The semantics of common nouns in Ga (Kwa, Niger-Congo) and their interaction with exclusive particles

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Abstract. This paper discusses the semantics of exclusive particles in Ga and their interaction with different types of common nouns. I argue that there are three, not two, types of common nouns in Ga: count nouns, mass nouns, and intermediate nouns with mixed properties. Crucially, the main evidence for the existence of the third, intermediate type of noun is its interaction with exclusive particles: *kome pe* and *kome too*.

Keywords: common nouns, exclusive particles, Ga language

1. Introduction

Common nouns and exclusive particles are both widely discussed in contemporary formal semantics. In this paper I present data from the Ga language (Kwa, Niger-Congo) that shed a new light on these topics by revealing unexpected interactions between both domains. It is impossible to understand the semantics of exclusive particles in Ga without prior understanding of the semantics of common nouns in Ga. Crucially, I claim that there are three, not two, types of common nouns in Ga: mass nouns, count nouns, and an intermediate type of noun with mixed properties. Moreover, there is also an unusual proliferation in the domain of exclusive particles in Ga. There are basic (*kome, too, pɛ*) and complex exclusives (*kome too, kome pɛ, kome too pɛ*) in the Ga language. Interestingly, the main evidence for the existence of the third intermediate type of noun in Ga comes from the interaction between different types of common nouns and complex exclusive particles.

The outline of the paper is as follows. First, I present the semantics of common nouns in Ga in Section 2 and I provide an overview of exclusives in Ga in Section 3. In Section 4 I present three puzzles which illustrate the interaction between common nouns and exclusive particles in Ga. In Section 5 I present the analysis of the basic (Subsection 5.1) and complex exclusives (Subsection 5.3). The solutions to the puzzles are given in Section 6, and Section 7 concludes.

Ga (Kwa, Niger-Congo) is a Ghanaian language spoken in The Greater Accra Region by about 600,000 speakers. It is an SVO, tonal language with two tones: Low and High. Ga belongs to the group of five government-supported languages. All data presented in this paper come from the author's field trips to Accra in May 2012 and February 2013. The data was collected using the fieldwork methodology presented in Matthewson (2004) and Renans et al. (2011).

2. Common nouns in Ga

The data shows that a standard two-fold distinction for count and mass nouns is not sufficient for properly describing the semantics of common nouns in Ga. I argue that there are three, not two, types of common nouns in Ga: singular and plural count nouns, mass nouns, and an intermediate type of noun. Whereas mass and count nouns in Ga show standard properties, the intermediate type of noun behaves in a non-standard way in exhibiting properties of both count and mass nouns.

2.1. Count nouns in Ga

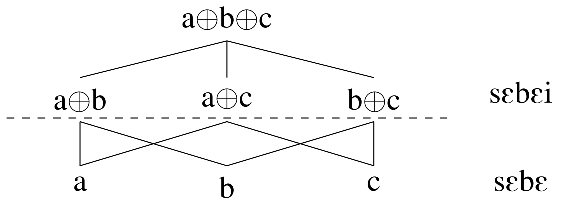
As in other languages, count nouns in Ga can combine with numerals without the use of classifiers and they are obligatorily pluralized when they refer to a cumulation of NP-entities, as in (1).

(1) Kofi ye sɛbɛ-i enyo nyɛ.
K. eat eggplant-PL two yesterday
'Kofi ate two eggplants yesterday.'

The following common nouns behave in the same way: *wolo — woji* (*book — books*), *nyɛmi yoo — nyɛmi yei* (*sister — sisters*), *aduawa — aduawai* (*fruit — fruits*), *sɛbɛ — sɛbɛi* (*eggplant — eggplants*).

I assume a standard mereological semantics for singular and plural count nouns in Ga (Link, 1983). Both of them denote sublattice structures: singular count nouns denote the set of all singular atomic entities, whereas plural count nouns denote the set of all plural individuals formed out of the underlying atomic entities. For example, the denotation of the Ga count noun *sɛbɛ (eggplant)* can be represented as follows:

(2) a. sɛbɛ$_{Sg}$: $\{a, b, c\}$
b. sɛbɛi$_{Pl}$: $\{a \oplus b,\ a \oplus c,\ b \oplus c,\ a \oplus b \oplus c\}$



2.2. Mass nouns in Ga

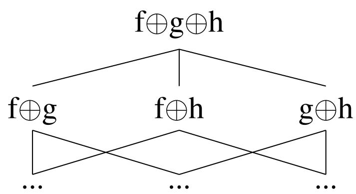
Mass nouns in Ga, as in other languages, cannot combine with numerals without the use of classifiers, as in (3-a), and they are not pluralized when they refer to a cumulation of NP-entities, as in (3-b).

(3) a. *Kofi ye yɔɔ enyo nyɛ.
K. eat bean two yesterday.
'Kofi ate two beans yesterday.'
b. Kofi ye yɔɔ pii nyɛ.
K. eat bean many yesterday.
'Kofi ate a lot of beans yesterday.'

