A COMPUTATIONAL APPROACH TO COLLECTIVITY AND

DISTRIBUTIVITY IN TURKISH QUANTIFICATIONAL SENTENCES

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IN TURKISH QUANTIFICATIONAL SENTENCES

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Dissertation Abstract

Eda Esra Bülbül, "A Computational Approach to Collectivity and Distributivity in
Turkish Quantificational Sentences"

This dissertation discusses the nature of quantificational sentences with the
quantifiers *her* "every" and *bütün* "all" in Turkish and investigates how
quantificational sentences get interpreted in terms of collectivity / distributivity.
Departing from previous approaches, the study proposes to examine the role each
constituent of a sentence attributes to the interpretation of a sentence and claims that
the distributive or collective interpretation of a sentence is a function of the meanings
of its constituents pertaining to the notion of collectivity and of the way they are
combined. The model proposed in the dissertation puts forward a computational
interpretation mechanism referred to as the Modified Plus Principle which operates
on the feature of [αCOLL] that every constituent in a structure is assumed to bring
from the lexicon. This interpretation mechanism enables us to argue that lexical
items associated with the [-COLL] feature such as the distributive predicates, the
quantifier *her* "every" and singular nouns are potentially have a more influential role
than the ones associated with the [+COLL] feature such as the collective predicates,
the quantifier *bütün* "all" and plural nouns in interpreting a sentence as either
collective or distributive.

Tez Özeti


Eda Esra Bülbül, "Türkçedeki Niceliksel Cümlelerin Bütünlük ve Dağıtımsallık Anlamlarına Ait İşlemsel Bir Yaklaşım"


Bu çalışma Türkçedeki *"her"* ve *"bütün"* gibi nicelik belirleyici kelimelerle kurulmuş niceliksel cümleleri tartışmakta ve bu cümlelerin bütünlük / dağıtımsallık yönünden nasıl anlam kazandıklarını sorgulamaktadır. Daha önceki modellerden farklı olarak, bu çalışma cümleyi oluşturan her öğeyi yapıya kattığı anlam bakımından inceler ve cümlenin sahip olduğu bütünlük / dağıtımsallık anlamlarının cümleyi teşkil eden bütün öğelerin kolektivite değerlerinin bileşkesinden oluştuğunu ortaya koyar. Tezde önerilen model, yapıyı oluşturan bütün öğelerin leksikondan getirdiği kolektivite değerini ifade eden [αCOLL] özelliklerinin etkileşimi üzerine kurulmuş olan ve "Uyarlanmış Artı Prensibi" olarak adlandırılan işlemsel bir yorumlama mekanizmasını öne sürer. Önerilen yorumlama mekanizması, [-COLL] değere sahip olduğu önerilen dağıtımsal özellikli eylemlerin, *"her"* nicelik belirleyicisi ile kurulmuş ad öbeklerinin ve tekil adların, [+COLL] değere sahip olduğu varsayılan bütünlük özellikli eylemlerle, *"bütün"* nicelik belirleyicisi ile kurulmuş ad öbekleriyle ve çoğul adlarla karşılaştırıldığında cümlenin yorumlanma aşamasında daha etkin ve belirleyici bir role sahip olduklarını ortaya koyar.

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*This dissertation is dedicated to my children, İpek and Ege.*

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CHAPTER 6: FURTHER EXTENSIONS AND CONCLUSIONS

# ABBREVIATIONS

| | |
|---|---|
| abl | ablative |
| acc | accusative |
| aor | aorist |
| coll | collective |
| dat | dative |
| distr | distributive |
| fut | future |
| loc | locative |
| neg | negative |
| nom | nominative |
| NP | noun phrase |
| per | person |
| pl | plural |
| pres | present |
| poss | possessive |
| QR | quantifier raising |
| refl | reflexive |
| VP | verb phrase |

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1. Aspectual composition

2. Elimination procedure flowchart (Single referent subjects)

3. Elimination procedure flowchart (Multi-referent subjects)

CHAPTER 1

INTRODUCTION

1.0     The Goal

In this dissertation my goal is to argue for a compositional approach to quantification

where every individual constituent has a contribution to the overall interpretation of a

sentence regarding its collectivity / distributivity. A computational interpretation

mechanism which will enable us to compute the overall collective / distributive

interpretation of a sentence will be proposed. The data of analysis will be mainly

Turkish. The analysis will exclusively be based on the two universal quantifiers *her*

"every" and *bütün* "all" both in the external argument position and the internal

argument position.

2.0     Existing Approaches to Quantificational Sentences

Quantifier interpretation has been a core issue in linguistic studies for a long time.

Sentences having quantified NPs have been analyzed and different models have been

put forward to account for the different interpretations of sentences. Studies on the

interpretation of quantificational sentences can be classified under two broad

categories: syntax based approaches and semantics based approaches.

Syntax based approaches such as May (1977, 1985), Hornstein (1999) and

Beghelli & Stowell (1994, 1997) analyze quantificational sentences depending on

syntactic movement operations within the sentence. The collective / distributive interpretations of sentences are discussed to be related to the quantificational NPs' having either wide scope or narrow scope with respect to the other NPs in the sentence.

Semantics based approaches, on the other hand, relate the collective / distributive interpretation to the presence / absence of distributivity operators on either the verbs (Link 1983, 1991; Lasersohn 1990, 1995, 1998) or on the nouns in a sentence (Scha 1981, Gillon 1987). These approaches do not refer to the narrow / wide scope of quantificational elements with respect to each other in constrast to syntax based approaches. Rather, they base their analyses on the collective / distributive interpretations that sentences have. The distinction between the "wide scope and narrow scope" in the syntax based analysis and the distinction between the "collective / distributive interpretations" in the semantics based analysis illustrate the two ways of approaching the problem of quantificational sentence interpretations.

I will discuss in this dissertation that an explanation regarding only the syntactic factors or only the semantic factors does not lead us to a comprehensive analysis of quantificational sentences. Attributing the different interpretations of the quantificational sentence only to the movement of the quantifiers as in syntax based approaches or only to the availability of relevant operators on the verbs and the NPs as in semantics based approaches do not seem to account for the issue. Neither the syntax based approaches nor the semantics based approaches consider the possible contributions of the different predicate types or the NP types as factors influencing the interpretation of sentences. However, the approach that I will be proposing in this dissertation claims that each constituent is equally influential in their contributions to the overall sentence. Therefore, I will argue for an analysis that considers both the

semantic properties of the constituents forming the sentence and the syntactic formation of the sentence as equally important.

### 3.0    The Problem of Quantificational Sentence Interpretation

The problem that I am attempting to address in the dissertation is related to how the quantificational character of sentences with the quantifiers *bütün* "all" and *her* "every" can be determined. Quantificational character of such sentences refers to the two possible readings that a quantificational sentence can have: collective or distributive. Quantificational NPs either in the internal argument or external argument positions impose two modes of interpretation on the sentence: collective vs. distributive. In other words, quantificational sentences with *bütün* "all" and *her* "every" have either collective or distributive readings. The dissertation argues that the quantificational character of the sentences is derived on a combination of both syntactic and semantic factors.

The underlying principle of this dissertation is the well-known Principle of Compositionality which means that "the meaning of an expression is a function of the meaning of its parts and of the way they are syntactically combined" (Frege 1982; Montague 1970; Partee 1984). This definition clearly places importance on the meanings of the smaller units making up a sentence as well as the way that these small units come together to form the bigger structure. The meanings of the smaller units refer to the semantic properties of the constituents forming a sentence and the way that these small units combine with each other refers to the syntactic combination of the constituents of the sentence.

Based on this principle I argue that the quantificational character of a sentence can only be computed provided that the semantic properties of each constituent as well as the interaction among these properties are taken into consideration.

(1), below illustrates that the semantic information contributed by the verb is an influential factor on the interpretation of sentences. The sentences in (1a)-(1c) have identical structure with the exception of the type of the verb. The external argument position for each sentence is occupied by a quantificational NP which has the quantifier *bütün* "all" followed by plural nouns *askerler* "soldiers", *kadınlar* "women" and *çocuklar* "children" respectively. The internal argument position for each sentence, on the other hand, is occupied by a non-specific indefinite NP. The sentences differ only in the semantic nature of their verb types. The verb *kuşatmak* "surround" is collective, *emzirmek* "breast feed" is distributive and *şarkı söylemek* "sing a song" is ambiguous with collective as well as distributive interpretations. The overall interpretations shown next to each sentence shows that (1a) has a collective interpretation where all the soldiers surrounded a single castle together, (1b) has a distributive interpretation where all the women breast fed a baby-probably a different one for each women. Finally, (1c) has an ambiguous interpretation where the children might have sung a song together or individually. The difference in the interpretations of these sentences must be the result of the difference between the verb types since the rest of the constituents in these sentences are of identical nature.

(1)     a.     Bütün asker-ler bir kale kuşat-tı.                              coll.

              all soldier-pl a castle surround-past

              "All the soldiers surrounded the castle".

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b.    Bütün kadın-lar bir bebek emzir-di.                    distr.

all woman-pl one baby feed-past

"All the women fed a baby."

c.    Bütün çocuk-lar bir şarkı söyle-di.                    distr. / coll.

all child-pl one song sing-past

"All the children sang a song."

(2) illustrates sentences where the different interpretations can be attributed to the different quantifiers used in the sentences. The sentences in (2a) and (2b) are identical with the exception that the quantificational NPs in the subject positions are different. In (2a) which has an overall distributive interpretation the subject is *her çocuk* "every child" whereas in (2b) which has an ambiguous interpretation the subject is *bütün çocuklar* "all the children". In the collective reading the children built a tent together and in the distributive reading every child built a different tent. This example shows that the difference in the quantificational nature of sentences might as well be arising from the quantifiers used in the external argument positions.

(2)    a.    Her çocuk bir çadır kur-du.                    distr.

every child a tent build-past

"Every child built a tent."

b.    Bütün çocuk-lar bir çadır kur-du.                    distr. / coll.

all child-pl.  a tent build-past

"All the children built a tent."

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Similarly, the source of the difference in the overall interpretations of (3a) and (3b) can also be attributed to the different quantificational elements in the object positions. The sentence in (3a) has a distributive reading where a single regiment surrounded every castle but at different time indices[1]. (3b), on the other hand, has an ambiguous reading. The collective interpretation describes a situation where a single regiment surrounded all the castles at the same time. The distributive reading is identical to the distributive reading of (3a).

(3)   a.      Bir birlik her kale-yi kuşat-tı.                          distr.

              one regiment every castle-acc surround-past

              "A regiment surrounded every castle."


      b.      Bir birlik bütün kale-ler-i kuşat-tı.                    distr. / coll.

              one regiment all castle-pl-acc surround-past

              "A regiment surrounded all the castles."


However, the example in (4) illustrates that a change in the quantificational element does not always result in a change in the interpretation of the sentence. (4) shows that although the quantifier *her* "every" is used in the (a) sentence and the quantifier *bütün* "all" is used in the (b) sentence the interpretations do not change in contrast with the example given in (2) above. Both sentences have a distributive reading despite the difference in the quantifiers used. This means that the quantifier alone cannot be held responsible for the quantificational character of a sentence. The

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[1] The distributivity of (3a) is quite different from the distributivity of (2a). (2a) displays a distribution between the subject and the object NPs whereas this is not the case for (3a). Another point to be analyzed and discussed in this dissertation is a classification of the distributivity types and the collectivity types based on similar examples. See Section 3 in Chapter 3 for this discussion.

interpretation of a sentence is a matter of the interaction among the semantic

properties of each individual unit in a sentence.

(4) a. Her kadın bir çocuk doğur-du.  distr.

   every woman one child give birth to-past

   "Every woman gave birth to a child."

  b. Bütün kadın-lar bir çocuk doğur-du.  distr.

   all woman-pl one child give birth to-past.

   "All the women gave birth to a child."

Another influential factor for the sentence interpretation is related to the type of the

NPs used in the subject or object positions of a quantificational sentence. The role of

the NP types in the determination of the quantificational nature of a sentence is

exemplified in (5a) and (5b) below.

(5) a. Bütün asker-ler bir kale kuşat-tı.  coll.

   all soldier-pl one castle surround-past

   "All the soldiers surrounded a castle."

  b. Bütün birlik-ler bir kale kuşat-tı.  distr. / coll.

   all regiment-pl one castle surround-past

   "All the regiments surrounded a castle."[2]

---

[2] The use of a singular group denoting noun like *birlik* "regiment" gives out an unambiguously collective interpretation as shown in (i) below. This collectivity displays a collectivity where all the members within the regiment are involved in the surrounding activity. However, the collectivity of (5b) is quite different from this. The collectivity displayed in (5b) is a collectivity where different

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(5a) is identical to (5b) differing only in the types of the nouns used in the subject positions. The plural noun *askerler* "soldiers" refers to a group of individual soldiers. However, the plural group denoting noun *birlikler* "regiments" in (5b) refers to a group of regiments each of which is composed of groups of individual soldiers. The possible interpretations pertaining to these sentences show that although (5a) has only a collective reading, both collective and distributive readings are possible for (5b). This interpretation difference can only be attributed to the difference between the NP types in the external argument positions.

Similar to the type of the NP in the external argument position, the type of the NP in the object position also has an impact on how the sentences get their quantificational interpretations. The sentence pair in (6) is presented to exemplify the role of the NP type in the internal argument position.

(6)    a.    Bir çoban bütün koyun-lar-ı otlağ-a götür-dü.        coll.

              one shepherd all sheep-pl-acc pasture-dat take-past

              "A shepherd took all the sheep to the pasture."

    b.    Bir çoban bütün sürü-ler-i otlağa götür-dü.        distr. / coll.

              one shepherd all herd-pl-acc pasture-dat take-past

              "A shepherd took all the herds to the pasture."

---

regiments come together and carry out the activity of surrounding a castle as a group. This means that only a single regiment is involved in (i) whereas (5b) is about more than a single regiment.

(i)    Bütün birlik        bir kale kuşat-tı.        collective
        all      regiment        a castle      surround-past
        "The whole regiment surrounded a castle".

It must be noted at this point that the quantifier in (i) has a different meaning than the one in (5b).The interpretation of the quantifier *bütün* "all" changes from "all" to "whole" once it is complemented by a singular group word. The quantifier *bütün* with the meaning of "whole" will not be analyzed in the dissertation. In this dissertation *bütün* will be analysed with the meaning of "all".

(6a) has only a collective reading where the shepherd took all the sheep to the pasture. (6b), on the other hand, may either mean that a shepherd took all the herds to the pasture collectively or that he took the herds separately, one after the other. The previous reading corresponds to the collective interpretation while the latter is a case of distributive interpretation.

(7) provides further examples illustrating the influence of the NP in the internal argument position. This pair of examples is quite different from the pair given in (6). (6) illustrates the impact of the individual denoting nouns vs. group denoting nouns on sentence interpretation. However, the difference in the interpretations of examples like (7) is caused by pragmatic factors. The object NPs in (7a) and (7b) differ from each other in terms of size. Eating a single nut sounds awkward when the agent is plural. However, a big tray of pastry is something that can be eaten by either a single agent or a group of agents. (7) and similar examples illustrate how our world knowledge influences the way the sentences can be interpreted. Pragmatic factors such as those discussed above will not be incorporated into the analysis in this dissertation.

(7)    a.      Bütün sincap-lar bir fındık ye-di.                        distr.

              all squirrel-pl a nut eat-past

              "All the squirrels ate a nut".


       b.      Bütün sincap-lar bir tepsi börek ye-di.                  distr. / coll.

              all squirrel-pl a tray pastry eat-past

              "All the squirrels ate a tray of pastry".

In summary, the examples that I have laid out so far reveal the fact that the quantificational character of a sentence which differentiates between a collective reading and a distributive reading is a matter of how the predicate, the object NP and the subject NP interact with each other. This interaction of the constituents has been overlooked in the literature. With this dissertation, I aim to make an in-depth analysis of how each constituent contributes to the interpretation of sentences. Semantic contribution of every constituent to the overall interpretation is in line with the principle of compositionality which was claimed to be forming the basis of my studies.

## 4.0     A Proposal for a Feature-Based Analysis

The example sentences provided in the previous section illustrated the observation that different types of predicates, different types of NPs in the internal and external argument positions and different quantificational elements have an impact on the quantificational character of a sentence. This observation led me to propose that different types of predicates, different types of NPs and different quantificational elements should be specified for their collective – distributive nature. I argue in the dissertation that the quantificational nature of a sentence is the result of the interaction of the featural specifications of the verbs, the nouns and the quantifiers in the sentence. Based on this argument, I propose that the verbs, the nouns and the quantificational elements in the lexicon are associated with features pertaining to their collectivity / distributivity nature. An overview of these featural specifications for the lexical items is presented in the following section.

The underlying principle of the computational interpretation mechanism to be

proposed is the well-known Principle of Compositionality which means that "the

meaning of an expression is a function of the meaning of its parts and of the way

they are syntactically combined". This definition clearly places importance on the

meanings of the smaller units making up a sentence as well as the way that these

small units come together to form the bigger structure. The meanings of the smaller

units refer to the semantic properties of the constituents forming a sentence and the

way that these small units combine with each other refers to the syntactic

combination of the constituents of the sentence.

Based on this principle, I argue that the collective vs distributive

interpretation of a sentence is computed based on the collective vs distributive

features in the structure. These features are stored among the properties of lexical

entries. The overall interpretation of the sentence regarding its collective /

distributive readings is a result of how these inherent features coming from each

constituent interact with each other. It is in this respect that this approach differs

from the existing syntactic approaches which attribute scope ambiguity to only

syntactic operations and from the existing semantic approaches which attribute

sentence interpretations to a single constituent within the structure.

4.1.1 Feature of Collectivity

I claim that nouns, quantifiers and predicates are specified for the collectivity feature

[$\alpha$COLL] in the lexicon. Each lexical item mentioned above may have the following

specifications: [+COLL], [-COLL] or [+/-COLL]. [+COLL] value refers to an inherently collective interpretation, [-COLL] refers to an inherently distributive interpretation and [+/-COLL] refers to an inherently ambiguous interpretation. Based on this feature specification of the lexical items, I assume that the lexical items are categorized into two broad semantic classes depending on their intrinsic collectivity feature: inherently unambiguous lexical items and inherently ambiguous lexical items.

Inherently unambiguous lexical items are either associated with the [+COLL] value or the [-COLL] value as a feature specification for collectivity. The lexical items that are associated with the [+COLL] value in this dissertation include the quantifier *bütün* "all", plural nouns and collective predicates. The quantifier *her* "every", singular nouns and distributive predicates, on the other hand, are associated with the [-COLL] value.

Inherently ambiguous lexical items constitute the second category for semantic classes. Group denoting nouns regardless of their morphological singularity or plurality and ambiguous verbs are classified under this second category. No quantificational elements are categorized in this semantic group which leads us to the claim that quantifiers are always inherently unambiguous. Thus, they are always associated with either the [+COLL] value or the [-COLL] value.


### 5.0    Proposal for a Mechanism of Sentence Interpretation


In this dissertation, I propose a computational mechanism to account for how sentences are interpreted regarding their collectivity / distributivity. The mechanism is argued to operate on the inherent collectivity features of the lexical items

depending on a principle referred to as the "Modified Plus Principle" which regulates how these collectivity features interact with each other. The principle states that when a minus collectivity feature combines with a plus or a minus collectivity feature, the result will be minus collective feature for the combination. This, in turn, implies that it is only the interaction of two plus collectivity features that gives out an overall plus collectivity feature for the combination.

As mentioned in the previous section, collectivity features of [+COLL], [-COLL] and [+/-COLL] will be assigned to collective predicates, distributive predicates and ambiguous predicates respectively. Similarly, singular nouns will be assigned [-COLL], plural nouns [+COLL] and singular / plural group denoting nouns [+/-COLL] features. Finally, the quantifiers *her* "every" and *bütün* "all", which will be the basic concern in this dissertation, are assigned collectivity features of their own. The quantifier *her* "every" will be assumed to be associated with the [-COLL] feature while *bütün* "all" will be associated with the [+COLL] feature. Based on these collectivity values, the application of the Modified Plus Principle will enable us to predict that the presence of an item having a [-COLL] feature such as the quantifier *her* "every" or a distributive predicate gives out an overall [-COLL] feature for the structure regardless of the collectivity features of the other constituents. To state it in simple terms, a basic prediction of the dissertation is that the presense of the quantifier *her* "every" or a distributive predicate unambiguously yields an overall distributive interpretation of the sentence. Those constituents having a [+COLL] feature, on the other hand, do not play such determining role since the collectivity features of the other constituents determine the interpretation of the sentence according to the Modified Plus Principle. This directly leads to the claim that neither the quantificational elements nor the predicates can be treated identically.

Rather, it is argued that quantifiers and predicates which are inherently associated with the [-COLL] feature have a more decisive role on the interpretation of a quantificational sentence. Thus, it is misleading to treat all quantifiers and all types of predicates in an identical manner. Their influences on the overall interpretation of a sentence change according to their inherent collectivity features. The discussion in the following chapters demonstrates that these basic predictions are borne out.

As a consequence, through an analysis of a variety of examples, the computational mechanism, which I name as the "Modified Plus Principle", will be shown to provide a plausible explanation of the distributive / collective interpretation of sentences.

6.0     Proposal for a Compatibility Condition of Predicate Types

In this dissertation, the traditional classification of the predicate types has been followed. The predicates have traditionally been categorized under three groups: the collective predicates, the distributive predicates and the ambiguous (mixed extension) predicates. Collective predicates are defined as those applying to groups or sums. Distributive predicates, on the other hand, apply to single individuals and the ambiguous ones can apply to both sums and individuals. These basic definitions of the predicate types lead us to predict that collective predicates can co-occur with plural subjects, distributive predicates with singular subjects and ambiguous predicates with both. An in-depth analysis of various sentences with different predicate types co-occuring with different types of external argument NPs illustrate that our predictions with respect to the collective predicates and the ambiguous predicates are borne out. However, the prediction regarding the distributive

predicates that they only co-occur with singular external arguments fail. It will be shown in the dissertation that such predicates can take singular as well as plural external arguments yielding only distributive readings no matter what their external arguments are.

Furthermore, collective predicates will be discussed to require the plurality of their external arguments and this requirement will be shown to be fulfilled by different means such as the presense of the morphological plural marker on the external argument, the group denoting nature of the head noun in the external argument or the availability of a comitative object NP complementing the external argument. Depending on the different means to achieve the plurality of the external arguments and the semantic meaning contributed by certain groups of collective predicates, the collective predicate type will be grouped under two categories named as Group 1 Collectives and Group 2 Collectives.

A set of other predictions follows from the observation that different predicate types have co-occurence restrictions on their external arguments regarding their singularity or plurality. Depending on this analysis, our study predicts that not every quantificational element can co-occur with every type of predicate. To be more specific, Group 1 Collectives which require morphological plurality of their external arguments are predicted to co-occur with the quantifier *bütün* "all" which is only complemented by a morphologically plural NP, but not with the quantifier *her* "every" which obligatorily takes a singular complement. Group 2 Collectives, on the other hand, will be discussed to be compatible with plural nouns, group denoting nouns even if they are morphologically singular and even with singular nouns in the presence of a comitative object NP. This leads us directly to the prediction that

Group 2 Collectives can co-occur with the quantifiers *her* "every" and *bütün* "all" in the external argument positions.

With respect to the distributive predicates and the ambiguous predicates, whose compatibility with both singular and plural external argument NPs will be discussed, our prediction is that these can co-occur with the quantifiers *her* "every" and *bütün* "all". Supported by a variety of examples, these predictions regarding the co-occurance restrictions of the different predicate types and the quantificational external argument NPs will be shown to be correct. The importance of having such a compatibility condition lies in the fact that a violation of this condition directly rules out the sentence before it enters the interpretation mechanism that is proposed in this dissertation.

7.0     Proposal for a Classification of Distributivity Types and Collectivity Types

Despite a vast number of studies regarding the quantificational sentences in the literature, analysis of the possible distributivity types has been ignored. However, our observation of the quantificational sentences in the dissertation puts forward the need to classify distributivity into sub-groups such as distributivity over time, distributivity over the argument and distributivity over the adjunct. I will claim that a quantificational subject NP or object NP which is always multi-referent has the potential to distribute over other constituents of the sentence provided that these are also multi-referent. The time indices provided by the verbs are also claimed to be possible candidates for being distributed over.

Furthermore, I will also argue that collectivity needs to be categorized into two groups: subject collectivity and object collectivity.

## 8.0     Overview of the Dissertation

The thesis is structured as follows: Chapter 2 provides a discussion of the existing

approaches on quantifier interpretations in order to provide some theoretical

background as to how quantificational sentences have been treated in the literature.

The discussion is presented in two basic categories. The first category presents a

discussion of the syntax-based approaches of May (1977, 1985) and Hornstein

(1999). The second category is on the semantics-based approaches of Link (1983,

1991), Lasersohn (1990, 1995), Scha (1981), Gillon (1987). Semantic based

approaches will be analyzed under two main titles: VP-centered semantic approaches

and NP-centered semantic approaches. Quantificational Turkish sentences will be

examined with respect to the syntax-based analysis as well as the semantics-based

analysis. I will argue that approaches that take only the syntactic side of the issue or

only the semantic side of the issue into consideration cannot provide a

comprehensive analysis of the problem of collectivity / distributivity distinction and

point out the need to follow an approach that unifies the syntactic side of the issue

with the semantic side.

Chapter 3 concentrates on the need to classify distributivity and collectivity

into sub-groups. Distributivity is classified under three groups labeled as:

distributivity over time, distributivity over the argument and distributivity over the

adjunct. The quantificational NPs which are always multi-referent are discussed to be

the constituents that have a potential to get distributed over other arguments

including the time indices provided by the verb. The distribution of these

quantificational NPs is observed regardless of their syntactic position in the sentence.

Collectivity, on the other hand, is classified under two categories called subject

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collectivity and object collectivity. Subject collectivity is discussed to be related to the group interpretation of the members constituting the external argument whereas object collectivity is related to the group interpretation of the members of the internal argument. The second goal of Chapter 3 is to provide a discussion on the co-occurance restrictions of the predicates and their external arguments. Predicates are analyzed under the three traditional categories: collective predicates, distributive predicates and ambiguous predicates. Each predicate type is analyzed as to whether they are compatible with morphologically singular, morphologically plural or group denoting nouns as external arguments. The compatibility condition is an integral part of my approach since a mismatch between the verb and its subject renders the sentence ungrammatical which means that it cannot enter the computational interpretation mechanism at all.

Chapter 4 proposes and discusses an alternative approach to quantificational sentences. This alternative approach is based on the compositionality principle which is discussed in the beginning of Chapter 4. Turkish data is analyzed to see how each constituent makes a semantic contribution to the overall interpretation of the sentence and it is pointed out that the interpretation of a sentence regarding its collectivity / distributivity is the result of an interaction of each constituent in the sentence. Based on this assumption, the chapter argues that the collective / distributive distinction of a sentence is a matter of the collectivity values of the verb, quantifier and the noun complementing the quantifier in the sentence. What features are claimed to be assigned to each lexical entry is also discussed in the chapter. Finally the operation of the computational mechanism is illustrated through various examples.

Chapter 5 argues for an additional strategy of sentence interpretation that places emphasis on the time indices. This strategy is a follow up for the

computational mechanism that was proposed in Chapter 4. The computational

mechanism of the "Modified Plus Principle" provides an advantage in giving us an

overall view of whether a sentence has a collective or distributive interpretation.

However, the elimination procedures discussed in Chapter 5 enables us to see more

than this overall possible interpretation. It enables us to see the actual realizations of

the sentences giving an idea of what kind of distributivity or what kind of collectivity

is involved in a particular sentence. It also gives us a clear idea of how

quantificational sentences are mentally represented.

Finally, Chapter 6 presents the conclusive remarks to our study paying

attention to the general outcomes of the proposed interpretive mechanism and points

out topics for further studies.

CHAPTER 2


APPROACHES ON QUANTIFIER INTERPRETATION


1.0     Introduction


Scope, which is defined as the domain within which an operator has the ability to affect the interpretation of other expressions, has been studied to a great extent in the past years. Different analyses regarding the interpretation of quantifiers have been put forward by May (1977, 1985), Beghelli and Stowell (1994, 1997), Szabolcsi (1997), and many others.

Chapter 2 attempts to provide a theoretical background as to how scope phenomenon has been dealt with in the literature. I will classify the previous approaches regarding quantifier interpretation into two basic sub-classes: syntax based analysis and semantics based analysis. As will be explained in the following parts in detail the syntax based analysis takes the focal point to be the syntactic positions of the operators either at the surface structure or at LF. The so-called semantics based approaches take the VP or the NP as responsible for the interpretation that a quantified sentence has. The syntactic positions of the quantifiers do not have influence in the interpretation of sentences in this view. The merely syntax based approaches that will be explained below do not consider the semantic properties of the external or the internal arguments or the type of the predicate used. The semantic based approaches, on the one hand, fail to provide a connection between the semantic properties of the arguments with the predicate.

I argue that neither the syntax based approaches nor the semantics based approaches are adequate to account for the Turkish data. The specific examples that will be presented below will make it clear that semantic properties of the constituents of a sentence and their interaction with each other are responsible for the different interpretations of sentences bearing quantifiers. In other words, a semantically based approach which takes each constituent of a sentence into consideration is proposed to explain the phenomena more adequately.

## 2.0    Syntax Based Approaches

Scope phenomenon has been basically dealt with in terms of the syntactic positions of the quantifiers and syntactic operations that these quantifiers undergo for a very long time. Among these approaches is May's quantifier raising approach, Hornstein's checking approach and Beghelli & Stowell's approaches. The common point of these approaches is that they account for the scope relations between the quantified NPs using the syntactic position of the quantifiers without paying attention to what other constituents like the external/ internal argument or the predicate might contribute to the interpretation of the sentence.

The following section will provide an explanation as to how these approaches explain the scope phenomena.

## 2.1    Quantifier Raising (QR)

Montague's pioneering work in the 1970s is a notable study regarding the issue of quantification. There is a significant affinity between the ideas of Montague (1974)

and May (1977, 1985), so a general outline of how Montague dealt with the issue of quantification will be beneficial before an in-dept analysis of May is presented.

In Montague (1974) an interpretation to quantificational sentences is presented such that quantifier phrases, just like proper names, enter the sentence in a functional application (merge) step. For a sentence like "Everyone walks" the merge steps are presented as given in (1) below.

(1)                                          Everyone walks.

                    Everyone                          walks.
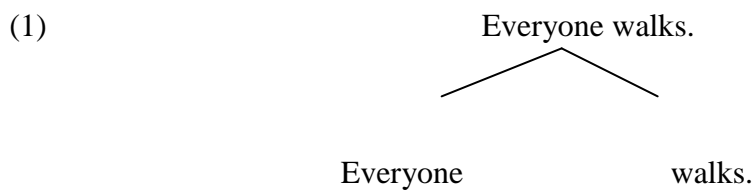
In this framework syntax and interpretation proceed hand in hand. At the syntactic level all noun phrases take a predicate as an argument and yield a sentence. Semantically "everyone" is interpreted as the set of properties that everyone has. Applied to the property "walk", this yields the statement that everyone has the property of walking. The underlying fact of this approach is that the introduction of a quantificational phrase by way of merging assigns it strictly direct scope over any other operator that is merged later. So the question at this point is how we could account for the possible inverse scope of some sentences. Montague's grammar has devices that can account for this inverse scope also. To illustrate how this device works, we can have a look at the ambiguous sentence "Everyone loves someone". The sentence is built bottom-up as was the case for (1). To arrive at the inverse scope interpretation, an open sentence "everyone loves him$_i$" is built with a placeholder pronoun in the object position. As a next step the object "someone" is merged to this open sentence. The interpretation is built by applying the quantifier to

a property that is obtained from the open sentence. The property of the open sentence in this case is that of being loved by everyone. The resulting interpretation is that there is a person being loved by everyone. This procedure is schematized in (2) below.

(2)                              Everyone loves someone.

                           Someone            everyone loves him$_i$
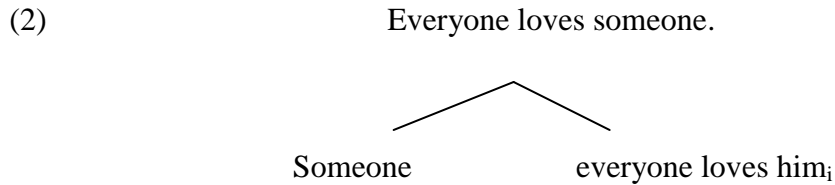
As has been noted above there is a similarity between the ideas of Montague and that of May. Let us see the underlying issues of May's approach and then have a look at the similarities and the differences between these two basic approaches to quantification.

May (1977) proposes that syntax does not end with producing the surface string. Instead movement operations continue at an abstract level called Logical Form (LF). The underlying assumption of the approach is that case positions never serve as scope positions for quantificational phrases. As a consequence, Quantifier Raising (QR) was introduced as a movement operation that places quantifier phrases into their scope positions at LF. These scope positions that the quantificational phrases move are non-argument positions. In this way, scopal ambiguity of sentences like (3a) and (3b) was resolved at the level of LF.

(3)      a. Some man likes every woman.

          b. Every man likes some woman.

A feature regarding quantifier raising that must be noted is that this covert movement applies to all quantifiers without exception. This is named as the scope uniformity principle of the movement of quantifiers. (4) below states this principle.

(4)     The Uniformity of Quantifier Scope Assignment (Scope Uniformity)

Quantifier Raising applies uniformly to all QPs. Neither QR nor any particular QP is landing-site selective; in principle, any QP can be adjoined to any non-argument XP.

Having mentioned the basic properties of QR briefly, (5) illustrates an example to make the explanation clearer.

(5)     Everyone admires someone.

a.  [$_s$ everyone$_j$ [$_s$ someone$_i$ [ t$_j$ admires t$_i$]]]

For every person x, there is some person y, x admires y.

($\forall > \exists$)

b.  [$_s$ someone$_i$ [$_s$ everyone$_j$ [ t$_j$ admires t$_i$]]]

There is a person x such that, for every person y, x loves y.

($\exists > \forall$)

As the LF representations show the sentence given above is ambiguous in English. As required by May's QR, all quantifiers undergo LF raising. So this raising movement would derive inverse scope in (5b) by moving the object "someone" above the scope position of the subject "everyone". 'Above' here means a position

that c-commands the LF position of the subject quantifier as in (5b). In this approach

scope is calculated on the basis of LF c-command relations. This means that scope is

a hierarchical notion directly related to the c-command domain. And in (5b) the

object quantifier "someone" c-commands the subject "everyone" at LF which means

that it takes scope over the subject quantifier. Conversely, in (5a) the subject

quantifier c-commands the object quantifier and takes scope over it. The LF

movement of the quantifiers is schematized with respect to May's approach in (6)

below.

(6)    a.                          S

                         everyone$_j$                    S

                                      someone$_i$        t$_j$ admires t$_i$


        b.                          S

                    someone$_i$                    S

                                    everyone$_j$        t$_j$ admires t$_i$
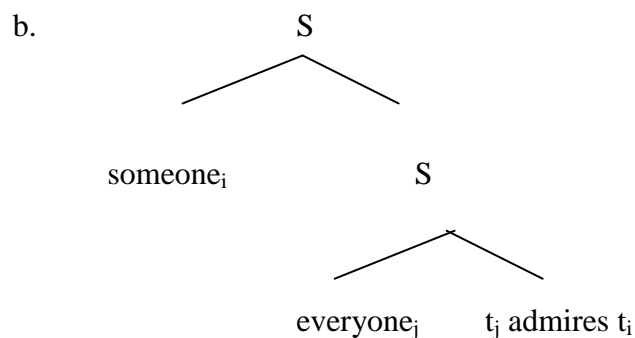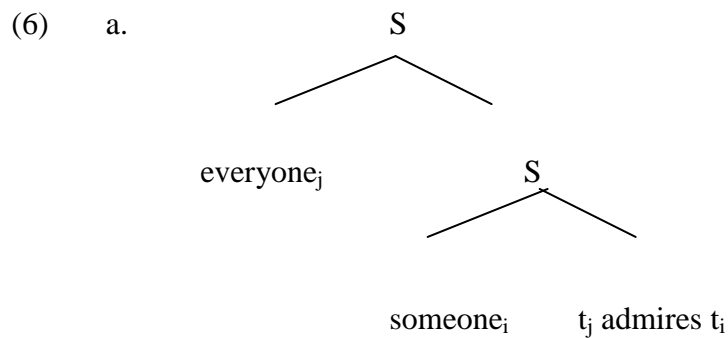

As is clear (6a) illustrates the wide scope of the subject quantifier whereas the

inverse scope where the object takes wide scope over the subject is presented in (6b).

The similarity between (2) and (6b) above indicates how similar the

approaches of Montague and May are. However, there are differences between these

approaches as well. One difference between Montague's and May's syntaxes is that in Montague's the steps building the surface string are interspersed with steps pertaining to its LF, while May first builds the surface structure and rearranges it into an LF representation.

Up to this point, I have attempted to provide a background to the phenomena of scope assignment through syntactic movement by providing a general explanation with respect to the two underlying approaches, namely that of Montague's and May's. Although an ambiguous English sentence containing two quantificational NPs seems to be accounted for using the May's approach, it will be shown below that some quantificational sentences in languages like Turkish, Japanese or even English cannot be explained in the same manner.

2.1.1   Objections to QR

The basic features of QR have been criticized in the literature by many linguists. (Hornstein 1999, Szabolcsi 2001) These objections can be grouped under two headings, namely conceptual objections and empirical objections. I attempt to elaborate on these these objections in the following section.

2.1.1.1 Conceptual Objections to QR

Conceptual objections are those related to arguments against the commonly accepted concepts in the literature. One of the conceptual objections is related to the fact that QR is an adjunction rule and no other core grammatical processes involve adjunction in the Minimalist Program. All syntactic movements have specific target positions. In

other words, movements like wh-, topic or focus movements do not move a wh-feature to the front of just any XP or focus an expression by adjoining it to any arbitrary projection. Rather, there are specific target positions that are reserved for these syntactic movements. However QR does not target a specific position. QR appends a quantified NP to virtually any maximal projection. This assumption that QPs adjoin to any XP holds in the two influencial works of May (1985) and Aoun & Li (1993).

Another conceptual objection is related to a focal point which is of great importance in the Minimalist framework. Within the Minimalist framework, each movement should be motivated by some reason. The minimalist program presumes that movement serves to check morphological features. In other words syntactic movements should be feature driven. In this line of thought, wh-movement is triggered by wh-features, focus movement by focus features or topic movement by topic features. Each of these features has overt morphological realization in some language, but the possible Q-features predicted to trigger quantifier movement are not attested overtly in any language. This suggests that Q-features do not exist and there can be no such movement that is triggered by these non-existing Q-features.

The conceptual objections concerning the unavailability of specific target positions for quantificational elements or lack of motivation for the QR movement indicate that QR is at odds with the basic properties of the Minimalist framework.

2.1.1.2 Empirical Objections to QR

Although QR can account for ambiguous structures containing two quantified NPs such as "Every man loves a woman", it cannot explain lack of disambiguity in some other English sentences or in other languages.

We have analyzed the scope uniformity principle as one of the most basic features of May's approach. It must be noted that scope uniformity cannot always be maintained in the QR approach. As defined in (4) above, the scope uniformity principle requires all the quantificational NPs to move to non-argument positions for scope reasons. This approach, as a result, predicts that a sentence bearing two quantificational NPs should have ambiguous interpretation depending on the fact that both of the NPs adjoin to non-argument positions for scope reasons. However, it will be illustrated that this prediction cannot be considered true in each case.

Beghelli & Stowell (1997) observe that even in English, sentences with two quantifiers might fail to give ambiguous interpretation. (7) taken from Beghelli & Stowell (1997) presents example sentences which fail to get inverse scope. The sentences in (7) have quantificational expressions both in the subject and the object positions. QR predicts ambiguity from these sentences due to the scope uniformity principle.

(7)     a       Some of the students visited more than two girls.

        b.      Some of the students visited few girls.

        c.      Every student visited more than three girls.

                                        (Beghelli & Stowell, 1997)

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None of the sentences given in (7) has inverse scope as a possible interpretation. This means that the object QPs cannot take scope over the subject QPs. (7a) does not have the interpretation that for more than two girls, it is the case that some student visited her. However, May's QR approach predicts that this inverse scope interpretation is a possible interpretation.

Similarly as observed in Ioup (1975) and Marsden (2003) when the quantifier in object position is "all", as in (8) below, there is a decrease in the availability of inverse scope.

(8)     Someone read all the books.

a.      There is x, such that, for all y, y is a book, x read y.

b.      ?? For all y, y is a book, there is an x, such that x read y.

When cross-linguistic data is considered we can see that sentences with two quantifiers do not always show ambiguity. Evidence comes from both Turkish and Japanese. (9) illustrates a Turkish unambiguous sentence which has two genuine quantifiers. The predicted interpretations for (9a) are that there are only three students who read every book and that every book is read by different sets of three students. However, Kelepir (2001) shows that the Turkish sentence lacks the second reading where *her* "every" takes scope over *sadece üç öğrenci* "only three students". The only possible reading is the former one for this particular sentence. (9b), on the other hand, is predicted to have either the meaning that for every child there are two toys such that they bought them or that there are two toys which every child bought. The existing interpretation is the former one.

(9)  a.  Sadece üç öğrenci  her kitab-ı     oku-du.

        only three student all book-acc     read-past

        "Only three students read all the books".

        (only 3 students > her)


    b.  Her çocuk sadece iki oyuncak al-dı.

        every child only   two book    buy-past

        "Every child bought only two books".

        (her > only two toys)

                                                (Kelepir, 2001)


Sano (2003) argues for the lack of inverse scope in Japanese presenting the sentence
given in (10) as an example.


(10)  Dareka-ga    daremo-o    aisite iru.              (∃>∀, *∀>∃)

      Someone-nom everyone-acc love

      "Someone loves everyone."

                                                (Sano, 2003)


The lack of inverse scope interpretation for some English sentences such as (7)-(8)
and Turkish and Japanese sentences such as (9) and (10) respectively indicates that
not all QPs are undergoing movement for scope reasons. In other words, this is an
indication that different QP types behave differently with respect to scope
phenomenon and that they have different scope possibilities. So, a generalization

saying that every quantificational element must move and adjoin to non-argument positions at LF in the same manner to get scope seems too strong.

In this section I attempted to classify the objections to QR under two headings. These objections present the theoretical shortcomings of the analysis briefly. The next section will analyze the Turkish data with respect to quantifier raising and explain why we cannot use QR to explain the relevant data.

2.1.2   QR and Turkish Data

In addition to the empirical and the conceptual objections to QR, certain Turkish data with quantificational elements remain to be unresolved with this approach. It will be shown in this section that although some data can be accounted for using the QR analysis, some other data which cannot be explained through QR, provide evidence that we need to approach the issue from another perspective so that we can come up with a unique explanation for all the quantificational sentences.

2.1.2.1 QR and Inverse Scope

An analysis of quantificational sentences in Turkish illustrates that some sentences allow for inverse scope interpretations as the possible readings of the sentences show in (11) below. The interpretations given in (i) illustrate the direct scope whereas the ones in (ii) are associated with the inverse scope interpretations. These ambiguous sentences seem to be unproblematic with respect to the QR approach. The inverse scope interpretations are predicted by QR.

(11)   a.   Herkes biri-ni sev-er.

everyone someone-acc love-aor

"Everyone loves someone".

(i) For every person there is someone that s/he loves.

($\forall > \exists$)

(ii) There is a person that everybody loves.

($\exists > \forall$)

b.   Bütün birlik-ler bir kale kuşat-tı.

all regiment-pl. a castle surround-past

"All regiments surrounded a castle."

(i) For all the regiments there is a possibly different castle that they

surrounded.    ($\forall > \exists$)

(ii) There is a castle that all the regiments surrounded collectively.

($\exists > \forall$)

c.   Herkes sadece iki kişi-yi aradı.

everybody only two people-acc call-past

"Everybody called only two people."

(i) For every person there are possibly two people that they called.

($\forall > \exists$)

(ii) There are two specific people that everybody called.

($\exists > \forall$)

However, as has been discussed in the previous section, some other Turkish sentences having double quantifiers provide counter-examples to the QR approach to scope phenomena. In addition to (9a) and (9b) presented above, (12) also is another example illustrating the lack of ambiguity in quantified sentences. Rather, it seems to be that the surface c-command relation reflects the scopal properties between the two quantifiers.

(12)    Biri herkes-i sev-er.

        someone everyone-acc love-aor

        "Someone loves everyone."

        a.      [$_s$ Biri$_j$ [$_s$ herkesi$_i$ [ t$_j$ t$_i$ sever]]]

                "There is a person x such that x loves every person y."

