedge e = \iota e'(\text{swim}(e')(s_2) \wedge Ag(e')(s_2) = \text{Kofi}])$
$= \lambda s''.\lambda s'.s' \approx s'' \wedge [\lambda s_2.\exists e[t_{top} \subseteq \tau(e) \wedge e = \iota e'(\text{swim}(e')(s_2) \wedge Ag(e')(s_2) = \text{Kofi}](s')$
$= \lambda s''.\lambda s'.s' \approx s'' \wedge \exists e[t_{top} \subseteq \tau(e) \wedge e = \iota e'(\text{swim}(e')(s') \wedge Ag(e')(s') = \text{Kofi})]$
m. $[\![\text{FP}_4]\!] = [\![\text{FP}_3]\!](s_{topic})$ =
$= \lambda s'.s' \approx s_{topic} \wedge \exists e[t_{top} \subseteq \tau(e) \wedge e = \iota e'(\text{swim}(e')(s') \wedge Ag(e')(s') = \text{Kofi})]$
$\approx$ counterparts of the topic situation (the actual situation exemplifying the proposition that Kofi swim) in which there is a unique event of Kofi swimming, the running time of which includes the topic time

Now I will discuss what happens when either the definite determiner *lɛ* or the exhaustive focus marker *ni* is not present in an imperfective sentence. Consider:

(35) Kofi ni sele-ɔ.
Kofi FM swim-IMPF
'It is Kofi who swims.'

Because there is no *lɛ* attached to the VP, there is no *iota* operator imposing a uniqueness requirement on the VP denotation. Moreover, the VP interpretation is not restricted to the topic situation, i.e., the exemplification does not influence the interpretation of the VP. Hence, there can be more than one swimming event in the topic situation with respect to which (35) is interpreted allowing for its habitual interpretation. By contrast, (35) without *ni* is not acceptable, as illustrated by (36).

(36) #Kofi sele-ɔ lɛ.
Kofi swim-IMPF DET
'Kofi swims.'

Since *lɛ* imposes a uniqueness requirement on the VP denotation, I argue that *VP lɛ* must be interpreted with respect to the topic situation exemplifying the VP denotation. Otherwise, *lɛ* cannot be felicitously used. Since there is no *ni* in (36) assuring the exemplification, *lɛ* cannot be felicitously used in (36) and thereby (36) is not acceptable.

To sum up this section, I have presented the compositional derivation of Progr2. It was shown that the progressive interpretation in Progr2 is an effect of the domain restriction for the VP interpretation and it is caused by the interaction between the imperfective aspect marked by the suffix -ɔ, the definite determiner *lɛ*, and the exhaustive focus marker *ni*.

6. Evidentiality and *not-ongoing* events

In this section, I show how the proposed analysis accounts for the data presented in section 2. As illustrated in example (37), repeated below, Progr2 is unacceptable in indirect evidential contexts:

(37) *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 **ni** sele-ɔ **lɛ**.
Anna FM swim-IMPF DET
'Anna is swimming.'

I argue that the direct evidence requirement in Progr2 is the by-product of the domain restriction mechanism. The interpretation of Progr2 is constrained to the actual ongoing situation exemplifying the VP denotation. Sentence (37-a) is unacceptable because the proposition denoted by (37-a) (λs.Anna swim in s) is not exemplified by the contextually provided situation. Moreover, it was shown that Progr2 cannot refer to the not-ongoing events, as was presented in (7), repeated in (38):

(38) Tom and John are jogging. They are talking about books. Tom asks John which books he is reading. John replies:

a. **Mii**-kane 'Harry Potter'.
PROG-read 'Harry Potter'

b. #'Harry Potter' **ni** mi kane-**ɔ** **lɛ**.
'Harry Potter' FM 1SG read-IMPF DET
'I am reading 'Harry Potter'.'

I argue that (38-b) is unacceptable in the context of (38), because the event of reading *Harry Potter* is not an ongoing, actual situation. Furthermore, the situation of jogging and talking about books by John does not exemplify the proposition denoted by (38-b).

7. Summary

It was argued that *lɛ* is a cross-categorial definite determiner that attached either to the NP or to the VP denotation. In order to account for the observed data, one needs the same domain restriction mechanisms in the verbal domain as in the nominal domain. Crucially, it was shown that domain restriction in the verbal domain can influence the aspectual interpretation of a sentence. Moreover, it was presented how Progr2 can be compositionally derived from the interaction between the general imperfective marker -*ɔ*, the exhaustive focus marker *ni*, and the definite determiner *lɛ* .

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