Further examples of mass nouns in Ga are the following: *nu* (*water*), *fɔ* (*oil*), *gari* (a food made from cassava), *shika* (*money*), *su* (*mud*), *tawa* (*tobacco*), *waŋ* (*gray hair*).

I propose to model the denotation of mass nouns in Ga with the use of a free join-semilattice structure without atomic entities, which is in line with, e.g., Link (1983), Krifka (1995), Wilhelm (2008). For instance, the denotation of the Ga mass noun *yɔɔ* (*bean*) is as in (4):

(4) yɔɔ: $\{f \oplus g,\ f \oplus h,\ g \oplus h,\ f \oplus g \oplus h\}$



2.3. Intermediate nouns in Ga

Intermediate nouns are neither purely count nor purely mass nouns. Like count nouns they can combine with numerals without the use of classifiers, but like mass nouns they must not be pluralized when referring to a cumulation of NP-entities, as in (5):

(5) a. Lisa ye atomo enyɔ nyɛ.
Lisa eat potato two yesterday
'Lisa ate two potatoes yesterday.'
b. *Lisa ye atomo-i enyɔ nyɛ.
Lisa eat potato-PL two yesterday
'Lisa ate two potatoes yesterday.'

Moreover, intermediate nouns can refer both to singular and plural entities without any morphological changes. In this sense, Ga intermediate nouns are number-neutral. Compare (5-a) to (6):

(6) Lisa ye atomo ekome nyɛ.
Lisa eat potato one yesterday
'Lisa ate one potato yesterday.'

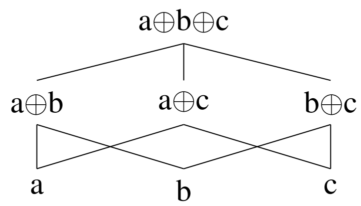
Consequently, from (7) it does not follow how many potatoes Lisa ate:

(7) Lisa ye atomo nyɛ.
Lisa eat potato yesterday
'Lisa ate potato(es) yesterday.'

The following Ga nouns can be classified as intermediate nouns: *loo* (*fish*), *bloodo* (*bread*), *amo* (*tomato*), *atomo* (*potato*), *kɔmi* (*kenkey*), *amadaa* (*plantain*), *abonua* (*lemon*), *waa* (*snail*), *kaa* (*crab*), *ŋaa* (*crab*).[1]

Direct combination with the numerals suggests the presence of discrete atomic entities in the denotation of the intermediate nouns. Furthermore, number-neutrality suggests that their denotation contains not only atomic entities but also all the pluralities formed out of them. Hence, I propose to model the denotation of intermediate nouns as a free join-semilattice structure with atomic entities, which was originally proposed by Chierchia (1998a, 1998b) for the denotation of mass nouns. Example (8) shows the denotation of the intermediate noun *atomo* (*potato*):

(8) atomo: $\{a, b, c, a \oplus b, b \oplus c, a \oplus c, a \oplus b \oplus c\}$.



Summing up, there are count, mass, and intermediate nouns in Ga which denote sublattice structures, a full join-semilattice structure without atomic entities, and a full join-semilattice structure with atomic entities, respectively. A summary of the syntactic properties of the different types of common nouns in Ga and the proposed structures for their denotations are presented in Table 1.

[1] All nouns that have been identified as intermediate nouns thus far are food terms. Further fieldwork will clarify whether this is a coincidence or not.

Table 1: Common nouns in Ga

	count nouns	mass nouns	intermediate nouns
direct combination with numerals	✓	—	✓
morphological pluralization	✓	—	—
structure of the denotation	sublattice	full semilattice	full semilattice
atomic elements in the structure	✓	–	✓

3. Exclusive particles in Ga — an overview

The mere existence of exclusive particles in a language is not in itself surprising. There are many of them in English (e.g., *only, merely, exclusively, solely*, etc.), German (e.g., *nur, ausschließlich*), Polish (e.g., *jedynie, tylko, zaledwie*), among other languages. In Ga, however, there is an unusual proliferation of them, including basic and complex exclusives. Basic exclusives are *kome, too, pɛ, kɛkɛ*, and *sɔɔ*. Complex exclusives are formed out of the basic ones, as shown in (9-b).

(9) a. **Basic exclusives:**
kome, too, pɛ, kɛkɛ, sɔɔ

b. **Complex exclusives:**
kome too, kome pɛ, kome too pɛ, too pɛ, kɛkɛ pɛ, etc.

Ga exclusive particles differ in their distribution and semantics. *Kɛkɛ* can be used only in typical scalar contexts like *He is only a plumber*, and in this respect it is similar to English *merely* (Beaver and Clark, 2008). *Sɔɔ*, on the other hand, can be paraphrased as *a lot of only something* and can be used, e.g., in the situation in which Mary ate only fish and the amount of fish that Mary ate was huge (cf. Eckardt (2006) on German *lauter*).