                (∃>∀)

        b.      *[$_s$ Herkesi$_i$ [$_s$ biri$_j$ [ t$_j$ t$_i$ sever]]]

                "For every person x there is a y such that x loves y."

                (*∀>∃)

As is clear from (12a) and (12b) the sentence can only be interpreted with the existential quantifier taking scope over the universal one which is associated with the interpretation that there is a person who loves everyone. The inverse scope interpretation is not available.

        Analyzing this particular datum in terms of May's analysis would yield an unwanted consequence. To conform to the principles of QR all quantifiers would undergo LF movement and we would expect to get scope ambiguity. So the problem

with the approach seems to be that an additional condition is required to explain the lack of the inverse scope presented in (12b).This additional condition comes from studies regarding quantificational sentences in other so-called scope rigid languages. In the following section the additional condition that can be useful in explaining the lack of inverse scope will be explained in detail.

It was shown earlier that Turkish is not the first language where lack of inverse scope interpretation is observed. Linguists studying Japanese data have observed that Japanese SOV sentences bearing two quantifiers are unambiguous with respect to scope relations. (Kuno 1973, Hoji 1985, Sano 2003) Sano (2003) presents the sentence in (13) to illustrate the phenomenon.


(13)    Dareka-ga      daremo-o      aisite iru.

Someone-nom everyone-acc  love

"Someone loves everyone".

(i)        There is a person x, such that, for every person y, x loves y.

(ii)       * For every person y, there is a person x, such that x loves y.


(13) shows that  interpretation in (i), that is the linear scope is possible, whereas the interpretation in (ii), that is, the inverse scope is not possible.

To provide a solution to this problem, "rigidity condition" has been proposed by Lasnik & Saito (1992) and Murasugi & Saito(1992). (14) below presents the rigidity condition.

(14)    Rigidity Condition

Supposing that $Q_1$ and $Q_2$ are operators (quantified NPs or WH), $Q_1$ cannot take wide scope over $Q_2$ if $t_2$ c-commands $t_1$ (where $t_1$ and $t_2$ are variables)

(Lasnik & Saito 1992, Murasugi & Saito 1992)

It is proposed that both of the quantifiers undergo QR in (13) above and result in two LF representations. Rigidity condition acts as an extra condition to dispense with the inverse scope interpretations presented in (13).

(15) presents the two possible LF representation of the sentence given in (13) after the QR applies. If we assume that these LF representations are subject to the rigidity condition, we can see that (15b) would be out since the trace of $Q_2$ c-commands the trace of $Q_1$.

(15)    a.    [dareka $_1$ [daremo $_2$ [t$_1$ [t$_2$ aisite iru]]]]

b.    *[daremo $_1$ [dareka $_2$ [t$_2$ [t$_1$ aisite iru]]]]

The question at this point is how come a sentence like (13) in Japanese is subject to the rigidity condition but a corresponding sentence like "Someone loves everyone" in English is not subject to this condition. Sano (2003) argues that a lexical account can provide an explanation for this question. This lexical account assumes that the difference regarding scope between an English sentence and its corresponding Japanese sentence is traced to a difference in the lexical identity of quantifiers. The exact nature of the lexical status of each quantifier is left as a question for further studies. This account stems from the observation that even in English

quantificational sentences, there are cases where the quantifier in the object scope fails to take wide scope over the quantifier in the subject position.

The lack of inverse scope in a Turkish sentence like *Biri herkesi sever* "Someone loves everyone" can also be explained in the same manner as discussed for Japanese above. It seems that it is only with the help of the rigidity condition that May's QR can account for this particular Turkish data.

Although the application of the rigidity condition after the QR has applied seems to take care of this unambiguous sentence, there are also sentences which show that inverse scope is possible in similar sentences in Turkish. (16) illustrates a sentence with two quantificational elements. This sentence clearly has inverse scope interpretations. This, once more brings the question of how we could explain an ambiguous structure if rigidity condition is assumed to work for quantificational sentences. In other words, how come the rigidity condition eliminates the inverse scope in *Biri herkesi sever* "Someone loves everyone" but not in (16).

(16)     Herkes biri-ni  sev-er.

         everyone someone-acc love-aorist

         "Everyone loves someone"

         ($\forall > \exists, \exists > \forall$)

In this section I attempted to analyze the Turkish data in terms of May's QR and showed that QR is not adequate to explain sentences having two quantifiers such as (12) above. Brief information has also been provided regarding an extra condition to follow the QR, namely the rigidity condition. It is only after the application of this extra condition that lack of inverse scope in (12) can be explained. However, there

still remain ambiguous sentences such as (16) which can have inverse scope interpretations. Such sentences remain to be problematic if the application of the rigidity condition is expected together with the application of QR.

In the next section I attempt to show that there are additional cases to the previously mentioned ones that QR fails to apply.

2.1.2.2 QR and the Scrambling Data

A general prediction of QR turns out to be that a sentence having two quantificational elements regardless of their position at S Structure is interpreted ambiguously. English sentences of this kind having quantifiers in both the external argument and the internal argument positions provide evidence that this prediction is borne out. However, as shown in the previous section, some Turkish quantificational sentences do not provide supporting evidence in favour of QR.

An analysis of sentences with double genuine quantifiers illustrates that scrambling results in a change in the dynamics of scope phenomena. (17a) with its scrambled counterpart given in (17b) are presented to illustrate this change in scopal relations between the quantifiers.

(17)   a. Sadece üç öğrenci her kitabı okudu.

        only three student every book-acc read-past

        "Only three students read every book."

   (i)      For only three students it is the case that they read every book.

            (only three > every)

b. Her kitab-ı sadece üç öğrenci oku-du.

every book-acc only three student read-past

"Every book, only three students read."

(i)      For every book, it is the case that only three students read it.

(every > only three)

(17a) presents an SOV sentence which has genuine quantifiers both in the external argument and the internal argument positions. The interpretations presented under the sentence shows that only wide scope reading for the external argument is possible. (17b) is the scrambled counterpart of (17a) where the object QNP *her kitabı* "every book" is scrambled to the sentence initial position. The interpretation provided for (17b) reflects the surface scope relation as the only possible reading.

Let us now consider a sentence having *her* "every" in the external argument position and *sadece üç* "only three" in the internal argument position. (18a) gives the canonical sentence structure whereas its scrambled counterpart is given in (18b) below. The interpretations given under each sentence illustrate that the scopal relations between the quantifiers are again changed after scrambling.

(18)      a. Her öğrenci sadece üç kitab-ı oku-du.

every student only three book-acc read-past

"Every student read only three books."

(i) For every student it is the case that they read only three books.

(every > only three)

b. Sadece üç kitab-ı her öğrenci oku-du.

only three books-acc every student read-past

"Only three books, every student read."

(i) For only three books it is the case that every student read them."

(only three > every)

What these example sets show is that theoretically a QR based analysis would predict that sentences such as (17a) and (18a) as well as (17b) and (18b) all have ambiguous interpretation depending on the supposition that both quantificational elements in the external argument position and the internal argument position undergo quantifier raising at LF. This movement would also be expected to take place in the scrambled forms of the sentences. However, we understand from the previous examples that this prediction is not borne out for these Turkish sentences. Thus, we can see that we cannot provide a comprehensive analysis of quantificational sentences with a QR based analysis.

## 2.1.2.3 QR and Indefinites

Turkish has traditionally been considered to be a scope rigid language which implies that scope relations are read off the surface order of quantifiers (Zidani Eroğlu 1997; Göksel 1997, Kelepir 2001 among others). Kelepir (2001) presents the sentence in (19) as an example which is generally used to illustrate scope rigidity. The sentence contains the universal quantifier *her* "every" and an indefinite and can only be interpreted with the reading where a boy read every book. This reading corresponds

to the direct scope construal. Inverse scope reading where every book is read by a possibly different boy is not possible.

(19)    Bir öğrenci her kitab-ı oku-muş.

        one student every book-acc read-past

        "A student read every book."

As is shown in Kelepir (2001), swapping the positions of these quantifiers, results in an ambiguous interpretation. (20) is taken from Kelepir (2001) to illustrate the ambiguous interpretation. The given readings underneath make it clear that the sentence can be interpreted either with a narrow scope construal of the indefinite object as in (20a) and a wide scope construal of the indefinite object as in (20b).[3]

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[3] Kelepir (2001) argues that the ambiguity only arises in case of an accusative marked object NP. The wide scope reading of the indefinite object is not accepted for "zero-marked" indefinite object NPs as in (i) below.
(i)      Her öğrenci bir kitap oku-du.
         every student one book read-past
         "Every student read a book."
         (a)    For every student there is a possible different book that s/he has read.
         (b)    * There is a book that every student read.
However, my intuitions with respect to the readings of the zero-marked indefinites differ. According to my intuitions, non-accusative marked indefinites may also take inverse scope as in (ii).
(ii)     Bütün çocuk-lar bir kale kuşat-tı.
         all child-pl. one castle surround-past
         "All children surrounded a castle."
         (a)    There is a castle that all the children surrounded."
         (b)    *For every child there is a possible different castle that s/he surrounded.
         However, for some other sentences as in (iii), the non-accusative marked indefinite object fails to take wide scope. Depending on this contradiction, I argue that the possibility for the indefinite object in taking wide scope is not a matter of whether it is accusative marked or not. Rather, this possibility is the result of how the predicates, the nouns and the quantifiers interact with each other in the sentence.
(iii)    Bütün çocuk-lar bir elma ye-di.
         all child-pl one apple eat-past
         "All the children ate an apple."
         (a)  For every child there is a possibly different apple that s/he ate.
         (b)  *There is an apple that all the children ate together.

(20)    Her öğrenci bir kitab-ı oku-du.

every student one book-acc read-past

"Every student read a book."

(a)    For every student there is a possibly different book that s/he has read.

(b)    There is a specific book that every student read.


The availability of a wide scope reading of the indefinite object NP in sentences such as (20) would not be surprising for a language such as English which illustrates scope ambiguities in sentences having double quantifiers. However, for Turkish, which is traditionally known as a scope rigid language, the wide scope reading of the indefinite is surprising. Although such examples seem to be violations to the scope rigidity phenomenon, Kelepir (2001) argues that they are not actually violations of scope rigidity, but a result of a general interpretive mechanism referred to as the choice function interpretation.

Following the proposal of the choice function analysis of Reinhart (1997) and analysis of the behavior of indefinites in Kannada by Lidz (1999), Kelepir argues that an existential operator is generated above the subject universal quantifier and binds the function variable embedded in the structure.[4] For a sentence such as (20), the following representations are given to illustrate the wide scope and the narrow scope construal of the indefinite object NP. In (21a), the existential operator is generated above the subject universal quantifier and binds the choice function variable which picks out an individual book, yielding the wide scope reading for the sentence. In (21b), on the other hand, the choice function is dependent on the value

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[4] Reinhart (1997) argues that the existential quantifier which binds the function variables can appear at any level. In contrast to Reinhart (1997), Kratzer (1998) propose that the ∃ quantifier over choice functions is generated at the top level of a clause. The analysis of Kelepir (2001) follows Kratzer's approach.

chosen by the universal quantifier. In other words, the choice function chooses for each student the book appropriately related to that student. This gives out the narrow scope reading of the object indefinite.

(21)  a.  $\exists f \forall x \ [\text{student } (x) \rightarrow \text{read } (x, f(\text{book}))]$  wide scope

   b.  $\exists f \forall x \ [\text{student } (x) \rightarrow \text{read } (x, f_x(\text{book}))]$  narrow scope

So far, we have seen that indefinites have been treated differently in terms of their scope interactions with other quantifiers. This difference is not a violation of scope rigidity. Rather, the difference is attributed to the properties of the indefinites with respect to their potential to get the widest scope in a sentence no matter what their syntactic positions are.

Let us consider this exceptional behaviour of the indefinites for the Turkish sentences provided in (22a)-(22c) below. The sentences are structurally identical. The universal quantifier is in the external argument position and the indefinite is in the internal argument position.

(22)  a. Bütün kız-lar bir çiçek kopar-dı.  $(\forall > \exists, *\exists > \forall)$

   all girl-pl. a flower  pick up-past

   "All the girls picked up a flower."

   b. Bütün çocuk-lar bir kale kuşat-tı.  $(*\forall > \exists, \exists > \forall)$

   all child-pl. a castle surround-past

   "All the children surrounded a castle."

c. Bütün birlik-ler bir kale kuşat-tı.                    ($\forall > \exists$, $\exists > \forall$)

all regiment-pl. a castle surround-past

"All regiments surrounded a castle."

An in-depth analysis of (22a) reveals only the narrow scope reading for the indefinite object NP. This reading refers to cases where all the girls picked up different flowers. (22b) is interpreted with only the wide scope construal of the indefinite object NP which refers to the interpretation where there is a castle surrounded by all the children. Finally, (22c) can be interpreted ambiguously, either with the wide scope or the narrow scope reading of the indefinite NP. The wide scope reading has the meaning where there is a castle surrounded by all the regiments. The narrow scope reading, on the other hand, refers to cases where the regiments surrounded different castles.

If we consider that indefinites have the freedom of taking wide scope over the other quantifiers in the sentences regardless of their syntactic positions, we would predict that the indefinite object NPs in (22a)-(22c) take wide scope over the universal subject NPs. However, as the interpretations illustrate, our predictions are not correct. Thus, we can conclude that some other mechanism regarding the interaction between the predicate type, the NP type and the quantifiers is in operation in the interpretation of quantificational sentences.

Up to now, I tried to present the basic syntax based approach- namely the Quantifier Raising Approach of May. Turkish data was analyzed in terms of the basic properties of this approach and it was shown that Turkish data cannot be accounted for with the approach of quantifier raising. In the coming section, Turkish data will be analyzed within the framework of the Checking Analysis of Hornstein.

## 2.2    Checking Analysis of Hornstein (1999)

Hornstein (1999) aims at eliminating QR as a rule of Universal Grammar. QR is defined as the operation that targets quantified NPs in A-positions and moves them to A′-positions. This definition predicts that a quantified NP contrasts with non-quantified expressions like names in being not interpretable unless moved to A′-position. Hornstein's analysis attempts to show that the scope and the binding properties of the quantified expressions depends on the movements which all NPs undergo to satisfy grammatical demands such as case requirement or other species of feature checking. This analysis on a more general level depends on the assumption that semantic structure is a by-product of grammatical operations driven by formal concerns.

### 2.2.1    A general Outline of Hornstein's Analysis

Depending on the general assumption pointed above, Hornstein considers relative scope to be a property of A-chains. The basic assumptions underlying his approach are that noun phrases originate in VP-internal positions and raise to the specifiers of agreement phrases to check case. The fact about noun phrases' originating in VP internal positions is the well-known "VP-internal subject hypothesis". NPs in VP-internal positions move to [Spec,Agr] positions to check case features. In particular, subjects move to [Spec,Agr$_s$] in overt syntax, and objects move to [Spec,Agr$_o$] at LF. This movement leaves copies in each link of the chain and only one link can survive till the Conceptual-Intentional interface. In other words, all other copies must be

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deleted. As a result, scope is determined by the asymmetric c-command relations of the surviving copies.

As was proposed by Hornstein, these assumptions suffice to provide an analysis of quantified sentences in English. (23) presents an example to illustrate how scope relations are determined in this new approach.

(23)    Someone attended every seminar.

(23) is ambiguous, either the universally quantified object or the indefinite subject is interpreted as taking wide scope. The LF structure of (23) before the deletion of copies is presented in (24) below.

(24)    [$_{AgrS}$ Someone [$_{Tns}$ Tns[ $_{AgrO}$ every seminar[ $_{VP}$ someone [$_{VP}$ attended every seminar]]]]]

As is clear in (24), "someone" raises to [Spec,Agr$_s$] to check its nominative case in the overt syntax. At LF, "every seminar" moves to [Spec,Agr$_o$] to check accusative case. Each move leaves a copy of the moved expression behind. Depending on the fact that an A-chain should have at most one and at least one member, one member of each of the two A-chains should be deleted. As a result of this deletion process four possible structures result and these are presented in (25).[5]

(25)    a.      [$_{AgrS}$ Someone [$_{Tns}$ Tns[ $_{AgrO}$ every seminar[ $_{VP}$ (someone) [$_{VP}$ attended (every seminar)]]]]]

---

[5] The deleted expressions are shown in paranthesis.

b. [$_{AgrS}$ Someone [$_{Tns}$ Tns[ $_{AgrO}$ (every seminar)[ $_{VP}$ (someone) [$_{VP}$ attended every seminar]]]]]

c. [$_{AgrS}$ (Someone) [$_{Tns}$ Tns[ $_{AgrO}$ every seminar[ $_{VP}$ someone [$_{VP}$ attended (every seminar)]]]]]

d. [$_{AgrS}$ (Someone) [$_{Tns}$ Tns[ $_{AgrO}$ (every seminar)[ $_{VP}$ someone [$_{VP}$ attended every seminar]]]]]

Following Diesing's Mapping Hypothesis (1992), Hornstein assumes that quantifiers like "every seminar" should land outside VP. Thus, (25b) and (25d), in which the quantifier "every seminar" is interpreted within the VP are crossed out. As a consequence the remaining structures are (25a) and (25c).

Hornstein assumes that a QNP (quantified NP) $Q_1$ takes scope over a QNP $Q_2$ if $Q_1$ c-commands $Q_2$. Using this interpretive principle, the ambiguity of the sentence can be presented. (25a) represents the LF structure in which "someone" takes scope over "every seminar" whereas in (25c) "every seminar" takes scope over "someone".

For this particular example, the analysis of Hornstein seems to work well. However, as has been also observed by Hornstein (1995) and Szabolcsi (2001) the ambiguity of (26) cannot be accounted for along these lines.

(26) Everyone attended some seminar.

The sentence presented in (26) is an ambiguous one. (27) below shows the four possible LF structures before the deletion process. Because of the Mapping Hypothesis the quantifier should be interpreted outside the VP. This means that (27c) and (27d) are crossed out. The quantifier "every" is lodged in AgrS and there is no

position above it where the object can take wide scope. This is a problematic instance for Hornstein's analysis. To deal with this problem Hornstein argues that (27) only has a subject wide scope reading, and the apparent object wide scope reading is due to the fact that everyone may have attended the same seminar.

(27) a. [_AgrS_ Everyone [_Tns_ Tns[ _AgrO_ some seminar[ _VP_ (everyone) [_VP_ attended (some seminar)]]]]]

b. [_AgrS_ Everyone [_Tns_ Tns[ _AgrO_ (some seminar)[ _VP_ (everyone) [_VP_ attended some seminar]]]]]

c. [_AgrS_ (Everyone) [_Tns_ Tns[ _AgrO_ some seminar[ _VP_ everyone [_VP_ attended (some seminar)]]]]]

d. [_AgrS_ (Everyone) [_Tns_ Tns[ _AgrO_ (some seminar)[ _VP_ everyone [_VP_ attended some seminar]]]]]

To sum up this section, we have seen that Hornstein attempted to explain the ambiguous structure of quantificational sentences as a by-product of grammatical operations driven by formal concerns. The grammatical operation under consideration is the checking of case features this time. From a minimalist perspective this analysis seems to be more advantageous over the QR analysis. The basic advantage is that the movement is triggered by case reasons. This is better than the QR analysis which lacked a formal trigger for the movement.

However, as has also been observed by Hornstein himself, not every quantificational sentence can be accounted in this line of thought. Considering the problematic example in (27) above, it must be noted that Hornstein's solution that

everyone might have attended the same seminar does not seem a persuasive argument.

In addition to (27), Szabolcsi lists down some other example sentences which remain unexplained by the analysis proposed by Hornstein. These are presented in (28) below.

(28)  a.    Exactly half of the students attended some seminar.

b.    Every second student attended some seminar.

c.    Two of the students attended three of the seminars.

d.    Neither student attended a seminar on rectangular circles.

(Szabolcsi, 2001)

Given that the quantificational subject must be interpreted VP-externally the ambiguity of the sentences above remains to be unexplained.

2.2.2    Hornstein's Analysis and Turkish Data

After presenting a brief introduction into the new approach, we can reconsider the Turkish data within the framework of Hornstein. In the following section I analyze the data in terms of the checking analysis and try to show that although some of the data can be explained with the help of this approach, some others fail to be explained.

(29) is presented below to provide an example that can be explained through the use of Hornstein's analysis. The sentence illustrated in (29) lacks the inverse reading where the object quantifier is supposed to take wide scope. With this

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interpretation the sentence is problematic for the QR approach. However, as will be shown below, it seems to be explainable with the checking analysis.

(29)     Her öğrenci sadece üç kitab-ı oku-du.                    (∀>∃, *∃>∀)

         every student only three books read-past

         "Every student read only three books."

The sentence presented in (29) has two genuine quantifiers in the object and subject positions. The structure of the sentence is given in (30) below. As is clear, the subject NP originates within the VP and then moves to Spec AgrSP for case reasons. On the other hand, the object NP which also originates VP internally moves to Spec AgrOP for the same reason. As was pointed out in the previous section quantifiers should be interpreted outside the VP. This indicates that both the subject and the object quantifiers in (29) will be interpreted in their case positions. The fact that the position occupied by the subject NP is the highest position in the sentence and that there is no other possible position higher than the Spec AgrSP for the object NP can account for the unavailability of ambiguity in the sentence. In short, the sentence in (29) is explainable by this approach.

(30)

AgrSp
- DP: Her öğrenci$_j$
- AgrS'
  - TP
    - DP
    - T'
      - AgrOP
        - DP: sadece 3 kitabı$_i$
        - AgrO'
          - vP
            - DP: t$_j$
            - v'
              - VP
                - DP: t$_i$
                - V: oku-
              - v
          - AgrO
      - T: -du.
  - AgrS
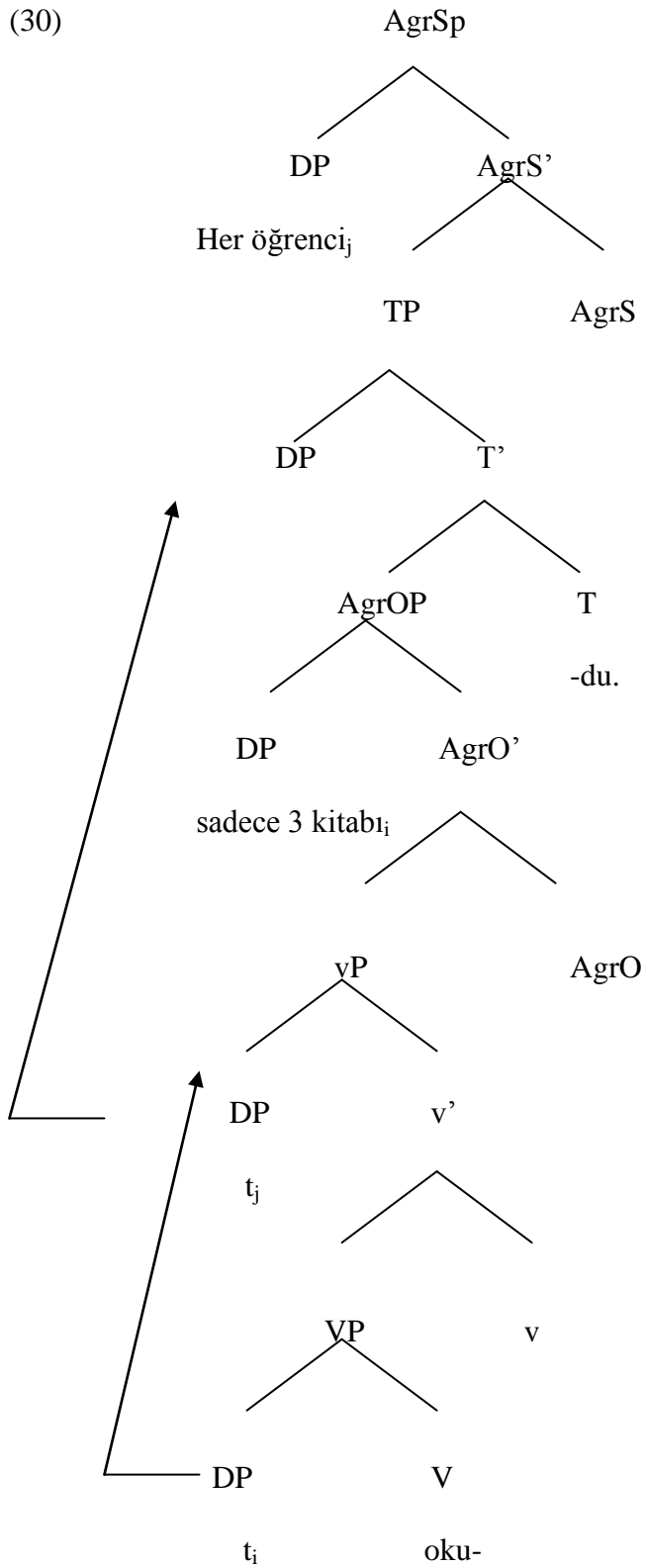
(31) and (32), on the other hand, provide counter-examples which remain to be problematic. (31) shows an ambiguous sentence where both linear scope and inverse

scope options are possible. (32), on the other hand, only has the inverse scope

interpretation and lacks the linear scope option.


(31)    Herkes sadece iki kişi-yi ara-dı.                    (∀>∃, ∃>∀)

everybody only two people-acc call-past

"Everybody called two people."


(32)    Her öğrenci sadece masa-da-ki üç kitab-ı oku-du.   (*∀>∃, ∃>∀)

every student only table-loc three books-acc read-past.

"Every student read the three books on the table."


(33) illustrates the structure of (31) above.

(33)

```
                        AgrSp
                      /       \
                    DP        AgrS'
                  herkes_j    /    \
                            TP     AgrS
                          /    \
                        DP      T'
                              /    \
                          AgrOP     T
                         /    \    -er
                       DP    AgrO'
                 sadece 2 kişiyi_i  /  \
                                  vP   AgrO
                                /    \
                              DP     v'
                              t_j   /   \
                                  VP     v
                                /    \
                              DP      V
                              t_i   aradı-
```

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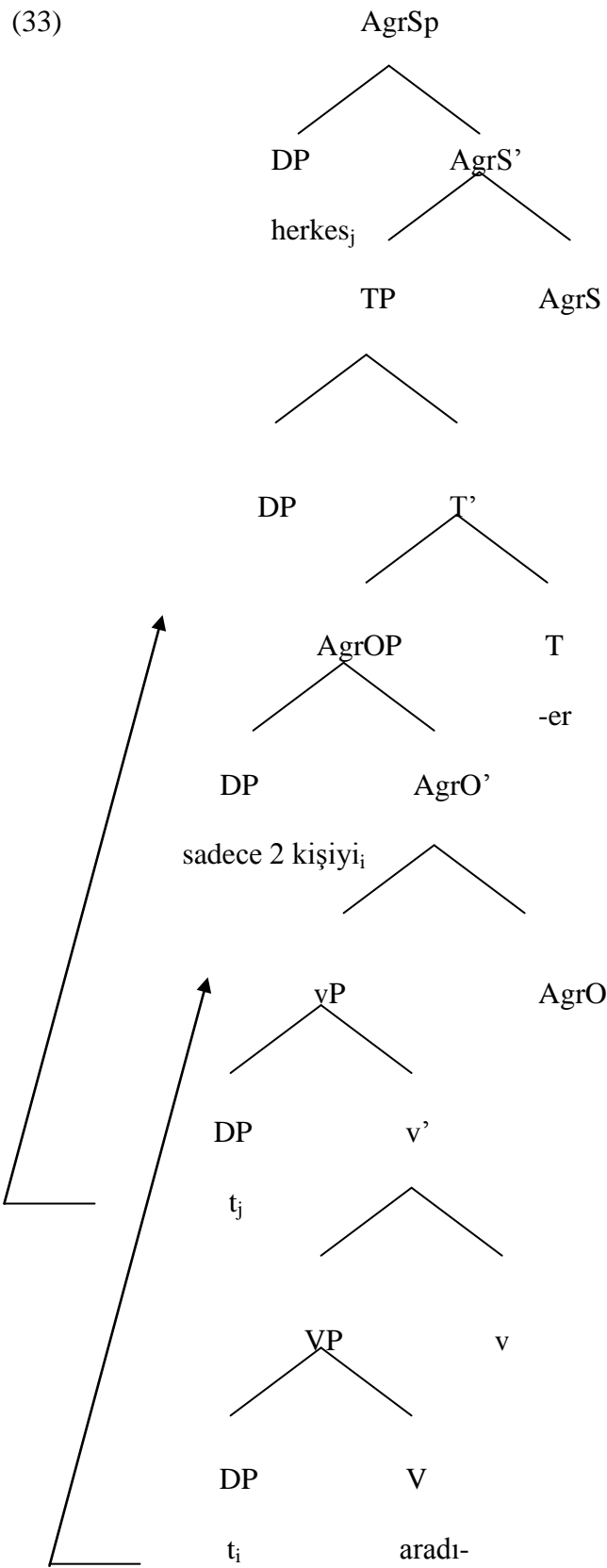
Similar to (30) above, both the subject quantifier NP and the object quantifier NP are supposed to be interpreted outside the VP. However, in this case we cannot arrive at the ambiguous interpretation in (31). The only possible interpretation which is the inverse scope reading of (32) cannot be accounted for either.

In this section the examples provided above contains genuine quantifiers. However, when sentences with indefinites are taken into consideration, we again see that some examples seem to be explainable whereas some others are not. Some examples which can be accounted for using Hornstein's approach are presented in (34) below.

(34)   a.   Bütün çocuk-lar bir elma ye-di.                ($\forall > \exists$, *$\exists > \forall$)

           all child-pl one apple eat-past

           "All the children ate an apple."

       b.   Bütün kız-lar bir çiçek kopar-dı.             ($\forall > \exists$, *$\exists > \forall$)

           all girl-pl one flower pick up-past

           "All the girls picked up a flower."

       c.   Her öğrenci bir öğretmen-i ziyaret et-ti.     ($\forall > \exists$, *$\exists > \forall$)

           every student one teacher-acc visit-past

           "Every student visited a teacher"

The sentences in (34) all have linear scope interpretations. Due to the fact that there is a genuine quantifier in the subject position and that quantifier takes scope outside

the VP, Hornstein's analysis correctly predicts wide scope reading of the subject quantifier. There is no possible position for the object to take higher scope.

Some examples illustrating counter evidence for the approach are listed in (35) below.

(35)  a.  Bütün çocuk-lar bir tepsi börek ye-di.           (∀>∃, ∃>∀)

all child-pl one dish of pastry eat-past

"All the children ate a dish of pastry."

b.  Bütün asker-ler bir kale kuşat-tı.                (*∀>∃, ∃>∀)

all soldier-pl  one castle surround-past

"All the soldiers surrounded a castle."

c.  Herkes biri-ni sev-er.                             (∀>∃, ∃>∀)

everybody somebody-acc love-aor

"Everybody loves somebody."

A common point between the examples presented in (34) and (35) is that all the sentences have a genuine quantifier in the subject position. Therefore, the subject quantifier NPs need to be interpreted outside the VP. As a consequence, there is no possible landing site for the object NP to take higher scope than the subject. This would result in an expectation that all the sentences given in (34) and (35) should be unambiguous with a wide scope of the subject NP. However, as is clear above, the sentences in (35) do not conform to this expectation.

Let me consider sentences which have an indefinite in the subject position and a genuine quantifier in the object position. (36) presents an example for this construction. The sentence is clearly unambiguous with the linear scope interpretation.

(36)    Bir kadın her çocuğ-u öp-tü.                    (*∀>∃, ∃>∀)

        one woman every child-acc. kiss-past

        "A woman kissed every child".

(37) shows the possible LF representations of the sentence given in (36). The representation given in (37b) and (37d) are ruled out since the quantifier *her* "every" cannot be interpreted within the VP. According to the remaining LF representations, that is (37a) and (37c), the sentence would be expected to have ambiguity. However, that is not the case. This construction also remains to be explained if Hornstein's analysis is thought to hold for quantificational sentences.

(37)    a.    [$_{AgrS}$ Bir kadın [$_{Tns}$ Tns[ $_{AgrO}$ her çocuğu[ $_{VP}$ (bir kadın) [$_{VP}$ (her çocuğu) öptü)]]]]]

        b.    [$_{AgrS}$ Bir kadın [$_{Tns}$ Tns[ $_{AgrO}$ (her çocuğu)[ $_{VP}$ (bir kadın) [$_{VP}$ her çocuğu öptü)]]]]]

        c.    [$_{AgrS}$ (Bir kadın) [$_{Tns}$ Tns[ $_{AgrO}$ her çocuğu[ $_{VP}$ bir kadın [$_{VP}$ (her çocuğu) öptü)]]]]]

        d.    [$_{AgrS}$ (Bir kadın) [$_{Tns}$ Tns[ $_{AgrO}$ (her çocuğu)[ $_{VP}$ bir kadın [$_{VP}$ her çocuğu öptü)]]]]]

In this particular section, I attempted to give an overview of how certain

quantificational sentences in English have been explained by Hornstein. It was

shown in the later parts that this analysis does not provide an adequate solution to the

data provided from Turkish.

When compared to May's QR approach, we can see that Hornstein's

checking approach does not have conceptual shortcomings. In other words, the

analysis proposed by Hornstein appeals to the minimalist spirit. However, both

approaches have empirical shortcomings. That is, although they seem to provide

explanation to some data, other data remain to be problematic.

In both the QR approach and the checking analysis, there seems to be a

fundamental similarity. Both approaches do not address the fact that different

quantifier types have different scope-taking abilities. The core point in both is the

syntactic movements that the sentence undergoes. The semantic side of the issue has

been left unobserved. In the following section, a brief explanation about a more

semantics based approach by Beghelli & Stowell (1994, 1997) will be provided.


## 2.3     Beghelli and Stowell (1994, 1997)


Beghelli & Stowell observe that even in English there are constructions with more

than one quantifier that can be interpreted unambiguously. This is in contradiction

with the predictions of May's and Hornstein's theories. Taking Liu (1990)'s

observation that quantifiers fall into two big classes as to whether they take inverse

scope, Beghelli & Stowell propose a hybrid theory incorporating aspects of both

May's and Hornstein's approaches.

Their analysis adopt two central assumptions of the standard theory of quantifier scope: first, quantifier scope is determined by c–command relations holding at the level of LF; second, quantifier phrases are assigned scope by undergoing movement to their scope positions in the derivation of the LF representations. However, they reject one assumption that all QPs have the same scope possibilities. This hybrid theory draws distinctions among various QP types; whereas certain QP types may take scope in their case positions, other QP types must move to distinct LF scope positions reserved for them. In other words, each QP type has a designated LF scope position.

In this system there are five major classes of QP types, namely Interrogative QPs, Negative QPs, Distributive-Universal QPs, Counting QPs and Group denoting QPs. (38) presents a list to illustrate the QP-types.

(38)   a. Interrogative QPs: Wh-phrases such as *what*, *which man* etc.

b. Negative QPs: Nobody, no man etc.

c. Distributive-Universal QPs: QPs headed by *every, each, all*.

d. Counting QPs: Decreasing QPs with determiners like *few, fewer than five, at most six* etc.

e. Group-denoting QPs: Indefinite QPs headed by *a, some, several,* bare numeral QPs like *one student, three students*, and definite QPs like *the students*.

The relative scope positions of the five QP-types, based on their location in the functional structure of the clause are given in (39) below.

(39)                     RefP
          Spec          AgrSP
           |
      (GQP) Spec          DistP
             |
        (CQP) Spec          ShareP
               |
          (DQP) Spec          NegP
                 |
            (GQP) Spec          AgrOP
                   |
              (NQP) Spec          VP
                     |
                (CQP)
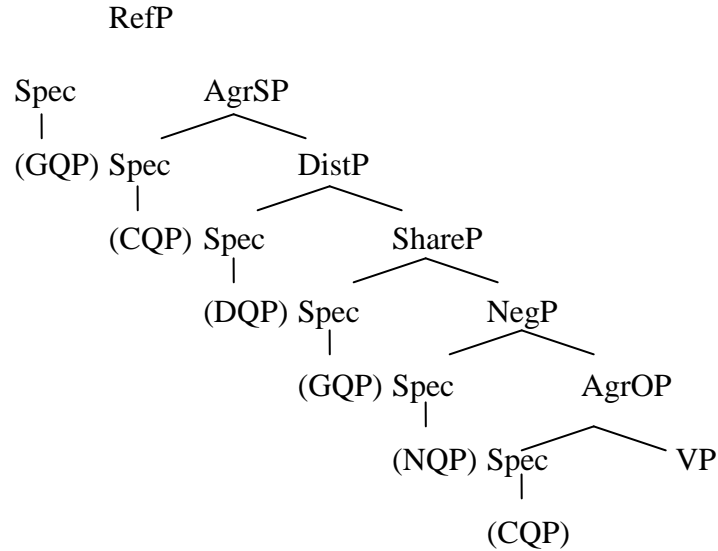
In their approach each type of quantifier acquires its scope by moving into the specifier of that functional projection which suits its semantic and morphological properties. In the system proposed by Beghelli and Stowell, the movement of the quantifiers to their scope positions is driven by the need to check features that are associated to their QP types. That is why Beghelli and Stowell refer to their proposal as a *checking theory of scope assignment.* .

Beghelli and Stowell (1997) point out that the checking theory of scope developed in their analysis is in some respects a hybrid of May's theory (1977, 1985) and Hornstein's theory (1995). The similarity of this new approach with May's QR is that in both approaches the movement of the quantifier is to non-case positions. On the other hand, the difference is that only certain types of QPs undergo QR to non-case scope positions in Beghelli & Stowell whereas in May's theory all QPs undergo QR.

The ambiguity of sentences given in (40) and (41) can be accounted for as follows in this approach.

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(40)     Someone attended every seminar.                    (∃>∀, ∀>∃)

     i.     [$_{RefP}$ someone [$_{DistP}$ every seminar [attended]]]

     ii.    [$_{DistP}$ every seminar [$_{ShareP}$ someone [attended]]]


(41)     Everyone attended some seminar.                    (∃>∀, ∀>∃)

     i.     [$_{RefP}$ some seminar [$_{DistP}$ everyone [attended]]]

     ii.    [$_{DistP}$ everyone [$_{ShareP}$ some seminar [attended]]]


"every seminar" in (40) is obligatorily distributive. Due to being obligatorily

distributive it has a [+dist] feature that needs to be checked against the distributive

operator heading DistP. Thus, the specifier of DistP is the position where "every

seminar" is supposed to land.  The indefinite QP "someone", due to being a GQP,

lands either in RefP or ShareP.  If its landing point is RefP, it takes scope over the

distributive NP. However, if it lands in Share P which is a functional projection

below DistP, it will scope under the distributive NP. Thus, the ambiguity of the

sentence is accounted for. The same explanation holds for (41) as well.

     Szabolcsi (2001) provides the following examples to illustrate how the

checking approach of Beghelli & Stowell works. The issue of reconstruction is also

crucial in giving an explanation regarding the ambiguity or the unambiguity of the

given sentences. (42) and (43) are taken from Szabolcsi to illustrate the

reconstruction process in the approach.


(42)     More than two students attended every seminar.

     i.     [$_{AgrSP}$ more than two students [$_{DistP}$ every seminar [attended]]]

     ii.    [$_{DistP}$ every seminar [ more than two students [attended]]

(43)     Everyone attended more than two seminars.

     i.       [$_{DistP}$ everyone [$_{AgrOP}$ more than two seminars [attended]]]

     ii.     * there are more than two seminars that everyone attended

(42) is an ambiguous sentence. The interpretation shown in (42i) stems from the fact that the modified numeral in subject position is a CQP which takes scope in situ. Therefore, "more than two students" takes scope in AgrSP which is located higher than DistP. The inverse scope presented in (42ii), on the other hand, is a result of reconstruction. In other word, the modified numeral in subject position reconstructs into a trace position and gets scope lower than the DistP.

(43), however, is an unambiguous sentence, because "more than two seminars" cannot get higher than AgrOP and "everyone" cannot reconstruct.

To summarize, scope is a by-product of feature checking in Beghelli & Stowell's approach. Phrases are driven to functional projections such as RefP, DistP or ShareP to check interpreted features. Reconstruction from these three positions is barred by the interpretive relevance of the features checked. Modified numerals, on the other hand, do not move to any of these three positions. They scope in their AgrPs or in a lower link of their chains.

### 2.3.1   Turkish Data in Beghelli and Stowell

So far I attempted to give brief information about how quantifiers are interpreted in terms of the analysis of Beghelli and Stowell. It was shown that the quantificational sentences in English are explainable by the checking approach of Beghelli & Stowell.  In the following section Turkish data will be analyzed to see whether the

feature checking approach is adequate to explain the data. Turkish data has been studied in terms of Beghelli & Stowell's approach by Aygen (1999) before and was argued to be unexplainable by this approach. Criticisms of Aygen (1999) with respect to Beghelli & Stowell will be presented followed by my criticism of the approach of Aygen (1999) as well as Beghelli & Stowell.

2.3.1.1 Syntax Based Analysis of Aygen (1999)

In an attempt to analyze scope relations in Turkish sentences, Aygen (1999) looks at all possible permutations of specific / non-specific subject DPs and definite / indefinite / specific / non-specific object DPs. She points out that the data presented in her analysis runs into trouble with the approach presented by Beghelli & Stowell. The interpretation of sentences having group denoting quantifier phrases in subject position and "bir NP" or "bir NP-acc" in object position is studied separately from the interpretation of sentences having distributive – universal QPs as subject and "bir NP" or "bir NP-acc" in object position.

*2.3.1.1.1   Group Denoting Quantifier Phrases (GQPs) as Subject*

The group of examples regarding GQPs presented in her analysis is given below from (44) to (47). The sentences are identical except their internal arguments. A bare noun is used in (44), a non-specific indefinite in (45), a specific NP in (46) and a specific indefinite NP in (47). The scope judgments presented in parentheses are that of Aygen's. My grammaticality judgments of the data will also be presented in the following section after Aygen's argumentation is given below.

(44)     Üç çocuk / bazı çocuk-lar araba al-dı.                    (S > O, O > S)

three kid / some kid-pl car buy-past

"Three / some kids bought car / did car-buying."

(45)     Üç çocuk / bazı çocuk-lar bir araba al-dı.               (*S > O, O > S)

three kid / some kid-pl one car buy-past

"Three / some kids bought a car."

(46)     Üç çocuk / bazı çocuk-lar araba-yı al-dı.               (*S > O, O > S)

three kid / some kid-pl car-acc buy-past

"Three / some kids bought the car."

(47)     Üç çocuk / bazı çocuk-lar bir araba-yı al-dı.          (*S > O, O > S)

three kid / some kid-pl one car-acc buy-past

"Three / some kids bought one of the cars."

(Aygen, 1999)

Her argument claiming that Stowell's system runs into trouble explaining (45) is

based on the nature of the determiner *bir* "one" in the object DP. She argues that if

*bir* "one" is a weak determiner and marks indefiniteness as Enç (1994) points out, it

must be at its case position that is Spec AgrOP. On the other hand, the quantifier *bazı*

"some" or *üç* "three" in subject position is classified as a GQP and GQPs may select

distinct scope positions at SpecRefP, at Spec ShareP or at its case position. Among

these three possible scope positions for the subject, none of them seems to be the

correct position of the subject since all these positions are above the object NP and

will end up with a meaning where the subject takes wide scope over the object.

However, in terms of the grammaticality judgment of Aygen, this interpretation is not available for this sentence.

With respect to (46), the crucial point is that the object NP is specific definite and specific definites scope at Spec RefP. However, as pointed out in Beghelli & Stowell, GQPs occupying the Spec of RefP position fulfill the function of logical subject of predication. But the specific definite is the object in (46).

The argumentation regarding (47) depends on the fact that the object NP is specific indefinite which is supposed to scope at either Spec RefP or Spec ShareP. The only available scope position for this specific indefinite object is the Spec ShareP which is under the scope of two of the possible positions of the subject GQP. Both in (46) and (47), Beghelli & Stowell's approach cannot account for the grammaticality judgments of Aygen.

In order to provide an adequate explanation for the Turkish data, Aygen questions the nature of the determiner *bir* "a". She argues that if *bir* "a" is not a weak determiner as Enç points out, then it could be the numeral quantifier "one". In such a case its position would be Spec ShareP or case position Spec Agr OP. The subject NP is still higher than the object NP. Aygen, in this case, argues that numeral quantifiers in subject and object QPs do not interact. So, the object QP is argued to be independent of the scope of the subject QP. However, as is also pointed out by Aygen, there is still difficulty in accounting for the fact that the notorious "bir" is independent of the scope of *bazı* "some".

When the grammaticality judgments of (44)-(47) are questioned, I have the intuition, similar to some other native speakers with whom I have talked, that the grammaticality judgment for (45) is quite different. I argue at this point that the interpretation of (45) changes with respect to whether the numeral *üç* "three" or the

quantifier *bazı* "some" is used. In other words, the sentence with the subject

quantifier *üç* "three" does not have the same interpretation with the sentence having

*bazı* "some" in the subject position. (45) is rewritten in (48) below with my

judgement of the sentences in paranthesis.


