

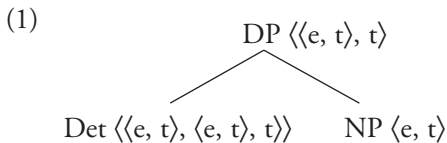
# QUANTIFICATION AND COMPOSITIONAL STRATEGIES

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## 1. Introduction\*

The standard analysis of quantification claims that the compositionality of a Generalized Quantifier, which denotes a set of sets and is of type  $\langle\langle e, t \rangle, t\rangle$ , comes from combining a determiner quantifier of type  $\langle\langle e, t \rangle, \langle\langle e, t \rangle, t\rangle\rangle$  (following Montague (1973)'s notation) with a Noun Phrase (NP) predicate of type  $\langle e, t \rangle$  as shown in (1) (cf. Barwise & Cooper (1981), Chierchia & McConnell-Ginet (1990), Dowty et al. (1981), Keenan (1987, 1996, 2002), Keenan & Stavi (1986), Heim & Kratzer (1998), Partee (1995), and references therein).



However, when applied to crosslinguistic scrutiny this analysis has been shown to have little comparative bite, since there are many languages that lack this standard construction (see Bach et al. 1995, Marlett 2000 among others).

This paper introduces an additional, very interesting problem that Basque nominal quantification poses to the standard analysis of Generalized Quantifiers and provides a new compositional<sup>1</sup> analysis for Basque nominal quantificational elements.

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<sup>1</sup> The compositionality principle can be expressed as follows: *The meaning of an expression is a function of the meanings of its parts and of the way they are syntactically combined* (see Partee 1982, 1995).

First of all, in section 2, we proceed to make a division between the so-called *strong* and *weak* Basque quantifiers considering some logical and linguistic properties that generalized quantifiers show. Taking this division as a starting point, section 3.1 introduces the problem that Basque nominal quantification poses to the standard analysis of Generalized Quantifiers. Then, section 3.2 presents and analyses the Basque article and proposes its semantic denotation, which as well as being able to account for the denotation both of count (singulars and plurals) and mass terms, also allows us (following Matthewson 2001) to make a correct semantic composition of Basque generalized quantifiers in section 3.3. A summarizing and concluding section follows.

## 2. Basque nominal quantification

The Basque quantifiers that are going to be analyzed in this paper are GUZTI (all), DEN (all), GEHIEN (most), BAKOITZ<sup>2</sup> (each), BATZU(E)K (some), ZENBAIT (some), ASKO (many), GUTXI (few), UGARI (many), NUMERALS, NUMERAL BAINO GEHIAGO (MORE THAN Numeral), NUMERAL BAINO GUTXIAGO (less than numeral).<sup>3</sup>

### 2.1. Basque strong and weak quantifiers

Barwise & Cooper (1981) offer a definition to divide quantifiers into strong and weak. The terms *strong* and *weak* are taken from Milsark (1974, 1977), where he states that only weak quantifiers can appear in *there*-insertion contexts. Milsark argues that weak determiners are *cardinal*, whereas strong quantifiers are *quantificational*. Barwise & Cooper (1981: 182) give the following definition in order to formalize the distinction:

- (2) DEFINITION: A determiner is *positive strong* (or *negative strong* resp.) if for every model  $M = \langle E, \parallel \parallel \rangle$  and every  $A \subseteq E$ , if the quantifier  $\parallel D \parallel (A)$  is defined then  $A \in \parallel D \parallel (A)$ . (Or  $A \notin \parallel D \parallel (A)$ , resp.). If  $D$  is not (positive or negative) strong then  $D$  is weak.

They also provide a test-sentence which can decide whether a quantifier has to be classified as positive strong, negative strong, or weak.

- (3) D N is a N/ are Ns

To classify the quantifiers it is necessary to check whether the above sentence is automatically valid, contradictory, or contingent.

According to Barwise & Cooper a quantifier is positive strong if the statement created is a tautology in every model in which the quantifier is defined. A quantifier will be negative strong if it is a contradiction, and a quantifier will be weak if the truth of the statement depends on the model.

<sup>2</sup> Cf. Etxeberria (2001, 2002a) for an analysis of the behaviour of this inherently distributive quantifier of Basque.

<sup>3</sup> Basque does have more quantifiers than the ones analysed in this paper. Note however that the analysis offered in this paper can also be applied to those quantifiers. See Euskaltzaindia (1985, 1993) and Euskal Hiztegia (1996) for a mention of some of them.

The sentences that we form with Basque quantifiers (following this test sentence) are the ones we have in (4).

- (4a) Baserritar guzti-ak baserritarrak dira.  
farmer all-ART.abs.pl farmer be.pl  
'All the farmers are farmers.'
- (4b) Baserritar den-ak baserritarrak dira.  
'All the farmers are farmers.'
- (4c) Baserritar gehien-ak baserritarrak dira.  
'Most farmers are farmers.'
- (4d) Baserritar bakoitz-a baserritar bat da.  
'Each farmer is a farmer.'
- (4e) Baserritar batzuek baserritarrak dira.  
'Some farmers are farmers.'
- (4f) Zenbait baserritar baserritarrak dira.  
'Some farmers are farmers.'
- (4g) Hainbat baserritar baserritarrak dira  
'Some farmers are farmers.'
- (4h) Baserritar asko baserritarrak dira.  
'Many farmers are farmers.'
- (4i) Baserritar gutxi dira baserritarrak.  
'Few farmers are farmers.'
- (4j) Baserritar ugari baserritarrak dira.  
'Many farmers are farmers.'
- (4k) Bi baserritar baserritarrak dira.  
'Two farmers are farmers.'
- (4l) Bost baserritar baino gehiago baserritarrak dira.  
'More than five farmers are farmers.'
- (4m) Bost baserritar baino gutxiago dira baserritarrak.<sup>4</sup>  
'Less than five farmers are farmers.'