In this paper I am focusing on the semantics of *kome, too*, and *pɛ*. *Kome* clearly differs from *pɛ* and *too*. Sentences with *kome* are not exhaustive, and in this sense *kome* is not a full-blooded exclusive particle. It derives from *ekome* (*one*), and I claim that the cardinality one should be built into its lexical entry (see Section 5.1). From this point of view *kome* resembles English *sole* (Coppock and Beaver, 2011). On the other hand, it is very difficult to find any differences in the semantics of *too* and *pɛ*. Both of them are exhaustive and their distribution is alike[2]. Yet divergences in their semantics become visible when they are part of the complex exclusives *kome pɛ* and *kome too*. In the next section I will present three puzzles regarding the semantics of *kome pɛ* and *kome too* which indirectly reveal the differences in the semantics of *pɛ* and *too*. Crucially, the discussion will illustrate how Ga exclusive particles interact with different types of common nouns providing

[2]So far I have detected two differences in the distribution of *too* and *pɛ*. Whereas *too* is dispreferred in scalar contexts, *pɛ* is perfectly fine. Moreover, some of the informants prefer *too* in combination with *pɛ* (*too pɛ*) over *too* in isolation; on the other hand, *pɛ* in isolation is always fine.

evidence for the existence of the third intermediate type of common noun.

4. Interaction of exclusive particles and common nouns

A very interesting fact about exclusives in Ga is that they interact in an unexpected way with the three types of common nouns. This is evidence that exclusives can play other roles apart from operating on the discourse structure (Beaver and Clark, 2008). In the following subsections I will present three puzzles arising in connection with the interaction of *kome pɛ* and *kome too* with count, mass, and intermediate nouns. Whereas both *kome pɛ* and *kome too* can modify singular count nouns, only *kome too* can modify plural count nouns (Puzzle 1). *Kome pɛ* cannot also modify mass nouns, whereas *kome too* can (Puzzle 2). Moreover, both *kome pɛ* and *kome too* can modify intermediate nouns although they produce different semantic effects: *kome pɛ* gives rise to the meaning *only 1 NP*, whereas *kome too* gives rise to the meaning *only NP* (Puzzle 3).

4.1. Puzzle 1: Interaction with count nouns

The behavior of *kome pɛ* and *kome too* differ when they modify plural count nouns:

(10) Priscilla he sɛii *kome pɛ/ ✓kome too nyɛ.
P. bought chairs PART PART yesterday
'Priscilla bought only chairs yesterday.'

In (10) the use of *kome pɛ* as the modifier of plural count noun *sɛii* (*chairs*) was judged by the informants as ungrammatical, whereas the same sentence with *kome too* was judged as perfectly fine. The generalization of this data is that *kome pɛ* cannot modify plural count nouns, whereas *kome too* can.

4.2. Puzzle 2: Interaction with mass nouns

The interaction of *kome pɛ* and *kome too* with mass nouns is exemplified by (11):

(11) Kofi he yɔɔ *kome pɛ/ ✓kome too nyɛ.
Kofi bought bean PART PART yesterday
'Kofi bought only beans yesterday.'

Yɔɔ (*bean*) is a mass noun in Ga and, as illustrated in (11), it cannot by modified by *kome pɛ*, but it can be modified by *kome too*. This observation extends to other mass nouns in Ga leading to the generalization that whereas *kome pɛ* cannot modify mass nouns, *kome too* can.

4.3. Puzzle 3: Interaction with intermediate nouns

Both *kome pɛ* and *kome too* can modify intermediate nouns. However, they give rise to different semantic effects. Let us consider example (12):

(12) Kofi he atomo ✓kome pɛ/ ✓kome too nyɛ.
Kofi bought potato PART PART yesterday
'Kofi bought only 1 potato/only potato(es) yesterday.'

(12) with *kome pɛ* obtains the reading that the cardinality of the potatoes that Kofi ate was only one. On the contrary, (12) with *kome too* obtains the reading that Kofi ate only potato(es) (of unknown cardinality: he could have eaten one potato but he also could have eaten dozens of potatoes) and nothing else. It suggests that while *kome pɛ* singles out the singular atomic entities out of the denotation of intermediate nouns, *kome too* does not.

In this section I have presented three puzzles that can be summed up in the following three questions:

- Puzzle 1: Why can *kome pɛ* not modify plural count nouns, whereas *kome too* can?
- Puzzle 2: Why can *kome pɛ* not modify mass nouns, whereas *kome too* can?
- Puzzle 3: Why do *kome pɛ* and *kome too* give rise to different semantic effects when combined with intermediate nouns?