(48)    a. Üç çocuk bir araba al-dı.                              (*S > O, O > S)

          three kid one car buy-past

        "Three kids bought a car."


        b. Bazı çocuk-lar bir araba al-dı.                    (S > O, O > S)

          some kid-pl one car buy-past

         "Some kids bought a car."


My judgment for (48a) is the same as Aygen's, but that of (48b) changes. (48)

illustrates that although (48a) only has the object wide scope interpretation, (48b) can

be ambiguous. The ambiguity can be shown more clearly as in (49).


(49)    a. Bazı çocuk-lar beraberce bir araba al-dı.             (*S > O, O > S)

          some child-pl together one car buy-past

        "Some children bought a car."


        b. Bazı çocuk-lar bir araba al-dı. Hepsinin araba-sı da mavi-y-di.

        (S > O, *O > S)

          Some child-pl one car buy-past

        "Some children bought a car. The cars of all the boys were blue."

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The difference in the interpretation of (48a) and (48b) indicates that the quantifiers *üç* "three" and *bazı* "some" should be treated separately. Aygen's proposal about the independent behavior of the numeral quantifiers in the subject and object position and the difficulty of proposing the same thing for the quantifier *bazı* "some" also indicates the point that *üç* "three" and *bazı* "some" should be analyzed separately.

Considering the proposal of Aygen to be true, we would expect all sentences having a numeral quantifier in the subject position and a "bir NP" construction in the object position to have the same interpretation. As (45) shows, such a sentence lacks the distributive interpretation and only has a collective one both in Aygen's and my judgments. However, (50) show that every constituent in the sentence has an influential effect on the interpretation of the sentence. (50) has a distributive interpretation, not a collective one. Aygen's approach seems to be unable to provide an adequate explanation for such a sentence.

(50)    Üç çocuk da bir araba al-dı.                    (S > O, *O > S)

        three kid-pl also one car buy-past

        "All three kids bought a car."

Another point that I will criticize in Aygen's approach is that semantic influences of the predicates or the NPs are not taken into consideration. The scope issue is studied only from a syntactic view. The fact that different types of predicates or NPs cause interpretation difference is not mentioned in Aygen's analysis either. (51) to (53) illustrate this point.

(51)     Üç çocuk bir araba al-dı.                                    (*S > O, O > S)

three kid one car buy-past

"Three kids bought a car."


(52)     Üç çocuk bir fındık ye-di.                                   (S > O, *O > S)

three kid-pl one nut eat-past

"Three kids ate a nut."


(53)     Üç çocuk bir tepsi börek ye-di.                              (S > O, O > S)

three kid-pl one plate of pastry eat-past

"Three kids ate pastry."


The syntax based analysis of Aygen would treat all these sentences similarly since all
the sentences illustrate numeral quantifier- indefinite interaction. The interpretation
difference must be due to the semantic side of the issue. However, the judgements
shown in parenthesis reveal the fact that the sentences are associated with different
readings.


## 2.3.1.1.2     *Distributive-Universal QPs  as Subject*


Following an analysis of GQP subjects interacting with different object NPs, Aygen
analyzes also the interaction of distributive – universal subject QPs with the object
NPs. As a result of the analysis she observes the universal force of *her* "every" and
*bütün* "all". In contrast to the universal force, she observes that although *her* "every"
has a distributive force over the object, *bütün* "all" does not have this distributive

force. In order to illustrate the universal and distributive forces of *her* "every" and *bütün* "all", Aygen gives the following examples.

(54)  a.  Her çocuk araba al-dı.                    (distributive reading)

          every child car buy-past

          "Every child did car buying".

      a.  Bütün çocuk-lar araba al-dı.              (distributive reading)

          all child-pl car buy-past

          "All the children did car buying."

(55)  a.  Her çocuk bir araba al-dı.                (her >bir)

          every child one car buy-past

          "Every child bought a car".

      b.  Bütün çocuk-lar bir araba al-dı.          (bir >her)[6]

          all child-pl one car buy-past

          "All the children bought a car."

                                                    (Aygen, 1999)

Aygen argues that the same truth condition values hold for (54a) and (54b). This observation is thought to indicate the universal force of *her* "every" and *bütün* "all". I also agree with Aygen that structures which show incorporation of the object NP to

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[6] This interpretation is that of Aygen. My interpretation will be given in the following part.

the verb indicates the feature of universality for the quantifiers *her* "every" and *bütün* "all".

Aygen gives the examples presented in (55a) and (55b) to arrive at the conclusion that *her* "every", but not *bütün* "all" has a distributive force. However, I disagree with her judgment that *bütün* "all" lacks the distributive force. If the sentence presented in (55b) is followed as given in (56) below, the distributive interpretation is seen more clearly. (56a) illustrates that *bütün* "all" might also have a distributive feature as opposed to Aygen's proposal.

(56)  a. Bütün çocuk-lar bir araba al-dı. Hepsinin arabası da maviydi.    (her >bir)

　　　　all child-pl one car buy-past

　　　　"All the children bought a car."

　　　b. Bütün çocuk-lar bir araba aldı. Arabanın rengi maviydi.        (bir >her)

　　　　 all child-pl one car buy-past

　　　　"All the children bought a car."

The use of the quantifier *bütün* "all" with distributive predicates also indicates that *bütün* "all" can have the distributive feature as well. This is illustrated with an inherently distributive predicate in (57a) and an ambiguous one in (57b) below.

(57)　a.　　Bütün çocuk-lar bir fındık ye-di.                 (bütün > bir)

　　　　　　all child-pl one nut eat-past

　　　　　　"All the children ate a nut."

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b.     Bütün çocuk-lar bir resim yap-tı.          (bütün > bir, bir > bütün)

all child-pl one picture draw-past

"All the children drew a picture."

As shown above both (57a) and (57b) illustrate the possible distributive nature of the quantifier *bütün* "all". This possible distributive nature of *bütün* "all" leads us to question whether *bütün* "all" behaves like any other GQP as Aygen proposes.

Up to now, I attempted to explain Aygen's approach to the quantifiers *her* "every" and *bütün* "all". I argued that *bütün* "all" does not lack the distributive feature as she proposes. In the following part of this section I continue presenting Aygen's criticisms about Beghelli & Stowell's approach.

Considering the hierarchical ordering of the quantifiers presented in (39) above, (58) puts forward the possible predictions of the theory. (Stowell & Beghelli, 1997)

(58)   a. A GQP should be scopally ambiguous with respect to a DQP in the same clause. GQP moves either to the Spec of RefP or to the Spec of ShareP.
       b. A CQP in object position should never be able to take inverse scope over a GQP or DQP occurring in subject position.
       c. A GQP receives a counting interpretation when it remains in its case position.

Aygen (1999) argues that these predictions are not attested in Turkish. Regarding the prediction in (58a) we can analyze the sentences presented in (59) below.

(59)  a.      Her öğrenci bir kitap oku-du.                    (∀>∃)

              every student one book read-past

              "Every student read a book."


      b.      Her öğrenci bir kitab-ı oku-du.                  (∀>∃, ∃>∀)

              every student one book-acc read-past

              "Every student read a book."


In this particular example *her öğrenci* "every student" is DQP, and *bir kitap / bir kitabı* "one book" is a GQP. In Stowell and Beghelli's system (1997), the quantifier "every" moves to Spec DistP. In (59a) the object is indefinite non-specific and as pointed out in Beghelli & Stowell it may take scope in case positions where it is interpreted non-specifically. Depending on this point, the indefinite non-specific QP object in (59a) takes scope at its case position, namely AgrOP. As a result the distributive quantifier *her* "every" has unambiguous scope over it.

In (59b) the subject NP "every" still occupies the Spec of DistP. However, the object NP is indefinite specific this time. In the analysis of Stowell and Beghelli specific indefinite GQPs can occupy either the Spec of ShareP or the Spec of RefP position. Spec ShareP is below DistrP and thus the sentence can receive the ∀>∃ interpretation.

Although (58a) predicts that there should be scope ambiguity in (59a) and (59b) depending on the co-occurrence of a GQP and DistP, the ambiguity can be only observed in (59b). This is due to the occurrence of the case morpheme which disambiguates the structure.

Considering the prediction given in (58b) - that a CQP never takes inverse scope over a GQP or a DQP in subject position, Aygen (1999) presents the following counter examples.

(60)    a. Her çocuk en çok beş kitap oku-du.             (every>at most five)

          every child at most five book read-past

        "Every child read at most five books."


        b. Her çocuk en çok beş kitab-ı okudu.     (every >at most 5, at most 5>every)

          every child at most five book-acc read-past

          "Every child read at most five books."

The object NP *en çok beş* "at most five" is classified as a CQP and these are considered to have very local scope and to resist specific interpretations. According to the prediction given in (58b) this CQP is not expected to take inverse scope over the DistP "every" which is in subject position. However, as is shown in (60b), this inverse meaning is readily available in Turkish. As a consequence, Stowell and Beghelli's analysis seems to fail once more.

The prediction given in (58c) is supposed to fail in the Turkish data as well. (Aygen, 1999) It was pointed out in (58c) that a GQP receives a counting interpretation when it remains in its case position. In other words, GQPs support a reading where they have very local scope behaving like CQPs.

(61)    Beş çocuk bir araba al-dı.                              (bir > beş)

         five child one car buy-past

         "Five children bought a car."

Both the subject and the object in the presented sentences are bare numeral non-specific GQPs. Therefore both of them must stay in their case position for scope reasons. Depending on the fact that Spec AgrSP is higher than Spec AgrOP, we would expect the subject QP to take wide scope over the object QP. However, it is not the case.

Up to this point, Aygen's observation with respect to Beghelli and Stowell's analysis and its application to the Turkish data have been summarized to illustrate that the predictions of Beghell & Stowell are not attested in Turkish. It must be pointed out that the analysis was based on the possible LF landing sites of the different quantifiers. Aygen's analysis attempts to point out that Turkish data cannot be adequately accounted for using the approach of Beghelli & Stowell. Although I agree with Aygen that the checking analysis of Beghelli & Stowell cannot explain the relevant data in Turkish, there are points that I criticize in Aygen's observation. In addition to having different grammaticality judgments regarding some sentences presented in Aygen (1999), I argue that my basic criticism lies on the fact that Aygen did not take the semantic effects of the different types of predicates or the NPs in the sentences into consideration in her analysis.

In the following section, I will provide a more semantic based criticism with respect to Beghelli & Stowell's analysis. I will try to make it clear that only providing different LF landing sites for different QPs is not enough to account for certain data in Turkish.

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2.3.1.2 Semantic Based Analysis with respect to Beghelli & Stowell

Considering the basis of Stowell and Beghelli's approach, we can see that this analysis is based on the different properties of the quantified NPs. Beghelli and Stowell (1997) point out that membership in any of the QP types is indicated by a number of syntactic properties. These properties are morphologically encoded in the determiner position of the QP. This is obvious in the case of WhQPs and NQPs. They bear WH and n-markings respectively. They have suggested that various quantifier types, such as DQPs and NQPs, are associated with fixed scope positions defined in the hierarchical phrase structure of the clause. They also propose that various types of (in)definite and numeral QPs have certain dedicated scope positions as well. This means that structurally similar sentences with the same quantifiers would be expected to have similar interpretations regardless of the types of predicates used or the NP types in the subject or object position. This approach focuses on the properties of only the quantificational elements, but I will show that properties of the predicate and the NPs have a crucial role in sentence interpretation as well.

Consider the two sentences presented in (62) below.

(62)    a. Her çocuk bir araba-yı al-dı.                    ($\forall > \exists, \exists > \forall$)

           every child one car-acc take-past

         "Every child took a car."

b. Her çocuk bir çiçeğ-i kopart-tı.                    ($\forall > \exists$, *$\exists > \forall$)

every child one flower pick up-past

"Every child picked up a fower."

With the presence of the distributive quantifier *her* "every" in the subject position and the indefinite specific NP in the object position, the two sentences in (62a) and (62b) are identical except their predicates. The verb *almak* "to buy" is an ambiguous predicate whereas *kopartmak* "pick up" is traditionally categorized as a distributive predicate.

In terms of Beghelli & Stowell's system the subject QP *her çocuk* "every child" will be interpreted in Spec of DistrP, whereas the indefinite specific object NP can occupy either the Spec of Share P or the Spec of RefP. In other words, the subject and the object NPs have determined scope positions and as a consequence, the same interpretation would be expected from both of the sentences. This means that both of the sentences would be expected to have ambiguous meaning. However, this is not the case as can be seen from the grammaticality judgments above.

This difference between (62a) and (62b) in terms of the scope interactions must be resulting from the different kinds of predicates and NPs used. The predicates used in (62a) and (62b) differ semantically from each other. The predicate used in (62b) is a distributive predicate whereas the one in (62a) can give ambiguous meaning depending on the contextual information.

In the previous example I attempted to show that the predicate type has an important role in sentence interpretation. But, it is not only the predicate type that is crucial for the interpretation of the sentence. In the coming section it will be clarified that the semantic properties of the NPs also have an influential role.

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(63)   a. Bütün asker-ler bir kale kuşat-tı.                    (*∀>∃, ∃>∀)

       all soldier-pl a castle surround-past

       "All the soldiers surrounded a castle."


       b. Bütün birlik-ler bir kale kuşat-tı.                   (∀>∃, ∃>∀)

       all regiment-pl a castle surround-past

       "All the regiments surrounded a castle."


The two sentences presented in (63a) and (63b) have similar constructions differing

only in the semantics of the NPs in subject position. The NP in (63b) refers to a

group interpretation whereas the NP in (63a) lacks this group interpretation and has

an individual interpretation. Analyzing these sentences in terms of Stowell and

Beghelli would end up with an expectation that these sentences have the same

interpretations. However, the sentences clearly differ from each other regarding the

possible readings that they reveal. (63a) has an unambiguous collective interpretation

where all the soldiers surround a castle. (63b), on the other hand, can be interpreted

ambiguously. The first interpretation describes a surrounding activity in which the

regiments undergo the action collectively; the second interpretation pertains to a

surrounding activity where different regiments surround different castles.

       The factors influencing the interpretations of sentences are not limited to the

type of the predicate or the NP type in the subject or object positions as illustrated in

(64) below. (64) presents a stranger example which seems unexplainable by the

analysis proposed by Beghelli & Stowell. The sentences presented in (64a) and (64b)

differ only in terms of the tense used. The predicates as well as the quantificational

expressions in the subject position are identical. (64a) illustrates a sentence with the past tense marker whereas the sentence in (64b) is with the present tense marker.

(64)    a. Her asker bir tank kullan-dı.                    ($\forall{>}\exists$, $\exists{>}\forall$)

         every soldier one tank drive-past

         "Every soldier drove a tank."


        b. Her asker bir tank kullan-ıyor.                 ($\forall{>}\exists$, *$\exists{>}\forall$)

          every soldier one tank drive-pres.

          "Every soldier is driving a tank."

Although the salient interpretation of (64a) is the distributive one shown by $\forall{>}\exists$, the other interpretation sounds possible once the sentence is uttered in a certain situation that will be presented below. Consider the commander of a tank regiment giving a briefing about what kind of training they have given to their soldiers during a training period. This regiment has 50 tanks whereas 250 soldiers. The following sentence presented in (65) below does not sound odd.

(65)    Yaptığımız planlamalar sonunda verilen eğitim süresince birliğimizdeki her asker bir tank kullandı.

        (In accordance with our plans, every soldier drove a tank in the training period.)

On such a situation the sentence given in (65) has neither the distributive interpretation nor the kolkhoz collective interpretation. It has the meaning that the

soldiers drove the tanks one by one in a certain order. The same tanks could have been

used over and over by different soldiers at different times. We would get the same

interpretation even if the number of the tanks in the regiment was reduced to just one.

So, as clarified in (65), the sentence given in (64a) does not only have the real

distributive interpretation where there is a one-to-one match between the tanks and the

soldiers.

However, the present tense counterpart of the same sentence given in (64b)

only has the real distributive interpretation and the sentence lacks the meaning given

in (65). This indicates that it is not only the type of the predicates or the NPs that

cause a meaning difference but the tense of the sentence is also influential on the

scope interactions.

The pair of sentences presented in (64) above seems unexplainable with the

analysis of Stowell and Beghelli either. The QPs used in the subject and the object

positions are similar and thus we would expect the sentences to be interpreted in the

same way. However, scopal interactions illustrate that it is not the case.

To sum up this section, it must be pointed out that the syntax based analysis

of scope interactions falls short of explaining the data in Turkish. It will be shown in

the pursuing sections that a more semantic based approach is needed to account for

the relevant data.


## 3.0     Semantic Based Approaches


Up to now, I have provided an explanation regarding the approaches which base their

analysis only on the syntactic properties, not taking the semantic properties of the

constituents into consideration. It was clarified that none of these syntax based

approaches could account for the Turkish data. It is at this point that semantic based approaches in the literature should be analyzed to see whether these approaches can explain the Turkish data.

Different studies in the literature have been put forward to provide evidence supporting the fact that both verbal semantics and the semantic properties of the NPs in a sentence have an important impact on how a sentence can be interpreted. The collective or the distributive interpretations that a sentence conveys is thought to be a result of either how NPs are interpreted (Bennett, 1975; Gillon, 1992; van der Does, 1993, Heim, Lasnik & May, 1991) or how the predicates are interpreted (Link, 1983, 1991, Lasersohn, 1989, 1996). These two basic categories will be named as NP centered approaches and VP centered approaches respectively. The following sections will briefly summarize these approaches.

## 3.1 VP Centered Sentence Interpretations

VP centered approaches base their analysis on the belief that the ambiguity is located on the verb phrase whereas the noun phrases are unambiguous. These studies base their assumptions on the classification of predicate types. Before a literature review of these approaches is presented, it will be useful to present a summary of how the predicate types have been classified in the literature.

### 3.1.1 Predicate Types

Predicates have been analyzed and categorized in a number of studies such as Dowty (1986), Winter (1998), Brisson (1998), Link (1983), Landman (1989). The

discussion in these works illustrates that predicates in the literature have generally been classified into groups such as "genuine collectives", "essentially plural predicates" and "lexically distributive predicates".

Genuine collective predicates are predicates which can only be applied to groups or sums, with the interpretation of a collective action or collective state. Collective predicates cannot apply to single individuals. (66) below presents examples for the genuine collective predicates.

(66)     a. The students *are a good team*.

        b. The students *are numerous*.

Sentences which require the genuine collective predicates to apply to individuals makes no sense as (67) shows. It is clear in (67) that genuine collective predicates cannot apply to external arguments denoting single individual such as "each student" or "one student".

(67)     a. *Each student is numerous.

        b. *One student is a large group.

Essentially plural predicates, on the other hand, have distributive sub-entailments as part of their meaning. (68) illustrates examples for the group of essentially plural predicates.

(68)     a. The students were *gathering in the hall way*.

        b. The students *met for lunch*.

The sentence given in (68a) does not entail that each student gathered individually. Yet, it does place a requirement on each individual that s/he must come to the hall and remain there for some time. Thus, *gather* distributively entails some property of the members of the subject. This notion of distribution does not necessarily mean that these can be used in sentences with individual subjects as shown in (69) below.

(69)    a.*Each student gathered in the hall.

         b. *One student met for lunch.

The subjects of the collective predicates, namely the genuine collective predicates and the essentially plural predicates must be *semantically plural,* but may be *syntactically singular or plural* as shown in (70) below.

(70)    a. The students gathered.

         b. The committee gathered.

The semantic plurality of (70a) comes from the plural morpheme on the noun. However, the subject in (70b)-the committee- lacks the overt plural morpheme. In this case, the semantic plurality of the subject NP depends on the fact that "committee" is a group denoting noun.

         Lexically distributive predicates, on the other hand, can only apply to individuals. This is exemplified in (71) below.

(71)    a. One little girl *fell asleep*.

         b. The little girls *fell asleep*.

When predicated of groups as in (71b), the distributive predicates require distribution- the predicate applies to each individual member of the group. In contrast to previous cases, QPs headed by "each / every" can also be used in sentences with lexically distributive predicates. This is exemplified in (72) below.

(72)    Each little girl fell asleep.

Putting these predicate types on a continuum would lead us to a continuous scale with genuine collective predicates on the one side and completely distributive predicates on the other side. Partially collective-partially distributive predicates fall in the middle. These predicates are the ones which can either be interpreted with the distributive or the collective interpretation depending on contextual clues or other constituents in the sentence. Consider the sentence given in (73) below. The predicate used is neither purely distributive nor purely collective.

(73)    The girls pushed the wagon.

The sentence could be interpreted with a collective interpretation where the girls pushed the wagon together; or with the distributive interpretation where the girls pushed the wagons individually. These predicates can also refered to as "*contextually collective / distributive predicates*". If they can be used sensibly together with the collective adverb "together", they must be grouped as "contextually collective", and if they are compatible with the distributive adverb "individually", they will be named as "contextually distributive".

Vailette (1998), on the other hand, makes a different kind of classification of the verbs. Under this classification the predicates fall into two different categories depending on whether they can be applied to individuals or not. (74) below presents this classification.

(74)    Type I: cannot be applied to individuals

A: pure cardinality (e.g. be numerous)

B: pure collective (e.g. gather, meet)


Type II: applicable to individuals

A: mixed (e.g. lift the piano)

B: pure distributive (e.g. die, be asleep)


Type I predicates are those that cannot be applied to individuals. Pure cardinality predicates are those defined as genuine collective predicates whereas pure collective predicates are those defined as essentially plural predicates. These two subclasses of Type I predicates are distinguished by the felicity of their combination with "all". Pure collective predicates can be used with "all" as in "They all gathered" but pure cardinality predicates do not allow the use of "all" in sentences such as "*The men are all numerous". Although the universal quantifier "all" has traditionally been associated with collective predicates, the fact that one group of collectives are compatible with "all" whereas the others are not, clearly shows that these two groups differ from each other in some respects.

To account for the difference between these two sub-classes of collectives, Dowty (1987) proposes that lexical representations of certain collective predicates

provide "distributive sub-entailments" for the quantifier "all" to operate on. The function of "all" is to distribute the sub-entailments of that predicate down to each individual in the subject noun phrase. Dowty gives the sub-entailments of the predicate "gather" as something like "come to be at the same place at the same time as a lot of other people". Brisson (1998) points out a problematic part of Dowty's analysis at this point. The problem put forward by Brisson is that although it is relatively easy to see the distributive sub-entailments of the predicate "gather", it is harder to see these sub-entailments for other collective predicates.

According to Dowty, genuine collective predicates do not allow "all" because they do not have sub-entailments, and hence do not give anything to "all" to operate on. There is no evidence about why these predicates lack distributive sub-entailments in the work of Dowty as Brisson points out.

The analysis of Dowty is not only criticized by Brisson but also by Taub (1989). This criticism is based on the assumption that Dowty's analysis is circular. To make it more clear, Dowty mentions the distribution of "all" to provide evidence for the existence of sub-entailments, and yet sub-entailments are called upon to explain the distribution of "all". To resolve this circularity problem, Taub suggests another classification of predicate types depending on their compatibility with the quantifier "all". This is referred to as Taub's generalization and is stated a presented in (75) below.

(75)    Taub's Generalization

The collective predicates that disallow "all" are the predicates denoting states and achievements.

(76) below illustrates how Taub's generalization works. The predicates in (76a) and (76d) denote states and achievements respectively. It is due to Taub's generalization that these are incompatible with the quantifier "all".

(76)  a. * The boys are all a big group.                    STATE

      b. All the boys carried the piano around for an hour.        ACTIVITIES

      c. All the girls gathered in the hall way.              ACCOMPLISHMENTS

      d. *All the students elected a president.            ACHIEVEMENTS

Since Taub's generalization based on the Aktionsart classification relies on grounds independent from anything having to do with "all", the circularity problem observed in Dowty is not suffered in Taub.

Type II predicates, on the other hand, are either mixed or pure distributive. Mixed predicates are classified under the same title with the distributive predicates since Vailette (1998) argues that even on the collective construal the mixed predicates entail downward from groups to their members.

So far the basic classification of the predicates has been summarized. We have seen that predicates can be grouped under three headings, namely the collective predicates, the distributive predicates and partially distributive-partially collective predicates. The so called collective predicates are further classified into two groups, one being the genuine collective predicates and the other being essentially collective predicates. This classification is based on whether the predicate is applicable to individuals, groups or both. As is clear from the explanation so far, this classification is semantic in nature. In other words, the semantic properties of the predicates have an important impact on this classification.

3.1.2   Previous VP Centered Approaches

After a brief presentation of the predicate types in the previous section, I will attempt to present an overview of the previous VP centered approaches in this section. The common point that these analysis point out is that it is the property of the predicate that determines whether a sentence will have a collective or a distributive interpretation. Some of the analyses take the interpretation of the NP to be unique whereas some others assume it to have dual interpretation and let the predicate determine which interpretation the NP will have.

Analysis basing their explanation on the VP dates back to the works of Bartsch (1973). Bartsch (1973) considers the interpretation of the plural NP to be unique. He argues that plural NPs are interpreted only as quantifying over sets rather than individuals. Consequently, the unmarked interpretation of a sentence having a plural NP in the external argument position turns out to be the collective interpretation. The analysis accounts for the possible distributive interpretation of a sentence with a plural NP in the subject position through the use of meaning postulates. A distributive verb has meaning postulates which relate these collective applications to applications on the constituent individuals. In other words, it is the meaning postulate on the distributive predicate that is responsible for the distributive interpretation of the sentence. A collective predicate which lacks this distributive meaning postulate ends up with a collective interpretation in the sentence.

In contrast to the analysis of Bartsch (1973), Bennett (1975) does not consider the interpretation of the NP unique. Bennett bases the distributive vs collective interpretation of a sentence on different meanings that a plural NP receives when combined with either the collective or the distributive predicate. In this approach

plural NPs have two distinct readings; a set reading and a universal quantification reading. The use of a collective verb leads us to the set reading while the use of a distributive verb leads to the universal quantification reading. (77) illustrates how a sentence with plural NP gets its interpretation.

(77)    a. The boys walk.

        b. The boys gather.

The predicate in (77a) is a distributive predicate whereas the one in (77b) is the so-called collective predicate. "the boys" in the subject position has two possible interpretations; a set reading and a universal quantification reading. When combined with a collective predicate as in (77b) the set reading is preferred and if combined with a distributive predicate as in (77a) the universal quantification reading is preferred. As a result, it is the responsibility of the predicate to choose the interpretation of the plural NP.

    This analysis of Bennett has been criticized by Scha (1981) and it has been argued that the approach of Bennett can account for the sentences with intransitive verbs but falls short of explaining the ones with transitive verbs. The examples cited in (77) also contain intransitive verbs. Scha gives the example "The squares contain the circles" to talk about the graphical representation given in (78) below. The predicate used in this sentence, namely "contain" is a transitive verb. Scha (1981) argues that Bennett's approach fails to explain such cases.

(78)    The squares contain the circles.
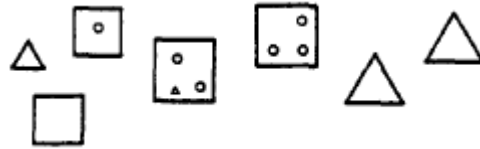


The plural subject "the squares" has a set reading and a universal quantification reading in Bennett's approach. Since the predicate in the sentence is a distributive one, Bennett's approach would predict that the subject will be interpreted with a universal quantification reading. (79) below shows the truth conditions of the sentence in (78).

(79)    $\forall x \in$ SQUARES: $\forall y$ CIRCLES: CONTAIN[x,y]

"For every x, such that, x is a square and for every y, y is a circle, x contains y".

Considering the formulae given in (79) and its paraphrase, it is clear that a sentence such as "The squares contain the circles" seems to be inappropriate for a representation like (78) above.

Scha, after presenting her criticism of Bennett, offers another explanation to resolve the collective / distributive dichotomy in sentences. Her analysis will be explained under the sub-section NP-centered approaches since Scha bases the collective / distributive distinction of sentences on the determiner in the NP.

Another basic study regarding the VP-centered approaches was carried out by Lasersohn (1989, 1990, 1995). He argues that the collective / distributive distinction is a property of the verb phrase. His argumentation is based on VP conjunctions.

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Basing his argumentation on VP conjunctions, he analyzes sentences such as (80) to provide supporting evidence for the VP based analysis.

(80)     Rick and Lisa met in a bar and had a drink.

(Lasersohn, 1989)[7]

As is clear from the example, the external argument denotes a plural subject NP with a collective predicate in the first part of the conjunct and with a distributive predicate in the second part. If collective / distributive distinction were the property of only the NP, it would be impossible to represent the truth conditions of this sentence because the same NP would have to be interpreted both collectively and distributively. However, if this distinction is thought to be the result of the different types of predicates used in the VP conjunct, the sentence seems to be explainable. Basing his analysis on such examples, Lasersohn (1989, 1995, 1998), as well as Brisson (1998), argue that collectivity / distributivity is a property of the VP (predicate) and discusses about an optional distributivity operator located on the verb. It is presented in the grammar by a "D Operator". Lack of a D operator yields a collective interpretation of the sentence. The function of the D Operator is argued to be introducing universal quantification over the plurality introduced by the subject. [8]

In this line of thought the so-called distributive predicates normally have a D Operator on them. The collective predicates, on the other hand, do not have the D

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[7] Lasersohn attributes this example to Dowty.

[8] To provide an NP-based strategy for sentences illustrating VP conjunction, van der Does (1993) and Gillon (1992) proposes two different strategies. Van der Does argues that a strategy like quantifying-in gives us a way to have one noun phrase in two places; and Gillon proposes that we can use small pro to have two noun phrases in an anaphoric relationship. However, as Brisson points out, the two noun phrases, though coindexed, are not coreferential, since one denotes a quantified expression (the distributive NP) and one is a definite description (the collective NP).

Operator on them thus they only have the collective interpretation. (81) gives an example of how a collective predicate is interpreted in sentences.

(81)  a.  The boys gathered in the hallway.

      b.  gathered. in the hallway. (the boys)

However, an ambiguous predicate like "eat" may or may not have the distributivity operator on it depending on the overall meaning of the sentences. This is illustrated by the predicate "eat" in (82) and (83) below.

(82)  a.  The boys ate a sandwich.

      b.  ate.a.sandwich.(the boys)

(83)  a.  The boys ate a sandwich.

      b.  $^D$ate.a.sandwich.(the boys)

      c.  $\forall x[x \in$ the boys$\Rightarrow$ate.a.sandwich(x)]

If the VP is interpreted with a D Operator that introduces universal quantification then we get the interpretation that the boys ate different sandwiches as shown in (83) above. On the other hand, the sentence can also be true in a situation where the boys ate the same sandwich. (Maybe the sandwich was too big) This collective reading can be represented by predicating *the boys* of the VP *ate a sandwich* without any D Operator as shown in (82).

It is argued in Lasersohn (1998) that the D Operator produces a distributive

reading for the argument with which the expression combines first. The following

examples are given to illustrate the point in Lasersohn (1998).


(84)    The first year students $^D$[took an exam].

(85)    John $^D$[summarized] the articles.

(86)    John $^D$[learned] about the impressionists.[9]


In (84) the disributivity operator on the predicate produces a distributive reading on

the subject, the one in (85) gives a distributive reading on the object and finally in

(86) the D-Operator produces a distributive reading on the object of the preposition.

Similar to Lasersohn's D-Operator, Link (1983, 1991) point out the existence

of a "* Operator" operating on the noun phrase while mentioning a D-Operator

functioning on the verb phrase to deal with the collective / distributive distinction.

The collective reading in the analysis of Link is only possible in combination with

individual denoting plural noun phrases such as "three men, the men, some men".

These individual denoting plural noun phrases are referred to as the individual sums

(i-sums). For example, the collective reading of (87) can be represented as in (88).


(87)    John lifted three tables.

(88)    $\exists x(*table(X) \land |X| = 3 \land lift(j,X))$

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[9] Although Lasersohn's argumentation regarding the distributivity operator seems plausible for these examples; other sentences having plural subject NPs such as (i) pose problems.
        (i)        John and Jason $^D$[summarized] the articles.
Considering Lasersohn's argumentation that the D operator produces a distributive reading for the argument with which the expression combines first , we would only expect the interpretation where John and Jason together summarized the articles distributively. However, it should be noted that another interpretation of the sentence is the one where John and Jason distributively summarized the articles.

The NP "three tables" in (87) is an individual denoting plural noun phrase. In the representation given in (88) this i-sum is represented as "*table". With this i-sum interpretation it has the option to be used with predicates of collective interpretation. The lack of a D-operator on the predicate indicates that the predicate will be used with its collective interpretation.

To obtain a distributive interpretation of the sentence in (87) Link needs the operation to get at the atomic individual of the i-sum denoted by "three tables". To do this Link uses the distributivity operator D which can be attached to one-place predicates and allows one to quantify over atomic individuals. As a consequence, (87) will be represented as (89) with its distributive interpretation.

(89)     $\exists x(*table(X) \wedge |X| = 3 \wedge^D lift(j,X))$

It is clear from the representations of both the collective and the distributive interpretations that the different interpretations are the results of the occurrence or the non-occurrence of the D-Operator on the predicate.

In consequence, in the analysis that we have gone over so far, the distributivity / collectivity distinction is explained to be represented as follows: the distributive interpretation is represented by means of a D Operator on the VP. A sentence that is interpreted collectively involves direct predication of the plural subject and the VP, without an intervening D-Operator.

### 3.1.3 Turkish with respect to VP-Centered Analysis

Before analyzing Turkish sentences in the framework of VP-centered approaches, I would like to present an important fact about the necessity of compatibility between the interpretations of the subject NP with the interpretation of the predicate in the sentence. This necessity is observed both in Turkish sentences as well as sentences of other languages. The compatibility condition for each predicate type will be analyzed and discussed in detail in Chapter 3. However, I will provide a summary of the basic facts of the compatibility condition in this section.

A singular NP can be interpreted only with the atomic individual representation and a plural NP can have either the atomic individual representation or the assemblage representation. In line with this, the predicates are typed to accept either NPs with assemblage interpretation or NPs with individual interpretation or both. A type mismatch would result in the unacceptability of the sentence. In other words, a subject-predicate agreement is expected for the sentence to be interpretable. The following section will attempt to clarify the point by presenting illustrations in Turkish.

The collective predicates like "meet, gather etc" require the subject NP to be plural. In the terminology used by Link (1983), this refers to the i-sums. Individual denoting singular noun phrases as external arguments cannot be used with these kinds of predicates as shown in (90) below.

(90)     a. Çocuk-lar oda-da toplan-dı.

        child-pl room-dat gather-past

        "The children gathered in the room"

b. *Çocuk oda-da toplan-dı.

   child room-dat  gather-past

   "*The child gathered in the room"

(91) illustrates that this plurality is not necessarily morphological plurality. Semantic plurality of the external argument is the necessary condition for a collective predicate rather than morphological plurality. The external argument in (91) is a group denoting noun. It does not have morphological plurality but the sentence is still interpretable. This is related to the semantic plurality of the external argument *sınıf* "class".

(91)    Bizim sınıf bahçe-de     toplandı.

        our class garden-loc gather-past

        "Our class gathered in the yard"

The distributive verbs, on the other hand, do not require this semantic plurality. They can be used either with singular NPs or with plural NPs. (92a) illustrates the use of a distributive predicate with a singular external argument whereas (92b) shows the use of a distributive predicate with a plural subject NP. The interpretation of the external arguments regardless of being singular or plural that is compatible with the meaning of the distributive predicate must be the atomic individual representation.

(92)    a. Bebek salıncak-ta uyu-du.

        baby swing-loc sleep-past

        "The baby slept in the swing."

b. Çocuk-lar salıncak-ta uyu-du.

child-pl swing-loc sleep-past

"The children slept in the swing."

A group denoting noun that has an inherent semantic plurality can also be used with distributive predicates. (93) presents that the interpretation of the group denoting noun in the external argument position is the atomic individual representation. Each individual member of the external argument undergoes the action denoted by the predicate individually.

(93)    Bizim sınıf bahçe-de uyu-du.

our class garden-loc sleep-past

"Our class slept in the yard"

Ambiguous predicates like *taşımak* "carry" are free to be used with either plural or singular external arguments. Only the distributive interpretation is available when such kinds of predicates are used with singular NPs as exemplified in (94), and both a distributive and collective interpretation is possible when they co-occur with plural subject NPs as shown in (95). (95) either has a meaning where the children carried a single box together or an interpretation where children carried different boxes. The previous interpretation coincides with the collective meaning whereas the latter one gives the distributive meaning.

(94) Çocuk kutu-yu taşı-dı.

child box-acc carry-past

"The child carried the box"


(95) Çocuk-lar kutular-ı taşı-dı.

child-pl box-pl-acc carry-past

"The children are carrying the boxes"


In this section I tried to point out that the choice of the atomic individual

representation or the assemblage representation of the NP must be compatible with

the requirements of the verb type for the sentence to be interpretable. In the coming

paragraphs I want to analyze Turkish sentences in terms of the VP-centered analysis.

The examples presented below will be those having compatibility between the

interpretation of the subject NP and that of the predicate. Non-interpretable sentences

due to the incompatibility will not be taken into consideration.

(96) presents some examples to be studied over within the framework of VP-

centered analysis. The discussion following the examples illustrates that they can be

explained with the so called D-Operator on the predicate. Three main predicate types

are exemplified below.


(96)    a.      Bütün asker-ler bir kale kuşat-tı.                    coll.

                all soldier-pl one castle surround-past

                "All the soldiers surrounded a castle."

b.	Bütün kız-lar bir çiçek kopart-tı.	distr.

all girl-pl one flower pick up-past

"All the girls picked up a flower."


c.	Her kız bir fındık ye-di.	distr.

every girl one nut eat-past

"Every girl ate a nut."


d.	Bütün kız-lar bir şarkı söyle-di.	distr. / coll.

all girl-pl one song sing-past

"All the girls sang a song."


e.	Her kız bir şarkı söyle-di.	distr.

every girl one song sing-past

"Every girl sang a song."


(96a) presents an example having a collective predicate. As was mentioned above, the collective predicates lack the D-Operator and the verb *kuşatmak* "surround", being a naturally collective predicate, also lacks the D-Operator. As a result the sentence ends up with a collective interpretation. (96b), on the other hand, has a distributive predicate and therefore a D-Operator on it. This D-Operator directly leads to a distributive interpretation of the sentence. The subject NP in (96c) does not represent an i-sum. The fact that its predicate has a D-Operator on it makes the sentence a distributive one. An ambiguous predicate is exemplified in (96d). This ambiguous predicate may bear a D-Operator in some cases and not in others. If it

bears the D-Operator, then the sentence will have a distributive reading. It will end up with a collective reading otherwise. Finally, the sentence in (96e) also has an ambiguous predicate. However, the subject NP *her kız* "every girl" lacks the i-sums interpretation this time. Therefore, due to the necessity for an agreement between the subject and the verb, the sentence only has a distributive interpretation despite the ambiguous predicate.

Although these particular examples seem to be explainable with this approach, there are cases that cannot be explained in a similar way. In the following paragraphs, the discrepancies of the VP centered approaches will be discussed. As mentioned in the previous sections, the interpretation of the sentence depends on whether the predicate has the distributivity operator or not. It was discussed above that the collective predicates naturally lack this operator whereas the distributive predicates necessarily have it. The ambiguous predicates, on the other hand, may or may not bear the D-operator. This property falls short of explaining sentences such as the ones presented in (97) below.

(97)   a. Bütün birlik-ler bir kale kuşat-tı.                   distr. / coll.

      all regiment-pl one castle surround-past

      "All the regiments surrounded a castle."

    b. Bütün sınıf-lar bir oda-da toplan-dı.                   distr. / coll.

      all class-pl one room-loc gather-past

      "All the classes gathered in one room."

c. Bütün kız-lar bir tabak fındık ye-di.                                    distr. / coll.

   all girl-pl a bowl of nuts eat-past

   "All the girls ate a bowl of nuts."

An analysis of the sentences in (97) reveals the inadequacy of the VP centered approaches. The sentences in (97a)-(97c) are ambiguous sentences with both a distributive interpretation and a collective interpretation. The VP centered analysis, which is based on the presence / absence of a D operator on the verb, places a D operator on the verb *yemek* "eat" in (97c). The verbs *kuşatmak* "surround" in (97a) and *toplanmak* "gather" in (97b), on the contrary, lack the D operator due to their collective nature. The subject NPs *bütün birlikler* "all regiments", *bütün sınıflar* "all classes" and *bütün kızlar* "all girls" have the i-sums interpretation of Link. The D operator on the verb in (97c) would predict a unique distributive interpretation of the sentence. However, the sentence is ambiguous with a collective interpretation where the girls ate a bowl of nuts together and a distributive interpretation where each girl ate a different bowl of nuts. Similarly, the lack of the D operator on the verb *kuşatmak* "surround" in (97a) and the verb *toplanmak* "gather" in (97b) predicts an unambiguous collective interpretation of the sentence. However, the sentences also have a distributive interpretation where the regiments surrounded different castles and the classes gathering in different rooms. These distributive readings are not expected if the VP centerd approach based on the D operators is assumed to hold.

   In this section an overall analysis of some quantificational sentences in Turkish within the VP-centered approach was presented. It was shown that some of the presented sentences were explainable within this approach and some were not. This indicates that the collective / distributive distinction cannot solely be a matter of

the type of the predicate. It seems that other factors seem to be influencing the overall interpretation of the sentence in addition to the type of the predicate.

### 3.1.4   Shortcomings and Benefits of the VP-Centered Approaches

Approaches basing their assumptions on the types of different predicates or on the availability / non-availability of the operators on the predicates seem to have benefits as well as shortcomings. These approaches seem to account for sentences containing two different types of predicates conjoined with a conjunction. Sentences such as (98) and (99) exemplify the conjoined sentences within the framework of the VP centered approaches.

(98)    John and Mary met in the bar and had a beer.
(99)    Three students worked tirelessly and mowed the whole meadow.

In both (98) and (99), we observe a combination of a collective activity and a distributive one. "Meeting in the bar" is the collective action and "having a beer" is the distributive one in (98), whereas "working tirelessly" is the distributive action and "mowing the whole meadow" is the collective one in (99). In (99), the subject plural NP, "three students" is interpreted distributively with respect to the predicate "work tirelessly", and collectively with respect to the predicate "mowed the whole meadow". The presence / absence of the D Operator on the verbs lead to the correct interpretation of the subject NP. Thus, the sentences are accounted for by the VP centered approaches. (100) is still more problematic in terms of the NP-centered approaches but seem to be explained in terms of the VP-centered ones.

(100)   Three students mowed the whole meadow together. They worked tirelessly.

If a set reading of the plural subject NP is required to give the collective interpretation to the first sentence, then the subject pronoun "they" in the second sentence would be expected to have the same set interpretation since "three students" act as the antecedent for it. However, with this set reading the second sentence would also have a collective interpretation which is not the case.

Such examples seem to be provided a better explanation by the VP-centered analysis. If the predicates are responsible for the collective / distributive distinction, both sentences would need to be analyzed on different grounds provided that their predicates are of different types.

Although VP-based analysis can provide explanation for these kinds of sentences, it falls short of explaining the cumulative interpretations expressed by sentences like (101).

(101)   a. Three boys invited four girls.

        b. Three students wrote a paper. They sent them to a journal.

It must be noted that there may be a lot of possible inviting relations between boys and girls in sentence (101a). If the collective / distributive distinction depends solely on the predicate and its meaning postulates, then the predicate would need to be typed both for individual and set-like arguments. However, predicates are expected to have a single meaning postulate and this creates a mismatch. As a result, correct interpretation for a sentence like (101a) would be difficult to get with the VP-centered analysis.

The first sentence in (101b) has an ambiguous predicate and therefore can be interpreted either collectively or distributively. However, the second sentence forces the interpretation of the first sentence to be only distributive. The fact that collective interpretation becomes invisible for this sentence seems to pose a problem for the idea that predicates are the only responsible constituents for the collective /distributive distinction of the sentence. This also makes it more clear that discourse and contextual clues play a crucial role in the interpretation of sentences. It cannot be solely a syntactic phenomena and it cannot be only related to the semantics of constituents at the sentence level.

Another discrepancy of the VP-centered approaches is pointed out by Scha & Stallard (1988). They mention the conjunctive noun phrases which they name as "the multi-level plurals" as the problematic issue. "the girls and the boys" and "the committees and the juries" are examples to be given to the multi-level plurals. As defined in Scha & Stallard (1988) these multi-level plurals have internal structure which cannot be abolished by assimilation to a single set. Consider a sentence as in (102) below.

(102)   The boys and the girls gathered.