According to Barwise & Cooper a quantifier is positive strong if the statement created is a tautology in every model in which the quantifier is defined. A quantifier will be negative strong if it is a contradiction, and a quantifier will be weak if the truth of the statement depends on the model.

Universal quantifiers will be easy to classify since they always come out true even in an empty domain. Therefore, *guzti*, *den*, and *bakoitz* will be defined as positive strong. The quantifier *gehien* will be defined only if there are elements in the domain, and, when that is the case, it will be described as positive strong (following Barwise & Cooper 1981: 182). Therefore, the Basque quantifiers *guzti* (all), *den* (all), *bakoitz* (each) and *gehien* (most) should be considered positive strong quantifiers since they give tautologies as a result.

<sup>4</sup> The sentences created by *gutxi* and *numeral baino gutxiago* are ungrammatical unless they appear preverbally as the examples in (4i-m) show. See Etxeberria (to appear) for a possible analysis of these facts.

It is interesting to mention the fact that there are no negative strong quantifiers in Basque, that is to say, Basque does not have quantifiers such as English *neither*. An English sentence like (5) is translated into Basque making use of a more complex construction (notice that the sentence is not completely grammatical).<sup>5</sup>

- (5) Neither superhero is a superhero.  
 (6) ??Superheroi [bakar bat ere ] ez da superheroia.  
           superhero [single one even] not be.pres.sg superhero

The characterization of weak quantifiers depends on the model, in other words, if a sentence is sometimes true and sometimes false, it is neither a tautology nor a contradiction, and the quantifier is therefore classified as weak. Following this reasoning, a quantifier like *batzu(e)k* (some) in (4e) is described as weak because when the model contains two or more than two farmers the sentence is judged true; but when the model contains less than two farmers the sentence will be false. The characterization of *asko* (many) in (4h) as a weak quantifier is based on its behaviour in models that contain less than ‘many’ farmers (whatever the context-dependent number happens to be). In such a model the sentence comes out false; in all other models the sentence will be true. The Basque quantifiers that behave this way are, in addition to the already mentioned *batzu(e)k* and *asko*; *zenbait* (some), *hainbat* (some), *asko* (many), *gutxi* (few), *ugari* (many), *numerals*, *numeral baino gehiago* (more than numeral), *numeral baino gutxiago* (less than numeral).

### 2.1.1. Logical Properties of Basque Quantifiers

#### 2.1.1.1. Symmetry and Intersectivity

One of the logical properties that can be used to differentiate strong quantifiers from weak quantifiers is symmetry. The equivalence that weak quantifiers fulfil is the one introduced in (7).

- (7)  $D(A)(B) \leftrightarrow D(B)(A)$

The prediction is then that *den*, *guzti*, *gehien*, and *bakoitz* (described as strong quantifiers in the previous section) will not show the equivalence presented in (7), this prediction is fulfilled as the examples (8a-b) show.<sup>6</sup>

- (8a) Euli guzti-ak itsusiak dira.  
       fly all-ART abs.pl ugly be  
       ‘All the flies are ugly.’  
       (( $\leftrightarrow$ )) (gauza) itsusi guzti-ak euliak dira.  
               thing ugly all fly be  
               ‘All the ugly (thing)s are flies.’

<sup>5</sup> Cf. Etxepare (2003).

<sup>6</sup> From now on—in order to make the reading easier—only two strong and two weak quantifiers will be used in the examples. The properties that these strong and weak quantifiers show should also be taken to apply to the rest of strong and weak quantifiers.

- (8b) Euli gehien-ak itsusiak dira.  
 ‘Most flies are ugly.’  
 ((↔)) (gauza) itsusi gehien-ak euliak dira.  
 ‘Most ugly (thing)s are ugly.’
- (8c) Zenbait euli itsusia ??da/ itsusiak dira.  
 ‘Some flies are ugly.’  
 ↔ (gauza) itsusi zenbait eulia da/ euliak dira.  
 ‘Some ugly (thing)s are flies.’
- (8d) Euli asko itsusia ??da/ itsusiak dira.  
 ‘Many flies are ugly.’  
 ↔ (gauza) itsusi asko eulia ??da/ euliak dira.  
 ‘Many ugly (thing)s are ugly.’<sup>7</sup>

The quantifiers in the examples (8c-d) fulfil the equivalence and must therefore be considered weak. These quantifiers give the cardinality of a set that is defined as the intersection of the sets A (flies in (8)) and B (be ugly in (8)). Since intersection is symmetric, the quantifiers described as symmetric are also intersective, and the roles of the A set and the B set in the relation can not be different.

- (9) A = the set denoted by *euli* (fly).  
 B = the set denoted by *itsusia izan* (be ugly).

(10) Strong Quantifiers

[[A guzti-ak B dira]]	$A \subseteq B$
[[A den-ak B dira]]	$A \subseteq B$
[[A bakoitz-a B da]]	$A \subseteq B$
[[A gehien-ak B dira]]	$ A \cap B  >  A - B ^8$

Weak Quantifiers<sup>9</sup>

[[A batzu(e)k B dira]]	$ A \cap B  \geq 2$
[[Zenbait A B da/ dira]]	$ A \cap B  \geq 2$

<sup>7</sup> The interpretation of the quantifiers *asko* (many), *gutxi* (few), and *ugari* (many) varies from context to context; it seems as though determining how many individuals count as many or few is strongly context-dependent. See Barwise & Cooper (1981), Keenan & Stavi (1986) among many others.