The aforementioned properties of *kome pɛ* and *kome too* are summarized in Table 2. For the sake of completeness I have also presented in Table 2 the properties of *kome*, *too*, and *pɛ*. Note that *pɛ* and *too* do not differ with respect to the three puzzles described above. Nonetheless, if one assumes that the semantics of *kome* does not vary with a change of the co-occurring particle, then the observed variations in the behavior of *kome pɛ* and *kome too* must be due to the underlying differences in the semantics of *pɛ* and *too*. The data shows that even though at a first glance *pɛ* and *too* seem alike, they are not. In the next section, I present the proposed analysis of *kome, pɛ*, and *too*.

Table 2: Exclusives in Ga and their interaction with three types of common nouns

		kome pɛ	kome too	kome	too	pɛ
1	plural count nouns	–	✓	–	✓	✓
2	mass nouns	–	✓	–	✓	✓
3	intermediate nouns	only 1	only	one	only	only

5. Analysis

In order to provide solutions to the aforementioned puzzles it is necessary to explain the interaction between common nouns and exclusive particles. The first part of the analysis, the denotations of the common nouns in Ga, was presented in Section 2. The second part of the analysis, the semantics of exclusive particles in Ga, will be presented below. The interaction between the denotations of different types of common nouns and exclusive particles will be discussed in Section 6.

5.1. Basic exclusives in Ga

The idea in a nutshell is as follows. I propose to analyze *kome* as a choice function (CF), *pɛ* as a non-conservative generalized quantifier, and *too* as a particle that denotes Landman's (1989) group-forming operator (↑). Furthermore, crucial for the analysis are the scopal relations between the three particles. Whereas *pɛ* scopes over *kome*, *too* is in the scope of *kome*. The motivation and the details of the analysis are given below.

5.1.1. *Kome*

On close inspection *kome* in isolation is not a real exclusive particle, as indicated by the fact that sentences with *kome* do not obtain exhaustive interpretation. This observation is illustrated by (13). If (13) had contained an exhaustive non-scalar exclusive particle, it would have been judged as infelicitous. Since (13) is judged as felicitous, this suggests that *kome* does not give rise to the exhaustive interpretation.

(13) Kofi kane adafitswawolo kome kɛ wolo kome nyɛ.
Kofi read newspaper PART and book PART yesterday.
'Kofi read (one) newspaper and (one) book yesterday.'
#Kofi read only a newspaper and only a book yesterday.

Kome derives from *ekome* (*one*) and I argue that in order to obtain the desired semantics for *kome* and the complex exclusives containing *kome* (*kome pɛ, kome too, kome too pɛ*), the cardinality *one* must be built into its denotation. I propose to analyze *kome* as denoting a restricted CF of type $\langle\langle e,t\rangle, e\rangle$. It takes as an input a set and returns one element out of this set (of type $\langle e\rangle$).

(14) a. 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).
 b. The output of the CF must be an atomic element.

Note that in comparison with the definition of CF given by Kratzer (1998), there is an additional requirement imposed on the CF in (14-b). Crucial for my analysis, the output of the function as defined in (14) must be of cardinality one. I also argue that the CF denoted by *kome* should not be existentially bound, but following Kratzer (1998) and Matthewson (2001) I argue that it should be left for contextual binding.

Sentences with *kome* can obtain an exclusive interpretation as an effect of the scalar implicature triggered by *kome*.

(15) Kofi kane adafitswawolo kome nyɛ.
 K. read newspaper PART yesterday
 'Kofi read (one) newspaper yesterday.'

(15) asserts that Kofi read a newspaper yesterday and implicates that he did not read more than one newspaper yesterday.

5.1.2. *Pɛ*

Pɛ is the most general and the most frequently used exclusive particle in Ga. I propose analyzing it as a non-conservative generalized quantifier. There are two main approaches to modeling the denotation of quantifiers. The first one is a standard, English-like approach that was initiated by Barwise and Cooper (1981). In this approach quantifiers are of type $\langle\langle e,t\rangle, \langle\langle e,t\rangle, t\rangle\rangle$: they take as an argument an NP of type $\langle e,t\rangle$ and as a consequence one obtains a QP (generalized quantifier) of type $\langle\langle e,t\rangle, t\rangle$. The second one is the Salish-like approach that was put forward by Matthewson (2001) as the denotation of quantifiers in St'át'imcets (a Lillooet Salish language spoken in British Columbia, Canada). In this approach quantifiers do not take as an argument an NP of type $\langle e,t\rangle$ but a DP of type $\langle e\rangle$ and therefore they are of type $\langle e, \langle\langle e,t\rangle, t\rangle\rangle$. I am arguing that Ga exclusives can be adequately modeled with the use of a Salish-like approach to quantifiers (5.3). Thus I am claiming that *pɛ* takes an argument of type $\langle e\rangle$ (not of type $\langle e,t\rangle$). Therefore, I propose the following lexical entry for *pɛ*:

(16) $[\![\text{pɛ}]\!] = \lambda x \lambda Q \forall y (Q(y) \rightarrow y = x)$