This sentence is ambiguous between two interpretations one of which is that the boys and the girls came together to form a single group whereas the other being, the boys gather in one place and the girls gather in another place. The second interpretation is named as "partially distributive". If the predicate "gather" is considered to be a collective quantifier and if the collectivity vs. distributivity depends solely on the predicate type, the sentence presented in (102) would be expected to have an

unambiguous interpretation. This interpretation would be the collective one where the boys and the girls came together to form a single group. However, the partially distributive interpretation is also commonly used.

Carpenter (1995) also presents a similar example as counter-evidence for the VP centered approaches. (103) presents his example.


(103)   Three committees met.


The plural NP "the committees" is also a multi-level plural even though it does not involve a conjunction. The sentence presented in (103) also has a partially distributive meaning similar to (102). If the predicate is considered to be responsible from the collectivity or the distributivity of the sentence, then the expected interpretation would be only the collective one where three committees met to form a large committee. At this point the meaning postulate analysis fails since the predicate "meet" brings a single meaning postulate to the sentence and due to this reason we expect to have similar interpretations from sentences like "The children met" and "The committee met."  Scha & Stallard (1988) point out that meaning postulates are stipulated to be true in all models, so it is logically incoherent to have several, mutually incompatible meaning postulates for the same constant.

Apart from these problematic parts, Turkish also has data that remain problematic for the VP-centered approaches. These were given and explained in the previous section so we do not need to discuss that issue over in this section.

In this particular section, I tried to provide a theoretical background on how the VP-centered studies approached the problem of collective /distributive distinction in sentences. The shortcomings as well as the benefits of the approach were

presented briefly. The following section will deal with the other end of the continuum- that is the studies basing their assumptions on the interpretation of the NPs in sentences.

## 3.2   NP Centered Sentence Interpretations

In contrast to the VP-centered approaches, the NP-centered analysis takes the focal point of the collective / distributive distinction to be the noun phrase. The noun phrases are thought to be ambiguous between three readings: collective, distributive and neutral interpretation. The interpretation of the noun phrase must coincide with the interpretation of the predicate. (Heim et al. 1991, Frazier et al 1999, Frazier & Clinton 2001)

Although the proponents of the NP-centered approach, some of whom are Scha (1981), Gillon (1987), Schwarzchild (1996, 1994, 1992), base the distributive / collective sentence interpretation on basically the noun phrase, their analysis vary in some respects. Gillon puts emphasis on the different minimal covers that an NP has whereas Scha attributes the difference between the two readings to the interpretation of the determiner. In the following sections I will provide a brief explanation as to how these approaches attempt to solve the meaning dichotomy.

### 3.2.1   Previous NP-Centered Approaches

The basic NP-centered approach that gives the responsibility of the collective / distributive distinction only to the NP is that of Scha (1981). According to Scha (1981), the collective-distributive ambiguity resides inside the noun phrase, not in the

predicate or the whole sentence. More precisely, Scha attributes the ambiguity to the lexical features of determiners. Numerals, the null determiner, *all*, plural *some* are ambiguous between three types of readings: a distributive (D), a collective (C) and a neutral (N) one. The distributive reading means we quantify over atomic individuals, the collective reading means that we quantify over collections and the neutral reading expresses that we quantify over objects that take part in certain collections. Only the plural definite article is unambiguously forcing a collective reading.

To provide a clearer explanation as to how Scha approached the problem of collective – distributive distinction, it must be noted that in this analysis noun phrases, regardless of number, quantify over sets of individuals: a singular noun phrases simply quantifies over a singleton set. Verbs are typed to accept sets of individuals as their arguments. The collective / distributive distinction consists in whether a verb is applied to a large set or to a singleton set. The determiner translations have an important impact on whether the predicate applies to the large set or the singleton set. In other words, determiner translations are either distributive or collective depending upon whether they apply the predicate to constituent singletons or to their union. Some determiners are unambiguously distributive, like "each". Other determiners like "all, some, three" are ambiguous between translations which are distributive and translations which are collective. Plural "the", on the other hand, is unambiguously collective. Scha & Stallard (1988) point out that for "the+plural NPs" the analysis are vague than one would desire. To illustrate their point they present the example sentences given in (104) below.

(104)   a. The boys walk.

         WALK(BOYS)

b. The boys gather.

GATHER(BOYS)

c. Each boy walks.

$$\forall x \in BOYS*:WALK(x)^{10}$$

It was pointed out above that the determiner translations are held responsible for the collective / distributive distinction of sentences. If that is the fact, the sentence given in (104c) can be accounted for easily considering the fact that the determiner in the subject NP is unambiguously distributive. However, the point that was mentioned above about the treatment of the plural "the" poses a problem. If plural "the" is considered to be unambiguously collective, then (104a) and (104b) would both be expected to have a collective interpretation. However, it clearly is not the case. (104a) is completely distributive whereas (104b) is completely collective. Meaning postulates for verbs are used in this case to derive other readings. These meaning postulates control how the predicate is distributed over the constituents of its argument.

To summarize what we have gone over so far, Scha, a pioneer of the NP centered approach places the responsibility of the collective / distributive distinction of sentences to the determiner in the NP. Meaning postulates were used to resolve the problematic cases as mentioned in the previous paragraphs.

Following Scha (1981), Gillon (1987) also studied the collective / distributive distinction within the framework of NP-centered approaches. The common point that it shares with the analysis of Scha is that both attributes the distinction between the collective and the distributive interpretations to the NP. However, unlike Scha,

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[10] The asteriks "*" operator creates the set of singleton subsets of "BOYS". The determiner "each" leads the predicate to apply on the singleton subset of BOYS since it is purely distributive.

Gillon does not put the responsibility on the determiner within the NP. Rather than the determiner interpretation, Gillon introduces the "minimal cover" notion in his approach.

It is argued in Gillon (1987) that the readings of plural noun phrases bijectively correspond with the "minimal covers" of the set denoted by the noun phrase. The reason behind the introduction of such a notion as "minimal cover" is that in the previous approaches a predicate is either interpreted distributively, in which case the property it denotes is distributed down to each atomic individual in its plural subject, or collectively, in which case there is no distributivity. However, Higginbotham (1980), Gillon (1987) and Schwarzchild (1994) point out that there are predicates that can be true on a reading that we call "intermediate distributivity". Intermediate distributivity refers to distributivity down to sub-pluralities of the plural subject but not all the way down to atoms. Covers give a formal way to make the D operator to range not only over atoms of plurality, but sub-pluralities of a plurality.

(105) is given below to illustrate the notion of minimal cover. If the NP "the men" denotes the set of {a, b, c}, some possible covers for this NP are presented in (105).

(105)  I = {{a},{b},{c}, {s,t}}

J = {{a},{c}, {b,s,t}}

K = {{a,b,c}, {s,t}}

L = {{a,b},{c}, {s,t}}

If the context assigns the minimal cover I in (105), then the sentence would have a fully distributive interpretation. On the other hand, assignment of the minimal cover

K would yield a collective interpretation. The minimal covers presented in J and L illustrate different sub-pluralities of the same NP.

Gillon emphasizes that noun phrases are not vague between their minimal covers but authentically ambiguous. Schwarzschild (1992, 1994, 1996) also uses the notion of minimal cover in his analysis of sentence interpretations. Schwarzschild argues that the relevant cover that the D operator will range over is determined by the context of utterance. The sub-pluralities that are salient in discourse makes up the cells of the cover. The D operator is called *Part* in the analysis of Schwarzschild. The Part Operator is accompanied by a context dependent domain selection variable called *Cov* variable. In interpreting a sentence the context assigns different minimal covers as *Cov* and the Part Operator (or the D-Operator) ranges over this minimal cover.

The importance of lexical semantics in assigning appropriate minimal covers should not be ignored. For instance, a predicate like "be hungry, sleep …etc." which applies only to individuals, should be assigned a Cov that has singleton cells. Otherwise, the sentence would be false depending on the fact that there cannot be sets of boys in the extension of "be hungry, sleep…etc." Likewise, a predicate like "build a raft" can apply to a plurality or a singleton, since it is a mixed- extension predicate. So, it is clear that pragmatics play an important role in determining what entities the predicate is supposed to be distributed down to.

When it comes to the interpretation of collective predicates, the analysis of Schwarzschild offers a new explanation. Since the Part Operator has *Cov* in its restriction, it is possible to interpret even collective predicates with a Part Operator. If the value assigned to *Cov* includes a cell that is equivalent to the set denoted by the subject DP, then the sentence will have a collective reading.

For example, a collective predicate like "surround" can be translated as shown in (106) below.

(106)  a. The soldiers surrounded a castle.

b. (Part(Cov)(surround a castle))(the soldiers)

c. [the boys] = {a, b, c}

I = {{a},{b},{c}, {s,t}}

J = {{a},{c}, {b,s,t}}

K = {{a,b,c}, {s,t}}

L = {{a,b},{c}, {s,t}}

Possible minimal covers for the subject NP of (106a) are presented in (106c). Lexical semantics of the collective predicate assigns only Cov in K. In other words, the Part Operator can only have the Cov K in its restriction. The other possible minimal covers are not appropriate for the sentence.

The approach of Gillon (1987) and Schwarzschild (1992, 1994, 1996) that takes the minimal covers as the basis of collective / distributive distinction has been criticized by others in the literature. On being a proponent of the VP centered approaches, Lasersohn (1995) finds this claim disturbing and mentions that Gillon's semantics assigns incorrect truth conditions in a number of cases.

Lasersohn presents the sentences in (107) and (108) as a counter evidence for the NP-centered approach of Gillon. Although the sentences given in (107) can be provided an explanation in the analysis of Gillon, the same explanation does not hold for (108).

(107)   a. The teaching assistants were paid exactly $7000 last year.

        b. The teaching assistants were paid exactly $21000 last year.

The situation presented by Lasersohn for this pair of examples is as follows: John, Mary and Peter are teaching assistants and were paid $7000 each last year. In this situation both of the sentences given in (107a) and (107b) are true as predicted by Gillon. Sentence (107a) is true since each element of the minimal cover {{John},{Mary},{Peter}}was paid exactly $7000 last year. Sentence (107b) is true since each member of the minimal cover {{John, Mary, Peter}} was paid exactly $21000.

Despite the fact that these sentences are unproblematic in Gillon' analysis, the sentence presented in (108) below makes a wrong prediction.

(108)   The teaching assistants were paid exactly $14000 last year.

Gillon's analysis would predict that the given sentence in (108) would be true because each member of the minimal cover {{John, Mary}, {John, Peter}} was paid exactly $14000. However, the sentence is not true in reality.

This particular section attempted to provide an explanatory background on the NP centered approaches. It was shown that the interpretation that an NP gets in accordance with the predicate leads to the interpretation of the whole sentence. In the following part, I will try to point out general drawbacks of the so-called NP centered approaches.

3.2.2.  <u>Turkish with respect to the NP-Centered Analysis</u>

It was mentioned in the previous section that some NP-centered approaches placed the responsibility of the distinction between collective vs. distributive interpretations on the determiner within the NP. (Scha, 1981) It seems that such an analysis is not preferable for the data in Turkish. (109) present a pair of sentences whose constituents are identical including the determiners in the subject NP. The only different constituent is the object NP.

(109)  a.  Bütün kız-lar bir fındık ye-di.                          distr.

        all girl-pl one nut eat-past

        "All the girls ate a nut."


       b.  Bütün kız-lar bir paket fındık ye-di.              distr. / coll.

        all girl-pl one packet of nuts eat-past

        "All the girls ate a packet of nuts."

As shown above the sentence presented in (109a) is distributive whereas the one in (109b) is ambiguous. If the analysis of Scha is considered, we would expect to have an identical interpretation of the two sentences. In such cases Scha's analysis uses meaning postulates to account for the differences between the two sentences. This pair of sentences shows that the meaning postulates of the predicates will not be enough to give the interpretation difference. The object NP should also be taken into consideration if we are to use the meaning postulates to differentiate the two sentences. Furthermore, I would also like to mention one point that, using meaning

postulates of the predicates would directly make this NP-centered analysis move to the side of the VP-centered approaches.

If we approach the issue in terms of the "minimal cover" analysis of Gillon (1987) and Schwarzschild (1994), we can see that many of the examples can be explained. However, some modifications to the approach may be needed also. (110a) presents an ambiguous sentence with a collective predicate. Some possible minimal covers are given in (110c). The collective reading of the sentence is possible if the context assigns the minimal cover K, the distributive reading is available if the minimal cover assigned by the context is I.

(110)  a. Bütün birlik-ler bir kale kuşat-tı.                    distr. / coll.

         all regiment-pl one castle surround-past

         "All the regiments surrounded a castle."

       b. (Part(Cov)(surround a castle))(the regiments)

       c. [the regiments] = {a, b, c}

              I = {{a},{b},{c}, {s,t}}

              J = {{a},{c}, {b,s,t}}

              K = {{a,b,c}, {s,t}}

              L = {{a,b},{c}, {s,t}}

However, one point seems problematic in this case. The minimal cover of a noun phrase is made up of atomic individuals as well as different combinations of those atomic individuals. In other words, {a},{b},{c}, represent the atomic individuals of the NP, "regiments". It is clear that for group words like "regiments, class etc.", these representations stand for a group of atomic individuals. The same representation for

the NP "the men" stand for real atomic individuals, however. This does not sound to be a big problem but to make things clearer I propose to represent the denotations of the group denoting nouns as underlined. In this case the sentence given in (110a) would be represented as (111) below. The predicate surround a castle" can now choose either the minimal cover I or K, since the underlined representations stand for group NPs, not individual atomic NPs.

(111)   [the regiments] = {<u>a</u>, <u>b</u>, <u>c</u>}

  I = {{<u>a</u>},{<u>b</u>},{<u>c</u>}, {<u>s</u>,<u>t</u>}}

  J = {{<u>a</u>},{<u>c</u>}, {<u>b</u>,s,t}}

  K = {{<u>a</u>, <u>b</u>, <u>c</u>}, {s, t}}

  L = {{<u>a</u>, <u>b</u>}, {c}, {s, t}}

"Why do we need to have a different representation for group NPs?" is a question to be answered now. In order to give an explanation for this question, let us remember the following examples given in (112) below.

(112)   a. *Bütün birlik-ler bir fındık ye-di.                    (IMPOSSIBLE)

       all regiment-pl one nut eat-past

       "All regiments ate a nut."


     b. Bütün kız-lar bir fındık ye-di.                    distr.

       all girl-pl one nut eat-past

       "All girls ate a nut."

The only difference between the two sentences given in (112a) and (112b) is the subject NPs. (112a) has a plural group denoting noun whereas (112b) has a plural noun in the external argument position. The predicates of the sentences are identical so this means that both would require the same minimal covers if we do not differentiate between the group nouns *birlikler* "regiments" and the plural noun *kızlar* "girls". Thus, this would lead us to a unique interpretation for the sentence. However, as the interpretation show this is not the case.

Therefore, I propose to use underlined denotations for group words in the minimal covers and furthermore propose to have a requirement that distributive predicates like "eat a nut" can appoint only distributive minimal covers except those denoting group denoting nouns. Such a predicate must be unable to assign the collective minimal cover. In this line of thought, the possible minimal covers for (112a) and (112b) can be as shown in (113a) and (113b) respectively.

(113)  a.  [the regiments] = {$\underline{a}$, $\underline{b}$, $\underline{c}$}

I = {{$\underline{a}$},{$\underline{b}$},{$\underline{c}$}, {$\underline{s},\underline{t}$}}

J = {{$\underline{a}$},{$\underline{c}$}, {$\underline{b}$,s,t}}

K = {{$\underline{a}$, $\underline{b}$, $\underline{c}$}, {s, t}}

L = {{$\underline{a}$, $\underline{b}$}, {c}, {s, t}}


b. [the girls] = {a, b, c}

I = {{a},{b},{c}, {s,t}}

J = {{a},{c}, {b,s,t}}

K = {{a, b, c}, {s, t}}

L = {{a, b}, {c}, {s, t}}

The predicate in (112a) "eat a nut" cannot assign any of the minimal covers presented in (113a) since it is unable to assign a collective minimal cover and also the distributive minimal cover with group representations. However, the same predicate in (112b) can assign the minimal cover I in (113b) since they do not denote group denoting NPs. If we do not use a different representation for group denoting noun, how are we to account for the unacceptability of the minimal cover I for (112a)?

In this section, I pointed out that although the analysis of Scha which placed importance on the determiners was not adequate, an analysis of Turkish data in terms of the minimal cover approach of Gillon and Schwarzschild gave out a better analysis provided that a different representation is used for the group denoting nouns.

### 3.2.3.  Shortcomings of the NP-Centered Approaches

Two main objections have been raised to the NP-centered approach of Scha in the literature. The first objection is related to the coordinate VP structures or as called in the literature "Dowty Sentences". (114) illustrates these coordinate VP structures.

(114)  a.     Four men went to the bar together and had a beer each.

       b.     John and Mary won a lottery drawing and then developed insomnia

              worrying about the money.

                                                          (Roberts 1987)

As is clear from the examples in (114) the first part of the VP conjunct is true of a collective construal whereas the second part is true with a distributive one. If the NP-

centered analysis is thought to apply, we get an inappropriate result. These approaches assume that NPs have different denotations in their collective vs. distributive interpretation. If so, for the coordinate structures, the same occurence of the determiner would be expected to have different denotations for different verbs.

The second objection is related to the anaphoric potential of plural noun phrases. Schwertel (2005) gives the sentence presented in (115) as a follow up of the sentence given in (114a).

(115)   They talked about football.

In this case the subject NP "they" refers to the four men who went to the bar together and had a beer each. Depending on the anaphoric potential of the plural NP, the interpretation of the pronoun "they"- collective or distributive"- would depend on the interpretation of "four men" in the previous sentence. However, it is difficult to talk about whether this subject NP is collective or not due to its being in a coordinate structure. So how are we to account for the interpretation of "they" in the following sentence?

Up to now, I tried to draw a general outline of the previous semantic based approaches in the literature. These semantic based approaches were classified into two main categories namely the VP-centered approaches and the NP-centered approaches. Turkish data was analyzed within the framework of both and it was seen that each approach had shortcomings of its own. It must be noted at this point that neither the VP-centered approaches nor the NP-centered approaches took the temporal side of the issue into consideration. However, it will be shown in the following section that the temporality is also of great importance for the

interpretation of a sentence. It will also be mentioned that different combinatorial possibilities for the sentences are ignored in both the VP and the NP centered analysis. The next section will attempt to provide a brief explanation as to the general drawbacks of the two approaches.

### 3.3.   General Drawbacks of the Semantics-Based Approaches

Both the VP-centered and the NP-centered approaches have their own discrepancies. These discrepancies were mentioned briefly in the previous section. One problem that these semantic based analyses have in common is related to the nature of distributivity expressed by the sentences. In other words, distributivity does not necessarily need to have a one-to-one correspondence between the subject NP and the object NP. However, the analysis of scope interactions is usually based on simply a distributive or a collective interpretation of the sentence. Neither the temporal side of the issue nor different combinatorial possibilities are taken into consideration in these approaches. To clarify this point, let's consider (116) below.

(116)   a. Three students lifted a table.

b. Three girls mailed four letters.

(Van der Does & Verkuyl, 1995)

An analysis of (116a) yields that this sentence has a collective and a distributive interpretation. However, the distributive interpretation can be true in a condition where each of the three students lifted three different tables either at the same time or at different times. It can also be true in a condition where the three students lifted the

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same table at different times. It could even be true in a condition where two students lifted the same table at different times and the third student lifted another table at a different time. When these different combinatorial possibilities are thought, providing an explanation for (116b) seems even much more difficult. These different combinatorial possibilities as well as different time indices are ignored in both the VP centered or the NP centered semantic approaches which are based on atemporal logic.

Having a look at the issue from the syntax based analysis would yield a similar result. The QR analysis of May will give either a plain distributive interpretation provided that "three" takes scope over "a" at LF or a collective interpretation provided that "a" takes a wide scope over "three" at LF. The nature of distributivity is not questioned in any way. This is the same for the analysis of Beghelli and Stowell as well. None of the syntax centered analysis takes the importance of the compositional nature of the quantificational sentences into consideration. It is at this point that a need for a semantic based approach seems to be a better way to analyze the phenomena. However, the need for a temporal approach also seems apparent to arrive at a correct and full interpretation of sentences. Studies based on atemporal logic seem to give correct but incomplete interpretations.

In the following chapters, I will analyze the relevant data on quantificational sentences within a perspective that places equal importance on the individual constituents of the sentence. The approach that is proposed in this dissertation is-in a way- a combination of the VP centered approaches and the NP centered approaches. The approach is similar to the VP centered approaches and the NP centered

approaches in that both the verb as well as the nouns in the subject and object

positions contribute to the collective / distributive sentence interpretations.

CHAPTER 3

COLLECTIVITY, DISTRIBUTIVITY AND THE COMPATIBILITY CONDITION


1.0     Introduction


A discussion of existing approaches with respect to quantificational sentences has

been laid out in the previous chapter. Quantificational Turkish data have been

analyzed within the framework of each approach and it was shown that these

approaches fall short of explaining our data. Before an alternative approach to

quantificational sentences is proposed, Chapter 3 will provide some preliminary

information regarding the collectivity and distributivity types and a compatibility

condition that has to be present between the external arguments and the predicates.

The first goal of Chapter 3 is to demonstrate the requirement to have a

semantic suitability between the different types of predicates and the NPs in the

external argument positions of sentences. Compatibility conditions of collective

predicates, distributive predicates and ambiguous predicates are discussed separately

and supported by relevant Turkish examples in Section 2 of this chapter.

The second goal of Chapter 3 is to show that distributive readings as well as

collective readings need to be classified into groups. Based on the possible

interpretations of quantificational sentences, I propose that distributive readings can

be categorized in three main groups: distributivity over time, distributivity over

arguments and distributivity over adjuncts. Similarly, the data under observation will

lead us to the conclusion that collective readings can be grouped in two categories:

subject collectivity and object collectivity. The discussion on the distributivity /
collectivity types is given in Section 3 of this chapter.

## 2.0 Compatibility Condition

The central point that this dissertation is focused on was discussed to be the semantic
contribution of each constituent of the sentence to the overall interpretation of the
sentence in Chapter 1. The examples presented below illustrate to the requirement to
have compatibility between the semantic information that the VP and the subject NP
contribute. The example sentences given in (1)-(3) illustrate that certain predicate
types seem to impose co-occurance restrictions on their subjects.

(1)  a.  *Bir asker bir kale kuşat-tı.

         one soldier one castle surround-past

         "*One soldier surrounded a castle."

     b.  Asker-ler bir kale kuşat-tı.

         soldier-pl one castle surround-past

         "The soldiers surrounded a castle."

     c.  Bir birlik kale kuşat-tı.

         one regiment castle surround-past

         "A regiment surrounded a castle."

(2)     a.     Kadın bir bebek emzir-di.

              woman one baby feed-past

              "The woman fed a baby."

     b.     Kadın-lar bir bebek emzir-di.

              woman-pl one baby feed-past

              "The women fed a baby."

     c.     Bir grup kadın bir bebek emzir-di.

              one group woman one baby feed-past

              "A group of women fed a baby."

(3)     a.     Komşu-nun oğlu bir çadır kur-du.

              neighbour-poss son one tent build-past

              "The neighbour's son built a tent."

     b.     Komşu-nun oğul-ları bir çadır kur-du.

              neighbour-poss son-pl one tent build-past

              "The neighbour's son built a tent."

     c.     Bizim sınıf bir çadır kur-du.

              our class one tent build-past

              "Our class built a tent."

The examples in (1)-(3) illustrate the co-occurrence of different predicate types with different NP types in the external argument positions. The same predicates are tested with singular NPs in the (a) sentences, with plural NPs in the (b) sentences and with group denoting NPs in the (c) sentences above.

(1) shows that singular NPs such as *bir asker* "one soldier" cannot be used as the subject of a predicate like *kuşatmak* "surround" except for the group denoting NPs such as *bir birlik* "one regiment". Plural NPs such as *askerler* "soldiers" are also appropriate with the same predicate. (2a)-(2c) illustrate, on the other hand, that predicates such as *emzirmek* "breast-feed" accept plural subject NPs such as *kadınlar* "women", group-denoting NPs such as *bir grup kadın* "a group of women" and singular NPs such as *kadın* "woman". (3a)-(3c) illustrate the use of predicates which accept plural NPs, singular NPs and group denoting NPs as external arguments.

Having observed that there are co-occurrence restrictions between the predicate types and the NP types in the subject positions leads us to propose the Compatibility Condition which is defined as in (4) below.

(4)     Compatibility Condition

        The denotation of the external argument must be semantically compatible
        with the denotation of the predicate in the sentence.

Compatibility condition is significant in understanding why certain quantificational external arguments cannot occur with a group of predicates whereas others can. We will see that it is not the determiner *per se* that determines the conditions on co-occurrence, but the presence or absence of morphological plurality on the head noun.

## 2.1    <u>Overview of Predicate Types</u>

In the literature, predicates are generally classified into three categories: *distributive predicates*, *collective predicates* and *mixed predicates*. It is assumed that collective predicates refer to properties of "plural individuals" whereas distributive predicates refer to properties of "singular individuals". Mixed predicates are ambiguous or vague between the two usages.

Winter (2002) provides the example sentences in (5) to illustrate the predicate types more clearly. Keeping the subjects identical, Winter (2002) points out the interpretational differences that the predicates impose on the sentences. The subjects of (5a)-(5c) are plural. The subject "Mary and John" illustrate a conjoined NP whereas the subject "children" illustrate a morphologically plural NP. The sentence in (5a) reports on individual smiling acts of both Mary and John / each of the children. The sentences in (5b) report on a joint meeting between these people. The sentences in (5c) are ambiguous or vague between the two interpretations, and mean either that the people ate some pizzas separately or that they ate one pizza together.[11]

(5)     a. Mary and John / the children smiled.

b. Mary and John / the children met.

c. Mary and John / the children ate a pizza.

(Winter, 2002)

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[11] This three way classification between the predicates is the traditional classification. There are also studies in the literature that prefer different classifications. These were discussed in Chapter 2 page 80-86 of this dissertation. The traditional classification will be used in this study.

What these sentences illustrate is that the inherent distributive and collective features of the predicates have a direct impact on the interpretation of their subjects. Kaup & Kelter & Habel (2002) argues that plural expressions have two representational views: atomic-individuals representation and assemblage representation. In the atomic-individuals representation, the atomic individuals are mentally kept apart. Each atomic individual is represented by a distinct token.[12] However, the individuals are conceived of as an integrated whole in the assemblage representation. These two representations, together with the inherent collective and distributive features of the predicates, show clearly the reason why the sentences in (5a)-(5c) have different interpretations with respect to collectivity-distributivity. A distributive predicate such as *smile* requires an atomic-individuals representation of the subject NP so that the predicate can apply to each atomic individual. A collective predicate such as *meet*, on the other hand, calls for an assemblage representation of the subject NP. Lastly, an ambiguous predicate such as *eat a pizza*, is equally acceptable with atomic-individuals representation as well as assemblage representation of the subject NP (Kamp & Reyle 1993; Link 1991; Landman 1989).

In the following sections, I will discuss different types of NPs in terms of semantic and morphological plurality in relation with the different types of predicates in terms of their inherent distributive and collective features. Turkish sentences will be analyzed in terms of what kinds of NP types the different predicates co-occur with. The analysis will be carried out in three sub-sections. The collective predicates, the distributive predicates and the mixed predicates will be analyzed separately to see what kind of restrictions they place on their external arguments.

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[12] These are referred to as "atomic discourse referent" in Kamp & Reyle (1993).

## 2.2 Compatibility Condition for the Collective Predicates

In this section, I will discuss different types of collective predicates and the kinds of NPs they are compatible with.

Collective predicates are those that require the action to be carried out by a sum of individuals. It is assumed in the literature that collective predicates refer to the properties of plural individuals (Dowty 1987; Landman 1989; Schwarzschild 1996; Brisson 1998).

An analysis of a variety of sentences with collective predicates reveals that collective predicates should be categorized under two basic groups. Semantic plurality refers to the requirement that the NP denoting an entity should be composed of more than a single individual. However, the sentences I have observed have shown the fact that this requirement is fulfilled by different means for the two sub-categories of the collective predicates. I will show that semantic plurality of an NP can be achieved with either morphological plurality or the group denoting nature of the head noun. I will call the first group which requires only morphologically plural external arguments *Group 1- collectives* and the second group which can take morphologically singular external arguments provided that they are semantically plural-that is, group denoting nouns- *Group 2 - collectives*. [13]

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[13] Kuruoğlu (1990) studied verbs formed with the suffix –(I)ş and showed that these verbs need to be classified into two groups: regular reciprocals and irregular reciprocals. Regular reciprocals are exemplified by *yazışmak* "write to each other", *öpüşmek* "kiss each other" etc. Irregular reciprocals are exemplified by *uçuşmak* "fly all around", *bekleşmek* "wait together", *kaçışmak* "disperse" etc. The distinction between these two groups is based on the meaning differences that these verbs impose on the sentence as well as the restrictions that they impose on their subject NPs. Although the classification that I will propose seems to coincide with Kuruoğlu's classification of –(I)ş verbs, I will classify the collective predicates under different titles. There are two reasons behind this. The first one is related with the definition of the term "reciprocal". Reciprocal constructions describe an event in which at least two agents perform the same action upon each other. (Göksel & Kerslake, 2005) What Kuruoğlu calls "regular reciprocals" are appropriate examples for the definition of reciprocal constructions. However, the category referred to as "irregular reciprocals" in Kuruoğlu's study do not illustrate reciprocity of any kind. Instead, these predicates indicate that the action denoted by the verb

### 2.2.1   Group 1 Collectives

Collective verbs of the first group describe an event in which the action is performed by the sum of individuals forming a group. In other words, these depict events in which the action is carried out by each member of the group at the same time, simultaneously. These verbs are referred to as "*irregular reciprocals*" in Kuruoğlu (1990), as "verbs of unity" in Gencan (1979) and as "verbs of cooperation" in Banguoğlu (1979). (6) shows a sample list of Group 1 Collectives.

| (6) | üşüşmek | "flock together" | bağrışmak | "shout together" |
|---|---|---|---|---|
| | bekleşmek | "wait together" | cıvıldaşmak | "twitter" |
| | gülüşmek | "laugh together" | ağlaşmak | "weep together" |
| | kaçışmak | "disperse" | kapışmak | "buy/take eagerly" |
| | koşuşmak | "run together" | ötüşmek | "chirp" |
| | toplanmak | "assemble" | uçuşmak | "fly about" |

(taken from Türkçe Sözlük, Türk Dil Kurumu, 2005)

The fact that these predicates require semantic plurality of the external arguments is illustrated in (7) below. As mentioned above semantic plurality of the external argument refers to the fact that the NP in the external argument position has a group interpretation. This group interpretation can be achieved either by the suffixation of

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root is performed in an unorganized manner as in *koşuş-* "run around", *uçuş-* "fly around". Although the suffix within these verb stems is identical to the reciprocal suffix, they do not have a reciprocal interpretation. (Göksel& Kerslake, 2005)

Another reason behind the need for a new classification is that there are other verbs like *kuşatmak* "surround", *toplanmak* "gather", *işbirliği yapmak* "cooperate", *yığmak* "pile", *yığılmak* "pile up", *ortaklık kurmak* "form a cooperation, *uzlaşmak* "agree", *anlaşmak* "agree" etc. which are not reciprocals but still fall in the category of collective predicates.

the plural morpheme or by the use of a group denoting noun. In the sentences

presented in (7), semantic plurality is achieved by means of the morphological

plurality of the external arguments. In other words, all the external arguments in (7a)

to (7c) have the plural morpheme –lAr.

(7)     a. Çocuk-lar bir anda bağrışmaya başla-dı.         Morph.& Semantic Plurality

        child-pl suddenly shout start-past

        "The children suddenly started to shout."

        b. Kız-lar köşe-de gülüş-üyor-lar.              Morph.&SemanticPlurality

        girl-pl corner-loc laugh together-pres-3rd per

        "The girls are laughing together in a corner."

        c. Çocuk-lar kaçıştılar.                        Morph.&SemanticPlurality

        child-pl run in all directions

        "The children ran all around."

To see whether semantic plurality-without morphological plurality- is enough to

license a sentence to be interpretable, I would like to test the same predicates with

group denoting noun phrases as external arguments in (8)  below. The external

arguments *sınıf* "class", *takım* "team" and *sürü* "herd" are group denoting nouns,

thus they are semantically plural although morphologically singular. If semantic

plurality were sufficient to satisfy the Compatibility Condition for Group 1

Collectives, then we would expect the sentences in (8a) to (8c) to be acceptable.

However, the marginality of these sentences shows the necessity of morphological plurality in the external argument positions for Group 1 Collectives.

(8) a. (?) Bizim sınıf bahçe-de bağrış-ıyor.    Semantic Plurality

    our class garden-loc shout together-pres

    "Our class is shouting together in the garden."


  b. (?) Karşı takım fıkra-ya gülüş-tü.    Semantic Plurality

    opposing team joke laugh together-past

    "Opposing team laughed together to the joke."


  c. (?)Sürü biranda kaçışmaya başla-dı.    Semantic Plurality

    herd suddenly run in all directions start-past

    "The herd started to run in all directions suddenly."[14]


A question that immediately arises is whether these group denoting nouns are licensed provided that they take the plurality marker. (9a) and (9b) shows that the plurality morpheme on the group denoting noun in the external argument licenses the sentences to be fully acceptable.

(9) a.  Savaş alanı-n-da-ki birlik-ler farklı yön-ler-e kaçış-tı-lar.

    war field-loc regiment-pl. different direction-pl run together-past

    "The regiments in the war field ran in different directions."

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[14] A majority of native speakers of Turkish find these sentences anomalous rather than unacceptable. If acceptable, the interpretation that they get from these sentences is the one where individual constituents making up the group referring noun are thought to undergo the action denoted by the verb. That is, for (8a) each member of my class is seen as shouting at the same time.

b.        Sınıf-lar farklı köşeler-de bekleş-ti-ler.

class-pl different  corner-pl-loc wait together-past-3rd per

"Classes waited in fferent corners."

The semantic plurality of the agents can also be accomplished by means of the comitative suffix –(y)lA. The sentences in (10) are given below in order to test whether this is an appropriate means for achieving semantic plurality for the Group 1 collectives. The grammaticality judgments of (10a)-(10c) illustrate that the sentences are not fully acceptable. The ungrammaticality of the sentences leads us to conclude that it is not possible to achieve semantic plurality of the agents via the comitative suffix.

(10)    a.        *Bülbül kanarya-y-la uçuş-tu.

nightingale canary-with fly around-past

"The nightingale flew around with the canary."

b.        (?) Ahmet Mehmet-le bir köşe-de bekleş-ti.

Ahmet Mehmet-with one corner wait-past

"Ahmet waited in a corner together with Mehmet."

c.        * Ayşe arkadaşı-y-la dört bir yan-a kaçış-tı.

Ayşe friend-with all around run around-past

"Ayşe ran all around with her friend."

As illustrated in the examples above, the compatibility condition for Group 1 Collective predicates is fulfilled by only morphological plurality. This necessity for the plural morpheme on the external argument enables us to predict that Group 1 Collectives cannot be used with external arguments that have the quantifier *her* "every" complemented by a singular noun even if this noun is a group referring one. (11) shows that this expectation is borne out.

(11)     a. *Her kuş gökyüzü-nde uçuş-tu.

               every bird sky-loc fly-past

               "Every bird flew about in the sky"


         b. (?)Her birlik dört bir yan-a koşuşuyor.

               every regiment all around run together-pres

               "Every regiment is running all around."


 (11a) illustrates a sentence that has a Group 1 Collective as a predicate and a quantificational NP in which *her* "every" is complemented by a morphologically singular head noun. The Compatibility Condition for Group 1 Collectives renders the sentence unacceptable. The sentence in (11b) is similar to the one given in (11a) except for the type of the head noun complementing *her* "every". The head noun *birlik* "regiment" is a group referring noun, thus has semantic plurality. However, this does not license the sentence to be fully acceptable.

The quantifier *bütün* "all", on the other hand, takes morphologically plural nouns as its complement. This leads us to predict that the structure with "bütün + plural noun" in the external argument position is compatible with Group 1

Collectives. (12) shows that our predictions are correct. The nouns in (12) complementing *bütün* "all" are plural nouns such as *kuşlar* "birds" and *askerler* "soldiers". Morphological plurality of these nouns allows the NPs to be compatible with Group 1 Collectives.

(12)    a. Bütün kuş-lar gökyüzü-nde uçuş-uyor.

      all bird-pl sky-loc fly about-pres

    "All the birds are flying about in the sky."


    b. Bütün asker-ler bir yan-a koşuş-uyor.

    all soldier-pl one direction run together-pres

    "All the soldiers are running around."


To summarize what we have argued so far, collective predicates of the first group, the so-called Group 1 Collectives, obligatorily require a morphologically plural external argument, that is, these collectives must take external arguments that are inflected with the plural morpheme –lAr. Group denoting nouns are not fully compatible with Group 1 Collectives if they lack the plural morpheme.

      It will be shown in the following section that, Group 1 Collectives differ from Group 2 collectives in that Group 2 Collectives use different means to fulfill the requirements of the compatibility condition.

2.2.2    Group 2 Collectives

Group 2 Collectives differ from Group 1 Collectives in terms of a reciprocal relationship that they denote. Collective predicates of Group 2 express actions and situations in which two or more people or two or more groups direct action towards one another, in a pair-wise relation. The reciprocal relationship related to Group 2 Collectives refers to the fact that individual members forming the external argument perform the action denoted by the predicate in a reciprocal manner.  A sample list of Group 2 Collectives is provided in (13)[15].

(13)    buluşmak        "meet"                          yazışmak        "correspond"

        boğuşmak        "fight"                          öpüşmek         "kiss each other

        dövüşmek        "fight"                          atışmak         "squabble"

        çarpışmak       "collide"                        didişmek        "scrap"

        dövüşmek        "fight with each other"          eşleşmek        "match"

        bakışmak        "look at one another"            görüşmek        "talk over"

        itişmek         "push one another"               cilveleşmek     "flirt"

        bayramlaşmak"exchange holiday greetings" tartışmak        "argue"

        benzeşmek       "look like each other"           selamlaşmak     "greet"

        sözleşmek       "make an appointment"            tokalaşmak      "shake hands"

        uzlaşmak        "come to an agreement"           el ele tutuşmak "be hand in hand"

        şakalaşmak      "joke with each other"           kesişmek        "cross"

        kapışmak        "fight with each other"

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[15] These predicates are referred to as "regular reciprocals" in Kuruoğlu (1990).

tanışmak      "come to know one another"

küsüşmek     "not to be on speaking terms"

karşılaşmak   "meet each other"

(taken from Türkçe Sözlük, Türk Dil Kurumu, 2005)

A comparison of (14a) with (14b) below shows that Group 1 Collectives lack this reciprocal relationship semantically. Recall that Group 1 Collectives have an interpretation in which the action is carried out by the members of the external argument simultaneously, whereas Group 2 Collectives denote an action in which the action is carried out by the members of the external argument in a reciprocal manner.

(14a) and (14b) have homophonous predicates. The collective predicate *kapışmak* "buy things" in (14a) denotes a buying action carried out by the members of the external argument at the same time. We cannot talk about a reciprocal relation between the members of the external argument for (14a). Thus the sentence exemplifies a Group 1 Collective. The same predicate with the meaning "fight" in (14b), on the other hand, denotes a fighting action in which the boys fought with each other, hence conveys a reciprocal relation between the members of the external argument. So, this sentence illustrates the use of a Group 2 Collective.

(14)    a. Kadın-lar ucuz mal-lar-ı kapış-tı-lar.         kap-ış-mak "to grab"

       woman-pl cheap good-pl-acc grab-past-3rd per

          "The women grabbed the cheap goods."

b. Ahmet ve Mehmet sokak ortası-nda kapış-tı-lar.     kapış-mak "to fight"

Ahmet and Mehmet street middle-loc figth with each other-past-3$^{rd}$ per

"Ahmet and Mehmet fought with each other in the middle of the street."

A further piece of evidence for distinguishing between Group 1 and Group 2 collectives can be provided by resorting to the use of the anaphor *birbiri* "each other". As noted in Kuruoğlu (1990), a reciprocal relationship may also be expressed by using a reciprocal anaphor *birbiri* "each other" in a sentence. If Group 2 Collectives express activities denoting reciprocal relation and if the same reciprocal relation can be expressed by means of *birbiri* "each other", the basic prediction that comes up is that sentences having Group 2 Collectives can be paraphrased using this anaphor. Similarly, sentences with Group 1 Collectives would be predicted to lack the paraphrase sentence with *birbiri* "each other". (15) and (16) are provided to clarify this point.

(15)  a.    Kız-lar gülüş-tü.                              Group 1 Collective

            girl-pl laugh together-past

            "The girls laughed all together."

  ≠  b.    Kız-lar birbirine gül-dü.

            girl-pl each other laugh-past

            "The girls laughed to each other"

(16)  a.  Öğrenci-ler yaz boyunca yazış-tı.          Group 2 Collective

student-pl summer during write each other-past

"The students wrote to each other all summer long."

=  b.  Öğrenci-ler yaz boyunca birbirlerine yaz-dı.

student-pl summer during each other write-past

"Students wrote to each other all summer long."

As the example in (15) illustrates the lack of the reciprocal relation for a Group 1

Collective does not permit the sentence to have a paraphrase such as (15b). However,

the sentence in (16a) can be paraphrased as in (16b) depending on the fact that the

predicate in (16a) is a Group 2 Collective which has a natural reciprocal

interpretation. This difference, once more, points to the need to have two sub-groups

within the group of collective predicates.

We shall now analyze sentences with Group 2 Collectives to find out what

kind of requirements these collective predicates place on their external arguments.

The examples presented in (17) show that the requirement for semantic plurality of

the external argument can be fulfilled through morphological plurality, similar to the

Group 1 Collectives.

(17)  a. Öğrenci-ler bir sınıf-ta buluş-tu.          Morph. & Semantic Plurality

student-pl one class-loc meet-past

"The students met in a classroom."

b. Genç-ler bütün yaz boyunca yazış-tı.       Morph. & Semantic Plurality

   teenager-pl all summer long write each other-past

   "The teenagers wrote each other all summer long."


c. Kız-lar pastane-de buluşmak için sözleş-ti.  Morph. & Semantic Plurality

   girl-pl café-loc meet make an appointment-past

   "The girls made an appointment to meet at the café."


Unlike Group 1 Collectives, however, the semantic plurality is not only achieved by morphological plurality in Group 2 Collectives. There are other means to achieve the obligatory semantic plurality of the external argument. One way is to use group denoting noun phrases in the external argument position. Recall that this strategy did not work for Group 1 Collectives as shown in (8) above. (18) illustrates the compatibility of the group denoting singular noun phrases with Group 2 Collective predicates.


(18)   a. Bizim komite alt kat-ta-ki sınıf-ta buluş-acak.      Semantic Plurality

       our committee downstairs class-loc meet-fut

       "Our committee will meet in a classroom downstairs."


b. Genç çift bütün yaz boyunca yazış-tı.       Semantic Plurality

    young couple all summer long write each other-past

    "The young couple wrote each other all summer long."

c. Ahmet-ler-in grubu sinema-ya gitmek için sözleş-ti.     Semantic Plurality

Ahmet-pl-poss group cinema-dat go make an appointment-past

"Ahmet's group made an appointment to go to the cinema."

The sentences in (18) show that the external arguments need not necessarily be morphologically plural. The nouns given in the external argument positions, *komite* "committee", *çift* "couple" , *grup* "group", do not bear the plurality marker, but they have semantic plurality due to being group denoting nouns. So, this shows that morphological plurality is not obligatory for the external arguments of Group 2 Collectives.

Furthermore, (19) shows that morphologically and semantically singular nouns in the external argument positions are also compatible with Group 2 Collectives provided that they are accompanied by objects which take the comitative suffix –(y)lA. The external arguments in (19) do not bear the plurality marker –lAr and they are not group denoting nouns either. However, the acceptability of the sentences illustrate that the presence of the object bearing the comitative marker *ile* "with" seems to license the sentence to be acceptable.

(19)    a. Ahmet arkadaşı-y-la okul-da buluş-tu.

Ahmet friend-with school-loc meet-past

 "Ahmet met his friend at school."

b. Zeynep yurt dışın-dan bir genç-le yazış-ıyor.

Zeynep abroad-from one teenager-with write each other-pres

"Zeynep is corresponding with a teenger from abroad."

c. Kız-ım arkadaşı-y-la buluşmak üzere sözleş-ti.

daughter-poss friend-poss-with meet make an appointment-past

"My daughter made an appointment to meet with her friend."

One final way to achieve the obligatory semantic plurality of the external argument is by means of conjunctives like *ve* "and" or *ile* "with". This is exemplified in (20) below.