Observe also that the weak quantifiers *zenbait* (some), *hainbat* (some), *asko* (many), *gutxi* (few), and *ugari* (many) can agree with the verb in plural or otherwise not show any kind of agreement. When these quantifiers do not agree with the verb the sentences in (8c-d) are not grammatical unless the QP appears in focused position (cf. Etxepare 2000, Etxeberria 2001, to appear).

<sup>8</sup> It is due to the fact that *guzti*, *den*, and *bakoitz* are universal quantifiers that the three elements are described the same way in (68), that is, the set denoted by the common noun is a subset of the set denoted by the VP. *Gehien* is not a universal quantifier and what  $|A \cap B| > |A - B|$  means is that the cardinality of the intersection of the set A and the set B is bigger than the cardinality of the set of elements in A that are not B. The important thing to observe is that with these four quantifiers it is necessary to know the elements in A (that are B) in order to derive the truth values of the sentence, and the rest of the set B is not relevant to the truth conditions.

<sup>9</sup> Weak quantifiers are assumed to be ambiguous between a strong and a weak reading. See among others Barwise & Cooper (1981), Keenan (1987), Keenan & Stavi (1986), Diesing (1992), Herburger (1997, 2000), de Hoop (1992), Milsark (1974, 1977), Partee (1988). See also Etxeberria (2004, to appear).

[[Hainbat A B da/ dira]]	$ A \cap B  \geq 2$
[[A asko B da/ dira]]	$ A \cap B  = \text{asko}^{10}$
[[A gutxi B da/ dira]]	$ A \cap B  = \text{gutxi}$
[[A ugari B da/ dira]]	$ A \cap B  = \text{ugari}$
[[Numeral A B dira]]	$ A \cap B  = \text{numeral}$
[[Numeral A baino gehiago B dira]]	$ A \cap B  > \text{numeral}$
[[Numeral A baino gutxiago B dira]]	$ A \cap B  < \text{numeral}$

While the strong quantifiers of Basque express a proportion of the A set, weak quantifiers denote the cardinality of the set derived from the intersection of the sets A and B. For example, in a sentence like *euli guztiak itsusiak dira* the quantifier *guzti* denotes a relation between the sets A (flies) and B (the individual that are ugly). For the sentence to be true the set A must be a subset of B. If there is a member of the set A that is not also a member of the set B, the sentence will be considered false.

### 2.1.2. Linguistic Properties of Basque Quantifiers

#### 2.1.2.1. Existential Sentences

It was Milsark (1974, 1977) who first pointed out that the strong/weak distinction plays an important role in the interpretation of existential *there* constructions. Existential sentences exhibit the so-called *definiteness effect*, which means that although some noun phrases are acceptable in *there*-insertion sentences, others are not. As a consequence, we distinguish between weak quantifiers which are acceptable in the position after *there be*, and strong quantifiers, which are unacceptable and anomalous in this context.

According to Milsark (1974, 1977), the quantifiers that occur in the postverbal position of *there*-sentences (or weak quantifiers) are cardinality markers, elements whose function “is to express the size of the set of entities denoted by the nominal with which they are construed” (Milsark 1977: 23). Milsark’s explanation of why only cardinality markers are allowed in *there*-sentences is as follows. Strong quantifiers are quantificational. Since *there be* is an existential quantifier, a *there*-sentence containing a postverbal strong quantifier “would have two quantifications on the NP... [which] should certainly be expected to be anomalous” (Milsark 1977: 24). If, on the other hand, the postverbal NP is cardinal (non-quantificational), no double quantification on the NP would occur and no anomaly arises.<sup>11</sup>

<sup>10</sup> Partee (1988) concludes that these quantifiers (*many* and *few*) are ambiguous between a cardinal and a proportional reading. According to her, the cardinal-weak interpretation (of English *many* and *few*) is intersective and symmetrical. The same applies to correlative Basque quantifiers *asko*, *ugari* and *gutxi*.

<sup>11</sup> Note, contra prediction, that the sentences in (ia/b) are completely grammatical,

- (ia) There was every kind of professor at that school.
- (ib) There were both varieties of rice for sale.

See McNally (1992, 1998), where she defends that the elements appearing in *there be* constructions must be predicative.

As predicted by Milsark (1974, 1977), and contrary to the behaviour of weak quantifiers (11c-d), Basque strong quantifiers are not acceptable in existential sentences (11a-b).

- (11a) \*Badira zientzilari guzti-ak laborategi honetan.  
yes-be.pl scientist all-ART.abs.pl laboratory this-in  
'\*There are all the scientist at this laboratory.'
- (11b) \*Badira zientzilari gehien-ak laborategi honetan.  
yes-be.pl scientist all-ART.abs.pl laboratory this-in  
'\*There are most scientist at this laboratory.'
- (11c) Bada/Badira zenbait zientzilari laborategi honetan.  
yes-be.sg/pl some scientist laboratory this-in  
'There are some scientists at this laboratory.'
- (11d) Bada/Badira zientzilari asko laborategi honetan.  
yes-be.sg/pl scientist many laboratory this-in  
'There are many scientists at this laboratory.'<sup>12</sup>

#### 2.1.2.2. Presuppositionality

The property of presuppositionality with regard to quantificational elements has been classically illustrated by means of a paradigm introduced by Lumsden (1988) (examples (12a-d) are taken from Zucchi 1995).