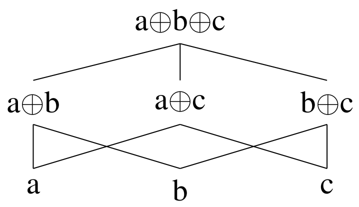
5.1.3. *Too*

Whereas the semantics of *kome* and *pɛ*, as proposed above, is rather standard for the elements expressing a cardinality one and exclusive particles, the semantics of *too* is non-standard. I propose analyzing *too* (in isolation) not as an exclusive particle but as a particle that denotes Landman's (1989) group-forming operator ('↑'), which is a function from sums to atomic group individuals. The denotation of *too* is presented in (17):

(17) $[\![\text{too}]\!] = \lambda P.\lambda r.\exists z \in P : r = \uparrow (z)$

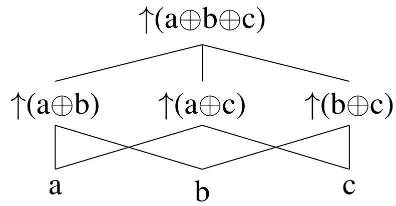
Too is a function of type $\langle\langle e,t\rangle, \langle e,t\rangle\rangle$ that takes all the elements from the NP denotation (all atoms and sums belonging to the given semilattice structure) and maps them onto atomic group individuals. Crucially, there are no sums (plural individuals) in the NP denotation modified by *too*. For illustration, consider (18). The denotation of the intermediate noun *atomo* (*potato*) is a full join-semilattice structure that contains all the atomic individuals which are potatoes and all the pluralities formed out of them.

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



Too, as defined in (17), maps all individuals (singular and plural) out of the denotation of *atomo* onto atomic group individuals. As a result, one obtains a structure that is comprised of atomic individuals only: pure atoms and impure atoms (groups).

(19) [[atomo too]] =



Note that there is nothing in the denotation of *too*, as presented in (17), that would suggest that *too* is an exclusive particle. I am arguing that the exhaustive interpretation of the sentences with *too* (and *kome too*) comes from the covert exhaustive operator *pɛ* (covert *only*; see Section 5.3). Note also that some of the native speakers do not like sentences with *too* in isolation (without any further particles). It suggests that *NP too* is still functional and needs another operator in order to be combined with a *VP*. In my analysis *NP too* is type-shifted from $\langle e,t\rangle$ to $\langle e\rangle$ by the CF (covert or overt *kome*); see structures (25) and (27).

Summing up, I put forward the following lexical entries for the basic exclusives in Ga:

(20) a. [[kome]] = CF
b. [[pɛ]] = $\lambda x \lambda Q \forall y (Q(y) \rightarrow y = x)$
c. [[too]] = $\lambda P.\lambda r.\exists z \in P : r = \uparrow (z)$

Kome denotes a CF, *pɛ* is a non-conservative generalized quantifier, and *too* is a particle which denotes Landman's group-forming operator. In fact, only *pɛ* is a real exclusive particle. The exclusive meaning of *kome* is an effect of the scalar implicature generated by the marked structure, whereas *too* needs overt or covert *pɛ* in order to express the exhaustive meaning.

5.2. Scopal dependencies

The scopal dependencies between *kome*, *too*, and *pɛ* follow automatically from their types: *pɛ* (of type $\langle e, \langle\langle e,t\rangle ,t\rangle\rangle$) scopes over *kome* (of type $\langle\langle e,t\rangle ,e\rangle$), whereas *too* (of type $\langle\langle e,t,\rangle ,\langle e,t\rangle\rangle$) is in the scope of *kome*. Their scopal relations are presented schematically in (21):

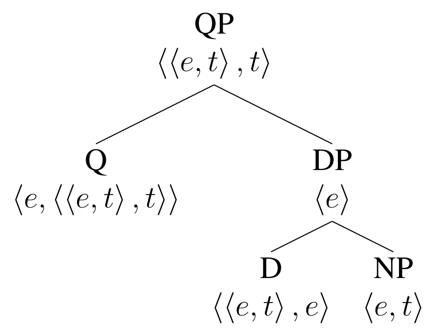
(21) pɛ (kome (too (NP)))

$$\dfrac{\dfrac{\text{p}\varepsilon}{\langle e,\langle\langle e,t\rangle,t\rangle\rangle} \quad \dfrac{\dfrac{\text{kome}}{\langle\langle e,t\rangle,e\rangle} \quad \dfrac{\dfrac{\text{too}}{\langle\langle e,t,\rangle,\langle e,t\rangle\rangle} \quad \dfrac{\text{NP}}{\langle e,t\rangle}}{\langle e,t\rangle}}{\langle e\rangle}}{\langle\langle e,t\rangle,t\rangle}$$