(20)   a.   Ahmet ve Mehmet okul-da buluş-tu.

Ahmet and Mehmet school-loc meet-past

"Ahmet and Mehmet met at school."

b.   Ahmet ile Mehmet okul-da buluş-tu.

Ahmet with Mehmet school-loc meet-past

"Ahmet and Mehmet met at school."

The example sentences in (18)-(19) clarify that Group 2 Collectives can co-occur with even singular external arguments provided that these external arguments are either group denoting nouns or complemented by a comitative object NP. (18) illustrates the co-occurance of group denoting singular external arguments while (19) and (20) exemplify the co-occurance of a singular external argument in the presence of a comitative object NP.

The fact that Group 2 Collectives can be used with singular group denoting nouns or with singular nouns in the presence of a comitative object NP leads us to make a prediction about the uses of *her* "every" and *bütün* "all" in the external

argument positions. Since the quantifier *her* "every" takes a singular noun as its complement, and since singular nouns are allowed in external argument position of sentences with Group 2 Collectives, we predict that "her + singular noun" structures in the external argument position are compatible with Group 2 Collectives. The acceptability of sentences in (21) illustrates this point more clearly.

(21)    a. Her çift maç sonun-da tokalaş-tı.

          every couple match end shake hands-past

          "Every couple shook hands at the end of the match."

    b. Her sporcu rakibi-y-le tanış-tı.

          every sportsman rival-with get acquainted with-past

          "Every sportsman got acquainted with his rival."

Recall that the quantificational determiner *bütün* "all" requires a morphologically plural noun complement, which is by nature also semantically plural. It is no surprise then that *bütün* "all" is compatible with Group 2 collectives. (22a) and (22b) present sentences with "bütün + plural noun" constructions as external arguments. The acceptability of these sentences shows that the quantifier *bütün* "all" is also compatible with Group 2 Collectives.

(22)    a. Bütün köylü-ler köy meydanı-nda bayram-laş-tı.

          all villager-pl. village area-loc greet each other-past

          "All the villagers greeted each other in the centre of the village."

b. Bütün çocuk-lar el ele tutuş-tu.

all child-pl hand in hand hold-past

"All the children held each other's hand."

To sum up what I have been discussing about the collective predicates in general so far, the examples show that all collective predicates require their agent to be composed of more than one individual. This requirement about the plurality of the external argument is fulfilled either by the suffixation of the plural marker –lAr or by the use of a group denoting noun phrase. Furthermore, the use of a comitative object *ile* "with" licenses a singular agent to be compatible with a collective predicate. Considering these conditions which make the external arguments acceptable for the collective predicates, I classified the predicates in two main groups, naming them as "Group 1 Collectives" and "Group 2 Collectives". Group 1 Collectives are the ones that require their agents to bear the plurality marker. The other conditions- that is, the use of a group denoting noun or a comitative object- are not acceptable for this group. Group 2 Collectives, on the other hand, require either the morphological plurality of the agent, the use of a group denoting noun or the use of a comitative object. A chart is provided to summarize the differences between Group 1 and Group 2 Collectives in Table 1 below.

Table 1.  Differences between Group 1 and Group 2 Collectives

| GROUP 1 COLLECTIVES | GROUP 2 COLLECTIVES |
|---|---|
| - expressing simultaneous action | - expressing reciprocal action |
| - Obligatory morphological plurality of the external argument | - morphological plurality and semantic plurality via group denoting nouns or the presence of a comitative object NP |
| - does not have reciprocal meaning, so cannot be paraphrased with *birbiri* "each other". | - Have a reciprocal meaning, so can be paraphrased with *birbiri* "each other". |
| - compatible with the quantifier *bütün* "all" but not with *her* "every" | - compatible with the quantifiers *bütün* "all" and *her* "every" |

A close analysis of Group 2 Collectives listed in (13) reveals a common morphological similarity. The verbal stems are inflected with the –(I)ş suffix and the nominal stems are inflected with the –lAş suffix yielding the meaning that the agents involved in the predication perform the same action upon each other. However, there are other collective predicates like *kuşatmak* "surround", *toplanmak* "come together", *toplaşmak* "come together", *işbirliği yapmak* "cooperate", *becayiş etmek* "change", *yığmak* "pile", *yığılmak* "pile up", *ortaklık kurmak* "form a cooperation", *uzlaşmak* "come to share the same opinion", *dağılmak* "disperse", *anlaşmak* "agree" etc which are not inflected with the suffix –(I)ş but which are still similar to Group 2

Collectives in terms of the requirements that they have with respect to their external arguments. In the next section, I will attempt to illustrate how these particular predicates show similarities to Group 2 Collective predicates.

Similar to Group 1 and Group 2 Collectives, these predicates also require their external arguments to be composed of more than one individual. Like Group 1 and Group 2 Collectives, this requirement can be achieved by morphological plurality as in (23) below. Sentences presented in (23a) to (23d) have morphologically plural external arguments, so they are acceptable sentences. However, the use of the singular counterparts of these external arguments as in (23a′) to (23d′) yields unacceptability.

(23)　　a. Asker-ler bir kale kuşat-tı.　　　　　　Morph. & Semantic Plurality

　　　　　　soldier-pl one castle surround-past

　　　　　　"The soldiers surrounded a castle."


　　　a′.* Asker bir kale kuşat-tı.

　　　　　soldier one castle surround-past

　　　　　"* The soldier surrounded a castle."


　　　b. Öğrenci-ler sınav için işbirliği yaptı-lar.　Morph. & Semantic Plurality

　　　　　student-pl exam for cooperate-past-3rd per

　　　　　"The students cooperated for the exam."

b′. *Öğrenci sınav için işbirliği yap-tı.

   student exam for cooperate-past

   "*The student cooperated for the exam."

c. Kız-lar bir ev-de toplan-dı.         Morph.& Semantic Plurality

   girl-pl one house-loc come together-past

   "The girls came together in a house."

c′. *Kız bir ev-de toplan-dı.

   girl one house-loc come together-past

   "*The girl came together in a house."

d. Gemi çalışan-ları bir kamara-ya yığıldı.   Morph. & Semantic Plurality

   ship worker-pl one room-dat pile up-past

   "The ship workers piled up in one room."

d′. *Gemi çalışanı bir kamara-ya yığıl-dı.

   ship worker one room-dat pile up-past

   "*The ship worker piled up in one room."

Similar to Group 2 Collectives, but unlike Group 1 Collectives, the obligatory semantic plurality of the external argument can also be achieved by the use of group denoting nouns, without any need for morphological plurality. Consider the examples in (24) where the head noun in the external argument position, *birlik*

"regiment", *sınıf* "class", *komite* "committee", *mürettebat* "crew" are group denoting nouns.


(24)   a Bizim birlik bir kale kuşat-tı.                    Semantic Plurality

   our regiment one castle surround-past

   "Our regiment surrounded a castle".


   b. Sizin sınıf sınav-da işbirliği yap-mış.           Semantic Plurality

   your class exam-loc cooperate-past

   "Your class cheated in the exam."


   c. Spor komitesi bir oda-da toplan-dı.              Semantic Plurality

   sports committee one room-loc come together-past

   "Sports committee came together in a room."


   d. Gemi mürettebatı bir kamara-ya yığıl-dı.         Semantic Plurality

   ship crew one room-dat pile up-past

   "The ship crew piled up in a room."


In the previous sections, the obligatory semantic plurality was shown to be achieved even with singular external arguments provided that they are accompanied by objects which take the comitative suffix –(y)lA for Group 2 Collectives. This is also true for these collective predicates. Sentences in (25) provide further evidence to show that these predicates belong to Group 2 Collectives. The external arguments of the sentences in (25), *komutan* "commander", *öğretmen* "teacher", *öğrenci* "student", are

morphologically and semantically singular, but the presence of an object NP as a complement of the comitative *ile* "with" licenses the sentence to be acceptable.[16]

(25)   a. Komutan bir manga asker-le bir kale-yi kuşat-tı.

   commander one squad of soldiers-with one castle-acc surround-past

   "The commander surrounded one castle with a squad of soldiers."

   b. Öğretmen-imiz bir öğrenci-y-le işbirliği yap-tı.

   teacher-poss one student-with cooperate-past

   "Our teacher cooperated with one student."

   c. İngilizce öğretmeni bir grup öğrenci-y-le bir oda-da toplan-dı.

   english teacher one group of student-with one room-past gather-past

   "English teacher gathered with a group of students in one room."

   d. Sınav-a gir-ecek her öğrenci ailesi-y-le beraber kapı-nın önün-e yığıl-dı.

   exam-dat take every student family-with together door-poss in front of

   pile-up-past.

   "Every student who will take the exam piled up in front of the door with his family."

All the collective predicates that we have analyzed so far are intransitive verbs. That is why their requirements were put on their external arguments. In other words, these predicates were analyzed with respect to what kinds of external arguments they can

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[16] The comitative suffix –yLA  is in fact some kind of a pluralization strategy.

take. However, not all collective predicates are intransitive. Some others such as *yığmak* "pile", *istiflemek* "pile", *sıralamak* "put in order", *dizmek* "lay out", *hizaya sokmak* "align", *toplamak* "collect / pick up fruits", *gruplandırmak* "put into groups" are transitive collective predicates. These place their compatibility condition requirements on their internal arguments rather than their external arguments. In other words, these require their internal arguments to be composed of more than a single element as shown in (26) below.

(26)   a. Ayşe kitap-lar-ı bir oda-ya yığ-dı.

   Ayşe book-pl-acc one room put-past

   "Ayşe put the books in one room."


  a′. *Ayşe kitab-ı bir oda-y-a yığ-dı.

   Ayşe book-acc one room-dat put-past.

   "Ayşe put the book in one room."


  b. İpek soru-lar-ı kolay-dan zor-a doğru sırala-dı.

   İpek question-pl-acc easy-from difficult-to put into order-past

   "İpek put the questions in order starting from easy to difficult."


  b′. * İpek soru-y-u kolay-dan zor-a doğru sırala-dı.

   İpek question-acc easy-from difficult-to put into order-past

   "İpek put the question in order starting from easy to difficult."

c. Ege oyuncak asker-ler-i-ni masa-nın üzerin-e diz-di.

Ege toy soldier-pl-acc-poss table-poss on lay out-past

"Ege laid out his toy soldiers on the table."

c′. *Ege oyuncak asker-i-ni masa-nın üzeri-ne diz-di.

Ege toy soldier-acc table-poss on lay out-past

"Ege laid out his toy soldier on the table."

d. Levent kitap-lar-ı-nı gruplandır-dı.

Levent book-pl.-acc-poss group-past

"Levent grouped his books."

d′. *Levent kitab-ı-nı gruplandır-dı.

Levent book- poss-acc group-past

"Levent grouped his book."

e. Esra elma-lar-ı sepet-e topla-dı.

Esra apple-pl-acc basket-dat put-past

"Esra put the apples in the basket."

e′. *Esra elma-y-ı sepet-e topla-dı.

Esra apple- acc basket-dat put-past

"Esra put the apple in the basket."[17]

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[17] The following sentences illustrate the fact that these collective transitive verbs might even take singular internal arguments. However, such cases seem to be instances of noun incorporation, and

To sum this section up about the compatibility conditions for the collective predicates, I have classified the collective predicates based on the compatibility requirement that they place on their arguments. Semantic plurality of the external argument was discussed to be the basic requirement for all the collective predicates. There are several means to achieve this semantic plurality, however. The use of a morphologically plural NP, the use of a group denoting noun as the head of the NP or the use of a comitative object NP renders the semantic plurality of the argument. Group 1 Collectives were discussed to illustrate only the first means as a way to achieve compatibility between the predicate and the subject NP. For Group 2 Collectives, however, the use of group referring noun phrases and the use of a comitatively marked object seem to work.

## 2.3    Compatibility Condition for the Distributive Predicates

The verb is generally defined as a predicate of events in the literature and its arguments are known to describe the participants in the event described by the verb (Schwarzschild 2009; Higginbotham & Schein 1989). Recall that the collective reading arises when multiple individuals participate in the same event whereby the

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they do not violate the compatability conditions that we have been talking about the collective predicates so far.

   (i)      Ceren ip-e boncuk diz-di.
            Ceren string-dat bead line up-past
            "Ceren lined up beads on a string."
   (ii)     Hakan elma topla-dı.
            Hakan apple pick up-past
            "Hakan picked up apples from the tree"
   (iii)    Kamyon ev-in önü-ne kömür yığ-dı.
            truck house-poss front coal pile-up-past
            "The truck piled coals up in front of the house."
   (iv)     Bütün yaz kış için odun istifle-di-k.
            all summer winter for wood stack neatly-past-1st per pl
            "We stacked wood for the winter all summer long."

event is carried out by a sum of individuals. Contrary to collective predicates, the distributive predicates are those that require the action to be carried out by atomic individuals only, hence, the distributive reading involves single individual participation in an event.

Based on this basic property of distributive predicates, they would be expected to be compatible with primarily singular external arguments. In this section, I will provide examples to show what kinds of external arguments the distributive predicates can co-occur with. Our examples will illustrate that the distributive predicates can take both singular external arguments and plural external arguments.

In (27) below a list of some unambiguously distributive predicates in Turkish is given. All of these predicates have the property that the action denoted by the predicate can only be restricted to atomic individuals. They cannot be carried out by a sum of these individuals, i.e., collectively by groups of individuals.

(27)     doğurmak           "give birth to"

         emzirmek           "breastfeed"

         yumurtlamak        "lay eggs"

         ayılmak            "come to consciousness"

         bayılmak           "faint"

         boğulmak           "drawn"

         öksürmek           "cough"

         hapşırmak          "sneeze"

         uyumak             "sleep"

         ayaklanmak         "have first steps for a child"

         hastalanmak        "become ill"

| | |
|---|---|
| hazırlanmak | "get ready" |
| bakınmak | "look around oneself" |
| söylenmek | "talk to oneself" |
| çırpınmak | "act of moving quickly for a fish" |
| giyinmek | "get dressed" |
| yalanmak | "lick oneself" |
| terlemek | "sweat" |
| öfkelenmek | "get angry with" |
| sürünmek | "put make up, perfume on oneself" |
| silinmek | "clean oneself" |
| taranmak | "comb oneself" |
| yıkanmak | "wash oneself" |
| boyanmak | "put makeup on oneself" |

The three verbs, *doğurmak* "give birth to", *emzirmek* "breast feed" and *yumurtlamak* "lay eggs" are the only transitive verbs in the sample verb list presented in (27) above. The differences with respect to the distributive interpretations pertaining to the transitive distributive verbs and the intransitive distributive verbs will be discussed in the pursuing sections on the types of distributivity.

I pointed out in the previous section that the distributive predicates are expected to be compatible with singular subjects due to the fact that the actions denoted by these predicates have the property of being carried out by atomic individuals only. The examples presented in (28) show that this expectation is borne out. The subjects, *kadın* "woman", *çocuk* "child", *adam* "man" are all singular nouns and the interpretations denoted by the sentences are all distributive.

(28)    a. Kadın bebek emzir-iyor.

      woman baby breast feed-pres

    "The woman is breast feeding the baby."


    b. Kadın ikiz bebek doğur-du.

     woman twin baby give birth to-past

    "The woman gave birth to twin babies."


    c. Mavi göz-lü çocuk uyu-du.

     blue eye-with child sleep-past

    "The child with blue eyes slept."


    d. Ön sıra-da oturan çocuk hastalan-dı.

     front seat-loc. sit child get sick-past

    "The child sitting in the front seat got sick."


    e. Adam bir saat boyunca yıkan-dı.

     man one hour long wash oneself-past

    "The man washed himself an hour long."


The examples presented in (28) are re-written with plural subjects in (29) in order to

see whether these are compatible with distributive predicates or not. The

grammaticality of the sentences implies that plural subjects are also allowed with

distributive predicates. However, this does not necessarily mean that the action

denoted by the verb is carried out collectively by the group of individuals constituting the plural subject. The interpretation that we got for plural subjects when they co-occur with collective predicates is totally different from the interpretation we get when these co-occur with distributive predicates. That is why the acts of breast feeding, giving birth, sleeping, getting sick and taking a bath in (29) are carried out separately by the members of the subjects although the subject is a plural NP.

(29)    a. Kadın-lar bebek emzir-di.

        woman-pl baby breast feed-past

      "The women fed babies."


    b. Kadın-lar ikiz bebek doğur-du.

      woman-pl twin baby give birth to-past

      "The women gave birth to twin babies."


    c. Çocuk-lar uyu-du.

      child-pl sleep-past

      "The children slept."


    d. Çocuk-lar hastalan-dı.

      child-pl get sick-past

      "The children got sick."

e. Adam-lar bir saat boyunca yıkan-dı.

man-pl one hour long wash oneself-past

"The men washed themselves an hour long."

One final NP type in the external argument position to be analyzed is the group denoting noun phrases. The sentences in (30) show that group denoting noun phrases are also acceptable with distributive predicates. However, the meaning expressed by the sentence is still a distributive one where each member of the group denoting noun undergoes the action denoted by the verb separately. In other words, each woman in the group undergoes the action of breast feeding in (30a), each member of our family undergoes the action of sleeping early in (30b), each soldier in our regiment undergoes the action of getting sick in (30c) and each individual fish in the group undergoes the action of fluttering in (30d) separately.

(30)    a.      Bir grup kadın karşı oda-da bebek emzir-di.

                 one group woman opposite room-loc baby breast feed-past

                 "A group of women fed the babies in the opposite room."


        b.      Bizim aile dün gece erken uyu-du.

                 our family yesterday night early sleep-past

                 "Our family slept early last night."


        c.      Bütün birlik aniden hastalan-dı.

                 whole regiment suddenly get sick-past

                 "The whole regiment suddenly got sick."

d.    Ağ-a takılan balık sürüsü çırpın-ıyor-du.

net-dat stuck fish school flutter-pres-past

"The school of fish stuck in the net was fluttering."

Up to this point, it has been shown that both singular and plural nouns can be used as subjects of distributive predicates. The final interpretation of the sentences, no matter what their external arguments are, was observed to be distributive. Compatibility of distributive predicates with singular external arguments enables us to predict that these must also be compatible with "her + singular noun" structures. Similarly, based on the observation that distributive predicates are also compatible with plural external arguments, we can predict their compatibility with "bütün + plural noun" structures. (31a) and (31b) show the acceptability of the quantifier *her* "every" with distributive predicates while (32a) and (32b) show their compatibility with the quantifier *bütün* "all".

(31)    a. Her çocuk sene sonu gösterisi-ne büyük bir titizlik-le hazırlan-dı.

every child year final show-dat great a fastidiously get ready-past

"Every child got ready for the final show of the year fastidiously."

b. Her kadın balo-ya gitmek için süslen-di.

every woman ball-dat go for dress oneself up-past

"Every woman dressed herself up to go to the ball."

(32)    a. Bütün genç-ler mezuniyet töreni-ne heyecan-la hazırlan-dı.

      all young person-pl graduation ceremony-dat excitement get ready-past

     "All the young people got ready for the graduation ceremony with

     excitement."


     b. Bütün çocuk-lar sırayla hapşır-dı

     all child-pl in turns sneeze-past

     "All the children sneezed in turns."


## 2.4    Compatibility Condition for the Ambiguous Predicates


Ambiguous predicates are those that can be performed either by atomic individuals

or by the sum of the individuals. A representative list of ambiguous predicates is

presented in (33) below.


| (33) | taşımak | "carry" | şarkı söylemek | "sing" |
|---|---|---|---|---|
| | çadır kurmak | "build a raft" | çekmek | "pull" |
| | itmek | "push" | boyamak | "paint" |
| | araştırmak | "search" | oynamak | "play" |
| | seyretmek | "watch" | yıkamak | "wash" |
| | yemek yapmak | "cook" | seyahat etmek | "travel" |


Due to the definition of ambiguous predicates presented above, we would expect

these predicates to be compatible with both singular NPs and pluralized NPs in the

external argument positions. (34)-(36) show that our predictions are correct. The (a)

counterparts of (34)-(36) have singular nouns, *genç kız* "young girl", *yeşil gözlü çocuk* "the child with green eyes", *küçük çocuk* "little child", as their external arguments. The pluralized external arguments are exemplified in the (b) sentences of (34)-(36). The interpretation that we get from the (a) sentences is a distributive interpretation where the acts of carrying a table, singing a song and playing with the ball are carried out by singular external arguments separately. The (b) sentences, on the other hand, are ambiguous between a collective and a distributive interpretation. In the distributive interpretations the acts of carrying a table, singing a song and playing with the ball are carried out separately by the girls, children participating in the competition and children, correspondingly. In their collective interpretations, on the other hand, (34b) means that the act of carrying the table is a result of a joint action of the girls, that is, they carried the table together. The collective interpretation of (35b) means that the children participating in the competition will sing a song together. Finally, (36b) has a collective interpretation where the children are playing together with the ball in the park.

(34)     a. Genç kız yan oda-y-a bir masa taşı-dı.

           young girl next room-dat one table carry-past

           "The young girl carried a table to the room next door."


        b. Kız-lar yan oda-y-a bir masa taşı-dı.

           girl-pl next room-dat one table carry-past

           "The girls carried a table to the room next door."

(35)   a.   Yeşil göz-lü çocuk bir şarkı söyle-di.

green eye-with child one song sing-past

"The child with green eyes sang a song."

b. Yarışma-y-a katılan çocuk-lar bir şarkı söyle-di.

competition-dat participate child-pl one song sing-past

"The children participating in the competition sang a song."

(36)   a. Küçük çocuk mavi top-la oyna-dı.

little child blue ball-with play-past

"The little child played with the blue ball"

b. Çocuk-lar park-ta top-la oyna-dı-lar.

Child-pl park-loc ball-with play-past

"The children played in the park with the ball."

As a final possibility, we shall analyze sentences to see whether group denoting nouns are acceptable with ambiguous predicates. The acceptability of plural nouns with ambiguous predicates enables us to predict that they will also be compatible with group denoting nouns. (37) shows that this prediction is correct.

(37)   a. Karşı daire-de oturan aile bir çadır kur-du.

opposite apartment-loc live family one tent build-past

"The family living in the opposite apartment built a tent."

b. Kamp-a katılan aile-ler çadır kur-du.

Camp-dat join family-pl tent build-past

"The families joining the camp built a tent."

The external argument of (37a) is *aile* "family" which is a singular group denoting noun whereas the one in (37b) is *aileler* "families" which is a plural group denoting noun. (37a) denotes a single event where there is one family and one tent building activity. (37b), on the other hand, has both a distributive meaning and a collective meaning. In the distributive meaning, families built different tents. In the collective meaning, they built a tent together.

As shown above in the (a) sentences of (34)-(37), the ambiguous predicates are compatible with singular external arguments, therefore are predicted to be compatible with the quantifier *her* "every". The interpretation that we get from such sentences is only the distributive one although the ambiguous predicates also have a potential to be interpreted collectively. The (b) sentences, on the other hand, illustrate that they can be used with plural external arguments, therefore are expected to be compatible with the quantifier *bütün* "all". (38a) and (38b) are provided to illustrate the use of quantificational elements with ambiguous predicates. (38a) has a distributive interpretation whereas (38b) is ambiguous between a distributive and a collective meaning.

(38)    a. Her öğrenci bir duvar-ı boya-dı.

every student one wall-acc. paint-past

"Every student painted a wall."

b. Bütün öğrenci-ler bir duvar-ı boya-dı.

all student-pl. one wall-acc. paint-past

"All the students painted a wall."

The examples examined in this section demonstrated that ambiguous predicates can co-occur with singular, plural or group denoting nouns in the external argument positions. This, in turn, lead us to predict that quantificational NPs having both *her* "every" and *bütün* "all" are compatible with ambiguous predicates. The examples revealed that our prediction is correct.

## 2.5 <u>Interim Summary</u>

Up to this point, I have attempted to analyze the Turkish data to see what requirements a predicate imposes on its external argument. The compatibility condition is a crucial condition that needs to be satisfied for a sentence to be grammatical. A mismatch between the external argument and the predicate directly rules out the sentence.

Collective predicates need to be divided into two categories depending on the different requirements that these two groups impose on the external arguments. More specifically, Group 1-Collectives require their subjects to be morphologically plural. Semantic plurality via group denoting nouns or via the presence of a comitative object is not acceptable for Group 1-Collectives. However, for Group 2-Collectives, morphological plurality of the external argument, presence of group denoting nouns in the external argument position or the presence of a comitative object licenses the sentence to be acceptable.

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Distributive predicates accept singular, plural as well as group denoting nouns. However, the overall interpretation of the sentence, regardless of the type of the subject, is the distributive one. In other words, even if the subject of a distributive predicate is a plural noun or a group denoting noun, the activity denoted by the predicate obligatorily distributes down to individual members of the subject NP. Assemblage representation of the subject NP is not a possible interpretation for the distributive predicates.

Finally, ambiguous predicates were discussed to be compatible with singular, plural and group denoting nouns. Unlike, distributive predicates, which give out unambiguous distributive interpretation regardless of the type of their subjects, ambiguous predicates display both collective and distributive interpretations.

<br>

## 3.0 Types of Distributivity

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Before an analysis of how the collective / distributive interpretations of a sentence are computed, a study regarding the possible types of distributivity and collectivity needs to be carried out. Types of distributivity will be discussed in this section and it will be shown that the distributive interpretations need to be grouped in three categories: distributivity over time, distributivity over the argument and distributivity over the adjuncts.

(39) and (40) present sentence pairs that seem to display a difference with respect to distributivity. In other words, although the (a) sentences and the (b) sentences of (39) and (40) are thought to have an overall distributive interpretation, the distributivity displayed by the sentences differs from each other.

(39) a. Her birlik bir kale kuşat-tı.                        distr.

     every regiment one castle surround-past

    "Every regiment surrounded a castle."


    b. Bir birlik her kale-y-i kuşat-tı.                        distr.

    one regiment every castle-acc surround-past

    "A regiment surrounded every castle."


(40) a. Bütün kadın-lar bir bebek emzir-di.                        distr.

    all woman-pl one baby feed-past

    "All the women fed a baby."


    b. Bütün kadın-lar bir bebeğ-i emzir-di.                        distr.

    all woman-pl one baby-acc feed-past

    "All the women fed the baby."


In (39a), the distributivity is between the regiments and the castles. In other words, such a sentence can be uttered in a situation where Regiment A surrounded Castle 1, Regiment B surrounded Castle 2, Regiment C surrounded Castle 3 etc. However, such a one to one correspondence between the regiments and the castles cannot be seen in (39b) in any way. The sentence can only be interpreted as denoting a single regiment surrounding each castle one after the other. Considering the fact that the act of surrounding extends over a time interval and that the regiment moves along this time interval surrounding each castle one after the other, we end up with an interpretation where Castle 1 is surrounded at point of time $t_1$, Castle 2 at $t_2$, Castle 3

at $t_3$ etc. In other words, the distribution is between the castles and the time indices denoted by the verb.

Although the distinction is less clear, (40a) and (40b) illustrate a difference in the distributivity that each expresses. (40a) displays a one to one distributivity between the members of the external argument and the members of the internal argument where all the women fed a different baby. (40b), however, displays a marked distributive interpretation where the women fed the same baby in turns as well as an unmarked distributive interpretation where the women fed different babies. The unmarked distributive interpretation of (40b) is identical to the one to one distributivity as in (40a). The marked interpretation where there is a single baby being fed by the women in turns is not an available interpretation for (40a).[18]

These different distributive interpretations displayed by these sentence pairs lead us to a conclusion that there should be distributivity types. Despite a great number of studies regarding the distributivity/ collectivity notions, possible types of distributivity have not been studied throughout the literature. One approach with respect to the types of distributivity is that of Moltmann (1997). Moltmann (1997) distinguishes between two different types of distributivity phenomena. The first type of distributivity, which is referred to as "Type 1 Distributivity" is exemplified in (41)

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[18] The marked interpretation for (40b) is seen more clearly when the adverb *sırayla* "in turns / one by one" is added to the sentence as shown in (i) below. However, for (ii) this marked interpretation is still very difficult to get. (ii) still has an unmarked distributive meaning where there is a one to one distributivity between the subject and the object.

    (i)       Bütün kadın-lar *sırayla / tek tek* bir bebeğ-i emzir-di.
                 all woman-pl in turns / one by one one baby-acc feed-past
                 "All the women fed the baby in turns."
    (ii)       Bütün kadın-lar *sırayla / tek tek* bir bebek emzir-di.
                 all woman-pl in turns / one by one one baby feed-past
                 "All the women fed a baby in turns."

The marked interpretation of (i) becomes more apparent when the adverb is scrambled to the immediately preverbal position as in (iii) below.

    (iii)      Bütün kadın-lar bir bebeğ-i *sırayla / tek tek* emzir-di.
                 all woman-pl one baby-acc in turns / one by one feed-past
                 "All the women fed the baby in turns."

below. The distributive interpretation is the one where each man individually lifted the piano in (41a) and each man showed a different woman the picture in (41b). For (41c), type 1 distributivity refers to the interpretation where for a group of four men and a group of two pianos, each one among the men lifted one of the pianos, and each one of the pianos was lifted by one of the men.

(41)    a. The men lifted the piano.

        b. The men showed the women the picture.

        c. Four men lifted two pianos.

                                                    (Moltmann, 1997, 49)

Type 1 distributivity is associated with plural NPs and it is possible with a plural NP in any argument position of a verb. Type 2 distributivity, on the other hand, characteristically involves an indefinite object NP which seems to take narrow scope. Type 2 distributivity is exemplified in (42) with readings in which each student works with a different computer in (42a) and each neighbour gave his dog a different fur coat in (42b). Type 2 distributivity reveals a reading where every one of four men lifted two pianos for (42c).[19]

(42)    a. These students work with a computer.

        b. All my neighbours gave their dog a fur coat.

        c. Four men lifted two pianos.

                                                    (Moltmann, 1997)

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[19] The sentence "Four men lifted two pianos" can be interpreted both as Type 1 distributivity in which for a group of four men and a group of two pianos, each one among the men lifted one of the pianos, and each one of the pianos was lifted by one of the men and as Type 2 distributivity where every one of four men lifted two pianos. In Type 1 reading the object NP has a wide scope interpretation whereas in Type 2 reading it has a narrow scope interpretation.

In a general sense, the distinction between the two types of distributivity that

Moltmann argues is a distinction between the distributivity of plural subject NPs

over definite object NPs as in (41) and distributivity of plural subject NPs over

indefinite object NPs as in (42). The previous corresponds to Type 1 distributivity

whereas the latter corresponds to Type 2 distributivity.

In Moltmann's approach, the distributivity types are basically associated with

the definiteness / indefiniteness of the NPs. However, the differences that we have

observed reveal the fact that semantic interpretations of the sentences also need to be

taken into consideration in differentiating between the types of distibutivity. In the

following section, I will put forward a new classification for distributivity types

depending on the overall semantic interpretations of the sentences.


## 3.1     A New Classification for Types of Distributivity


The example sentences in (43) below show that there is a difference between the

distributive interpretations displayed by each sentence. The sentence in (43a) is

distributive in a sense that the regiments are distributed over the castles. However,

this one to one distributivity cannot be observed for the sentence in (43b). Although

the sentence in (43b) has a distributive interpretation, the distributivity is not between

the members of the subject NP and that of the internal argument. Distributivity is

observed between the members of the internal argument and the time indices

provided by the verb.[20] In other words, the castles get distributed over the time

indices which give out an interpretation where a single regiment surrounded the

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[20] The notion "time index" is used to refer to the points of time through which an event happens to
take place.

castles one after the other. (43c) provides a further example for distributivity. The distributivity observed in (43c) is between the quantificational NP and the adjunct of the sentence. The sentence has a reading where every woman fed a baby in a different room. This means that there is a distribution between the women and the rooms where they feed their babies.

(43) a. Her birlik bir kale kuşat-tı.                          distr.

  every regiment one castle surround-past

  "Every regiment surrounded a castle."


  b. Bir birlik her kale-y-i kuşat-tı.                          distr.

   one regiment every castle-acc surround-past

   "A regiment surrounded every castle."


  c. Her kadın bir oda-da bebek emzir-di.                          distr.

   every woman one room-loc baby feed-past

   "Every woman fed a baby in a room."


Distributivity in an event structure requires the presence of a "distributor" and a "distributed share / distribute" in the structure. The term "distributor" refers to the element that gets distributed in the structure. Other terms "distributed share / distributee", on the other hand, refer to the element that the distributor distributes over. Choe (1987) labels the wide scope QPs as the "distributor" and the narrow scope indefinites as the "distributed share / distributee". Similarly, Beghelli &

Stowell (1997) refer to the QPs headed by "each / every / all" as distributors.[21] Following these I assume that the quantificational element acts as the distributor in the structure and has a potential to get distributed over the other constituents of the sentence which includes either an indefinite NP (argument or adjunct) or the time index.

The definition of "distributive" is given as "a term used in semantics for predicates or quantifiers which ascribe a property or action to the individual members of a group, as opposed to the group as a whole" in Crystal (2003). In other words, a distributive event leads us to think about individual members of a group forming the "distributors" and individual members of the group forming the "distributees", thereby illustrating a correspondence between individual distributors and individual distributees. Based on this general definition, the distributors as well as the distributees are required to have multi-referents. By definition, a single referent NP cannot distribute over another entity since the single referent NP has a unique denotation. However, depending on the fact that they are associated with multi denotations, multi-referent NPs naturally have the potential to get distributed.

The examples in (44) are presented to illustrate the multi-referent nature of the quantificational NPs in general. The multi-referent nature of the quantificational NPs is exemplified on a sample group of quantifiers in (44). The quantificational NPs all appear in the external argument positions in all these sentences. The external arguments *her çocuk* "every child" in (44a), *bütün öğrenciler* "all students" in (44b), *birkaç futbolcu* "a few footballers" in (44c), *tam 10 öğrenci* "exactly 10 students" in (44d), *en az 5 soru* "at least 5 questions" in (44e) and *bazı balıklar* "some fish" in

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[21] Beghelli & Stowell (1997) differentiates between "each / every" and "all" by asserting that "all" is a pseudo-distributor" while "each / every" are strong distributors. The distinction between "each" and "every" ia also discussed in the study. In their approach *each*-QPs are endowed with a [+Distributive] feature which must be checked in Spec of DistP; *every*-QPs, on the other hand, are underspecified for [Distributive].

(44f) are all associated with more than a single denotation for each entity. In other words, we are talking about a number of children, a number of students, a number of footballers etc. The morphological singularity of the head noun complementing the quantifiers *her* "every", *birkaç* "a few", *tam 10* "exactly 10", *en az 5* "at least 5" in (44a), (44c), (44d) and (44e) respectively does not hinder the multi-referent nature of these quantificational NPs. We are still concerned about more than a single child, a single footballer, a single student and a single question in these sentences despite the morphological singularity of the head noun.

(44)     a. Her öocuk çizgi film sev-me-z.

every child cartoons like-neg

"Every child does not like cartoons."


b. Bütün öğrenci-ler sınav-a gir-di.

all student-pl exam-dat take-past

"All the students took the exam."


c. Birkaç futbolcu hastalan-dı.

a few footballer get sick-past

"A few footballers got sick."


d. Tam 10 öğrenci yarışma-ya katıl-dı.

exactly 10 student competition-dat attend-past

"Exactly 10 students attended the competition."

e. En az 5 öğrenci soru-y-u yanıtla-dı.

at least 5 student question-acc answer-past

"At least 5 students answered the question."


f. Bazı balık-lar tatlı su-da yaşa-r.

some fish-pl non-salty water-loc live-aor

"Some fish live in non-salty water."


Depending on the requirement of the distributors to have multi-referents and the fact that quantificational NPs have multi-referents regardless of their morphological singularity or plurality, we predict that a multi-referent quantificational NP as the distributor will distribute over a multi-referent distributee. In (43a), the subject QNP acts as the distributor and having multi-referents distributes over the object NP that is labeled as the distributee. In (43b), the distributor is in the internal argument position distributing over the points of time through which the action is realized. Finally, in (43c), the subject QNP as the distributor gets distributed over the adjunct of the sentence. This first observation leads to the claim that there are three basic distributivity types, *distributivity over arguments, distributivity over time indices* and *distributivity over adjuncts*.[22] (43a)-(43c) exemplify these distributivity types respectively.

Having arrived at a generalization with respect to the possible types of distributivity, let us analyze the three distributivity types in detail in the following

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[22] A similar observation is also observed in Beghelli & Stowell (1997). In their study distributivity is observed in roughly two different cases. The first involves cases when there is distribution between the indefinite GQP serving as the distributed share and other QP types. The second involves cases when a covert existential quantifier over events function as a distributed share. The second condition for distributivityis similar to our "distributivity over time" cases.

sections. The discussions in these sections will show that our prediction with respect to the distributive nature of the quantificational NPs is correct.

### 3.1.1   Distributivity Over Time Indices

In the previous section, the quantificational subject and object NPs were discussed to act as distributors. These distributors are predicted to distribute over distributees such as the other arguments of the sentences, the time indices provided by the verbs or the adjuncts of the sentences provided that the distributees also have multi-referents. The discussion in this section illustrates that points of time through which the action is realized also act as potential "distributed shares / distributees". These points of time within the time interval in which the event extends over will be referred to as "time indices".

Some further examples for the notion of "distributivity over time" are provided in (45) below. These examples which have a QNP in the internal argument positions acting as the distributors illustrate distributivity cases where the members of the internal arguments get distributed over time indices. In other words, the babies, the flowers and the songs get distributed over time indices in (45a), (45b) and (45c) respectively. Due to this distributivity between the time indices and the internal arguments, the members of the internal arguments undergo the predication "one by one, one after the other, at different time indices."

distributivity over time

(45) a. Genç kadın her bebeğ-i emzir-di.

young woman every baby-acc breast feed-past

"The young woman breast fed every baby."

distributivity over time

b. Genç çift her çiçeğ-i kokla-dı

young couple every flower-acc smell-past

"The young couple smelled every flower."
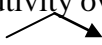
distributivity over time

c. Çocuk her şarkı-y-ı söyle-di.

child every song-acc sing-past

"The child sang every song."

A careful examination of sentences in (45) enables us to observe that the external arguments of all these example sentences are singular definite NPs. The referent of this singular external argument NP is a specific individual. In other words, "the regiment, the young woman, the young couple, the child" used as the external arguments of a sentence refers to a specific regiment, a specific young woman etc. The presence of a singular definite NP in the external argument position eliminates the possible distributivity of the object NP over the subject NP. In other words, the QNP in the internal argument position cannot distribute over the subject NP although it has the potential to. Therefore, it can only show distributivity over time.

The same "distributivity over time" interpretation is available for sentences with indefinite singular subject NPs as shown in (46) below.

        distributivity over time

(46) a. Bir kadın her bebeğ-i emzir-di.

     one woman every baby-acc breast feed-past

     "A woman breast fed every baby."

        distributivity over time

   b. Bir çift her çiçeğ-i kokla-dı.

     one couple every flower-acc smell-past

     "A couple smelled every flower."

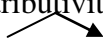        distributivity over time

   c. Bir çocuk her şarkı-y-ı söyle-di.
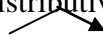
     one child every song-acc sing-past

     "A child sang every song"

The sentences in (47) demonstrate the fact that "distributivity over time" interpretation is achieved with a variety of different quantifiers in the internal argument positions. This provides evidence that it is not the inherent properties of the quantifier *her* "every" that gives out the "distributive over time" reading.

distributivity over time

(47)　a. Bir kız bütün şarkı-lar-ı söyle-di.

　　　　one girl all song-pl-acc sing-past

　　　　"A girl sang all the songs."

distributivity over time

　　b. Bir tavuk en az beş yumurta yumurtla-dı.

　　　one chicken at least five egg lay-past

　　　"A chicken laid at least five eggs."

distributivity over time

　　c. Bir futbolcu tam beş gol at-tı.

　　　one football player exactly five goal kick-past

　　　"A footballer kicked exactly five goals."

distributivity over time

　　d. Bir adam birkaç çadır kur-du.

　　　 one man a few tent build-past

　　　"A man built a few tents."

Consequently, (45)-(47) make it clear that the "distributivity over time" interpretion is neither a matter of the different quantifiers in the internal argument positions nor a matter of the in/definiteness of the subject NP. The fact that the singular subject NP has a single referent and the quantificational object NP has multi-referents leads to the impossiblility of a distribution between the members of the subject and the

object. The natural outcome turns out to be the distribution of the quantificational object NP over the time indices.

A point that needs further investigation is whether the distributivity over time indices is restricted to the quantificational object NPs. The example sentences in (48) illustrate the fact that the subject QNPs can also get distributed over time indices. The possible interpretations of (48a), (48b) and (48c) are presented underneath the sentences. Although the sentences have multi interpretations, our main concern in this section is the (i) interpretations which is related to the distributivity over time cases. For the interpretations presented in (i), the regiments in (48a), the women in (48b) and the children in (48c) distribute over the time indices provided by the verb. In other words, the multi-referent quantificational subject NP acts as the distributor and distributes over the time indices acting as the distributees yielding the (i) interpretations.

distributivity over time
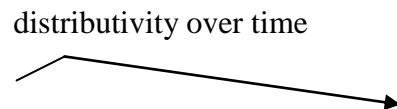
(48)    a.      Bütün birlik-ler bir kale-y-i kuşat-tı.

all regiment-pl one castle-acc surround-past

"All the regiments surrounded a castle."

     (i)      The regiments took turns in surrounding one of the castles.

     (ii)      The regiments surrounded different castles.

     (iii)      The regiments surrounded a castle together.

distributivity over time

b. Bütün kadın-lar bir bebeğ-i emzir-di.

all woman-pl one baby-acc feed-past

"All the women fed a baby."

    (i)        The women took turns in feeding one of the babies.

    (ii)      The women fed different babies.

distributivity over time
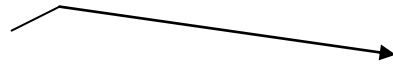
c.    Bütün çocuk-lar bir şarkı-y-ı söyle-di.

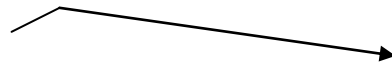all child-pl one song-acc sing-past

"All the children sang a song."[23]

    (i)        The children took turns in singing one of the songs.

    (ii)      The children sang different songs.

    (iii)    The children sang a song together.

(49) presents the sentences given in (48) differing only in terms of the absence of the

accusative marker on the object NP. The interpretations are also identical to the ones

in (48). The difference between (48) and (49) lies in the fact that the presence of the

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[23] Additional adverbs can be inserted in these sentences to make their different interpretations clearer. The adverb *sırayla* "in turns", makes the sentences unambiguously "distributive over time" as shown in (i), whereas the adjective *farklı* " different" makes them unambiguously "distributive over the argument" as in (ii) and the adverb *beraberce* "together" makes them unambiguously "collective" as in (iii) below.

    (i) Bütün birlik-ler bir kale-y-i sırayla kuşat-tı.
       all regiment-pl one castle-acc in turns surround-past
       "All the regiments took turns in surrounding the castle."
    (ii) Bütün birlik-ler farklı bir kale-y-i kuşat-tı.
       all regiment-pl different one castle-acc surround-past
       "All the regiments surrounded a different castle."
    (iii) Bütün birlik-ler beraberce bir kale-y-i kuşat-tı.
       all regiment-pl together one castle-acc surround-past
       "All the regiments surrounded a castle together."

accusative marker on the object in (48) leads to an unmarked "distributive over time" interpretation whereas the absence of it as in (49) yields an unmarked "distributive over the argument" interpretation. Both structures- the one with the accusative marker and the other without- also have the other distributivity interpretations as the marked interpretations. In other words, (48a)-(48c) are also associated with a marked "distributive over the argument" interpretation and (49a)-(49c) are also associated with a marked "distributive over time "interpretation. [24]

(49)    a. Bütün birlik-ler bir kale kuşat-tı.

        all regiment-pl one castle surround-past

        "All the regiments surrounded a castle."

            (i)     The regiments took turns in surrounding one of the castles.

            (ii)    The regiments surrounded different castles.

            (iii)   The regiments surrounded a castle together.

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[24] We have discussed that the presence of the accusative marker on the internal argument yields an unmarked "distributive over time" reading along with the marked "distributive over the argument" reading. However, (i) and (ii) present two cases which lack this unmarked "distributive over time" interpretation despite the presence of the accusative marker on the object NP. These sentences are not acceptable due to pragmatic reasons. That is, semantically the sentences are expected to have the "distributivity over time" interpretation, but pragmatically this interpretation is left out, since our world knowledge places the restriction that a baby can be born only once or that a flower can be picked up only once. Verbs of creation such as *doğurmak* "give birth to", *yumurtlamak* "lay an egg" and verbs of destruction such as *kopartmak* "pick up /tear up", *yıkmak* "pull down" are referred to as "one time predicates" or "once only predicates" in the literature. (Szabolcsi, 1997) One time predicates, by nature, happen in a single point of time, thus, have a single referent $t_1$ acting as the distributee. Therefore, the distributor in the external argument position fails to distribute over this single referent distributee. On the other hand, the internal argument *bir bebeği* "one baby-acc" is specific. The specificity of the internal argument and the presence of the adverb *sırayla* "in turns" also blocks the distribution of the subject QNP over itself. As a consequence, the sentence is totally out.