- (12a) If you find every mistake, I'll give you a fine reward.  
(12b) If you find most mistakes, I'll give you a fine reward.  
(12c) If you find some mistake, I'll give you fine reward.  
(12d) If you find four mistakes, I'll give you a fine reward.

According to Lumsden or Zucchi, the examples (12a-b) presuppose the set denoted by the common mistakes to be non-empty, whereas (12c-d) sound neutral with respect to this regard.<sup>13</sup> As a consequence they claim that only strong quantifiers are presuppositional.

As expected, Basque strong quantifiers behave presuppositionally,<sup>14</sup> in (13a-b) *den*, *guzti*, *gehien*, and *bakoitz* presuppose the existence of the set denoted by *akats* (mistake). Weak quantifiers on the other hand do not necessarily do so (13c-d).

<sup>12</sup> Existential sentences can also be constructed with the verb *egon* (be in a location) in most Basque dialects. Freeze (1992) claims that both the structures in (i) and (ii) are derived from the same basic structure.

(i) Badago gizon bat atean.                      (ii) Atean gizon bat dago.  
yes-is-egon man one door-at                      door-at man one is-egon  
'There is a man at the door.'                      'There is a man at the door / A man is at the door.'

<sup>13</sup> See Zucchi (1995: 77) for arguments in support of the idea "that the presuppositional characterization of strong NPs yields the most accurate predictions concerning which NPs are allowed in *there*-constructions".

<sup>14</sup> Some authors claim that all the quantifiers are presuppositional (see von Stechow 1994). This might be so, but there is still a clear difference between the interpretations we obtain in (41a-d) where the set of mistakes is presupposed, and the interpretations we obtain in (41e-l) where this is not necessary.

- (13a) Akats guzti-ak aurkitzen badituzu, goxoki bat emango dizut.  
 mistake all-ART find if-aux. candy one give aux.  
 'If you find all the mistakes, I'll give you a candy.'
- (13b) Akats gehien-ak aurkitzen badituzu, goxoki bat emango dizut.  
 mistake all-ART find if-aux. candy one give aux.  
 'If you find most mistakes, I'll give you a candy.'
- (13c) Zenbait akats aurkitzen baduzu/badituzu, goxoki bat emango dizut.  
 some mistake find if-aux.sg/pl candy one give aux.  
 'If you find some mistakes, I'll give you a candy.'
- (13d) Akats asko aurkitzen baduzu/badituzu, goxoki bat emango dizut.  
 mistake many find if-aux.sg/pl candy one give aux.  
 'If you find many mistakes, I'll give you a candy.'

Once we have applied all these properties to the Basque nominal quantificational elements, the final division we get is presented in the following chart:

(14)

	LOGICAL PROPERTIES		LINGUISTIC PROPERTIES	
	symmetry	intersectivity	existential sentences	presuppositionality
<i>GUZTI</i>	NO	NO	NO	YES
<i>DEN</i>	NO	NO	NO	YES
<i>GEHIEN</i>	NO	NO	NO	YES
<i>BAKOITZ</i>	NO	NO	NO	YES
<i>BATZU(E)K</i>	YES	YES	YES	NO
<i>ZENBAIT</i>	YES	YES	YES	NO
<i>HAINBAT</i>	YES	YES	YES	NO
<i>ASKO</i>	YES	YES	YES	NO
<i>GUTXI</i>	YES	YES	YES	NO
<i>UGARI</i>	YES	YES	YES	NO
<i>NUMERAL</i>	YES	YES	YES	NO
<i>NUM. BAINO GEHIAGO</i>	YES	YES	YES	NO
<i>NUM. BAINO GUTXIAGO</i>	YES	YES	YES	NO

The chart in (15) offers the division of Basque quantifiers according to the strength/weakness criterion:

(15)

<p><b>Strong Quantifiers:</b> GUZTI (all), DEN (all), GEHIEN (most), BAKOITZ (each).</p> <p><b>Weak Quantifiers:</b> BATZU(E)K (some), ZENBAIT (some), HAINBAT (some), ASKO (many), GUTXI (few), UGARI (many), NUMERALS, NUMERAL BAINO GEHIAGO (more than numeral), NUMERAL BAINO GUTXIAGO (less than numeral).</p>
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### 3. Towards a Compositional Analysis of Basque Generalized Quantifiers

#### 3.1. Problem for the Standard Analysis of Generalized Quantifiers Theory

One crucial difference between the strong and weak quantifiers is that Basque strong quantifiers (*GUZTI* (all), *DEN* (all), *GEHIEN* (most), *BAKOITZ* (each)) must necessarily appear with the article *-A/-AK* as examples (16-17) shows.

- (16a) [Ikasle **guzti-ak**] berandu etorri ziren.  
 [student all-ART.pl(abs)] late come aux.past.pl  
 ‘all the students came late.’
- (16b) \*[Ikasle **guzti**] berandu etorri dira.
- (17a) [Ikasle **gehien-ak**] berandu etorri ziren.  
 [student most-ART.pl(abs)] late come aux.past.pl  
 ‘most student came late.’
- (17b) \*[Ikasle **gehien**] berandu etorri ziren.