5.3. Complex exclusives — syntax

There are two ways of modeling the denotation of generalized quantifiers: the English-like approach and the Salish-like approach. As was already written in 5.1.2, I argue that the Salish-like approach (Matthewson, 2001) models Ga data in a more adequate way. Matthewson (2001) claims that generalized quantifiers (both in St'át'imcets and English) are formed in a two-step procedure. First, the domain of quantification is overtly restricted by the determiner, and then the quantifiers quantify over the parts of the resulting DP. Crucially for the Ga data, determiners in St'át'imcets are analyzed by Matthewson (2001) as a choice function (CF) of type $\langle\langle e,t\rangle,e\rangle$: they take an NP denotation of type $\langle e,t\rangle$ and return an individual of type $\langle e\rangle$.[3] As a consequence, quantifiers in St'át'imcets are not of type $\langle\langle e,t\rangle,\langle\langle e,t\rangle,t\rangle\rangle$ but of type $\langle e,\langle\langle e,t\rangle,t\rangle\rangle$:

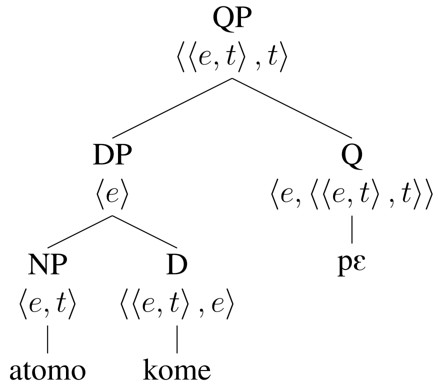
(22)



I argue that exclusives in Ga give rise to the same structure. Analogous to St'át'imcets, the NP denotation is first restricted by the CF denoted by *kome*, and then the quantifier (*pɛ*) quantifies over the resulting DP:

[3]Note, however, that whereas the CF denoted by determiners in Salish is defined for sums (plural individuals), the CF denoted by *kome* in Ga is defined only for atoms (atomic individuals).

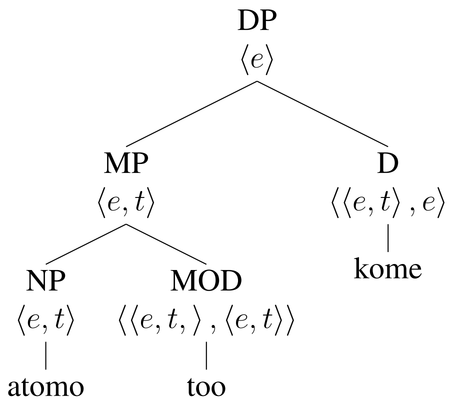
(23)



(24) a. ⟦atomo⟧ $= \lambda s.$atomo(s)
b. ⟦atomo kome⟧ = ⟦kome⟧(⟦atomo⟧) $= f(\lambda s.$atomo$(s))$
c. ⟦atomo kome pɛ⟧ = ⟦pɛ⟧(⟦atomo kome⟧) =
$= [\lambda x \lambda Q \forall y(Q(y) \rightarrow y = x)][f(\lambda s.$atomo$(s))]$
$= \lambda Q.\forall y(Q(y) \rightarrow y = f(\lambda s.$atomo$(s)))$

On the other hand, when the NP is modified by *kome too* one obtains the following structure:

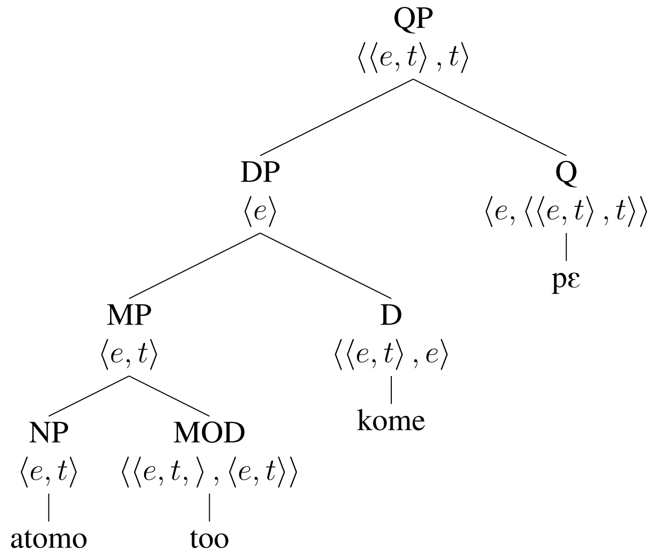
(25)



(26) a. ⟦too⟧ $= \lambda P.\lambda r.\exists z \in P : r =\uparrow (z)$
b. ⟦atomo too⟧ = ⟦too⟧(⟦atomo⟧) =
$= [\lambda P.\lambda r.\exists z \in P : r =\uparrow (z)]$(⟦atomo⟧)
$= \lambda r.\exists z \in$ ⟦atomo⟧ $: r =\uparrow (z)$
c. atomo kome too = ⟦kome⟧(⟦atomo too⟧) =
$= f(\lambda r.\exists z \in$ ⟦atomo⟧ $: r =\uparrow (z))$

Recall that *kome too* alone does not give rise to the exhaustive interpretation. In 5.1.3 I proposed that the exhaustivity of the sentences with *kome too* comes from the covert *only* operator (*pɛ*). I argue that *NP kome too pɛ* is in fact a full overt spell out of *NP kome too*. Moreover, the scalar implicature triggered by *kome* (in isolation) is canceled when *kome* is part of the complex exclusive *kome too*.