(i)    *Bütün kadın-lar bir bebeğ-i sırayla doğur-du.                    Verb of creation
       all woman-pl one baby-acc in turns give birth-past
       "All the women took turns in giving birth to the baby."
(ii)   *Bütün kız-lar bir çiçeğ-i sırayla kopar-dı.                      Verb of destruction
       all girl-pl one flower-acc in turns pick up-past
       "All the girls took turns in picking up the flower."

b. Bütün kadın-lar bir bebek emzir-di.

all woman-pl one baby feed-past

"All the women fed a baby."

(i) The women took turns in feeding one of the babies.

(ii) The women fed different babies.


c. Bütün çocuk-lar bir şarkı söyle-di.

all child-pl one song sing-past

"All the children sang a song."

(i) The children took turns in singing one of the songs.

(ii) The children sang different songs.

(iii) The children sang a song together.


The fact that the accusative marker on the internal argument yields a specific reading of the NP turns out to be the reason for the difference between the sentences having an accusative marked internal argument and the ones without the accusative marker. To make this clearer, let us compare (48a) and (49a) rewritten as (50) below.


(50)    a. Bütün birlik-ler (sırayla / farklı) bir kale-y-i kuşattı.

all regiment-pl (in turns / different) one castle-acc surround-past

"All the regiments surrounded a castle."

(i) The regiments took turns in surrounding a specific castle.

UNMARKED

(ii) The regiments surrounded different castles.

MARKED

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b. . Bütün birlik-ler (sırayla / farklı) bir kale kuşat-tı.

all regiment-pl one castle surround-past

"All the regiments surrounded a castle."[25]

(i)     The regiments took turns in surrounding one castle.

MARKED[26]

(ii)    The regiments surrounded different castles.

UNMARKED

The sentences are identical except that the internal argument carries the accusative marker in (50a) whereas it does not in (50b). As the possible readings of the two sentences illustrate, they are also identical in terms of their possible interpretations. The accusative marked internal argument *bir kaleyi* "one castle-acc" in (50a) is associated with a specific castle. Considering a specific castle which has a single referent, it is not surprising to see that the distribution of the quantificational subject NP over the internal argument is somewhat "blocked". This only leaves the possibility of the distribution of the quantificational subject NP over the time indices, thus yielding an unmarked "distributive over time" interpretation. However, the marked "distributive over the argument" reading of (50a) which means that the regiments surrounded different castles leads us to the fact that this cannot be a total blockage. In other words, making a generalization which states that the presence of the accusative marker blocks the distribution of the quantificational subject NP over

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[25] The third interpretation of these sentences is a collective interpretation where the regiments collectively surrounded a castle. This interpretation is left out on purpose since we are dealing with only the different types of distributivity in this section. We will be discussing the third interpretation pertaining to a collective reading in the section about collectivity types.

[26] This marked interpretation of (50b) is clearer when it is uttered in a situation where all the regiments are getting a tactical training on surrounding castles. On being asked about the results of the training, the commander might have said that all the regiments experienced a surrounding activity by surrounding the only castle around the area one by one.
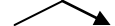
the object NP is misleading. The marked interpretation of (50a) clearly shows that the accusative marker only reduces the possibility of the "distributivity over the argument" interpretation but does not block it all together.

In short, the discussion in this section reveals that the first distributivity type- that is, distributivity over time indices- is related to the distribution of the quantificational NPs in external argument positions as as well as internal argument positions over time indices provided by the verbs. In other words, subject quantificational NPs as well as object quantificational NPs have a potential to get distributed over the time indices. The distribution is based on the fact that the entity getting distributed has multi-referents. Quantificational NPs, regardless of their positions in the sentences, have multi-referents and thus, are predicted to have the potential to get distributed over time indices, or other arguments of the sentence provided that the distributees are also multi-referential. We argued about their distribution over time indices in this section and have seen that this is a correct prediction. The distribution of these multi-referents over other arguments or the adjuncts of the sentences will be discussed in the following sections.

### 3.1.2   Distributivity Over Arguments

In the previous section, it was discussed that distribution of both the members of the quantificational external argument and the members of the quantificational internal argument was possible. In addition to "distributivity over time indices", we also predict to have a distribution between the members of the external argument and the members of the internal argument provided that both have multi-referents. (51) and (52) are presented as illustrations for "distributivity over arguments" cases. In (51a)-

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(51c), the quantificational NPs are in the external argument position and act as the source of distributivity. In (52a)-(52c), however, the quantificational internal arguments act as the distributors. Having discussed the potential of the quantificational NPs to distribute over other constituents depending on their multi-referent nature, we predict that the subject QNPs in (51a)-(51c) and the object QNPs in (52a)-(52c) distribute over the other arguments of the sentence as well as the time indices provided by the verb. Possible interpretations for each sentence are provided underneath.

distributivity over the object

(51)    a. Her birlik bir kale-y-i kuşat-tı.

every regiment one castle-acc surround-past

"Every regiment surrounded a castle."

   i. Regiment A surrounded Castle 1, Regiment B surrounded Castle 2, Regiment C surrounded Castle 3etc.

   ii. Regiment A, Regiment B and Regiment C surrounded the same castle at different time indices.

distributivity over the object

b. Bütün kadın-lar bir bebeğ-i emzir-di.

all woman-pl one baby feed-past

"All the women fed a baby."

   i. Ece fed baby A, Tülay fed baby B, Elçin fed baby C etc.

   ii. Ece, Tülay and Elçin fed the same baby at different time indices.

distributivity over the object
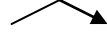
c. Her çocuk bir şarkı-y-ı söyle-di.

　every child one song sing-past

　"Every child sang a song."

　　i. Ege sang Song 1, İpek sang Song 2, Defne sang Song 3 etc.

　　ii. Ege, İpek and Defne sang the same song at different time indices.


distibutivity over the subject

(52)　a. Birlik-ler her kale-y-i kuşat-tı.

　regiment-pl all castle-acc surround-past

　"The regiments surrounded all the castles."

　　i. Regiment A surrounded Castle 1, Regiment B surrounded Castle 2

　　and Regiment C surrounded Castle 3.

　　ii. Regiment A, Regiment B, Regiment C etc. came together and

　　surrounded Castle 1, Castle 2 and Castle 3 etc. one after the other.


distributivity over the subject

b. Kadın-lar her bebeğ-i emzir-di.

　woman-pl every baby-acc breast feed-past

　"The women breast fed every child."

　　i. Ayşe fed baby A, Tülay fed baby B, Selin fed baby C etc.

　　ii. Ayşe fed baby A at $t_1$, baby B at $t_2$, baby C at $t_3$, Tülay fed baby A

　　at $t_2$, baby B at $t_3$, baby C at $t_1$; Selin fed baby A at $t_3$, baby B at $t_1$,

　　baby C at $t_2$.[27]

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[27] In this example we observe the distributivity of both the subject and the object on time indices.

distributivity over the subject

c. Çocuk-lar her şarkı-y-ı söyle-di.

child-pl every song-acc sing-past

"The children sang every song."

    i.      Ege sang Song 1, İpek sang Song 2, Defne sang Song 3and

          Beril sang Song 4.

    ii.     Ege, İpek, Defne and Beril came together and sang Song 1,

          Song 2, Song 3, Song 4 one after the other.

The (i) interpretations of (51a)-(51c) illustrate the "distributivity over argument" cases. For these sentences, the subject gets distributed over the object. The (i) interpretations of (52a)-(52c) are also examples for the "distributivity over argument" cases but it is the objects that get distributed over the subjects this time. The (ii) interpretations of (51) and (52) are also possible interpretations of the sentences. Howerever, these interpretations refer to the "distributivity over time" cases explained in the previous section.

The requirement for the multi-referent nature of both the distributors and the distributees was discussed in the previous paragraphs. The distributive nature of the quantificational NPs is based on the fact that they are multi-referent NPs. (53) presents the sentences in (52) with the change that their subjects are singularized. The singular subject NP has a single referent. Considering this, we predict that the quantificational object NPs cannot distribute over the subject NP yielding only the "distributivity over time" interpretation as the possible reading of the sentence. The possible interpretations of the sentences presented below show that our predictions

are borne out. (53a) lacks the reading where each regiment surrounded a different castle, (53b) lacks the reading where each woman fed a different baby and (53c) lacks the reading where each child sang a different song which are all "distributivity over argument" cases. These sentences show that the singularity of the subject NP hinders the possibility of the distribution of the quantificational NP over the subject. The only possible interpretation for these sentences is the "distributivity over time" interpretation.[28]

(53)    a. Bir birlik her kale-y-i kuşat-tı.

        one regiment every castle-acc surround-past

      "A regiment surrounded every castle."

              i.Regiment A surrounded Castle 1, Castle 2 and Castle 3 etc.one after

              the other.


      b. Bir kadın her bebeğ-i emzir-di.

        one woman every baby-acc breast feed-past

      "A woman breast fed every child."

              i. A woman fed every baby one after the other.


      c. Bir çocuk her şarkı-y-ı söyle-di.

        one child every song-acc sing-past

      "The children sang every song."

---

[28] Note that similar sentences in languages which are not scope rigid such as English might have ambiguous interpretation. The (a) interpretation is identical to the distributivity over time reading which was also observed for the Turkish counterpart. However, the interpretation in (b) which is a distributivity over the argument reading is not available in the Turkish counterpart of the sentence.
    (i) A regiment surrounded every castle.
        (a) There is a regiment such that it surrounded every castle one by one.
        (b) For every castle, there is a different regiment such that it surrounded the castle.

i. A child sang every song one after the other.

Taking (52c), re-written as (54) below, as an example, let us analyse how the possible interpretations of this particular sentence could be achieved.

$$\overset{\text{DOA} \quad \text{DOT}^{29}}{\frown}$$
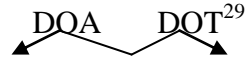
(54)    Çocuk-lar her şarkı-y-ı söyle-di.

child-pl every song-acc sing-past

"The children sang every song."

    i.      Ege sang Song 1, İpek sang Song 2, Defne sang Song 3and Beril sang Song 4.

    ii.     Ege, İpek, Defne and Beril came together and sang Song 1, Song 2, Song 3, Song 4 one after the other.

    iii.    Ege sang the four songs one after the other, İpek sang the four songs one after the other, Defne sang the four songs one after the other and Beril sang the four songs one after the other individually.[30]

As mentioned before, the interpretation given in (i) is the "distributivity over argument" interpretation where the songs distribute over the children. This interpretation can only be achieved when the subject *çocuklar* "children" is interpreted with an atomic individual interpretation (distributively). This means that

---

[29] Distributivity over argument is abbreviated as "DOA" and distributivity over time is abbreviated as "DOT".

[30] This final interpretation of the sentence was not given in (52c) in order to show the interpretations pertaining to the two distributivity types more clearly.

the plurality of the subject NP makes it possible for the quantificational object NP to distribute over.

The interpretation given in (ii) is that of "distributivity over time". This interpretation is achieved when the subject *çocuklar* "children" is interpreted with a group interpretation (collectively). This leads us to the conclusion that the collective interpretation of the subject prevents the possible distributivity of the quantificational NP over the subject. Therefore, the quantificational object NP has to display distributivity over time indices.
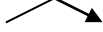
Finally, the interpretation given in (iii) where each song is sung by each child at different time indices, is achieved when the object NP *her şarkıyı* "every song" distributes over time indices and over arguments simultaneously.
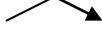
### 3.1.3 Distributivity Over Adjuncts
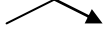
The sentences that we have been analyzing so far did not have adjuncts within their structure. In this section we will be dealing with sentences having adjuncts as well. The distributive nature of the quantificational NPs would lead us to predict that both subject QNPs and object QNPs will distribute over the adjuncts of the sentences. This final distributivity type will be referred to as the "distributivity over the adjunct" cases.
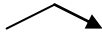
The sentences in (55) have the quantificational NPs in their external argument positions. The phrases *bir odada* "in one room" and *bir saksıdan* "from a flowerpot" in (55a) and (55b) respectively illustrate cases of locative adjuncts. The phrase *bir tarakla* "with a comb" in (55c) is an illustration of an instrumental adjunct and the phrase *bir öğretmenle* "with a teacher" in (55d) is an example of a comitative

adjunct. The possible interpretations discussed in the following paragraph show that our prediction with respect to the possible distribution of the QNP over the adjunct of the sentence is correct.

distributivity over the adjunct

(55)    a. Her kadın bir oda-da bebek emzir-di.

every woman one room-loc baby feed-past

"Every woman fed a baby in a room."

distributivity over the adjunct

b. Her çocuk bir saksı-dan çiçek kopart-tı.

every child one flowerpot-abl flower pick up

"Every child picked up a flower from a flowerpot."

distributivity over the adjunct

c. Her kız bir tarak-la tara-n-dı.

every girl one comb-with comb-refl-past.

"Every girl combed her hair with a comb."

distributivity over the adjunct

d. Her öğrenci bir öğretmen-le buluş-tu.

every student one teacher-with meet-past

"Every student met with a teacher."

In addition to the "distributivity over adjunct" interpretations, these sentences also display the "distributivity over time" interpretations as well. The possible interpretations of the sentences in (55) with the distributivity type that they are associated with are provided in (56a)-(56d) below. The interpretations in (i) are associated with the "distributivity over the adjunct" cases where the quantificational subject NPs distribute over the adjuncts. (ii) interpretations, on the other hand, refer to the "distributivity over time" interpretations where the quantificational subject NPs distribute over the time indices.

(56)   a.   (i) Ece fed a baby in Room A, Fügen fed a baby in Room B and Aliye
              fed a baby in Room C.

              ⇒ distributivity over the adjunct

              (ii) Ece, Fügen and Aliye fed a baby in the same room in turns.

              ⇒ distributivity over time[31]

       b.   (i) Ege picked a flower from pot A, İpek picked a flower from pot B,
              Duru picked a flower from pot C.

              ⇒ distributivity over the adjunct

              (ii) Ege, İpek and Duru picked up a flower form the same flowerpot in
              turns.

---

[31] The compatibility of a sentence with the adverb *sırayla* "in turns" illustrates the "distributivity over time" interpretation of the sentence. On the other hand, the compatibility of the sentence with *farklı* "different" illustrates the "distributivity over argument / adjunct" interpretation of the sentence. This is illustrated for (55a) in (i) and (ii) below.
(i)      Her kadın *farklı* bir oda-da bebek emzir-di.
         Every woman different one room-loc baby feed-past.
         "Every woman fed a baby in a different room."      ⇒ distributivity over the adjunct
(ii)     Her kadın *sırayla* bir oda-da bebek emzir-di.
         Every woman in turns one room-loc baby feed-past.
         "Every woman fed a baby in a room in turns."      ⇒ distributivity over time

$\Rightarrow$ distributivity over time

c.  (i) İpek combed her hair with the pink comb, Defne combed her hair

with the yellow comb and Beril combed her hair with the green one.

$\Rightarrow$ distributivity over the adjunct

(ii) İpek, Defne and Beril combed their hair with the same comb in

turns.

$\Rightarrow$ distributivity over time

d.  (i) Levent came together with the maths teacher, Ege with the Physics

teacher and İpek with the English teacher.

$\Rightarrow$ distributivity over the adjunct

(ii) Levent, Ege and İpek came together with the English teacher in

turns.

$\Rightarrow$ distributivity over time

Up to now, we have analyzed sentences that exhibit the distributivity of the subject

NP over the adjuncts. The sentences in (57) show that the quantificational element

can also fill in the internal argument positions in the sentences. With its multi-

referent nature, the quantificational object NP is predicted to distribute over the

adjunct of the sentence as well as the time indices since these possible distributees

also have multi-referents. The (i) interpretations of the sentences in (57) are

associated with the "distributivity over the adjunct" readings whereas the (ii)

interpretations denote the "distributivity over time" readings. The subject NPs in

(57a)-(57d) are all single referent NPs depending on their specific nature. The definiteness of the subject NP hinders the possible distribution of the quantificational object NP over the subject as predicted. As a consequence, the sentences in (57) provide evidence that a quantificational NP in the object position can distribute over the adjunct in the sentence as well.

distributivity over the adjunct

(57)    a. Kadın her bebeğ-i bir oda-da emzir-di.

woman every baby-acc one room-loc feed-past

"The woman fed every baby in a room."

(i) The woman fed İlknur in Room A, Gülnur in Room B, Ayşe in Room C etc.

$\Rightarrow$ distributivity over the adjunct

(ii) The woman fed the babies in the same room at different time indices.

$\Rightarrow$ distributivity over time

distributivity over the adjunct

b. Öğretmen her oyuncu-y-u bir sınıf-tan seç-ti.

teacher every player-acc one class-abl choose-past

"The teacher chose every student from a class."

(i) The teacher chose Player 1 from Class A, Player 2 from Class B, Player 3 from Class C etc.

$\Rightarrow$ distributivity over the adjunct

(ii) The teacher chose the players from the same class at different time indices.

⇒ distributivity over time

distributivity over the adjunct
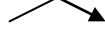
c. Kadın her bebeğ-i bir tarak-la tara-dı.

woman every baby-acc one comb-with comb-past

"The woman combed every baby with a comb."

(i) The woman combed İpek's hair with the red comb, Defne's hair with the orange comb and Beril's hair with the blue comb.

⇒ distributivity over the adjunct

(ii) The woman combed İpek's, Defne's and Beril's hair with the same comb at different time indices.

⇒ distributivity over time

distributivity over the adjunct
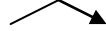
d. Müdür her öğrenci-y-i bir öğretmen-le tanıştır-dı.

principal every student-acc one teacher-with introduce-past

"The principal introduced every student with a teacher."

(i) The principal introduced Ege with the maths teacher, İpek with the English teacher, Levent with the history teacher etc.

⇒ distributivity over the adjunct

(ii) The principal introduced every student with the same teacher.

⇒ distributivity over time

A last point that needs further investigation is what happens if the quantificational element is in the adjunct of the sentence. In such a case we would again predict the quantificational adjunct to distribute over time or constituents having multi-referents in the sentence. (58)-(60) are provided to analyze the cases of quantificational adjuncts.

(58)    a. Kadın bir bebeğ-i her oda-da emzir-di.

      woman one baby-acc every room-loc feed-past

    "The woman fed a baby in every room."

    (i)      There is a single baby being fed by a woman in every room at different time indices.

    $\Rightarrow$ distributive over time

    b. Kadın bebek-ler-i her oda-da emzir-di.

      woman baby-pl-acc every room-loc feed-past

      "The woman fed the babies in every room."

    (i)      Baby A is fed by the woman in Room A, Room B and Room C at different time indices, Baby B is fed by the woman in Room A, Room B and Room C at different time indices etc.

        $\Rightarrow$ distributive over time + distributive over the object

    c. Kadınlar bir bebeğ-i her oda-da emzir-di.

      woman-pl one baby-acc every room-loc feed-past

    "The women fed a baby in every room."

(i)     A baby is fed in different rooms by different women at different time indices.

$\Rightarrow$ distributive over time + distributive over the subject

(59)    a. Müdür İpeğ-i her öğretmen-le tanıştır-dı.

principal İpek-acc every teacher-with introduce-past

"The principal introduced İpek with every teacher."

(i)     İpek is being introduced with every teacher by a principal at different time indices.

$\Rightarrow$ distributive over time

b. Müdür İpek ve Ege-y-i her öğretmen-le tanıştır-dı.

principal İpek and Ege-acc every teacher-with introduce-past

"The principal introduced İpek and Ege with every teacher."

(i)     İpek and Ege are introduced to every teacher together at different time indices.

$\Rightarrow$ distributive over time

(ii)    İpek and Ege are introduced to every teacher separately at different time indices.

$\Rightarrow$ distributive over time + distributive over the object

c. Müdür-ler İpeğ-i her öğretmen-le tanıştır-dı.

principal-pl İpek-acc every teacher-with introduce-past

"The principals introduced İpek with every teacher."

(i)       The principals together introduced İpek with every teacher at different

time indices.

⇒ distributive over time

(ii)     The department deans separately introduced İpek with every teacher

in their own departments at different time indices.

⇒ distributive over time + distributive over the subject

(60)    a. Fotoğrafçı bir çocuğ-u her kamera-y-la görüntüle-di.

Photographer one child-acc every camera-with take picture of-past

"The photographer took the picture of a child with every camera."

(i)       There is a single child being photographed by a photographer with

every

camera at different time indices.

⇒ distributive over time

b. Fotoğrafçı çocuk-lar-ı her kamera-y-la görüntüle-di.

photographer child-pl-acc every camera-with take picture of-past

"The photographer took the picture of children with every camera."

(i)       The children are photographed by a photographer as a group with

every camera at different time indices.

⇒ distributive over time

(ii)     The children are photographed by a photographer separately with

every camera at different time indices.

⇒ distributive over time + (distributive over the object)

c. Fotoğrafçılar bir çocuğ-u her kamera-y-la görüntüle-di.

   photographer-pl one child-acc every camera-with take picture of-past

   "The photographers took the picture of a child with every camera."

   (i)     The child is photographed by photographers as a group with every

           camera at different time indices.     ⇒ distributive over time

   (ii)    The child is photographed by photographers separately with every

           camera at different time indices.

           ⇒ distributive over time + distributive over the subject


In the (a) sentences of (58)-(60), the external arguments and the internal arguments have single referents. Therefore, the quantificational adjunct would only be expected to distribute over time. Considering the interpretations of each (a) sentence, we can see that our predictions are borne out.

In the (b) sentences, however, the object NPs *bebekler* "babies", *öğrenciler* "students", *çocuklar* "children" have multi-referents. This leads us to expect that the quantificational adjunct distributes over the members of the internal arguments as well as time. The interpretations of the (b) sentences, however, illustrate that (58b) does not have an interpretation where baby A is fed in a room, baby B is fed in a different room etc. Similarly, (59b) cannot be interpreted as İpek being introduced to a teacher and Ege to a different teacher. Finally, (60b) also lacks the interpretation where there is a one to one distributivity between the children and the camera. The (b) sentences, on the contrary, illustrate cases of simultaneous distributivity over the objects and time indices. This means that although the quantificational adjuncts can display distributivity over only time indices, they are not capable of displaying

distributivity only over the object. "Distributivity over the argument" should be accompanied by "distributivity over time".

In the (c) sentences, the subject NPs *kadınlar* "women", *müdürler* "principals" and *fotoğrafçılar* "photographers" have multi-referents. This directly brings up the possibility of the distributivity of the quantificational adjunct over the subject NPs. However, the interpretations illustrate that the quantificatinonal adjuncts distribute over the members of the external argument simultaneously over time indices. In other words, (58c) has an interpretation where different women might have fed the baby in different rooms but this requires the time indices to be different. Similarly, for (59c), different principals might have introduced İpek to different teachers provided that these acts of introducing take place at different time indices. (60c) is different from (58c) and (59c) in that different photographers might have photographed the child with different cameras at the same time indice. Only (60c) illustrates sole distributivity of the adjunct over the subject NP due to pragmatic reasons.

3.1.4   Interim Summary

We have seen in this section that the quantificational element in the sentence-either in the subject position or the object position- acts as the "distributor", whereas the remaining constituent and the time indices provided by the verb act as the "distributed share / distributee." The multi-referent nature of the quantificational elements enables the quantificational element to act as the source of the distribution regardless of its position in the sentence. If the QNP is in the external argument position, it can distribute over the object NP and if the QNP is in the internal

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argument position, it can distribute over the subject NP for "distributivity over argument" cases. The quantificational NP in either the subject or the object position distributes over the time indices in the "distributivity over time" cases.

Having seen that our predictions turned out to be correct, we can come up with a new classification for the distributivity types under three headings: distributivity over time, distributivity over arguments and distributivity over the adjuncts. The quantificational NPs can distribute over time, over the other argument of the sentence or over the adjuncts of the sentence provided that the distributor as well as the distributees have multi-referents.

The table given below illustrates the predicted distributivity types in possible combinations of atomic-individual / multi-referent NPs and quantificational subject NPs / object NPs.

Table 2.     Possible Distributivity Types for Different Combinations of Subject

NPs and Object NPs

| SUBJECT | OBJECT | DISTRIBUTIVITY TYPE | EXAMPLE |
|---|---|---|---|
| Atomic-individual | Quantificational NP | Dist. over time | Bir birlik her kaleyi kuşattı. Bir kadın her bebeği emzirdi. Bir çocuk her şarkıyı söyledi. |
| Multi-referent | Quantificational NP | Dist. over time Dist. over argument | Birlikler her kaleyi kuşattı. Kadınlar her bebeği emzirdi. Çocuklar her şarkıyı söyledi. |
| Quantificational NP | Atomic-individual | Dist. over time Dist. over argument | Her birlik bir kale/yi kuşattı.[32] Her kadın bir bebek/i emzirdi. Her çocuk bir şarkı/yı söyledi. |
| Quantificational NP | Multi-referent | Dist. over time Dist. over argument (simultaneous) | Her birlik kaleleri kuşattı. Her kadın bebekleri emzirdi. Her çocuk şarkıları söyledi. |

Having completed the analysis of distributivity types, our discussion can procede on

to the possible collectivity types in sentences. The next section provides a discussion

of collectivity types.

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[32] Recall that the presence of the accusative marker on the object NP yields an unmarked "distributive over time" interpretation although the "distributivity over the argument" interpretation is also available as the marked reading.

A sentence that is judged as having an overall collective interpretation has a meaning in which the members of the external argument carry out the action denoted by the verb as a group (collectively). The sentence can also be interpreted collectively provided that the members of the internal argument undergo the predication denoted by the verb as a group (collectively). (61) and (62) illustrate example sentences having collective meanings as possible interpretations.

The sentence presented in (61a) below has only a collective interpretation. The reason for this collective interpretation is the fact that the members constituting the external argument carry out the action of surrounding a castle as a group. Similarly, the collective interpretation of (61b) is also a result of the collective acts of tent building by the members of the external argument.[33] I will refer to this kind of collectivity, which is triggered by the collective construal of the subject NPs, as "subject collectivity" and claim that these form the first type of collective interpretation.

(61)     a. Bütün asker-ler bir kale-y-i kuşat-tı.

all soldier-pl one castle-acc surround-past

"All the soldiers surrounded a castle"

b. Bütün çocuk-lar bir çadır kur-du.

all child-pl one tent build-past

"All the children built a tent."

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[33] This sentence also has a distributive interpretation where each child built a different tent. However, this interpretation will not be considered in this section since our aim is to classify the collectivity types.

However, the examples presented in (62a) and (62b) do not seem to fall under this category. These sentences also have overall collective interpretations. The collective interpretation of (62a) is the one where a single regiment surrounded all the castles by forming a circle around it. The fact that the members of the internal argument – *castles-* undergo the predication denoted by the verb-*surround-*makes the overall collective interpretation of the sentence possible.

Similarly, (62b) also has a collective interpretation where a child carried all the boxes putting them on top of the other. The overall collective interpretation of the sentence is achieved by the fact that each member of the internal argument undergoes the predication at the same time as a group. These examples form the second category of collectivity types which I will refer to as "object collectivity".

(62)   a. Bir birlik bütün kale-ler-i kuşat-tı.

one regiment all castle-pl-acc surround-past

"One regiment surrounded all the castles."


b. Çocuk bütün kutu-lar-ı taşı-dı.

child all box-pl-acc carry-past

"The child carried all the boxes."


5.0   Chapter Summary

As a preliminary study before our approach to how quantificational sentences get interpreted, this chapter attempted to put forward a necessary condition that needs to be satisfied before the sentence is interpreted. The Compatibility Condition was

discussed to be the relation of the types of the predicates and the types of the nouns in the subject positions. The co-occurance restrictions of the predicates on their external arguments were discussed thoroughly in the first half of the chapter. A violation of the Compatibility Condition yields an unacceptable sentence and consequently the sentence can be interpreted neither as collectively nor as distributively. The sentences which will be studied within the framework of our newly-proposed computational mechanism, the Modified Plus Principle, are all in line with the co-occurance restrictions that we have laid out in this section.

In the second half of this chapter, I attempted to classify distributive interpretations and collective interpretations of sentences into groups. Distributivity was discussed under three groups: distributivity over time, distributivity over argument and distributivity over adjuncts. Collectivity, on the other hand, was discussed under two main categories: subject collectivity and object collectivity. The next chapter will discuss that the overall sentence interpretations that we get at the end of the computation of the Modified Plus Principle will be either +COLLECTIVE or –COLLECTIVE. The sentences computed as having a +COLLECTIVE interpretation illustrates either subject collectivity or object collectivity. The sentences computed as having a -COLLECTIVE interpretation, on the other hand, illustrate cases of distributivity over time, distributivity over the argument or distributivity over the adjunct.

CHAPTER 4


COMPOSITIONAL COMPUTATION OF COLLECTIVITY AND

DISTRIBUTIVITY: THE MODIFIED PLUS PRINCIPLE


1.0     Introduction


In Chapter 2 of this dissertation, both syntax-based and semantic based approaches to

sentence interpretation have been explained and relevant Turkish data have been

analyzed in detail. It was further shown that quantificational sentences in Turkish

could be fully accounted for neither by syntax-based approaches nor by semantic

based approaches. In what follows I will propose a new approach to account for the

collective vs. distributive interpretation of sentences in general. At the heart of this

attempt lies a compositional approach to sentence interpretation. The principle of

compositionality which is defined as "The meaning of an expression is a function of

the meanings of its parts and of the way they are syntactically combined" in *The*

*Stanford Encyclopedia of Philosophy* is taken as a basic building block for the

analysis of collectivity/ distributivity distinction in this dissertation.  This principle

has been taken as a core principle in formal semantics whose roots lie in logic and

the philosophy of language. Taking the compositionality principle as the central

point on which my analysis is formulated, I will start out my discussion by

presenting some background information on the notion of compositionality and how

this notion has been treated in the literature.

        The following parts of the chapter will be structured as follows: Some

theoretical information on compositionality will be provided in Section 2. In Section

3, an analysis of aspectuality which is based on the principle of compositionality will be introduced and discussed (Verkuyl 1993, 1997, 2002).The discussion on aspectuality is presented just to explain the Plus Principle which is a way to account for the aspectuality of sentences. I would like to point out at this point that this dissertation is not about aspectuality. It is only the Plus Principle that will be borrowed from the analysis of aspectuality. Next, adopting the basic points of the Plus Principle, I will propose a computational analysis of quantificational sentences which I refer to as the "Modified Plus Principle". The application of the Modified Plus Principle will illustrate that compositionality needs to be considered as the guiding principle in the notion of collectivity vs. distributivity. Finally in Section 4, I will propose that each constituent of a sentence has a collectivity feature. The Modified Plus Principle will be proposed to operate on the collectivity features of the constituents. The outcome of the combination of these features within the framework of the Modified Plus Principle yields the overall collective / distributive interpretation of the sentence.

## 2.0    Compositionality in Semantics

The well-known principle known as "the compositionality principle" is discussed, obeyed or rejected in philosophy, linguistics, logic and computer science (Partee1984; Dever 1999; Dowty 2006; Janssen 1986, 2001; Pelettier, 2001)[34] . The principle of compositionality has traditionally been defined as presented in (1) below.

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[34] The studies which argue that natural languages are compositional are Dever (1999), Dowty (2006), Janssen (1986) and Grandy (1990) among others. The studies which argue against the presence of compositionality in natural languages are Chomsky (1975), Pelletier (1994), Cohen (1985), Kittay (1987), Schiffer (1987) and Higginbotham (1986).

(1)     The Compositionality Principle

The meaning of an expression is a function of the meanings of its parts and of the way they are syntactically combined.

This definition of the principle of compositionality is found in Frege (1892), Montague (1970), Tarski (1983), Partee (1984), Janssen (1997), Hodgez (2001) and Fodor (2001). Since the principle was first mentioned in the works of Frege, the principle is usually attributed to him and is often called "Frege's Principle". This principle basically refers to a meaning theory which shows how the meanings of wholes depend upon the meanings of their components. Based on the principle of compositionality, Fodor (2001) argues that the semantic value of a sentence is inherited from the semantic values of its constituents, together with their arrangement. A survey of the relevant literature shows that almost all modern linguistic theories which give serious attention to semantics follow the principle of compositionality such as Montague Grammar, Generalized Phrase Structure Grammar, Categorial Grammar and Lexicalized Tree Adjoining Grammar.

Dever (1999) defines compositionality as a tool for limiting what can be relevant to determining the meaning of a complex expression. Compositionality is assumed to represent the simultaneous imposition of two constraints. These constraints are referred to as "Semantic Closure" and "Semantic Locality". Semantic Closure refers to the fact that only semantic information can go into the determination of the semantic value of a complex expression. This means that the meaning of a sentence is determined by the meanings of the words rather than the phonetic, morphological etc properties of the word. Semantic locality, on the other

hand, refers to the fact that only information derived from parts of a complex expression can go into the determination of the semantic value of that expression. This means that natural language semantics is compositional on the basis of the constituent structure of the sentence. For a sentence like, "The small dog chased the big cat", the word "small" restricts the noun "dog" (but not the noun "cat") whereas the word "big" restricts the noun "cat" (but not the noun "dog"). It is the constraint of "Semantic Locality" that leads to a compositional semantics which proceeds constituent by constituent. Combining Semantic Closure and Semantic Locality yields compositionality- the requirement that the meaning of a complex expression be determined by the meanings of its parts.

Arguments as to why we need a compositional semantics for natural languages also start with Frege (1963). The following paragraph given in (2) presents Frege's ideas as to why compositionality should be treated as a core issue in natural languages.

(2)    "…It is astonishing what languages can do. With a few syllables it can express an incalculable number of thoughts, so that even a thought grasped by a terrestrial being for the very first time can be put into a form of words which will be understood by somebody to whom the thought is entirely new. This would be impossible, were we not able to distinguish parts in the thought corresponding to the parts of a sentence, so that the structure of the sentence serves as an image of the structure of thought…"

(Frege, 1963)

This most well-known passage by Frege, gives us a reason for the need of compositionality: to account for our ability to understand language. Frege suggests that, we need compositionality in the language in order to account for our ability to comprehend an infinite number of sentences using a finite cognitive capacity. We are able to understand the thoughts expressed by novel sentences because these thoughts

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are built up out of the thoughts expressed by the components of the sentence. In line with what Frege suggests, Grandy (1990) argues that productivity, novelty and exponentiation provide good reasons to believe in compositional semantics. Fodor (2001) also argues that the fact that the language is productive and systematic brings up the requirement for the compositionality of the language.

## 2.1 Homomorphism and Compositionality

A core issue in the discussion of compositionality is the "homomorphism" between syntax and semantics. The requirement for "homomorphism" between syntax and semantics has been described in Montague (1970) in a general sense. Homomorphism refers to the requirement that semantic interpretation closely track syntactic form. Both syntax and semantics are thought of as algebras. Syntax is the algebra of basic expressions and application of the syntactic operations yields derived expressions from these basic expressions. Semantics, on the other hand, is the algebra of meanings. Semantics has basic meanings of words and semantic composition procedures that operate on these basic meanings. Homomorphism requires that the syntactic and meaning operations match up. To clarify this point, let us suppose that a complex expression is built up via application of two syntactic rules: one of predication of a verb phrase to a subject, and one of adjectival modification of a subject. Then, there ought to be two corresponding semantic rules: one determining the meaning of a sentence from the meanings of its components verb phrase and the subject, and one determining the meaning of a complex subject from the meanings of its components adjective and noun. In other words, the semantic rules apply in line with the syntactic construction rules for combining the

constituents of a sentence. This homomorphemic relation between syntax and semantics is called the "*rule to rule hypothesis*" (Bach, 1980). Syntactic construction rules as well as the semantic interpretation rules are purely "bottom-up" in Frege's compositionality.

The requirement of homomorphism between syntactic operations and semantic operations will be argued to be important for the compositional analysis of quantification in my analysis.

<br>

## 2.2     Substitution and Compositionality

One other important notion in Frege's compositionality is the substitution property. A general formulation of the substitution property is presented in Janssen (2001) as given in (3) below.

(3)     If in an expression, a sub-expression is replaced by one with the same

        meaning, then the meaning of the complete expression is unchanged.

The substitution property of compositionality dates back to the studies of Frege (1892). Frege considers the meaning of a sentence as its truth value and puts forward his ideas with respect to the substitution property as in (4).

(4)     If our supposition that the meaning of a sentence is its truth value is correct,
        the latter must remain unchanged when a part of the sentence is replaced by
        an expression with the same meaning. And, this is indeed the case.
                                                                        (Frege, 1892)

Janssen (1986) argues that the substitution property follows directly from the notion

of compositionality. A language is compositional if substitution of synonyms always preserves synonymy. Quantificational data that I will be dealing with will be shown to provide supporting evidence that substituting a sub-expression with another one having an identical collectivity feature will result in the same collectivity feature for the overall sentence.

Up to now, I attempted to provide some background information with respect to the "Principle of Compositionality". The underlying concepts of compositionality were shown to be the close connection between syntactic construction rules and semantic composition procedures and the substitution property.

A feature based analysis based on the compositionality principle will be proposed to analyze the collective / distributive interpretation of the sentences. Similar feature based analyses were also used to account for the aspectuality of sentences in the literature. In the next section, I will provide a discussion of how aspectuality is treated within a compositional feature based analysis to exemplify the methodology of such a feature based analysis. Following this preliminary discussion, I will propose a methodologically similar feature-based analysis for the collective / distributive distinction.

### 3.0     A Compositional Analysis of Aspectuality

Compositionality, which is a guiding principle in the domain of aspectual phenomena, forms the basis of the analyses offered in Verkuyl (1972, 1989, 1993, 1997, 2002) where the core point of semantic analysis is taken as Fregean compositionality. On a Fregean view, a verb has a constant meaning in the aspectual composition, independently from the information contributed by its arguments. This

implies that both the verb and its arguments contribute to the aspectuality of sentences (Verkuyl, 1972).

The importance of compositionality in the aspectual interpretation of a sentence is highlighted in the sentences shown in (5). Each individual constituent in a sentence has a role to play in the sentence interpretation. This implies that approaches to aspectuality that base their analyses only on a single constituent of the sentence would be predicted to fail.

(5)    a. Judith ate a sandwich.          Terminative

       b. Judith ate sandwiches.         Durative

       c. Nobody ate a sandwich.         Durative

       d. Judith disliked a sandwich.    Durative

Verkuyl (1997)

The aspectual distinction between (5a) and (5d) can only be attributed to a difference between the predicates. The predicate "eat" in (5a) is a terminative verb whereas the predicate "dislike" in (5d) is a durative one. However, comparing (5b) to (5a) yields the result that meaning differences do not follow solely from the predicate. This proves that internal arguments also play a role in the determination of aspectuality. (5a) and (5c), which are identical except for their external arguments, on the other hand, illustrate the importance of the external argument in determination of aspectuality.

The conclusion reached in Verkuyl (1972) after a brief inspection of these sentences given above is that both the verb and its arguments contribute to the aspectuality of the sentences and that the overall aspectual interpretation of a

sentence cannot be a matter of only a single constituent. This observation is clearly a supporting evidence for the compositional nature of languages. The overall meaning is simply the combination of the meanings of all the constituents of the sentence.

Having observed the contribution of each constituent to the overall aspectual meaning of the sentences, Verkuyl (1997, 2002) uses Montague's model-theoretic work that basis the interpretation of complex expressions on the principles of Frege. A Fregean interpretation in the works of Montague (1970, 1974) means that complex expressions are interpreted bottom-up, starting with the lexical items and yielding phrasal meaning. In other words, the verb can be seen as a predicate of a certain functional type asking for an internal argument $NP_{int}$ and forming a VP which combines with the $NP_{ext}$ so as to form a sentence.

Basing his analysis on the notion of compositionality as discussed in Frege and Montague, Verkuyl proposes to provide an explanation as to how the sentences get their overall aspectual interpretation with a principle called *The Plus Principle*. A detailed discussion on the compositional nature of aspectuality and the Plus Principle is given in the following section. The discussion on the Plus Principle is presented so as to clarify how the principle operates. Recall that the Plus Principle will be adopted to account for the quantificational data in the dissertation.

### 3.1 The Plus-Principle and Aspectuality

The feature based analysis that I will discuss in this section of the dissertation requires the need to assign features to the verbs as well as the other constituents of the sentence. The Plus Principle which will be discussed in the following paragraphs in detail will be shown to operate on these features assigned to the verbs and the

arguments of the sentence. After a discussion of these features, we will be able to understand how the Plus-Principle can be applied to sentences to provide information about its aspectual property.[35]

### 3.1.1  Features Assigned to Verbs and Arguments

Basing his analysis on the observation of Poutsma (1926) that each verb has a basic aspectual feature and that this aspectual feature interacts with the aspectual features of the arguments of the sentence, Verkuyl (1972, 1993, 2002) analyzes the aspectuality of sentences with the help of two features. The first semantic feature is the [+ / - ADD TO] feature which is attributed to the verb and the second is the [+ / - SQA] property attributed to the NPs.[36] Let us have a look at what each of these features denotes.

Verbs expressing change and verbs expressing a state differ from each other aspectually. This distinction is often referred to as an opposition between non-statives and statives. Non-stative verbs are distinguished from stative verbs in their ability to invoke an interpretation in which their arguments participate in a temporal structure. The [+ / - ADD TO] property of the verb distinguishes stative verbs from non-stative verbs. The [+ADD TO] feature expresses dynamic progress, change or nonstativity. So, non-stative verbs such as *mail, lift, eat* etc. are referred to as [+ADD

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[35] My thesis is based on the quantificational information of the sentences. This discussion regarding how the aspectuality of sentences is computed is given here just to show the methodology of the approach. I will only use the Plus Principle modifying it in such a way to account for the quantificational data.

[36] [+ / - ADD TO] is the short form for "additivity", [+ / -SQA] is the short form for "Specified Quantity of A".

TO]. The [-ADD TO] feature expresses stability. So, stative verbs like *love, hate* etc. are known to have the [-ADD TO] feature.[37]

The [+ / - SQA] property, on the other hand, expresses information from the arguments of the predicate.[38] More specifically, the [+SQA] property expresses that the NP pertains to a specified quantity of things whereas [-SQA] property expresses an NP pertaining to an unspecified quantity. In Verkuyl (1972), [+SQA] is purported to generalize over such NPs as *a sandwich*, *the concerto*, *a piece of/from X*, *three concertos*, *some of Boccherini's cello concertos*, *the whisky*, *a draught of/from X*, *a Norwegian sweater*, *a house*, *many things*, etc., whereas [-SQA] to *sandwiches, music, sonatas etc.*

To clarify what the property of SQA denotes, Verkuyl (2002) presents sentences given in (6a) and (6b), the first exemplifying the [+SQA] property whereas the second exemplifying the [-SQA] property. The internal arguments given in (6a), that is "three sonatas, some sonatas, a sonata etc." denote a specified quantity of things, thus they are finite, whereas the ones in (6b), that is "sonatas, music etc." denote an unspecified quantity, thus they are non-finite.

(6)    a.    She played three sonatas, some sonatas, a sonata etc.

       b.    She played sonatas, music etc.

These features attributed to the verbs and the NPs have a crucial role in how the compositional mechanism works to give an understanding of the aspectuality of

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[37] Verkuyl (1997) prefers to use the [+ / - ADD TO] feature in place of the [+ / - STATIVE] feature. He uses this opposition to point out that verbs of change which have the [+ ADD TO] feature are responsible for the property of additivity in non-stative verbs. The property of additivity refers to the temporal structure of non-stative verbs starting from some point of origin and introducing a well-ordered set of time indices. These verbs are given a dynamic treatment.

[38] [+ / - SQA] is the abbreviation of "*Specified Quantity of A*". *A* is the denotation of the head noun.

sentences. Having discussed how verbs can have the [+ / - ADD TO] feature and

how the NPs can have the [+ / - SQA] feature, we can analyze the interaction of these

features in the Plus Principle.