On the other hand, and in opposition to what happens with strong quantifiers, Basque weak quantifiers (*BATZU(E)K* (some), *ZENBAIT* (some), *ASKO* (many), *GUTXI* (few), *UGARI* (many), *NUMERALS*, *NUMERAL BAINO GEHIAGO* (more than numeral N), *NUMERAL BAINO GUTXIAGO* (less than numeral N)) do not take *-A/-AK* as observed in the following example.

- (18a) [**Zenbait** ikasle] berandu iritsi zen/ziren.  
 [some student] late arrive aux.sg/aux.pl.past  
 ‘some students arrived late.’
- (18b) \* [**Zenbait(-ak)** ikasle(-ak)] berandu iritsi ziren.
- (19a) [Ikasle **asko**] berandu iritsi zen/ziren.  
 [student many] late arrive aux.sg/aux.pl.past  
 ‘many students arrived late.’
- (19b) \* [Politikari **asko-ak**] berandu iritsi ziren.
- (20a) [Ikasle **batzu(e)k**] berandu etorri ziren.  
 [student some] late come aux.past.pl  
 ‘some students came late.’
- (20b) \* [Ikasle(-ak) **batzu(e)k(-ak)**] berandu etorri ziren.

The problem that Basque poses to the standard theory of Generalized Quantifiers derives from the necessity that Basque strong quantifiers have to appear with the article. These quantifiers always make use of an element more than the ones presupposed by the standard theory; and besides the combination of the Noun Phrase with the Quantifier, the presence of the article is essential if the sentence is going to be grammatical [NOUN+STRONG QUANTIFIER+ARTICLE].

Now that the problem has been introduced, and maintaining the compositionality of Basque Generalized Quantifiers as the final aim, the following subsection is dedicated to decide the function that the Basque article fulfils both in simple DPs and inside QPs.

### 3.2. The Basque article: *-A/-AK*

In principle, it seems as though the Basque article behaves like the definite article of Spanish or English. The English sentences in (21a-b), for example, are translated into Basque making use of the article *-A* (singular in this case) as can be seen in the sentences (22a-b).

(21a) Peru read the book.

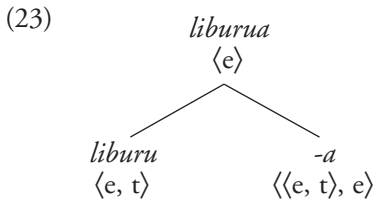
(21b) The dog ate the candy.

(22a) Peru-k liburu-*a* irakurri zuen.  
Peru-erg.sg book-ART.sg(abs) read aux.past.sg

(22b) Txakurr-*ak* goxoki-*a* jan zuen.  
dog-ART.sg(erg) candy-ART.sg(abs) eat aux.past.sg

Observing these sentences we could come to the conclusion that the interpretation forced by the Basque article is a specific interpretation. In the sentences in (22) it is possible to say that the speaker has a particular referent in mind, that is, presupposes<sup>15</sup> the existence of a book in particular, a dog in particular and a candy in particular respectively.

Consequently, the lexical entry of the Basque article can be said to be equivalent to the definite article of Spanish or English. According to this definition, the article (of type  $\langle\langle e, t \rangle, e\rangle$ ) combines with a set (of type  $\langle e, t \rangle$ ), which is formed by a single element, and gives as a result an entity (of type  $\langle e \rangle$ ) that is that single element of the contextually relevant set.



The described specific interpretation is the most natural (and in many occasions) the only possible interpretation (as just seen in examples (22)). However, there are situations where the article can also force a non-specific interpretation (indefinite-like) as can be seen in (24) (cf. Artiagoitia 1997, 2001, Laka 1993 among others).

(24) Peru-k kotxe-*a* erosi zuen.  
Peru-erg.sg car-ART.sg(abs) buy aux.past.sg

Specific: 'Peru bought the car'

Non-specific: 'Peru bought a car'

<sup>15</sup> The classical definition of presuppositional relations can be described as follows:

The sentence A presupposes B if and only if A entails B and the negation of A entails B.

It follows from this definition that (in bivalent systems) B has to be true for A to have a truth-value. In other words, if B is false A can not receive a classical truth-value. This is the logical test to see whether a sentence A presupposes a sentence B.

The non-specific interpretation of *car* in (24) can not be expressed making use of the terms described for the definite article.<sup>16</sup> In this particular case, the speaker does not have a particular referent in mind; therefore, the interpretation obtained can not be presuppositional. This interpretation of the article is can be said to be similar to the interpretation of the indefinite article; thus, it is possible to conclude that the non-specific interpretation of the Basque article introduces variables over Choice Functions (the car chosen from the set of cars by the contextually relevant choice function) (see Reinhart 1997, Winter 1997, Kratzer 1998, Matthewson 1999). There is no change in the semantic type of the article ( $\langle\langle e, t \rangle, e \rangle$  type), that is, the combination of the Noun Phrase and the article yields again individuals of type  $\langle e \rangle$ . The only difference between the specific and the non-specific interpretation is the presuppositionality, which is only present in the specific interpretation.

The ambiguity is much more general when it comes to plurals and mass terms. Sentences containing [NP+plural article] sequences (except when in external argument positions where they are interpreted in a specific way obligatorily) can be interpreted both specifically and non-specifically even in constructions where the singular article Basque article -A does not admit non-specific interpretations (see example (22a)).