(27)



(28) $[\![\text{atomo kome too pɛ}]\!] = [\![\text{pɛ}]\!]([\![\text{atomo komɛ too}]\!]) =$
$= [\![\text{pɛ}]\!](f(\lambda r.\exists z \in [\![\text{atomo}]\!] : r =\uparrow(z)))$
$= [\lambda x.\lambda Q.\forall y(Q(y) \rightarrow y = x)](f(\lambda r.\exists z \in [\![\text{atomo}]\!] : r =\uparrow(z)))$
$= \lambda Q.\forall y(Q(y) \rightarrow y = f(\lambda r.\exists z \in [\![\text{atomo}]\!] : r =\uparrow(z)))$

In this section I presented the syntactic representation of *NP kome pɛ, NP kome too* and *NP kome too pɛ*. In the next section, I will show solutions to the three puzzles presented in Section 4.

6. Solutions to the puzzles

In section 4 I presented three puzzles arising in connection with the interaction of exclusive particles and common nouns in Ga: (1) the interaction with plural count nouns, (2) the interaction with mass nouns, and (3) the interaction with intermediate nouns. In this section I present the solutions to the three aforementioned puzzles which are based on the analysis presented in sections 2 and 5.

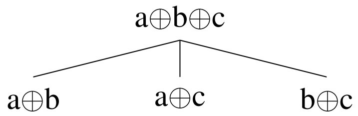
6.1. Interaction with plural count nouns

As was shown in example (10), repeated as (29), *kome pɛ* cannot modify plural count nouns, whereas *kome too* can:

(29) Priscilla he sɛii *kome pɛ/ ✓kome too nyɛ.
Priscilla bought chairs PART PART yesterday
'Priscilla bought only chairs yesterday.'

Sɛii (*chairs*) as the plural count noun denotes the following sublattice structure:

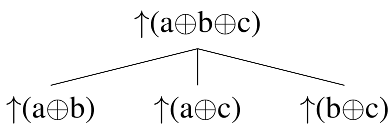
(30) [[sɛii]] =



In *kome pɛ*, *kome* is in the scope of *pɛ*. The sublattice structure denoted by *sɛii* (*chairs*) comprises only plural individuals. Since the CF denoted by *kome* is undefined for plural individuals as output and since in (30) there are no atomic individuals that can be picked up by the CF denoted by *kome*, the CF denoted by *kome* is undefined for the structure denoted be *sɛii*. Thus, *sɛii kome* is ungrammatical and so is *sɛii kome pɛ.*

In the case of *kome too*, *too* is in the scope of *kome*. *Too* maps all the plural individuals from the denotation of *sɛii* to the atomic group individuals and in consequence one obtains the structure in (31):

(31) [[sɛii too]] =



Since the structure denoted by *sɛii too* is composed of atomic (group) individuals which are available to be picked up by the CF denoted by *kome*, *kome too* can modify plural count nouns.

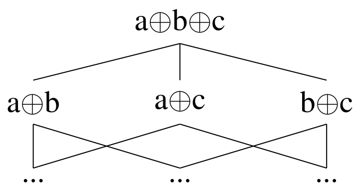
6.2. Interaction with mass nouns

As is illustrated by (11), repeated as (32), mass nouns cannot be modified by *kome pɛ* but they can be modified by *kome too*:

(32) Kofi he yɔɔ *kome pɛ/ ✓kome too nyɛ.
Kofi bought bean PART PART yesterday
'Kofi bought only beans yesterday.'

The way of reasoning is analogous to the one in Section 6.1. Mass nouns in Ga denote a full join-semillatice structure without the underlying atomic entities:

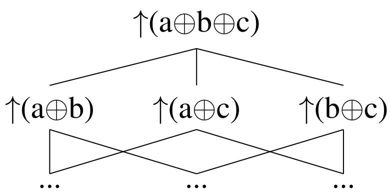
(33) ⟦yɔɔ⟧ =



In *kome pɛ*, *pɛ* scopes over *kome*. The CF denoted by *kome* is undefined for mass nouns, because there are no atomic individuals in their denotation that could be picked up by the CF denoted by *kome*. *Pɛ* scopes over *kome*, and therefore *kome pɛ* cannot modify mass nouns either.