3.1.2   The Plus Principle

The underlying issue that I have been discussing so far is the fact that the meaning of

a complex expression is computable on the basis of its constituent parts. Figure 1 will

help me to clarify how the computational machinery of aspectual composition works

with the help of the features provided by the verb and its arguments. Semantic

information is expressed by the features [+ / - ADD TO] and [+ / - SQA].
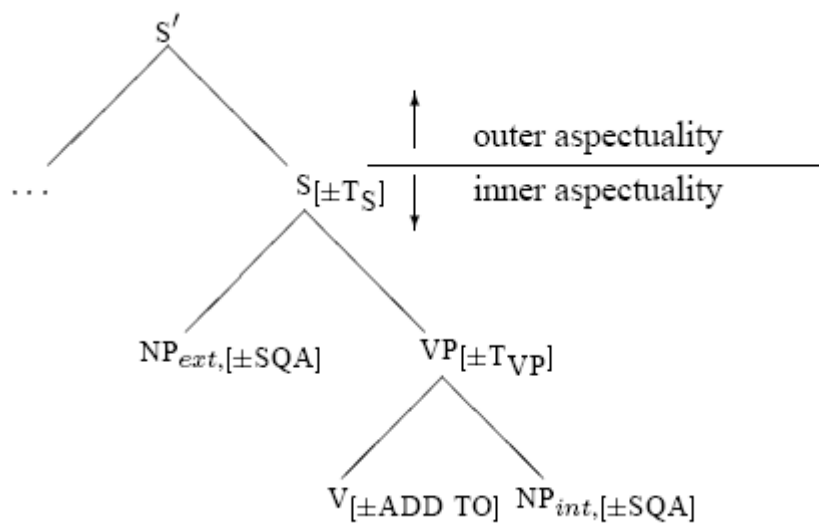


FIGURE 1: Aspectual Composition

What Figure 1 illustrates is the syntactic structure suitable for a bottom-up

interpretation construing the aspectuality of sentences.The idea of the diagram as a

whole is that the features of each constituent of the sentence contributes to the

overall aspectual interpretation of the sentence. In other words, a verb is specified for some semantic property, and it takes an $NP_{int}$ which is also specified for some semantic property forming a VP at which level a complex semantic object is construed. The VP, furthermore, combines with $NP_{ext}$ yielding a tenseless sentence S that carries the complex aspectual information labeled $[+ / - T_S]$ and collected from lower levels in the form of a complex semantic feature. Then this process comes to an end after which other principles are operative in a higher domain. To mark this transition a distinction is made between inner and outer aspectuality. The aspectual kernel consisting of the verb and its internal and external arguments is referred to as the "inner aspectuality". The term "outer aspectuality" is used for the result of applying modifying adverbials to inner aspectual information. (7a) and (7b) are provided to illustrate inner and outer aspectuality more clearly. The sentence given in (7a) is seen as the aspectual kernel on which adverbials and other adjuncts may operate. If we extend (7a) to (7b) this kernel remains intact and it acts as the point of departure for the determination of higher forms of aspectuality.


(7)     a. Judith ate a sandwich.

        b. Judith ate a sandwich in the bathroom at midnight yesterday.

                                                        (Verkuyl, 1997)


Figure 1 which I have been trying to discuss up to now will act as a starting point on which the Plus Principle will be expected to apply. In the following paragraphs, examples will be given to show how the Plus Principle is put into operation. The sentences presented in (8a) to (8d) have different aspectual interpretations. (8a) is terminative whereas (8b)-(8d) are all durative sentences. This difference in the

aspectual interpretation of the sentences is a consequence of the different values of [SQA] and [ADD TO] features that different constituents bear. Interaction of the features of [SQA] and the [ADD TO] in terms of the Plus Principle, which will be defined below, yields differences in the overall aspectual interpretation of the sentences.

(8)  a.     [Mary              [walked          three miles]].

$[ +T_S [+SQA]$       $[ +T_{VP} [+ADD\ TO]$          $[+SQA]]]$

$\Rightarrow$ terminative

b.     [Mary              [walked          miles]].

$[-T_S [+SQA]$       $[-T_{VP}\ [+ADD\ TO]$          $[-SQA]]]$

$\Rightarrow$ durative

c.     [Children          [walked                three miles]].

$[-T_S [-SQA]$       $[+T_{VP} [+ADD\ TO]$          $[+SQA]]]$

$\Rightarrow$ durative

d.     [Mary              [saved          three miles]].

$[-T_S [+SQA]$       $[-T_{VP} [-ADD\ TO]$          $[+SQA]]]$

$\Rightarrow$ durative[39]

(Verkuyl, 2002)

The sentences in (8a), (8b) and (8c) have the same predicate "walk". The predicate "walk" expresses dynamic change and non-stativity, so has the [+ADD TO] feature.

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[39] $+T_{VP}$ / $-T_{VP}$ represent whether the VP is terminative or not respectively. $+T_S$ / $-T_S$ represents the terminativity or the non-terminativity of the whole sentence.

The predicate of (8d), that is "save", is a stative verb, thus have the [-ADD TO] feature.

The internal arguments of (8a), (8c) and (8d) are "three miles". Since this NP pertains to a specified quantity of miles, they have the [+SQA] feature. The NP "miles", in (8b), on the other hand, has the [-SQA] feature since it refers to a non-specified quantity.

The external arguments of the sentences in (8a), (8b) an (8d) are "Mary", thus have the [+SQA] feature, whereas "children" in (8c) has the [-SQA] feature. It is only after the determination of these feature values of each constituent that the Plus Principle can be put into operation.

Plus Principle is used to account for how these features interact with each other to give the aspectual interpretation of the VP and the overall sentence. This principle is defined as presented in (9) below.

(9)    Plus-Principle

One minus value is sufficient to yield a $[-T_S]$ at the top (sentential level).[40]

To reword it more precisely, the Plus Principle indicates that the presence of a minus value in any of the constituents of a sentence makes the sentence non-terminative. A comparison of (8a) with (8b) shows us the fact that the internal argument "three miles" in (8a) is [+SQA] hence renders the sentence terminative, whereas the internal argument "miles" in (8b) is [-SQA] hence yields a durative sense as opposed to terminative. The [-SQA] feature of the external argument in (8c) and the [-ADD TO] feature of the predicate in (8d) lead to the non-terminativity of the sentences.

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[40] $[-T_S]$ represents the non-terminativity of the overall sentence.

A step-by-step analysis of (8a) to (8d) shows that the VPs also have a value for terminativity as well. In (8a), for instance, the [+ADD TO] feature of the predicate combined with the [+SQA] feature of the internal argument yields a $+T_{VP}$ value for the VP. A further combination of this $+T_{VP}$ value for the VP with the [+SQA] feature of the external argument results in the $+T_S$ value for the overall sentence. This indicates that the sentence is terminative. In (8b), on the other hand, the [+ADD TO] feature of the predicate combined with the [-SQA] feature of the internal argument yields a $-T_{VP}$ value for the VP. When this $-T_{VP}$ value for the VP combines with the [+SQA] feature of the external argument, we get the $-T_S$ value for the overall sentence, which means that the sentence is durative.

The operation of the Plus Principle above clearly illustrates that the interpretation of a sentence depends totally on the composition of features of the predicate and the internal argument and later on the composition of features of the VP and the external argument. Trying to place the aspectual interpretation of a sentence on only one constituent will yield erroneous results.

In this section, I tried to explain how the Plus Principle works and defined the features of the verbs and the NPs needed for the Plus Principle to operate on. The application of the Plus Principle in a bottom-up manner is a clear indication that the principle operates compositionally. The application of the principle in a bottom-up manner closely tracks the way the sentence is constructed syntactically. This means that, the Plus Principle is in line with the homomorphism property of compositionality which means that there is a close connection between the syntactic and the semantic operations. Furthermore, the fact that the features of each constituent play a role in the operation of the Plus Principle illustrates that the overall aspectual interpretation of the sentence is a matter of the combination of the

aspectuality values of each single constituent. This also supports the compositional approach of Frege and Montague.

Having discussed a compositional approach to aspectuality of sentences in detail, I would like to discuss my observations of the Turkish data regarding the importance of how each constituent contributes to the interpretation of the quantificational sentence. Similar to the analysis of aspectuality of sentences presented above, the quantificational sentences in Turkish also reveal the importance of the notion of compositionality. The following section is a discussion of a compositional analysis with respect to quantificational sentences in Turkish.

## 4.0     A Compositional Analysis of Quantification

Just as the verb and its arguments each contribute to the aspectuality of sentences as shown above, they each have an important role to play in the determination of collective vs. distributive interpretations. We have observed in Chapter 1 that each constituent of a sentence contributes to the overall collectivity / distributivity of the sentence. The example sentences that we have analyzed in Chapter 1 brought out the importance of the principle of compositionality in interpreting a sentence either as collective or distributive.

Having observed that the same assumption about compositionality seems to be the underlying principle in the quantificational data that I am working with, I take the Plus Principle, which was explained with respect to the aspectuality of sentences in the previous section and will modify it in such a way to account for the collectivity / distributivity of sentences in Turkish. In an attempt to modify the Plus Principle to accommodate the quantificational data I will propose that the verbs and the NPs have

quantificational features of their own and that the Plus Principle operates on these quantificational features to yield the overall quantificational information of the sentence.

### 4.1 The Modified Plus Principle

I propose that the collective / distributive interpretations of a proposition is the result of a combination of + / - collective features of its constituents; namely, the verb, its arguments and adjuncts. The computational mechanism for quantificational sentences which works on these + / - collective features will be referred to as the Modified Plus Principle in the dissertation.

The Plus Principle requires that each constituent in the sentence has features and as a result of the interaction between these features the sentences receive their overall interpretations. The Plus Principle was defined as the rule that allows just one minus value to be sufficient to yield a minus value at the top (sentential level). The table in (10) shows the possible combinations of two values coming from two constituents and their outcoming features.

(10)    Interaction of Features

| FEATURE 1 | FEATURE 2 | FINAL FEATURE |
|-----------|-----------|---------------|
| +         | +         | +             |
| +         | −         | −             |
| −         | −         | −[41]         |

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[41] The table does not indicate that Feature 1 is associated with the NP in the external argument position and Feature 2 with the NP in the internal argument position. The table only represents what the outcomes of the interaction between the + and − values will be in any structure.

The table makes it clear that a combination of two plus features yields a plus feature for the overall structure. The table also illustrates that the interaction of a plus and a minus feature ends up with an overall minus feature at the end. Similarly the interaction of two minus values gives out an overall minus value. This means that if any of the constituents brings a minus value to the structure, the outcoming feature is always a minus value. Considering the fact that we will assign features of collectivity for each constituent of the sentence, the table implies that the presence of a constituent with a minus collectivity feature within the structure directly yields a minus collectivity feature for the whole sentence. This is an important implication of the approach since it enables us to predict that a minus collective constituent-that is, a distributive one, in any position of the sentence will give out a minus collective-that is, a distributive- sentence. Similarly, the table also implies that an overall collective interpretation of a sentence is the result of an interaction of constituents having only plus collectivity features. (11) presents the Modified Plus Principle for collectivity.

(11)    The Modified Plus Principle for Collectivity

        If the proposition contains a constituent with [-COLLECTIVE] feature, then

        the proposition is interpreted as [-COLLECTIVE].

In contrast to Verkuyl's use of the Plus Principle to aspectuality, I argue here that a feature might have a + / - value. For the feature of collectivity, this means that a constituent can have a + / -COLL feature which is an indication of its ambiguous nature. However, it will be shown in the following sections that such an ambiguous

constituent enters the computational interpretive mechanism either with the + value

or the − value but not both.

### 4.1.1   Collectivity Features of Predicates

For the Plus Principle to work for quantificational sentences, I propose to have a [+ /

- COLLECTIVE] feature for the different predicate types[42]. Based on how the

predicates have generally been classified in the literature and the meanings denoted

by each predicate type, I propose that collective predicates have a [+COLLECTIVE]

feature, distributive predicates have a [- COLLECTIVE] feature and ambiguous

predicates have a [+ / - COLLECTIVE] feature. This is schematized in (12) below.

 (12)   Collectivity features attributed to predicates

| PREDICATE TYPE | COLLECTIVITY FEATURE |
|---|---|
| * Collective Predicates | [+COLLECTIVE] |
| * Distributive Predicates | [- COLLECTIVE] |
| * Ambiguous Predicates | [+ / - COLLECTIVE] |

### 4.1.2   Collectivity Features for Determiners and Noun Phrases

In addition to the collectivity features attributed to the predicates, I also propose to

assign collectivity features to the quantificational NPs in sentences. The

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[42] Classifications for the predicate types are discussed in Section 3.1.1 of Chapter 2.

quantificational NPs in the data that we are dealing with are composed of a quantificational determiner such as *her* "every" or *bütün* "all" complemented by either a singular or a plural noun correspondingly. The question to be asked at this point is "*Which particular element within the noun phrase should bear the [+ / - COLLECTIVE] feature- the quantificationaldeterminer, the noun itself or both?*" The following paragraphs attempt to provide an answer for this question.

Suppose that it is only the plurality or the singularity of the noun complementing the quantificational element that provides the [+ / - COLLECTIVE] feature to the overall noun phrase and that the quantificational elements do not have any influence on the interpretation of a sentence. I assume that a singular noun has the [- COLLECTIVE] feature, whereas a plural noun has the [+ COLLECTIVE] feature. Based on this assumption, let me analyze the sentences provided in (13) to (15) below. The predicates of these sentences are all ambiguous predicates. Therefore they can be interpreted both collectively and distributively, thus have a [+ / - COLLECTIVE] feature. In other words, it cannot be the predicate that is giving the overall collective or distributive interpretation to the sentence. The influencing factor seems to be the interpretation of the quantificational NP in the external argument positions in this case.

(13)   a. Her kız$_{[- COLL]}$  bir şarkı söyle-di$_{[-/+ COLL]}$.                    distr.

every girl one song sing-past

"Every girl sang a song."

b. Bütün kız-lar[+ COLL]   bir şarkı söyle-di[-/+ COLL].          distr. / coll.

all girl-pl. one song sing-past

"All the girls sang a song."


(14)   a. Her çocuk[- COLL]   bir resim çiz-di[-/+ COLL].              distr.

every child one picture draw-past

"Every child drew a picture."


b. Bütün çocuk-lar[+ COLL] bir resim çiz-di[-/+ COLL].          distr. / coll.

all child-pl one picture draw-past

"All the children drew a picture."


(15)   a. Her öğrenci[- COLL]   bir çadır kur-du[-/+ COLL].            distr.

every student one raft build-past

"Every student built a raft."


b. Bütün öğrenci-ler[+COLL]   bir çadır kur-du[-/+ COLL].        distr. / coll.

all student-pl one raft build-past

"All the students built a raft."


The (a) sentences in (13)-(15) have singular nouns as their external arguments, so

they enter the overall computational mechanism of collectivity with a [- COLL]

feature. The predicates of these sentences, on the other hand, have a [+ / - COLL]

feature due to being ambiguous predicates. A combination of these features in terms

of the Plus Principle yields a [- COLL] final feature for the overall interpretation of

the sentence. This means that the (a) sentences are all distributive where every girl sang a different song, every child drew a different picture and every student built a different tent.

The (b) sentences, on the other hand, have plural nouns in their external argument positions and are claimed to carry the [+COLL] feature. Ambiguous predicates are used in the (b) sentences as well and have the [+ / - COLL] feature. A combination of these features give a [+ / - COLL] feature for the overall sentence.[43] This means that the sentence is ambiguous between a collective and a distributive interpretation. In the collective interpretation, (13b) has the meaning that the girls sang a song together, (14b) has the meaning that the children drew a picture together and (15b) has the meaning that the students built a tent together.

For the analysis of sentences given in (13) to (15) above, the quantifiers in the external arguments were assumed to have a null effect, without any influencing effect on the interpretation of the sentence. In other words, the quantificational NP was supposed to get its collectivity feature based on only the plurality or the singularity of the noun. However, other examples show that things are not as simple as they seem. And the following examples demonstrate that the quantifier cannot be considered as having a null effect in sentence interpretation.

In order to show that the quantifiers cannot have a null effect in a quantificational NP, I will compare the (a) sentences of (13) to (15) with sentences that have identical meaning and structure with the exception of pluralized nouns

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[43] The ambiguous predicates have a [+ / - COLL] feature. This means that such a predicate can enter the computational procedure with either a +COLL value or a –COLL value. Supposing that it enters the system with a +COLL feature and interacts with the +COLL feature of the external argument, we get a +COLL value for the sentence. On the other hand, the –COLL feature feature of the ambiguous predicate and the +COLL feature of the external argument yields a –COLL value for the sentence.

rather than singular nouns in the external argument positions. Let us analyze the sentence pairs in (16)-(18) below.

(16)  a. Her kız[- COLL]  bir şarkı söyle-di[-/+ COLL].          distr.

      every girl one song sing-past

      "Every girl sang a song."

    b. Kız-lar-ın[+COLL] herbiri bir şarkı söyle-di[-/+ COLL].          distr.

      girl-pl-poss each one on song sing-past

      "Each one of the girls sang a song."

(17)  a. Her çocuk[- COLL]   bir resim çiz-di[-/+ COLL].          distr.

      every child one picture draw-past

      "Every child drew a picture."

    b. Çocuk-lar-ın[+ COLL] herbiri bir resim çiz-di[-/+ COLL].          distr.

      child-pl-poss each one one picture draw-past

      "Each one of the children drew a picture."

(18)  a. Her öğrenci[- COLL] bir çadır kur-du[-/+ COLL].          distr.

      every student one raft build-past

      "Every student built a raft."

b. Öğrenci-ler-in$_{[+ COLL]}$ herbiri bir çadır kur-du$_{[-/+ COLL]}$.     distr.

  student-pl-poss each one one raft build-past

  "Each one of the students built a raft."

The (a) sentences are structurally different from the (b) sentences in (16)-(18). In the (a) sentences the distributive quantifiers are used in a pronominal position. The pronominal quantifier *her* "every" is followed by singular nouns. However, in the (b) sentences, the quantificational elements are used in post nominal positions. In this case, the quantifier *herbiri* "each" is preceded by plural nouns. Despite this structural difference the sentences have identical interpretations in terms of the collectivity/ distributivity distinction. The sentences in (16)-(18) are all distributive with meanings that every girl sang a different song, every child drew a different picture and every student built a different tent. If only the singularity or the plurality of the noun in the external argument carried the collectivity feature, we would expect to have different interpretations for the (a) sentences and the (b) sentences of (16)-(18). To make it clearer, let me explain my point on (16). The external argument in (16a), *kız* "girl", is a singular noun and thus is supposed to carry the [- COLL] feature according to the proposal offered here. The predicate, being an ambiguous one, has the [-/+ COLL] feature as proposed in (12) above. Since one minus value is enough to give a minus value at the top in the Plus Principle, the overall interpretation of the sentence would be [- COLL] for (16a) and the sentence would be expected to have a distributive interpretation. Up to now, there seems to be no problems. However, in (16b) the subject noun is pluralized due to the use of a post nominal quantificational element. Therefore, I assume that it carries the [+ COLL] feature. The predicate is still an ambiguous one with the [-/+ COLL] feature. The application of the Plus

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Principle to this sentence would render a [-/+ COLL] overall interpretation which means that we would expect the sentence in (16b) to be both distributive and collective in meaning. (16b) clearly has a distributive interpretation where each girl sang different songs, but the expected collective interpretation is not available. In other words, the sentence does not have an interpretation where the girls sang a song together. The same holds for (17a) vs (17b) and for (18a) vs (18b) as well. This clearly shows that the distributive/ collective distinction cannot be solely dependent on the singularity/ plurality of the noun in the external argument.

Having observed that it cannot be only the noun in the noun phrase that carries the [-/+ COLL] feature, we have another alternative for the possible element bearing the collectivity feature. The quantificational element in the NP should be the constituent carrying the collectivity feature. The following paragraphs and examples will illustrate how they bear this feature. It has been observed in the literature that "every" and "each" are obligatorily distributive. On the other hand, plural noun phrases with "all" or a numerical NP are not obligatorily distributive. (19) and (20) are taken from Szabolcsi (1997) to illustrate the obligatory distributivity of "each" and "every" and  distributivity and collectivity for "all".

(19)    a. * Every man / each man surrounded the fort.

        b. Every man / each man lifted the table (*together)


(20)    a. The men / a hundred men / all the men surrounded the fort.

        b. The men / a hundred men / all the men lifted the table (together).

                                                            Szabolcsi (1997)

(19b) has a distributive meaning where the men lifted different tables but (20b) can

have both the collective and the distributive interpretations. Depending on this

observation, I assume that *her* "every" has an unmarked [- COLLECTIVE] feature

whereas *bütün* "all" has an unmarked [+COLLECTIVE] feature. (21)-(23) present

examples to be analyzed to see whether the constituent carrying the collectivity

feature is only the quantificational element or not.


(21)  a. Komutan bütün$_{[+COLL]}$ asker-ler-e bir kale kuşat-tır-dı$_{[+COLL]}$.       coll.

   commander all soldier-pl-dat one castle surround-caus-past

   "The commander had all the soldiers surround a castle."


   b. Komutan her$_{[-COLL]}$ birliğ-e bir kale kuşat-tır-dı$_{[+COLL]}$.       distr.

   commander every regiment-dat one castle surround-caus-past

   "The commander had every regiment surround a castle."


(22)  a. Bütün$_{[+COLL]}$  öğrenci-ler bir sınıf-ta buluş-tu$_{[+COLL]}$.       coll.

   all student-pl one classroom-loc gather-past

   "All the students gathered in one classroom."


   b. Her$_{[-COLL]}$  komite bir sınıf-ta buluş-tu$_{[+COLL]}$.       distr.

   every committee one classroom-loc gather-past

   "Every committee gathered in a classroom."

(23)  a. Bütün[+COLL] öğrenci-ler bir bilgisayar-a üşüş-tü[+COLL].          coll.

all student-pl one computer-dat crowd together-past

"All the students crowded around a computer."


b. Her[-COLL]  grup bir bilgisayar-a üşüş-tü[+COLL]  .          distr.

every group one computer-dat crowd together-past

"Every group crowded around a computer."


Attributing the collectivity feature to only the quantificational element in the NP seems to explain the collective/ distributive interpretations of these sentences. The collectivity features of the subject noun phrases and of the predicates are as shown in the sentences above. To illustrate the application of the Plus Principle, let us analyze (21a) and (21b). A combination of two [+COLLECTIVE] features in (21a) yields a [+COLLECTIVE] feature for the overall sentence. This means that, the sentence would be expected to have a collective feature which is absolutely correct. (21a) only has a meaning where all the soldiers are surrounding the castle. In (21b), however, a [-COLLECTIVE] feature from the external argument combines with a [+COLLECTIVE] feature from the predicate and gives the [-COLLECTIVE] feature as the final outcome. The expectation that (21b) has a distributive interpretation is also correct since the sentence has a meaning where every regiment surrounded a castle. Similar explanations can be provided for (22a) vs. (22b) and (23a) vs. (23b).

However, some other examples show that we still fall short of explaining the collective/ distributive interpretations of some sentences if we attribute the collectivity feature to only the quantificational element in the noun phrase as we did with (21)-(23). These examples are given in (24)-(268) below.

(24)  a. Komutan bütün[+COLL] asker-ler-e bir kale kuşat-tır-dı[+COLL].    coll.

commander all soldier-pl-dat one castle surround-caus-past

"The commander had all the soldiers surround a castle."


b. Komutan bütün[+COLL] birlik-ler-e bir kale kuşat-tır-dı[+COLL].    distr. / coll.

commander all regiment-pl-dat one castle surround-caus-past

"The commander had all the regiments surround a castle."


(25)  a. Bütün[+COLL]  öğrenci-ler bir bilgisayaa üşüş-tü[+COLL] .    coll.

all student-pl one computer-dat crowd together-past

"All the students crowded around a computer."


b. Bütün[+COLL]  grup-lar bir bilgisayara üşüş-tü[+COLL].    distr. / coll.

all group-pl one computer-dat crowd together-past

"All the groups crowded around a computer."


(26)  a. Bütün[+COLL] öğrenci-ler bir sınıf-ta buluş-tu[+COLL].    coll.

all student-pl one classroom-loc gather-past

"All the students gathered in one classroom."


b. Bütün[+COLL] komite-ler bir sınıf-ta toplan-dı[+COLL] .    distr. / coll.

all committee-pl one classroom-loc gather-past

"All the committees gathered in one room."

An analysis of the given sentences above reveals that plural nouns are used as complements of the quantificational determiner *bütün* "all" in the (a) sentences. In the (b) sentences, however, a plural group denoting noun complements the same quantificational element. To have a better understanding of the application of the Plus Principle, let us have a look at (24a) and (24b). (24a) is identical to (24b) except that a plural noun complements the quantifier *bütün* "all" in (24a) and a plural group denoting noun in (24b). If the quantifier is assumed to carry the collectivity feature without any influence of the complementing noun, then we would expect *bütün askerler* "all the soldiers" and *bütün birlikler* "all the regiments" to have the [+COLL] feature although the complementing nouns are different. Since the remaining constituents of the two sentences are identical, we would have an expectation to get identical interpretations for both sentences. The interaction of the [+COLL] feature of the subject and the [+COLL] feature of the predicate leads to an overall [+COLL] interpretation for the sentence in (24a). This correctly gives a collective meaning for (24a). However, considering the same features for (24b) would again give a collective meaning. In this case, we cannot account for the [-COLL] overall interpretation for (24b). However, the (b) sentences clearly have an additional [-COLL] overall interpretation as well. So, as a consequence, this shows us that it cannot also be solely the quantificational element that bears the [+/-COLL] feature in the quantificational noun phrase.

This argumentation leads us to the answer of the question that was asked before: "*Which particular element within the quantificational NP should bear the [+/- COLLECTIVE] feature: the quantificational element, the noun itself or both?*" Having shown that the collectivity feature cannot be only on the quantificational element or the noun complementing the quantifier, we can arrive at the conclusion

that both the quantifier and the noun complementing it bear a separate [+/-COLL] feature. Since the quantifier and the noun have separate [+/-COLL] features on them, the Plus Principle can now apply to the quantificational NP to assign an overall collectivity value to it. Gradually this collectivity feature of the quantified NP and the collectivity feature of the predicate combine to assign an overall collectivity value to the sentence. In the following paragraphs, I will provide examples to show how the Plus Principle applies gradually to arrive at an overall collectivity interpretation of the whole sentence.

In this section, I have proposed to assign different values for the collectivity feature to the quantifiers and the singular or plural nouns complementing it. (27) makes a summary of the collectivity values that I propose to assign to the quantifiers and the nouns complementing them.

(27)    Proposed collectivity values for the constituents within the quantificational NP

| *HER* "EVERY" | [-COLL] |
|---|---|
| *BÜTÜN* "ALL" | [+COLL] |
| SINGULAR NOUNS | [-COLL] |
| PLURAL NOUNS | [+COLL] |
| SINGULAR GROUP DENOTING NOUNS | [+ / -COLL] |
| PLURAL GROUP DENOTING NOUNS | [+ / -COLL] |

4.2     Application of the Modified Plus Principle


After having discussed how the Plus Principle can be modified to deal with

quantification in the previous section, I would like to illustrate how the Modified

Plus Principle accounts for the interpretations of quantificational structures. In order

to examine the application of the Modified Plus Principle thoroughly, I will analyze

all different possible combinations of predicate types and quantificational noun

phrases. As a first step to begin, I will consider the quantificational NPs in the

external argument position and see their combinations with different predicate types.


4.2.1   Quantificational NPs as External Arguments


 Table 3 below shows all the possible combinations of different predicate types with

the quantifier *her* "every" in the external argument position. Unacceptable sentences

are marked with *, and application of the Modified Plus Principle for each acceptable

sentence is given in the column next to the sentence in the table.

Table 3.        Possible Combinations of Predicate Types with the Quantifier *her* "every" [44]

| QUANTIFIER *HER* "EVERY" | | | APPLICATION OF THE MODIFIED PLUS PRINCIPLE |
|---|---|---|---|
| COLLECTIVE PREDICATES | SG.NOUNS | (28) *Her asker kale kuşat-tı.<br>  every soldier castle surround-past<br>  "Every soldier surrounded a castle." | UNGRAMMATICAL |
| | PL.NOUNS | (29) *Her asker-ler kale kuşat-tı.<br>  every soldier-pl castle surround-past<br>  "*Every soldiers surrounded a castle." | UNGRAMMATICAL |
| | SG.GR.NOUNS | (30) Her birlik kale kuşat-tı.<br>  every regiment castle surround-past<br>  "Every regiment surrounded a castle." | $[_{-COLL}[_{-COLL}[_{-COLL}Her][_{+/-COLL} \text{ birlik}]]$<br>$[_{+COLL}\text{kale kuşattı}]]$. |
| | PL. GR. NOUNS | (31) *Her birlik-ler kale kuşat-tı.<br>  every regiment-pl castle surround-past<br>  "*Every regiment surrounded a castle." | UNGRAMMATICAL |
| DISTRIBUTIVE PREDICATES | SG. NOUNS | (32) Her kadın bebek emzir-di.<br>  every woman baby breast feed-past<br>  "Every woman fed a baby." | $[_{-COLL}[_{-COLL}[_{-COLL}Her] [_{-COLL} \text{ kadın}]][_{-COLL}$<br>$\text{bebek  emzirdi}]]$. |

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[44] I refrained from using indefinite NPs (specific or non-specific) or definite NPs as internal arguments of the above sentences and used bare nouns in the internal argument positions. My aim in using bare nouns in the internal argument position was my intention to analyze the impact of only the external argument in sentence interpretation. In other words, by using bare nouns, I wanted to eliminate the possible influence of the indefinite determiner *bir* "one" or the possible influence of the accusative marker in specific NPs. Using bare nouns as the internal argument which are considered as incorporated to the verb in the literature allowed me to give a single collectivity feature to the "bare noun + verb" combination in the application of the Modified Plus Principle.

| | | QUANTIFIER *HER* "EVERY" | APPLICATION OF THE MODIFIED PLUS PRINCIPLE |
|---|---|---|---|
| | | Table 3. continued | |
| | PL. NOUNS | (33) *Her kadın-lar bebek emzir-di.<br>every woman-pl baby breast feed-past<br>"*Every women fed a baby." | UNGRAMMATICAL |
| | SG.GR.NOUNS | (34) Her birlik erken uyu-du.<br>every regiment early sleep-past<br>"Every regiment slept early." | [$_{-COLL}$ [$_{-COLL}$[$_{-COLL}$Her][$_{+/-COLL}$bölük]][$_{-COLL}$ erken uyudu]]. |
| | PL.GR.NOUNS | (35) *Her bölük-ler erken uyu-du.<br>every regiment-pl early sleep-past<br>"*Every regiments slept early." | UNGRAMMATICAL |
| AMBIGUOUS PREDICATES | SG. NOUNS | (36) Her çocuk şarkı söyle-di.<br>every child song sing-past<br>"Every child sang a song." | [$_{-COLL}$[$_{-COLL}$[$_{-COLL}$Her][$_{-COLL}$çocuk]][$_{-/+COLL}$ şarkı söyledi]]. |
| | PL. NOUNS | (37) *Her çocuk-lar şarkı söyle-di.<br>every child-pl song sing-past<br>"*Every children sang a song." | UNGRAMMATICAL |
| | SG.GR. NOUNS | (38) Her aile çadır kur-du.<br>every family tent build-past<br>"Every family built a tent." | [$_{-COLL}$[$_{-COLL}$[$_{-COLL}$Her][$_{+/-COLL}$ aile]][$_{-/+COLL}$çadır kurdu]]. |
| | PL. GR. NOUNS | (39) *Her aile-ler çadır kurdu.<br>every family-pl. tent build-past<br>"*Every families built a tent." | UNGRAMMATICAL |

The sentence given in (28) is unacceptable due to the fact that it violates the compatibility requirement of collective predicates. The predicate *kuşatmak* "surround" is a Group 2 Collective predicate and as discussed in the previous sections a collective predicate requires its external argument to be semantically plural. However, the external argument used in (28) is a singular noun and thus violates the compatibility requirement of the predicate.

(29) also presents an unacceptable sentence. This time the unacceptability stems from the incompatibility of the noun with the quantifier. The quantifier *her* "every" takes a morphologically singular noun as its complement. Morphologically plural nouns are not allowed to be used as complements of *her* "every". Due to this requirement of *her* "every", the sentence is out. The sentences given in (31), (33), (35), (379) and (39) are also unacceptable for the same reason.

Let us now turn to an analysis of the acceptable sentences in the table. The analyses of the sentences are also provided in Table 1 above. As shown in the table collectivity features are assigned to each constituent for the application of the Modified Plus Principle. I will provide a discussion of how the collectivity features of the constituents gradually combine to yield an overall collectivity feature for a structure, taking (30) as an example. Other acceptable sentences can also be explained similarly and we can see that the application of the Modified Plus Principle makes correct predictions with respect to the available interpretations of the sentences.

In (30), the noun *birlik* "regiment" in the external argument position is a singular group denoting noun, so I assume that it has the [+/ -COLL] feature and the quantifier *her* "every" bears the [-COLL] feature as well. The combination of these two constituents yields the [-COLL] feature for the quantificational NP in the

external argument position. Its combination with the [+COLL] feature of the collective predicate gives out a [-COLL] final feature for the sentence. This means that the sentence is expected to have a distributive interpretation. The sentence has a meaning where each regiment surrounds a possibly different castle. Therefore our expectations are borne out.

Having examined the sentences with the quantifier *her* "every", we can move on to an analysis of sentences with *bütün* "all" quantifier in the external argument positions. Table 4 below shows all the possible combinations of different predicate types with the quantifier *bütün* "all" in the external argument position. The application of the Modified Plus Principle for each acceptable sentence is given in the column next to the sentence in the table.

Table 4.        Possible Combinations of Predicate Types with the Quantifier *bütün* "all"

| | | QUANTIFIER "BÜTÜN" | APPLICATION OF THE MODIFIED PLUS PRINCIPLE |
|---|---|---|---|
| COLLECTIVE PREDICATES | SING. NOUNS | (40) * Bütün asker kale kuşat-tı.<br>all soldier castle surround-past<br>"*All soldier surrounded a castle." | UNGRAMMATICAL |
| | PL. NOUNS | (41)   Bütün asker-ler kale kuşat-tı.<br>all soldier-pl castle surround-past<br>"All soldiers surrounded a castle." | $[_{+COLL}[_{+COLL}[_{+COLL}\text{Bütün}][_{+COLL}\text{askerler}]][_{+COLL}\text{kale kuşattı}]]$. |
| | SING. GR. NOUNS | (42) Bütün birlik bir kale kuşat-tı.<br>whole regiment castle surround past<br>"The whole regiment surrounded a castle." | ONLY WHOLE / ENTIRE INTERPRETATION |
| | PL. GR. NOUNS | (43)   Bütün birlik-ler bir kale kuşat-tı.<br>all regiment-pl castle surround-past<br>"All regiments surrounded a castle." | $[_{-/+COLL}[_{-/+COLL}[_{+COLL}\text{Bütün}][_{-/+COLL}\text{birlikler}]][_{+COLL}\text{kale kuşattı}]]$. |

| | | QUANTIFIER "BÜTÜN" | APPLICATION OF THE MODIFIED PLUS PRINCIPLE |
|---|---|---|---|
| **Table 4. continued** | | | |
| DISTRIBUTIVE PREDICATES | SING. NOUNS | (44) *Bütün kadın bebek emzir-di.<br>all woman baby breast feed-past<br>"*All woman fed a baby." | UNGRAMMATICAL |
| | PL. NOUNS | (45) Bütün kadın-lar bebek emzir-di.<br>all woman-pl baby breast feed-past.<br>"All women fed a baby." | [$_{-COLL}$[$_{+COLL}$[$_{+COLL}$Bütün] [$_{+COLL}$kadınlar]] [$_{-COLL}$ bebek ezirdi]]. |
| | SING. GR. NOUNS | (46) Bütün birlik erken uyu-du.<br>whole regiment early sleep-past<br>"The whole regiment slept early." | ONLY WHOLE / ENTIRE INTERPRETATION |
| | PL. GR. NOUNS | (47) Bütün birlik-ler erken uyu-du.<br>all regiment-pl early sleep-past<br>"All regiments slept early." | [$_{-COLL}$[$_{-/+COLL}$[$_{+COLL}$Bütün] [$_{-/+COLL}$ birlikler]] [$_{-COLL}$ erken uyudu]]. |
| AMBIGUOUS PREDICATES | SING. NOUNS | (48) *Bütün çocuk şarkı söyle-di.<br>all child song sing-past<br>"*All child sang a song." | UNGRAMMATICAL |
| | PL. NOUNS | (49) Bütün çocuk-lar şarkı söyle-di.<br>all child-pl song sing-past<br>"All the children sang a song." | [$_{-/+COLL}$[$_{+COLL}$[$_{+COLL}$Bütün] [$_{+COLL}$çocuklar]] [$_{-/+COLL}$ şarkı söyledi]]. |
| | SING. GR. NOUNS | (50) Bütün aile çadır kur-du.<br>whole family tent build-past<br>"The whole family built a tent." | ONLY WHOLE / ENTIRE INTERPRETATION |
| | PL. GR. NOUNS | (51) Bütün aile-ler çadır kur-du.<br>all family-pl tent build-past<br>"All families built a tent." | [$_{-/+COLL}$[$_{-/+COLL}$[$_{+COLL}$Bütün] [$_{-/+COLL}$ aileler]] [$_{-/+COLL}$ çadır kurdu]]. |

The sentences given in (40), (44) and (48) are unacceptable. The unacceptability of all of these sentences is a result of the incompatibility between the quantificational element and the head noun in the subject NP. Since *bütün* "all" requires the use of plural NPs as its complement, the subject NPs in these sentences, *\*bütün asker* "all soldier", *\*bütün kadın* "all woman", *\*bütün çocuk* "all child", violate this requirement.

As seen in (42), (46) and (50), singular group denoting nouns can be used as complements of the quantifier *bütün* "whole". In such constructions the meaning denoted by the quantificational element *bütün* "all" turns out to be "whole/ entire". In other words, constructions like *bütün aile* "the whole/ entire family", *bütün birlik* "the whole/ entire regiment", *bütün sınıf* "the whole/ entire class" etc. do not have identical meaning to *bütün aileler* "all the families", *bütün birlikler* "all the regiments", *bütün sınıflar* "all the classes". The fact that these group denoting nouns are composed of sub-elements within its structure licenses its use with the quantifier *bütün* "all". In other words, there is a covert plurality for the group denoting nouns due to the fact that a group denoting noun such as *birlik* "regiment" is composed of individual soldiers structurally. This covert plurality licenses the co-occurance of these group denoting nouns with the quantifier *bütün* "all". As a consequence of the change in the meaning of the quantifier *bütün* "all" in such noun phrases, the collectivity denoted by a sentence such as "*Bütün birlik bir kale kuşattı*" (The whole regiment surrounded a castle) is different from the collectivity denoted by a sentence such as "*Bütün birlikler bir kale kuşattı*" (All the regiments surrounded a castle) . For the former sentence, there is a single regiment and a single castle that undergoes the activity of surrounding, thus distributivity is out of question. The collectivity is *within the constituents* of the noun phrase. However, for the other sentence, there are

more regiments and a single castle in the activity of surrounding. This time, the collectivity is *within the members* of the noun phrase. Sentences with *bütün* "whole" + singular group word" as external arguments will not be analyzed in this dissertation.

The examples analyzed so far provide evidence that the Modified Plus Principle can account for the collective/ distributive interpretation of a sentence. The presence of the quantifier *her* "every" always yields an unambiguous distributive interpretation of the overall sentence. However, the presence of the quantifier *bütün* "all" gives out three different interpretations: [+COLL], [-COLL] or [+/-COLL]. Since neither the determiner *bütün* "all" nor its complement is [-COLL], the quantificational nature of the sentence with bütün "all" is determined by the other constituents. A discussion of the role of internal arguments in the interpretation of a sentence and how this can be taken care of within the Modified Plus Principle is presented in the next section.

4.2.1.1 Role of the Internal Arguments in the Modified Plus Principle

The internal arguments in the previous examples are all instances of bare nouns. Such structures where a bare non-case marked noun immediately precedes a verb head are generally treated as noun incorporation cases in the literature. Turkish has been frequently cited in the literature as a language that exhibits head incorporation of nouns following Baker (Baker 1988, Mithun 1984, Knecht 1986, Nilsson 1986, Kornfilt 2003, Aydemir 2004).In head incorporation analysis, a noun head incorporates into a verb head forming a new V°. A common point shared among these studies is that incorporated nouns have no syntactic status of their own, so they

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bear no case marker. They are unmarked for definiteness and number. Mithun

(1984), Nilsson (1985, 1986) and Aydemir (2004) argue that noun incorporation has

to take place in the lexicon.

Based on phonological facts, Knecht (1986) argues that the bare nouns are

incorporated to their verbs similar to compound formation. Generally, sentence stress

falls on the verb when all other elements of the sentence are discourse-presupposed

as in (52) below. (Erguvanlı, 1979)

(52)     A: Köpek kediyi ısırdı değil mi?

         B: Isırmadı. Köpek kediyi YALADI.

              "The dog bit the cat, didn't it?"

              "No, the dog LICKED the cat."

                                                      (Knecht, 1986)

One exception for this generalization is illustrated in (53) where the verb cannot be

assigned sentence stress. In such a case sentence stress falls on the object.[45]

(53)     A: Murat odasında mektup yazıyor, değil mi?

         B: Hayır, yazmıyor. MEKTUP okuyor. / *Mektup OKUYOR.

         "Murat is in his room writing letters, isn't he?"

         "No, he is READING letters."[46]                    (Knecht, 1986)

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[45] It is illustrated in Ketrez (2005) that the stress can easily shift away from the incorporated noun if a
focus particle or negative suffix is present in the sentence. (i) is given to illustrate this fact.
(i)      a. Ayşe kitap oku-MUS bile.
            Ayse book read-perf even
            'Ayşe even book-read.'
         b. Ayşe kitap okU-ma-mıs,.
            Ayşe book read-neg-perf
            'Ayşe did not book-read.'
                                           (Ketrez, 2005)
[46] The words written in capital letters are the constituents that bear the sentence stress.

Based on its similarity to the stress pattern of compounds, where stress is assigned to the first element in the compound such as *AYAKkabı* "shoe", *KIZ lisesi* "girls' school" etc., Knecht suggests that a caseless non-definite object (bare object) and its verb have the structure of a compound.

Kornfilt (2003) proposes a syntactic incorporation analysis. She embeds bare nouns under DPs with empty heads, which are in return embedded under empty KP projections. The noun head moves into the empty K head position then moves and incorporates into V head. Challenges to Kornfilt's account are discussed in Öztürk (2009).

In short, these accounts of immediately preverbal bare nouns in Turkish argue for a head-to head incorporation analysis where the noun-head incorporates into the verb head to form a morphologically complex verb head. Erguvanlı-Taylan (1984) presents a piece of evidence challenging the head status of immediately preverbal nouns. Similarly, Öztürk (2005, 2009) discusses some evidence that challenges the head incorporation analysis and suggests that immediately preverbal nouns are not head categories, but are phrasal categories. This implies that a different approach is required for the noun incorporation cases.

Based on some problematic issues in the head-incorporation analysis discussed in Öztürk (2005, 2009), she argues that bare nouns are pseudo-incorporated NPs rather than head incorporations. The idea of pseudo-incorporation originates in the works of Massam (2001), where she argues that bare nouns in these constructions are NPs, rather than DPs, which are base-generated as the complement of the lexical verb. Adopting the pseudo-incorporation analysis of Massam (2001), Öztürk (2005) argues that immediately preverbal bare nouns in Turkish are

independent phrasal categories, i.e., NPs. This independent phrasal nature of the bare

noun in the preverbal position is exemplified as in (54) below.


(54)    Ali oda-da [$_{NP}$kitap] oku-du.

        Ali room-loc book read

        "Ali did book reading in the room."

                                                            (Öztürk, 2005)


The fact that the preverbal bare nouns are independent "syntactic constituents" does

not imply that they are also syntactic arguments (Öztürk, 2005). Based on

passivization facts, Öztürk claims that the pseudo-incorporated bare NPs are not

"syntactic arguments" but should be analyzed as part of the predicate. In short, bare

object NPs are separate "syntactic constituents" but are not "syntactic arguments". [47]

    When the notion of incorporation is analyzed with respect to the non-specific

indefinite NPs such as *bir kitap* "a book", we see that the similarity between

immediately preverbal bare nouns and non-specific indefinites has been observed in

the literature and it has been claimed that non-specific indefinites can also be

analyzed as a case of head incorporation in Aissen (1974) and Kornfilt (1994);

whereas they are claimed to be analyzed as instances of pseudo-incorporation in

Öztürk (2005).[48] The similarity between the non-specific indefinite NPs and

immediately preverbal nouns is attested in the fact that both are subject to the same

movement constraints. In other words, they cannot be scrambled away from the verb.

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[47]Note also that similar to the pseudo-incorporation of themes, Öztürk (2005, 2009) argues for the pseudo-incorporation of agents as well.

[48] Aydemir (2004) has a different point of view with respect to the bare noun / non-specific indefinite NP distinction. In her analysis, the bare noun is not analyzed as an independent syntactic constituent. Bare nouns are considered as head-incorporated to their verbs. On the other hand, non-specific indefinite NPs are considered as true syntactic arguments and are not incorporated to their verbs.