- (25) Peru-k        liburu-ak            irakurri zituen.  
 Peru-erg.sg libro-ART.pl(abs) read    aux.past.pl  
 Specific:        'Peru read the books'  
 Non-specific:   'Peru read books'

In contrast to the singular article (which creates singular individuals of type  $\langle e \rangle$ ), the plural Basque article creates plural individuals (of type  $\langle e \rangle$  too), but its semantic type will be equal to the singular article -A,  $\langle\langle e, t \rangle, e \rangle$  (see Link 1983). The different interpretations available depend on the functional application chosen, just like with the singular article

Mass terms, which must necessarily appear with the singular article,<sup>17,18</sup> show exactly the same properties shown by the plurals and can be interpreted both specifically or non-specifically (depending again on the functional application used as in the example (26)).

<sup>16</sup> Bosque (1996) considers that sentences like the following are stereotypical and analyses them in terms of incorporation, see (i). Rodriguez (2003) assumes this analysis and applies it to Basque.

(i) Peru se            ha    comprado coche  
 Peru refl.pronoun have buy        car  
 'Peru has bought a car'

<sup>17</sup> Crosslinguistically, mass terms lose their mass denotation when combined with the plural article. Basque is not an exception.

<sup>18</sup> One interesting property of Basque Determiner Phrases is that the presence of an overt Determiner seems obligatory, even in Determiner Phrases (as mass terms or plurals) that are described as bare in many languages.

- (26) Peru-k ardo-*a* edan zuen.  
 Peru-erg.sg wine-ART.sg(abs) drink aux.past.sg  
 Specific: 'Peru drunk the wine'  
 Non-specific: 'Peru drunk wine'

The non-specific interpretation, where we refer to *mass* in general, is obtained when the speaker does not have a specific referent in mind. In this case, the article -A introduces a variable over Choice Functions. The Choice Function selects an element (a quantity) of the contextually relevant set (of wine).<sup>19</sup>

This parallelism between plural forms and mass terms can be explained if we assume the analysis offered by Chierchia (1998), where the so-called 'Inherent Plurality Hypothesis' is proposed. This hypothesis defends that "mass nouns come out of the lexicon with plurality already built in and that that is the (only) way in which they differ from count nouns" (Chierchia (1998: 53).

The next section proposes a new compositional analysis of Basque nominal quantificational elements.

### 3.3. Compositional Analysis of Basque Generalized Quantifiers

As already mentioned in section 3.1, the problem that Basque poses to the standard theory of Generalized Quantifiers derives from the necessity that Basque strong quantifiers (*guzti* (all), *den* (all), *gehien* (most), *bakoitz* (each)) have to appear with an element more than the ones presupposed by the standard theory; the article (singular or plural) -A/-AK. In the proposal that is going to be developed in this paper<sup>20</sup> the compositionality of Basque strong quantifiers does not maintain the word order shown by the surface structure [NOUN+QUANTIFIER+ARTICLE] (see examples (16-17)). Instead, and following Matthewson (2001), first, the Nominal Phrase combines with the article yielding an individual of type  $\langle e \rangle$  (singular or plural), and in a second step, the quantifier quantifies over parts of the created individual.

Let us construct an example so that we can see and check how the composition of a Basque strong quantifier proceeds. The nouns with which the article combines will be marked as count terms or mass terms in the Lexicon.

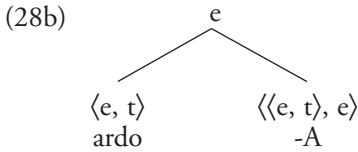
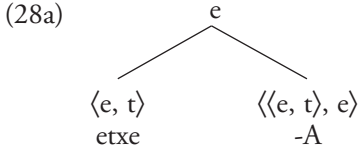
- (27a) *etxe* (house) [+ COUNT / - MASS]  
 (27b) *ardo* (wine) [- COUNT / + MASS]

When -A is attached to a count noun like the one in (81a) it creates a singular individual and asks to find in the context a singular individual with the property of being a house. When the article -A is combined with a mass term (*ardo* in (81b)) it will be necessary to find in the context an individual with the property of being wine. Thus, the article combines with a one-place predicate of type  $\langle e, t \rangle$  and creates

<sup>19</sup> The function fulfilled by the Basque article -A, that must necessarily appear with mass terms, can be related to the function fulfilled by the French partitive element 'du' in 'du vin' (French mass terms can not be bare in French). Both -*a* (in Basque) and 'du' (in French) select a quantity of the contextually relevant set, wine in this particular case.

<sup>20</sup> See also Etxeberria (2004).

an individual. *-A/-AK* can be said to be of type  $\langle\langle e, t \rangle, e\rangle$ , a function that takes set denoting expressions and gives individuals as a result.



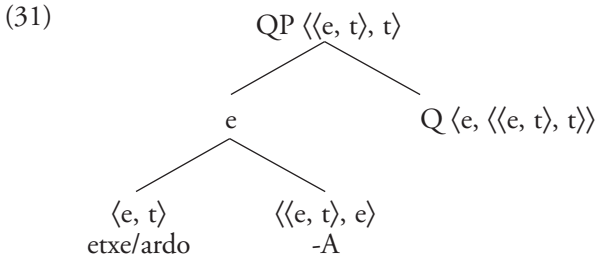
Once the structures in (28) have been built the quantifier comes into play; what the quantifier does is quantify over parts of the individual denoted by the combination of the noun and the article. When the quantifier joins something like *etxe+A*, i.e., a count noun, it will quantify over parts of a contextually relevant single house, an atom that can be divided into smaller pieces (bedrooms, kitchen, toilet, etc.) but is not already considered a house.

(29) *etxe + A + GUZTI*: quantification over parts of the singular individual (house).