In *kome too*, on the other hand, *too* is in the scope of *kome*. *Too* maps all the plural individuals from the denotation of *yɔɔ* to atomic group individuals:

(34) ⟦yɔɔ too⟧ =



Since the above structure is composed of atomic (group) individuals, the CF denoted by *kome* can pick up any of them. Hence, *kome too* can modify mass nouns.

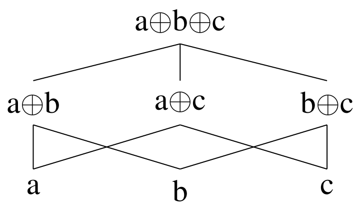
6.3. Interaction with intermediate nouns

Both *kome pɛ* and *kome too* can modify intermediate nouns but they give rise to different semantic effects (see (12), repeated as (35)). Intermediate nouns with *kome pɛ* give rise to the meaning *only one NP*, whereas intermediate nouns with *kome too* give rise to the meaning *only NP* (of unknown cardinality).

(35) Kofi he atomo ✓kome pɛ/ ✓kome too nyɛ.
Kofi bought potato PART PART yesterday
'Kofi bought only 1 potato/only potato(es) yesterday.'

Intermediate nouns in Ga denote a full join-semilattice structure with underlying atomic entities:

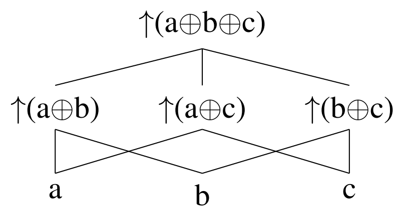
(36) $[\![\text{atomo}]\!] =$



Recall that in the case of *kome pɛ*, *pɛ* scopes over *kome*. The above structure contains atomic individuals that can be picked up by the CF denoted by *kome*. Hence, intermediate nouns can be modified by *kome*. Note, however, that the CF denoted by *kome* can pick up from (36) only pure atomic elements of cardinality *one* (from the bottom layer of the structure). Subsequently, by feeding the denotation of *NP kome* to the denotation of *pɛ*, one obtains the reading as in (35) that Kofi bought only one potato.

On the other hand, when intermediate nouns are modified by *kome too*, first *too* maps all the individuals from the denotation of *atomo* to atomic group individuals:

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



In consequence the above structure contains only atomic individuals. Thus, from such a structure the CF denoted by *kome* can pick up any individual: a pure atom (an atomic individual of cardinality *one*) or an impure atom (an atomic group individual of any cardinality). Therefore, it does not follow from (35) — with *kome too* — how many potatoes Kofi bought. He could have bought one potato but he could have also bought a group of potatoes of unknown cardinality.

The puzzles and solutions to them show that there is an intimate relation between exclusive particles and common nouns in Ga, and it is impossible to understand the semantics of exclusives in Ga without careful examination of their interaction with NP denotations.

7. Conclusions

In this paper it was argued that the standard distinction between count and mass nouns is not a sufficient tool for describing the semantics of common nouns in Ga. I argue that there are three, not two, types of common nouns in Ga: singular and plural count nouns, mass nouns, and intermediate nouns with mixed properties. Moreover, it was shown that one of the main pieces of evidence for the existence of the third intermediate type of noun is its interaction with exclusive particles.

References

Barwise, J. and R. Cooper (1981). Generalized quantifiers and natural language. *Linguistics and Philosophy 4*, 159–219.

Beaver, D. and B. Clark (2008). *Sense and Sensitivity: How Focus Determines Meaning*. Oxford: Blackwell.

Coppock, E. and D. Beaver (2011). Sole sisters. In N. Ashton, A. Chereches, and D. Lutz (Eds.), *Proceedings of SALT*, pp. 197–217.

Eckardt, R. (2006). *Meaning Change in Grammaticalization: an Enquiry into Semantic Reanalysis.* Oxford: Oxford University Press.

Kratzer, A. (1998). Scope or pseudoscope? Are there wide-scope indefinites? In S. Rothstein (Ed.), *Events and Grammar*. Kluwer Academic Publishers.

Krifka, M. (1995). Common nouns: a contrastive analysis of Chinese and English. In G. N. Carlson and F. J. Pelletier (Eds.), *The Generic Book*, pp. 398–411. Chicago: The University of Chicago Press.

Link, G. (1983). The logical analysis of plurals and mass terms: a lattice-theoretic approach. In R. Bäuerle, C. Schwarze, and A. von Stechow (Eds.), *Meaning, Use, and the Interpretation of Language*, pp. 303–323. Berlin: de Gruyter.

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.

Renans, A., M. Zimmermann, and M. Greif (2011). *Questionnaire on Focus Semantics. Working Papers of the SFB632, Interdisciplinary Studies on Information Structure (ISIS)*, Volume 15. Potsdam: Universitätsverlag Potsdam.

Wilhelm, A. (2008). Bare nouns and number in Dëne Sųłiné. *Natural Language Semantics 16*, 39–68.