The procedure will be the same when the quantifier combines with a mass term like *ardo+A*, again the quantifier will quantify over parts of the contextually relevant quantity of wine.

(30) *ardo + A + GUZTI*: quantification over parts of the mass singular individual (water).

Following Matthewson’s proposal, I assume that the quantifier creates a function which takes an individual of type  $\langle e \rangle$  and gives a generalized quantifier of type  $\langle\langle e, t \rangle, t\rangle$  as a result. The quantifier, then, must be of type  $\langle e, \langle\langle e, t \rangle, t\rangle\rangle$ .



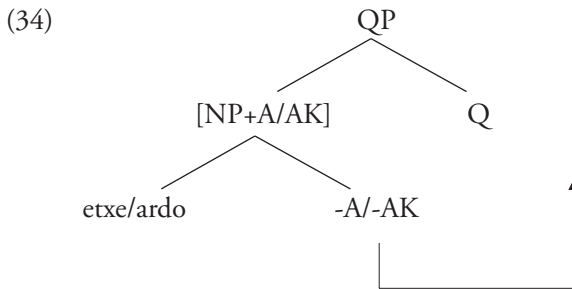
The compositional structure of a QP does not change when instead of *-A* the plural form of the article is combined with the common noun. Thus, first *-AK* combines with the common noun (count or mass) and creates an individual (plural), and then the quantifier quantifies over parts of the plural individual denoted by the [NP+Article] sequence.

One difference between the singular and the plural article is that the plural -AK asks to find in the context a plural individual (instead of a singular one) with the property of being houses (count) or with the property of being wines (count) respectively (in the cases at hand). As it has already been mentioned the mass term comes with the plurality built in and when it is combined with the plural article it loses its mass denotation and becomes a count noun (Chierchia 1998). Therefore, when the strong quantifier is added to the plural individual it will quantify over parts of the plural individual, in this case, different houses and different wines, in other words, it quantifies over different atoms.

- (32) *etxe* + AK + GUZTI: quantification over parts of the plural individual (houses).  
 (33) *ardo* + AK + GUZTI: quantification over parts of the (-mass) plural individual (different types of wine).

It is important to note that the Basque article loses its indefinite (non-specific) interpretation when combined with a quantifier; as a consequence, the only possible interpretation will be that where the speaker has a particular referent in mind, that is, the presuppositional (specific). Presuppositionality is a property that strong quantifiers of natural languages show (see section 2.1.2.2).

Once the whole structure of the (strong) generalized quantifiers is built the article must move to the final position of the quantifier phrase by some Phonological Form (PF) requirement.<sup>21</sup>



The proposed compositional strategy will be the one used by the Basque strong quantifiers *guzti*, *den*, *gehien*, and *bakoitz*. The first three can combine both with a singular and a plural individual, depending on whether the common noun is combined with the singular form or the plural form of the article respectively.

*Bakoitz*, the fourth strong quantifier that has not been mentioned, can only combine with a singular individual [NP +A]. Considering what it has been said about the contribution of the quantifiers it seems as though this quantifier could only quantify over parts of a contextually relevant singular individual of type ⟨e⟩ (parts of house or parts of wine). However, and contrary to the prediction, *bakoitz*

<sup>21</sup> Elordieta (1997: 189) claims that “the determiner always appears attached as a suffix to the last element in the NP. [...] The determiner is a bound morpheme, a suffix, and it attaches to the last element of the phrase that precedes it. Thus, it would be a phrasal clitic [...] or a lexical clitic.”

quantifies over different houses or (kinds) of wine. This might be due to *bakoitz*'s inherent distributive properties and to the fact that in order to obtain distributive interpretation the agreement with the verb must be made in singular in Basque.<sup>22</sup>

- (35) Futbolari      bakoitz-**ak** / \***ek**<sup>23</sup>      gol bat sartu zuen.  
 football player each-ART.sg(erg) / pl(erg) goal one score aux.past.sg  
 'each student scored a goal.'

Up until now I have explained how the compositionality of a Basque strong quantifier would be according to this analysis, but I have not said anything about the compositionality of weak quantifiers, let us move on to that then.

As has been shown during the paper (section 3.1) weak quantifiers do not combine with an individual of type  $\langle e \rangle$ , that is, they do not combine with a sequence [NP+article].<sup>24</sup> The creation of a weak quantifier will not be a two-step process and they appear to be combining directly with an NP predicate of type  $\langle e, t \rangle$ .

Weak quantifiers are assumed to be ambiguous between a strong (proportional/presuppositional) and a weak (cardinal/non-presuppositional) interpretation (cf. Milsark 1974: 19). Following Milsark's observations, I will assume that the cardinal reading seems to be basically adjectival/modificational and not intrinsically quantificational; this reading will be the one that is weak, intersective, and symmetrical. Partee (1998: 14) claims that "these properties would follow from an analysis that treated these NPs as Kamp-Heim indefinites". Therefore, the structure we would obtain is the one we have in (36) where the weak quantifier of  $\langle e, t \rangle$ <sup>25</sup> combines with a common noun of type  $\langle e, t \rangle$  to yield a predicative element of type  $\langle e, t \rangle$  again.

- (36)
- ```

      mutil asko  $\langle e, t \rangle$ 
     /      |      \
    mutil  $\langle e, t \rangle$    asko  $\langle e, t \rangle$ 
  
```

<sup>22</sup> See Etxeberria (2001, 2002a) for the different interpretations that different quantifiers force; in these papers it is claimed that distributive interpretations are obtained when quantificational phrases agree with the verb in singular.

<sup>23</sup> Historically: *-ak + (e)k* [caso ergativo] > \**a-gek* > \**-aek* > *-ek*.

<sup>24</sup> Note however that numerals can appear with the plural article: *Hamalau ikasle-ak* in (ib). At the moment I do not have explanation of why the order of *bost ikasleak* is Q+NP+AK, but some authors have argued that numeral quantifiers in Basque can fill two different syntactic positions, initial and final (specifier and head position). Note that other languages do also make use of these kinds of constructions that give raise to presuppositional interpretations.

- Basque: (ia) Hamalau ikasle berandu iritsi ziren.  
 (ib) Hamalau ikasle-ak berandu iritsi ziren.  
 English: (iia) Fourteen students arrived late.  
 (iib) The fourteen students arrived late.  
 French: (iiia) Quatorze étudiants sont arrivés tard.  
 (iiib) Les quatorze étudiants sont arrivés tard.  
 Spanish: (iva) Catorce estudiantes llegaron tarde.  
 (ivb) Los catorce estudiantes llegaron tarde.

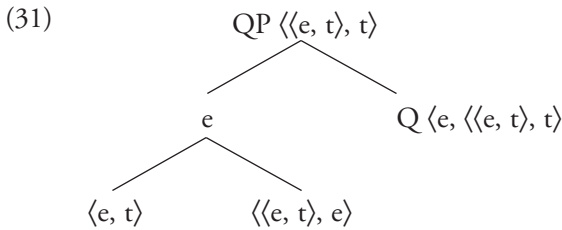
<sup>25</sup> The common noun and the weak quantifier (both of type  $e, t$ ) will combine through Predicate Modification (cf. Heim & Kratzer 1998).

In order to combine the outcome of the weak quantifier and the common noun (of type  $\langle e, t \rangle$ ) with the monadic verb phrase (*etorri* ‘come’) of type  $\langle e, t \rangle$  in a sentence like (37a) the so called Existential Closure have been postulated (see Kamp 1981, Kamp & Reyle 1993), and a sentence like (37a) would have the logical form in (37b). What the Existential Closure allows us to do is combine two  $\langle e, t \rangle$  type elements by introducing a quantification (since weak quantifiers do not have quantificational force themselves) and saying that their intersection is (that of *neska asko* (many girls) and *etorri ziren* (came) in (37)) is not empty, but filled with many girls that came.

(37a) Neska asko etorri ziren.  
 girl many come aux.  
 ‘Many girls came.’

(37b)  $\exists x$  [neska asko(x) & etorri ziren(x)]<sup>26</sup>

While the cardinal weak interpretation will derive from the structure offered in (36), where the cardinal quantifier directly combines with the noun; the proportional strong interpretation will be claimed to derive from a structure similar to that in (31) (repeated here for convenience) where first the noun and the article combine and then the quantifier comes into play to create a generalized quantifier of type  $\langle\langle e, t \rangle, t \rangle$ .



This analysis makes us think that there is an extra element in the strong interpretation of weak quantifiers which is responsible of creating an individual<sup>27</sup> and making the structure similar to that of strong quantifiers (two step process); a structure that necessarily forces a presuppositional reading. The overt version of this covert element is the partitive NP-ETATIK (‘of the NP’) shown in (37).

<sup>26</sup> In Discourse Representation Theory (DRT) the logical form of a sentence like (i) is expressed as in (ii) (Kamp 1981, Kamp & Reyle 1993):

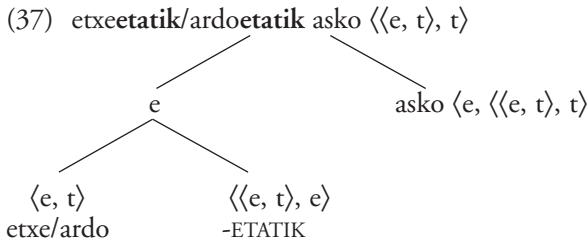
- (i) Many professors arrived yesterday  
 (ii) DRS for cardinal weak reading: existential quantifier implicit.

|                                            |
|--------------------------------------------|
| x<br>professor (x)<br>many (x)<br>came (x) |
|--------------------------------------------|

Truth conditions: there is (was) a group of professors whose cardinality is many and which arrived yesterday

<sup>27</sup> *-etatic* in (37) derives from joining the article -AK and the partitive -TIK. Following Matthewson (2001), we are forced to treat partitive *of* as semantically vacuous, contra Ladusaw (1982). See Matthewson (2001) for extensive discussion of this point.





#### 4. Final Remarks

This paper has explored how the internal structure of the Basque Quantifier Phrases could go. Section 2 has been dedicated to make a division between Basque strong and weak quantifiers taking into account some logical and linguistic. In section 3 I have shown that Basque strong quantifiers pose a problem to the standard compositional analysis proposed by GQT due to the element that must necessarily appear helping them: the article *-A/-AK*. Observing the ambiguity (section 3.2) shown by the article I have concluded that the Basque article can be interpreted in two ways: (i) direct functional application, (ii) variable over choice functions. In the last part of the paper (section 3.3) I have argued that Basque Generalized Quantifiers (both strong and strongly interpreted weak quantifiers) are composed in a two step process (relying on Matthewson’s 2001 work); weak quantifiers (which following Milsark (1974, 1977) do not have quantificational force) will combine directly with the common noun and will need of the existential closure in order to be interpreted.

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