(55) illustrates the impossibility of scrambling the non-specific indefinite object NP as well as the preverbal bare object NP.

(55)    a. *Bir kitap Ali oku-du.

          one book Ali read-past

          "Ali read a book."


        b. *Kitap Ali oku-du.

          book Ali read-past

          "Ali did book reading."

                                        (Öztürk, 2005)

The impossibility of inserting an adverb between the bare noun and the verb is well-known in the literature. The non-specific indefinite NP and the preverbal bare noun display another similarity in terms of this impossibility with respect to adverb insertion. The sentences presented in (56) and (57) show this similarity. The sentences in (56) are identical to the sentences in (57) except that non-specific indefinite NPs are used in (57) whereas bare nouns are used in (56). These examples provide further evidence that the non-specific indefinite NPs can be treated in the same way as the bare nouns. To state it more clearly, both should be analyzed in an identical fashion with respect to the incorporation phenomena- be it head incorporation or pseudo-incorporation.

(56)    a.      *Her birlik kale başarı-y-la kuşat-tı.

                every regiment castle success-with surround-past

                "Every regiment surrounded a castle with success."

b.        *Her çocuk çadır kolaylık-la kur-abilir.

         every child tent easy-with build-can

         "Every child can build a tent easily."


c.        *Bütün çocuk-lar tost iştah-la ye-di.

        all child-pl toast appetite-with eat-past

        "All the children ate toast with great apetite."


(57)   a.      *Her birlik <u>bir kale</u> başarı-y-la kuşat-tı.

        every regiment one castle success-with surround-past

        "Every regiment surrounded a castle with success."


b.        *Her çocuk <u>bir çadır</u> kolaylıkla kur-abilir.

        every child one tent easy-with build-can

         "Every child can build a tent easily."


c.        *Bütün çocuk-lar <u>bir tost</u> iştah-la ye-di.

        all child-pl one toast apetite-with eat-past

        "All the children ate toast with great apetite."


This similarity between the preverbal bare noun and the non-specific indefinite NP in the object position leads us to conclude that both object types have to be treated in an identical way in the application of the Modified Plus Principle. Whether we follow the head incorporation analysis or the pseudo-incorporation analysis does not make any difference with respect to the overall result that is obtained at the end of the

application of the Modified Plus Principle. What differs is how the computational process pertaining to the collective / distributive readings is carried out. In the following paragraphs, I will demonstrate the application of the computational process following the frameworks of both the head-incorporation analysis and the pseudo-incorporation analysis.

Taking the head-incorporation analysis as the basis, we would need to consider both the preverbal bare noun and the non-specific indefinite noun in the object position as head-incorporations into the verb and would not need to assign separate collectivity features for these. (58) is provided to illustrate what we have proposed at this point. The preverbal bare nouns are considered as head incorporations in both (58a) and (58b), so they are not considered as phrasal categories. Based on their non-phrasal nature, we cannot assign separate collectivity features to them. Thus, the [N+V] compound receives a single collectivity feature.

(58)    a. [$_{+COLL}$[$_{+COLL}$[$_{+COLL}$Bütün][$_{+COLL}$asker-ler]] [$_{+COLL}$kale kuşat-tı]].

all soldier-pl castle surround-past

"All soldiers surrounded a castle."

b. [$_{+COLL}$[$_{+COLL}$[$_{+COLL}$Bütün][$_{+COLL}$ asker-ler]] [$_{+COLL}$ bir kale kuşat-tı]].

all soldier-pl One castle surround-past

"All soldiers surrounded a castle."

(following the head incorporation analysis)

In a pseudo-incorporation analysis, the preverbal bare NP and the non-specific indefinite NP should again be treated similarly. However, in this case, due to being

phrasal categories, they need to have a separate room for their collectivity features. An analysis of the sentences in Table 3 and Table 4 reveals that the [N+V] compounds have collectivity features identical to the collectivity feature of their verbs. This yields the result that if the pseudo-incorporation analysis of internal arguments is followed, the collectivity features of the preverbal bare noun and the non-specific indefinite NP must be $\phi$ so that they will not have an influential effect on the overall collectivity of the [N+V] compounds. The fact that the preverbal bare nouns and the non-specific indefinite NPs are considered as "syntactic constituents" leads to the requirement that we have a separate room for their collectivity features. However, the fact that they are not "syntactic arguments", following Öztürk (2004, 2005, 2009), leads to the requirement that they act as neutral elements in the application of the Modified Plus Principle.[49] (59) illustrates the computational process following the pseudo-incorporation analysis.

(59)  a. [$_{+COLL}$[$_{+COLL}$[$_{+COLL}$Bütün][$_{+COLL}$asker-ler]] [$_{+COLL}$ [$_{\phi}$kale] [$_{+COLL}$kuşat-tı]].

all soldier-pl castle surround-past

"All soldiers surrounded a castle."

b. [$_{+COLL}$[$_{+COLL}$[$_{+COLL}$Bütün][$_{+COLL}$asker-ler]] [$_{+COLL}$ [$_{\phi}$bir kale] [$_{+COLL}$kuşat-tı]].

all soldier-pl one castle surround-past

"All soldiers surrounded a castle."

(following the pseudo-incorporation analysis)

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[49] Although both the head incorporation based analysis and the pseudo-incorporation based analysis of the Modified Plus Principle seem to be equally acceptable at this point, it will be shown in the following paragraphs that sentences with specific indefinite objects and quantificational objects provide evidence that the computational mechanism following the pseudo-incorporation based analysis gives out a neater analysis.

Having established the conclusion that preverbal bare nouns and non-specific indefinite NPs should have a unique analysis with respect to their influence in the application of the Modified Plus Principle, we can progress our analysis with the influence of the specific indefinite NPs as internal arguments. We will address the question of how the specific indefinite NPs are treated in the Modified Plus Principle in the following paragraphs.

(60) and (61) illustrate sentences that have specific indefinite NPs as their internal argument. The specificity is marked with the accusative marker on the head noun as in *bir kaleyi* "a castle" and *bir şarkıyı* "a song". The possibility of inserting an adjunct between the definite noun and the verb shows us that these internal arguments can not be considered as incorporated to the verb and that they occupy true "syntactic argument" positions unlike the preverbal bare nouns and the non-specific indefinite NPs. The fact that the notion of noun incorporation is limited only to the non-specific NPs and that it is not possible for the specific NPs to be considered as noun incorporations in Turkish has been previously discussed in the literature (Nilsson 1986, Kuribayashi 1990, İşsever 2006).

(60)    Bütün asker-ler bir kale-y-i <u>başarı-y-la</u> kuşat-tı.

         all soldier-pl one castle-acc success-with surround-past

         "All the soldiers surrounded a castle with success."


(61)    Bütün kız-lar bir şarkı-y-ı <u>yüksek</u> ses-le söyle-di.

         all girl-pl one song-acc high volume-with sing-past

         "All the girls sang a song with high volume."

(62)- (69) present sentences in which bare nouns are used in the (a) sentences, non-specific indefinite  internal arguments are used in the (b) sentences whereas specific indefinite internal arguments are used in the (c) sentences. The interpretations of sentences in terms of the collectivity vs. distributivity are also provided for each sentence.


(62)  a.    Bütün asker-ler kale kuşat-tı.                coll.

            all soldier-pl. castle surround-past

            "All the soldiers did castle surrounding".


      b.     Bütün asker-ler bir kale kuşat-tı.           coll.

            all soldier-pl one castle surround-past

            "All the soldiers surrounded a castle".


      c.    Bütün asker-ler bir kale-y-i kuşat-tı.        coll.

             all soldier-pl one castle-acc surround-past

            "All the soldiers surrounded a castle".


(63)  a.    Bütün birlik-ler kale kuşat-tı.          distr. / coll.

            all regiment-pl castle surround-past

            "All the regiments did castle surrounding".


      b.    Bütün birlik-ler bir kale kuşat-tı.      distr. / coll.

            all regiment-pl one castle surround-past

            "All the regiments surrounded a castle".

c. Bütün birlikler bir kale-y-i̱ kuşattı.      distr. / coll.

all regiment-pl one castle-acc surround-past

"All the regiments surrounded a castle".

(64) a. Her birlik kale kuşat-tı.      distr.

every regiment castle surround-past

"Every regiment did castle surrounding".

b. Her birlik bir kale kuşat-tı.      distr.

every regiment one castle surround-past

"Every regiment surrounded a castle".

c. Her birlik bir kale-y-i̱ kuşat-tı.      distr.

every regiment one castle-acc surround-past

"Every regiment surrounded a castle".

(65) a. Bütün kadın-lar bebek doğur-du.      distr.

all woman-pl baby give birth-past

"All the women gave birth to a baby."

b. Bütün kadın-lar bir bebek doğur-du.      distr.

all woman-pl one baby give birth-past

"All the women gave birth to a baby."

c. (?)Bütün kadın-lar bir bebeğ-i doğur-du. . distr.

all woman-pl one baby-acc give birth-past

"All the women gave birth to a baby."[50]


(66) a. Bütün kız-lar şarkı söyle-di. distr. / coll.

all girl-pl song sing-past

"All the girls sang songs."


b. Bütün kız-lar bir şarkı söyle-di. distr. / coll.

all girl-pl one song sing-past

"All the girls sang a song."


c. Bütün kız-lar bir şarkı-y-ı söyle-di. distr. / coll.

all girl-pl one song-acc sing-past

"All the girls sang a song."


(67) a. Bütün sınıf-lar şarkı söyle-di. distr. / coll.

all class-pl song sing-past

"All the classes sang a song."


b. Bütün sınıf-lar bir şarkı söyle-di. distr. / coll.

all class-pl one song sing-past

"All the classes sang a song."

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[50] Kelepir (2001) argues that creation verbs such as "give birth, knit, write etc" cannot have specific indefinites as their complements unless the complement functions as the "topic / given" phrase of the clause and some other element is focused. The reason behind this unacceptability is discussed to be the mismatch between the presuppositional nature of the accusative marked indefinite and the topic-focus structure of the clause.

c.　Bütün sınıf-lar bir şarkı-y-ı söyle-di.　　distr. / coll.

all class-pl one song-acc sing-past

"All the classes sang a song."

(68)　a.　Her kız kutu taşı-dı.　　distr.

every girl box carry-past

"Every girl carried one box."

b.　Her kız bir kutu taşı-dı.　　distr.

every girl one box carry-past

"Every girl carried one box."

c.　Her kız bir kutu-y-u taşı-dı.　　distr.

every girl one box-acc carry-past

"Every girl carried one box."

(69)　a.　Her aile çadır kur-du.　　distr.

every family tent build-past

"Every family built a tent."

b.　Her aile bir çadır kur-du.　　distr.

every family one tent build-past

"Every family built a tent."

c. Her aile bir çadır-ı kur-du.                    distr.

every family one tent-acc build-past

"Every family built a tent."

An analysis of the interpretations of sentences given above shows that the (a) sentences with bare nouns, (b) sentences with non-specific indefinite internal arguments and (c) sentences with specific indefinite internal arguments have identical interpretations in terms of collectivity. This indicates that indefinite internal arguments, regardless of being bare, specific or non-specific, do not seem to have any influence that can change the overall collectivity of the sentence. This further indicates that bare nouns, specific indefinite nouns and specific indefinite nouns can be treated in the same manner in the application of the Modified Plus Principle.

In the previous paragraphs, we discussed two possible ways that the Modified Plus Principle can apply: following the head incorporation analysis and the pseudo-incorporation analysis. (58) and (59) are rewritten below as (70) and (71). The internal arguments in (70) are not considered as "syntactic constituents" within the head incorporation analysis, so do not have separate contribution to the overall collectivity of the sentence. However, the internal arguments in (71) are considered as "syntactic constituents"[51] , so are assumed to have a separate projection (level) for their collectivity features.

(70)    a. $[_{+COLL}[_{+COLL}[_{+COLL}$Bütün$][_{+COLL}$asker-ler$]]$ $[_{+COLL}$kale kuşat-tı$]]$.

all soldier-pl castle surround-past

"All soldiers surrounded a castle."

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[51] Recall that although they are "syntactic constituents", they are not "syntactic arguments".

b. [$_{+COLL}$[$_{+COLL}$[$_{+COLL}$Bütün][$_{+COLL}$asker-ler]] [$_{+COLL}$ bir kale kuşat-tı]].

all soldier-pl one castle surround-past

"All soldiers surrounded a castle."

(following the head incorporation analysis)

(71)  a. [$_{+COLL}$[$_{+COLL}$[$_{+COLL}$Bütün][$_{+COLL}$asker-ler]] [$_{+COLL}$ [$_{\phi}$kale] [$_{+COLL}$kuşat-tı]].

all soldier-pl castle surround-past

"All soldiers surrounded a castle."

b. [$_{+COLL}$[$_{+COLL}$[$_{+COLL}$Bütün][$_{+COLL}$asker-ler]] [$_{+COLL}$ [$_{\phi}$bir kale] [$_{+COLL}$kuşat-tı]].

all soldier-pl one castle surround-past

"All soldiers surrounded a castle."

(following the pseudo-incorporation analysis)

Both approaches, the one following the head incorporation analysis and the other following the pseudo-incorporation analysis, work equally well for sentences having bare nouns and non-specific indefinite internal arguments. In order to find a unique approach with respect to how the internal arguments, including the specific indefinite ones, behave in the application of the Modified Plus Principle, we have to investigate which approach is suitable for the specific indefinite NPs. The fact that specific indefinite NPs are not instances of noun incorporation leads us to the answer. Since the specific indefinite NPs are true syntactic arguments, they are expected to have a separate level where their collectivity features are realized. In other words, since they are not integrated into their verbs, they have to have separate collectivity features. Consequently, this indicates that the approach following the head incorporation

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analysis presented in (70) has discrepancies when specific indefinite internal argument NPs are considered. As a result, the approach following the pseudo-incorporation analysis is the suitable one for the specific indefinite internal objects.

Considering the fact that the internal arguments should be treated at least as "syntactic arguments"[52], we claim that they should theoretically have a level / projection where their collectivity features are realized. This leads us to question the value of the collectivity feature of the internal argument. It was shown in (62)-(69) that the sentences with specific indefinite NPs as internal arguments have identical interpretations with the sentences having bare nouns or non-specific indefinite NPs as internal arguments. This observation enables us to claim that the collectivity feature attributed to the specific indefinite NPs, as well as the preverbal bare nouns and the non-specific indefinite NPs should also be $\phi$. Having a $\phi$ value for the collectivity feature means that the specific internal argument will not have an effective role in changing the overall collectivity of the sentence similar to preverbal bare nouns and the non-specific indefinite NPs. (72) and (73) illustrate the computational mechanism of the Modified Plus Principle for sentences having specific indefinite internal arguments.

(72)    $[_{+COLL}[_{+COLL}[_{+COLL}\text{Bütün}][_{+COLL}\text{asker-ler}]][_{+COLL}[_{\phi}\text{bir kale-y-i}][_{+COLL}\text{kuşat-tı}]]$.

all soldier-pl one castle-acc surround-past

"All soldiers surrounded a castle."

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[52] Recall that preverbal bare nouns and non-specific indefinite internal arguments are only "syntactic constituents", but not "syntactic arguments". Specific indefinite internal arguments, on the other hand, are both "syntactic constituents" and "syntactic arguments".

(73)    [+/-COLL[+/-COLL[+COLLBütün][+/-COLLkız-lar]][+/-COLL[φbir şarkı-y-ı]][+/-COLL

söyle-di]].

all girl-pl one song-acc sing-past

"All the girls sang a song."

In conclusion, the discussion in this section shows us that the internal arguments, no matter what they are, are claimed to have a separate level where their collectivity features are realized for the computational mechanism of the Modified Plus Principle. However, the collectivity features that are associated with the preverbal bare nouns, non-specific indefinite internal arguments and specific internal arguments are null in nature. This means that these internal arguments do not have an impact on the overall collectivity of the sentence. Although the application of the Modified Plus Principle following both the head incorporation analysis and the pseudo-incorporation analysis yields equally acceptable results for sentences having bare and non-specific indefinite object NPs, I claim that a unified approach for all types of internal arguments, including the specific indefinite object NPs, is achieved via the pseudo-incorporation analysis.

(74) and (75) present sentence pairs that seem to provide counter evidence to our findings that the internal arguments, that is preverbal bare nouns, non-specific indefinite internal arguments and the specific indefinite internal arguments, do not have a changing effect on the overall collectivity of the sentence. However, these are not counter-examples to our findings, rather they are instances of how our pragmatics knowledge influences the way sentences are interpreted in terms of collectivity.

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(74)  a. [$_{-COLL}$[$_{+COLL}$[$_{+COLL}$Bütün] [$_{+COLL}$ çocuk-lar]] [$_{-COLL}$ bir fındık ye-di]].

all child-pl one nut eat-past

"All the children ate a nut."


b. [$_{-/+COLL}$[$_{+COLL}$[$_{+COLL}$Bütün] [$_{+COLL}$ çocuk-lar]] [$_{-/+COLL}$ bir kase fındık ye-di]].

all child-pl one bowl nut eat-past

"All the children ate a bowl of nut."


(75)  a. [$_{-COLL}$[$_{+COLL}$[$_{+COLL}$Bütün] [$_{+COLL}$ kız-lar]] [$_{-COLL}$ bir çiçek kopar-dı]].

all girl-pl one flower pick up-past

"All the girls picked up a flower."


b. [$_{-/+COLL}$[$_{+COLL}$[$_{+COLL}$Bütün] [$_{+COLL}$ kız-lar]][$_{-/+COLL}$ kalın bir kablo kopar-dı]].

all girl-pl thick cable cut-past

"All the girls cut a thick cable."


The internal argument in (74a) is *bir fındık* "a nut" and the one in (75a) is *bir çiçek* "a flower", whereas the internal argument in (74b) is *bir kase fındık* "a bowl of nuts" and the one in (75b) is *kalın bir kablo* "a thick cable". This difference in the internal arguments yields a difference in the overall interpretation of the sentence. (74a) has a distributive interpretation where each child ate a different nut. (74b), on the other hand, has an interpretation where the children might have eaten a bowl of nuts together or where each child ate a different bowl of nuts. Similarly (75a) is associated with a distributive interpretation where each girl picks up a different

flower. (75b), on the other hand, is ambiguous. The reason behind this interpretation

difference lies in pragmatics which eliminates some of these possible interpretations.

Having analyzed the role of each argument in the application of the Modified

Plus Principle up to now, we will continue with an analysis of sentences having

quantificational internal arguments and indefinite external arguments in the

following section.

### 4.2.2   Quantificational NPs as Internal Arguments

In the previous section, we have analyzed examples that have the quantificational

NPs as their external arguments. In these examples preverbal bare nouns, non-

specific indefinite NPs and specific indefinite NPs as internal arguments were

analyzed with respect to their contributions to the overall collectivity of the sentence.

It was claimed that all the constituents have collectivity features of their own which

interact with each other in the course of the Modified Plus Principle. Preverbal bare

nouns as well as specific / non-specific indefinite NPs were claimed to have a

separate level  for their collectivity features but the collectivity feature associated

with these types of internal arguments were supposed to be ϕ. In this section, I will

discuss sentences that have the quantificational NPs as their internal arguments to see

whether the Modified Plus Principle works for such sentences as well. We will see

that the quantificational NPs in the internal argument positions will also have a

separate level / projection for their collectivity features and that + / - COLL features

will be assigned to these quantificational internal arguments.

Enç (1991) observes that NPs that involve universal quantification require the

accusative case in the internal argument positions. This means that the quantifiers *her*

"every" or *bütün* "all" in the internal argument positions require their complements to bear the accusative marker as shown in (76) and (77) below. The quantificational NPs in (76a) and (77a) lack the accusative case marker, therefore are marked as unacceptable. However, their counterparts with the accusative marker in (76b) and (77b) are completely acceptable sentences. The requirement of the accusative case marker when the internal argument is a quantificational NP is the first indication that these should be treated as separate "syntactic constituents". This further yield the result that they are not integrated to the verb of the sentence.

(76)     a. *Asker-ler her kale kuşat-tı.

        soldier-pl every castle surround-past

        "The soldiers surrounded every castle."


       b. Asker-ler her kale-y-i kuşat-tı.

        soldier-pl every castle-acc surround-past

        "The soldiers surrounded every castle."


(77)     a. *Asker-ler bütün kale-ler kuşat-tı.

        soldier-pl. all castle-pl. surround-past

        "The soldiers surrounded all the castles."


       b. Asker-ler bütün kale-ler-i kuşat-tı.

        soldier-pl all castle-pl-acc. surround-past

        "The soldiers surrounded all the castles."

The possibility of using an intervening adjunct between the quantificational internal argument and the verb provides the second evidence that the quantificational NPs should be treated separately from their verbs. (78) and (79) illustrates the possibility of inserting an adverb between the internal argument and the verb.

(78)    Asker-ler bütün kale-ler-i kısa bir süre içinde kuşat-tı.

        soldier-pl all castle-pl short a time in surround-past

        "The soldiers surrounded all the castles in a short period of time."

(79)    Kız-lar her yemeğ-i büyük bir iştah-la tat-tı.

        girl-pl every food great apetite-with taste-past

        "The girls tasted every food with great apetite."

A time indicating adverbial and manner adverbial are placed between the internal argument and the verb in (78) and (79) respectively. The grammaticality of the sentences provides evidence for the fact that quantificational internal arguments cannot be considered as incorporated to the verb. This, in turn, indicates that the quantificational internal arguments should bear collectivity features of their own. "*What can the collectivity feature of the quantificational internal argument be- a null (ϕ) element or an appropriate feature of [+ / - COLL]?*" is the next question to be answered.

        The semantic contributions of the quantificational internal arguments to the overall collectivity / distributivity of the sentence are shown in (80) and (81) below. Although the (a) sentences have a distributive sense where each castle is surrounded in 3 hours and each wall is painted in 10 minutes, the (b) sentences have both a

collective and a distributive sense. The collective interpretation is the one where all

the castles are surrounded in 3 hours and all the walls are painted in 10 minutes. This

difference in the interpretations of the sentence pairs provide evidence that the

collectivity features provided by these quantificational NPs cannot be a null ($\phi$)

element.

(80)  a. Bir birlik her kale-y-i 3 saat içinde kuşat-tı.                    distr.

        one regiment every castle-acc 3 hours in surround

        "A regiment surrounded every castle in 3 hours."

    b. Bir birlik bütün kale-ler-i 3 saat içinde kuşat-tı.           distr. / coll.

        one regiment all castle-pl-acc 3 hours in surround-past

        "A regiment surrounded all the castles in 3 hours."

(81)  a. Genç adam her duvar-ı 10 dakika içinde boya-dı.              distr.

        young man every wall-acc 10 minutes in paint-past

        "The young man painted every wall in10 minutes."

    b. Genç adam bütün duvar-lar-ı 10 dakika içinde boya-dı.      distr. / coll.

        young man all wall-pl-acc 10 minutes in paint-past

        "The young man painted all the walls in 10 minutes."[53]

In this sub-section, I have provided examples supporting the claim that the

quantificational internal arguments are not incorporated to the verb, and thus enter

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[53] The distributive interpretations refer to the "distributivity over time" interpretations which we have
discussed in Chapter 3.

the computational mechanism of the Modified Plus Principle with their own

collectivity features. The collectivity feature of the quantificational internal argument

cannot be a null element since a clear interpretation difference is observed depending

on the choice of the quantifier as in (80) and (81) above. Therefore, we can arrive at

the conclusion that the quantificational internal arguments enter the mechanism of

Modified Plus Principle with three possible collectivity features: [+COLL], [-COLL]

or [+ / -COLL]. The operation of the Modified Plus Principle will be discussed

through examples in Table 5  in the following paragraphs.

Table 5 shows all the possible sentence combinations with "her + noun" as

the internal argument of the sentences. The application of the Modified Plus

Principle is presented next to each sentence in the table. It must be noted that the

presence of the quantifier her "every" in the internal argument position renders the

sentence to have a distributive interpretation.


Table 5.	Possible Combinations of Predicate Types with the quantifier *her*

"every" in internal argument positions

| QUANTIFIER "HER" | | | APPLICATION OF THE MODIFIED PLUS PRINCIPLE |
|---|---|---|---|
| COLLECTIVE PREDICATES | SG.NOUNS | (82) * Bir asker her kale-y-I kuşat-tı. One soldier every castle-acc surround-past "*A soldier surrounded every castle." | UNGRAMMATICAL |
| | PL.NOUNS | (83)  Asker-ler her kale-y-I kuşat-tı. Soldier-pl every castle-acc surround-past "The soldiers surrounded every castle." | $[_{-COLL}[_{+COLL}$Askerler$][_{-COLL}[_{-COLL}[_{-COLL}$ her$][_{-COLL}$kaleyi$]]$ $[_{+COLL}$kuşattı$]]]$ |
| | SG.GR.NOUNS | (84) Bir birlik her kale-y-I kuşat-tı. One regiment every castle-acc surround-past "One regiment surrounded every castle." | $[_{-COLL}[_{-/+COLL}$Birbirlik$][_{-COLL}[_{-COLL}[_{-COLL}$ her$][_{-COLL}$kaleyi$]]$ $[_{+COLL}$kuşattı$]]]$ |

| | | QUANTIFIER "HER" | APPLICATION OF THE MODIFIED PLUS PRINCIPLE |
|---|---|---|---|
| | | **Table 5. continued** | |
| DISTRIBUTIVE PREDICATES | PL.GR.NOUNS | (85) Birlik-ler her kale-y-I kuşat-tı. Regiment-pl every castle-acc surround-past "The regiments surrounded a castle." | $[_{-COLL}[_{+/-COLL}\text{Birlikler}][_{-COLL}[_{-COLL}[_{-COLL}\text{ her}][_{-COLL}\text{kaleyi}]][_{+COLL}\text{kuşattı}]]]$ |
| DISTRIBUTIVE PREDICATES | SG.NOUNS | (86) Bir kadın her bebeğ-i emzir-di. one woman every baby-acc breast feed-past "A woman breast fed every baby." | $[_{-COLL}[_{-COLL}\text{Bir kadın}][_{-COLL}[_{-COLL}[_{-COLL}\text{ her}][_{-COLL}\text{bebeği}]][_{-COLL}\text{emzirdi.}]]]$ |
| DISTRIBUTIVE PREDICATES | PL.NOUNS | (87) Kadın-lar her pasta-y-ı tat-tı. woman-pl every pastry-acc taste-past "The women tasted every pastry." | $[_{-COLL}[_{+COLL}\text{ Kadınlar}][_{-COLL}[_{-COLL}[_{-COLL}\text{ her}][_{-COLL}\text{pastayı}]][_{-COLL}\text{tattı.}]]]$ |
| DISTRIBUTIVE PREDICATES | SG. GR.NOUNS | (88) Jüri heyeti her yemeğ-i tat-tı. jury committee every dish-acc taste-past "The jury committee tasted every dish." | $[_{-COLL}[_{-/+COLL}\text{Jüri heyeti}][_{-COLL}[_{-COLL}[_{-COLL}\text{ her}][_{-COLL}\text{yemeği}]][_{-COLL}\text{tattı.}]]]$ |
| DISTRIBUTIVE PREDICATES | PL.GR.NOUNS | (89) Jüri heyet-ler-i her yemeğ-i tat-tı. jury committee every dish-acc taste-past "The jury committees tasted every dish." | $[_{-COLL}[_{+/-COLL}\text{ Jüri heyetleri}][_{-COLL}[_{-COLL}[_{-COLL}\text{ her}][_{-COLL}\text{yemeği}]][_{-COLL}\text{tattı.}]]]$ |
| AMBIGUOUS PREDICATES | SG.NOUNS | (90) Bir çocuk her şarkı-y-ı söyle-di. one child every song-acc sing-past "A child sang every song." | $[_{-COLL}[_{-COLL}\text{ Bir çocuk}][_{-COLL}[_{-COLL}[_{-COLL}\text{ her}][_{-COLL}\text{şarkıyı}]][_{+/-COLL}\text{söyledi.}]]]$ |
| AMBIGUOUS PREDICATES | PL.NOUNS | (91) Çocuk-lar her şarkı-y-ı söyle-di. child-pl every song-acc sing-past "The children sang a song." | $[_{-COLL}[_{+COLL}\text{Çocuklar}][_{-COLL}[_{-COLL}[_{-COLL}\text{ her}][_{-COLL}\text{şarkıyı}]][_{+/-COLL}\text{söyledi.}]]]$ |
| AMBIGUOUS PREDICATES | SG.GR.NOUNS | (92) Bizim sınıf her çadır-ı kur-du. our class every tent-acc build-past "Our class built every tent." | $[_{-COLL}[_{+/-COLL}\text{ Bizim sınıf}][_{-COLL}[_{-COLL}[_{-COLL}\text{ her}][_{-COLL}\text{çadırı}]][_{+/-COLL}\text{kurdu.}]]]$ |

| | QUANTIFIER "HER" | APPLICATION OF THE MODIFIED PLUS PRINCIPLE |
|---|---|---|
| Table 5. continued | | |
| PL. GR.NOUNS | (93) Çift-ler her şarkı-y-ı söyle-di.<br>couple-pl every song-acc sing-past<br>"The couples sang every song." | [$_{-COLL}$[$_{+/-COLL}$Çiftler][$_{-COLL}$[$_{-COLL}$[$_{-COLL}$her][$_{COLL}$şarkıyı]][$_{+/-COLL}$söyledi.]]] |

The sentence given in (82) is marked as ungrammatical due to the violation of the Compatibility Condition. A collective verb like *kuşatmak* "surround" cannot co-occur with a singular non-group denoting noun such as *bir asker* "a soldier".

As an example let us discuss how the overall collective interpretation of (83) is achieved via the gradual application of the Modified Plus Principle. We have argued in the previous paragraphs that the quantificational internal arguments need to bear collectivity features of their own unlike preverbal bare nouns and specific/ non-specific indefinite internal arguments which are claimed to bear ɸ collectivity feature. Based on this claim, the noun in the quantificational internal argument, *kale* "castle", bears the [-COLL] feature since it is a singular noun. Together with the quantifier *her* "every", which bears the [-COLL] feature, it gives out a [-COLL] feature for the internal argument. This feature, in turn, combines with the [+COLL] feature of the verb *kuşatmak* "surround" yielding the [-COLL] feature for the overall VP. The final step is a combination of the collectivity feature of the VP, that is [-COLL], with the collectivity feature of the external argument- that is [+COLL]. This gives an overall interpretation of [-COLL] for the sentence. Similar explanations can be provided for the other sentences as well.

Having examined the sentences with the quantifier *her* "every", we can move on to an analysis of sentences with *bütün* "all" in the internal argument positions. Table 6 below shows all the possible combinations of different predicate types with the quantifier *bütün* "all" in the internal argument position. The application of the Modified Plus Principle for each acceptable sentence is given in the column next to the sentence in the table.

Table 6.　　　Possible Combinations of Predicate Types with the quantifier *bütün* "all" in internal argument positions

| | | QUANTIFIER "BÜTÜN" | APPLICATION OF THE MODIFIED PLUS PRINCIPLE |
|---|---|---|---|
| COLLECTIVE PREDICATES | SG. NOUNS | (94) * Bir asker bütün kale-ler-i kuşat-tı.<br>one soldier all castle-pl-acc surround-past<br>"*A soldier surrounded all the castles." | UNGRAMMATICAL |
| | PL. NOUNS | (95)  Asker-ler bütün kale-ler-i kuşat-tı.<br>soldier-pl all castle-pl-acc surround-past<br>"The soldiers surrounded all the castles." | $[_{+COLL}[_{+COLL}$Askerler$[_{+COLL}[_{+COLL}[_{+COLL}$bütün$][_{+COLL}$kaleleri$]][_{+COLL}$kuşattı.$]]]$ |
| | SG.GR.NOUNS | (96) Bir birlik bütün kale-ler-i kuşat-tı.<br>one regiment all castle-pl-acc surround-past<br>"A regiment surrounded all the castles." | $[_{+/-COLL}[_{+/-COLL}$Bir birlik$[_{+COLL}[_{+COLL}[_{+COLL}$bütün$][_{+COLL}$kaleleri$]][_{+COLL}$kuşattı.$]]]$ |
| | PL.GR.NOUNS | (97)   Birlik-ler bütün kale-ler-i kuşat-tı.<br>regiment-pl all castle-pl-acc. surround-past<br>"The regiments surrounded all the castles." | $[_{+/-COLL}[_{+/-COLL}$Birlikler $[_{+COLL}[_{+COLL}[_{+COLL}$bütün$][_{+COLL}$kaleleri$]][_{+COLL}$kuşattı.$]]]$ |

Table 6. continued

| | | QUANTIFIER "BÜTÜN" | APPLICATION OF THE MODIFIED PLUS PRINCIPLE |
|---|---|---|---|
| DISTRIBUTIVE PREDICATES | SG. NOUNS | (98) Genç kadın bütün bebek-ler-i emzir-di.<br>young woman every baby-acc breast feed-past<br>"The young woman breast fed every baby." | [-COLL[-COLLGenç kadın[-COLL[+COLL [+COLLbütün] [+COLLbebekleri]][-COLL emzirdi.]]] |
| | PL.NOUNS | (99) Kadın-lar bütün pasta-lar-ı tat-tı.<br>woman-pl all pastry-pl-acc taste-past<br>"The women tasted all the pastries." | [-COLL[+COLLKadınlar[-COLL[+COLL [+COLLbütün] [+COLLpastaları]][-COLLtattı.]]] |
| | PL.GR.NOUNS | (100) Jüri heyet-ler-i bütün yemek-ler-i tat-tı.<br>jury committee all dish-pl-acc taste-past<br>"The jury committees tasted all the dishes." | [-COLL[+/-COLLJüriheyetleri[-COLL[+COLL [+COLLbütün][+COLLyemekleri]][- COLLtattı.]]] |
| AMBIGUOUS PREDICATES | SG. NOUNS | (101) Çocuk bütün şarkı-lar-ı söyle-di.<br>child all song-pl-acc sing-past<br>"The child sang all the songs." | [-COLL[-COLLÇocuk[-/+COLL[+COLL [+COLLbütün] [+COLLşarkıları]][-/+COLL söyledi.]]] |
| | PL. NOUNS | (102) Çocuk-lar bütün şarkı-lar-ı söyle-di.<br>child-pl all song-pl-acc sing-past<br>"The children sang all the songs." | [+/-COLL[+COLLÇocuklar[-/+COLL[+COLL [+COLLbütün] [+COLLşarkıları]][- /+COLLsöyledi.]]] |
| | SG.GR.NOUNS | (103) Bizim sınıf bütün çadır-lar-ı kur-du.<br>our class all tent-pl-acc built-past<br>"Our class built all the tents." | [+/-COLL[+/-COLLBizimsınıf[-/+COLL[+COLL [+COLLbütün] [+COLLçadırları]][- /+COLLkurdu.]]] |
| | PL. GR.NOUNS | (104) Çift-ler bütün şarkı-lar-ı söyle-di.<br>couple-pl all song-pl-acc sing-past<br>"The couples sang all the songs." | [+/-COLL[+/-COLLÇiftler[-/+COLL [+COLL [+COLLbütün] [+COLLşarkıları]][- /+COLLsöyledi.]]] |

The discussion in this section shows us that determines her "every" and bütün "all" should be treated separately with respect to their collectivity values. These determiners differ from each other in terms of the meanings they contribute to the overall sentence. Regardless of its syntactic position in the sentence, the determiner her "every" gives out an unambiguous distributive interpretation for the sentence. However, this differs for the determiner bütün "all" which can lead to [+COLL], [-COLL] or [+/-COLL] depending on the other constituents of the sentence.

## 5.0 Chapter Summary

The approach proposed in this dissertation is based on a compositional nature whereby each constituent is assumed to contribute to the overall collectivity / distributivity of the sentence. The computational mechanism works on the basis of the "Modified Plus Principle" which was originally used as the "Plus Principle" to account for the aspectuality of sentences. The Modified Plus Principle operates on the collectivity features assigned to each particular constituent of the sentence. Collective predicates were associated with the +COLL feature, the distributive predicates with the –COLL feature and the ambiguous predicates +/-COLL features. Similarly the quantificational elements were shown to carry collectivity features of their own. Furthermore the nouns complementing these quantificational elements were also discussed to bear separate collectivity features.

It was discussed that the NP in the internal argument position is also associated with a projection where its collectivity feature is realized. However, it was discussed that the collectivity feature of the specific / non-specific indefinite object NP as well as the bare object NP is null ($\phi$) element. Thus, the null element as the

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collectivity feature of the definite internal argument does not have an influential effect on the overall sentence interpretation. On the other hand, whenever the internal argument of the sentence is a quantificational NP, both the quantifier and the noun complementing it have collectivity features of their own, and these features combine with the collectivity feature of the verb to contribute to the overall collectivity / distributivity of the sentence.

All possible combinations of sentences have been analyzed and it has been argued that the Modified Plus Principle can predict the collectivity nature of the sentence correctly. One point remains to be problematic, however. The Modified Plus Principle enables us to provide the information that a sentence like (105) has an ambiguous interpretation. The collective interpretation indicates a situation where all the girls carry the box all together. The distributive interpretation, on the other hand, might indicate a situation of one to one distributivity between the girls and the boxes. In such a case each girl carried a different box. It might also be referring to a situation where each of the girls carried the same box but at different times. The information that we get as a result of applying the Modified Plus Principle does not show us how the distributivity is realized. In other words, we cannot understand whether the distributivity is a one to one distributivity or distributivity over time. In order to be able to indicate what kind of distributivity is present in a sentence, we should be talking about time indices as well. However, the Modified Plus Principle is just a computational mechanism used to distinguish between the collectivity and the distributivity of a sentence.

(105)  Bütün kız-lar bir kutu-y-u taşı-dı.

all girl-pl one box-acc carry-past

"All the girls carried a box."

In the next chapter, I will provide a discussion of how sentences get their actual interpretations making use of the time indices. The use of the time indices will enable us to differentiate between the kinds of distributivity to arrive at an accurate interpretation of the sentence.

CHAPTER 5

TEMPORAL STRUCTURE AND TIME INDICES IN SENTENCE

INTERPRETATION


1.0 Introduction


In the previous chapter, the core issue of sentence interpretation was discussed to be the principle of compositionality. It was shown that each constituent of the sentence has a collectivity feature of its own and that the interpretation of the whole sentence is based on the interaction of these features provided by each individual constituent. The application of the Modified Plus Principle enabled us to make a prediction as to whether the sentence has an overall collective or distributive interpretation. When the sentence presented in (1) is analyzed in terms of the Modified Plus Principle, the final possible interpretation computed for this sentence is the [+ / - COLL]. As shown in (1) the VP has a [+ / -COLL] feature and when combined with the [+COLL] feature of the external argument NP, it yields a [+ / - COLL] feature for the overall sentence. This means that the sentence potentially has both a collective interpretation where the three girls lifted a box together and distributive interpretation where each of the three girls underwent the predication denoted by the verb separately. The distributive interpretation implies that separate carrying activities were accomplished by different girls. The distributive interpretation of the sentence either implies a distributive over argument reading where the girls carry different boxes or a distributive over time reading where the girls carry the same box but at different times. However, the overall [-COLL]

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interpretation that we find as a result of the application of the Modified Plus

Principle does not provide an implication as to whether we have distributive over

time or distributive over the argument interpretations. In other words, we cannot

understand whether each girl carried a different box simultaneously, or whether each

girl carried the same box at different time indices or even whether each girl carried

different boxes at different time indices and so on.

(1)     $[_{+/\text{-COLL}}[_{+\text{COLL}}[_{+\text{COLL}}\text{Bütün}] \ [_{+\text{COLL}}\text{kız-lar}]] \ [_{+/\text{-COLL}}[_{\phi}\text{bir kutu-y-u}] \ [_{+/\text{-COLL}}\text{taşı-dı}]]]$.

all girl-pl one box-acc carry-past

"All the girls carried a box."

The Modified Plus Principle is a beneficial computational mechanism which enables

us to achieve an overall impression of whether a sentence can have a collective or a

distributive interpretation once we know the collectivity features assigned to each

constituent in the sentence. In this chapter, I will provide a discussion related to how

this overall interpretation of the sentence is achieved taking the time indices as well

as the collectivity features of the constituents into consideration. This discussion will

enable us to see the steps taking us to the overall result that we obtain from the

application of the Modified Plus Principle. In a way, the procedure that will be

outlined in this chapter will let us see between the lines. The terms "collective /

distributive" which remain somewhat vague will be expressed on concrete spatial

information as a result of representing the actual realizations of sentences in

notational terms. We will show that the use of index dependent time indices as well

as index dependent NPs in the formulations that we will be dealing with in this

chapter are of great importance in resolving the collective / distributive dichotomy. In an attempt to find a computational mechanism to illustrate the possible actualizations of a sentence, an elimination method will be used where possible interpretations of a sentence are supposed to be provided first and impossible interpretations will be eliminated gradually. This elimination will be carried out with the help of the features that were used for the application of the Modified Plus Principle in the previous chapter. So, this also means that the elimination process is also feature based.

## 2.0 The Notion of Paths in the Localistic Approach

In order to have an insight on how an action denoted by the verb is carried out, we need to reduce the semantic and conceptual information coming from the sentence to concrete spatial information. In other words, we investigate how the action denoted by the sentence extends over a time interval. It is at this point that we resort to the localistic approach which is defined as the claim that semantic and conceptual information of a sentence is reducible to concrete spatial information[54] (William, 1992).The basic notion underlying the localistic approach is the notion of Path. The notion of Path is used in different semantic frameworks to analyze the meanings of expressions that describe how something is moving or extending in space. [55] In other words, in the domain of interpretation of sentences expressing a change, there is a Path along which the change expressed by the predicate takes place. All sorts of

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[54] The localistic tradition in linguistics is very old dating back to the works of Anderson (1970) and Gruber (1976). It has been very important and influential for getting an insight into the way changes and states are expressed.

[55] Jackendoff (1983) contains a well-known exposition of path concepts that ties together earlier localist work. It also plays a role in Cognitive Grammar (e.g. Talmy 1983 and Langacker 1987) and in formal treatments (Habel 1989, Piñon 1993, Nam 1995, Krifka 1998 and Kracht 2002).

change can be modelled with the help of an abstract notion of Path. For example, in a sentence such as "Judith ate four sandwiches", Judith moves through a metaphorical Path until the four sandwiches are eaten.

Different formalizations have been proposed for the notion of Path in the literature. Zwarts (2006) takes the notion of Path as an atemporal representation of a trajectory, a linear directed stretch of space. Zwarts (2006) uses a model where a path is a continuous function from a real interval [0,1] to spatial points. Considering $p$ as a function, $p(0)$ is the starting point of the Path and $p(1)$ is its end point. For every index $i$ between 0 and 1, $p(i)$ is an intermediate point. In this way a path corresponds roughly to a sequence of positions.

On the other hand, Verkuyl, whose 1971-thesis is based on the localistic notion of Path, uses the temporal representation of a structure in defining the Path of the predication. The leading idea of his approach is that there is some dynamics involved in sentences expressing change. The notion of Path, where the development of the change can be followed, is related to the process of accommodating an NP to its functioning in the temporal structure of the sentence. A sentence like "Judith ate four sandwiches" contains an atemporal unit- "four sandwiches"- which is involved in the development of temporal structure introduced by the verb. Relating the internal argument to a verb so as to form a VP is "going through the way in which quantificational information contributed by the internal argument is integrated in a temporal structure". The internal argument, in this case, is part of the Path. The external argument, on the other hand, forms the domain of the path and all the elements of the external argument are associated with an individual VP. This brings up the possibility to see how each member of the external argument is undergoing the predication denoted by the VP.

## 2.1    Paths in an Analysis of Quantification

In an attempt to analyze quantificational sentences such as (2) below, different approaches have been put forward. One of these approaches is the NP based approach of Scha (1981). Scha (1981) stipulated that noun phrases are ambiguous between a distributive reading (D) and two collective readings ($C_1$, $C_2$). $C_1$ represents the truly collective interpretation where the individuals forming the NP all together undergo the predication denoted by the verb. The difference of $C_2$ from $C_1$ is that, $C_2$ allows different combinations within the members of the NP. In sentences with transitive verbs having two quantificational NPs such as (2), a combination of these 3 readings results in a total of 9 readings for the overall sentence. These readings range from DD, $DC_1$,….., $C_1C_2$. For example, on the DD reading of (2), each of the girls mailed three letters, each on different occasions. On the $C_1C_1$ reading, the girls mailed the three letters in one single occasion. The $C_1C_2$ reading, on the other hand, implies that the girls all together mailed the three letters on different occasions. In this case $C_2$ allows configurations such as 2+1, 1+1+1, 1+2, 3. This means that $C_2$ comprises D and $C_1$ naturally. The idea of "scale" seems to be forming the basis of Scha's approach. However, Scha, himself, did not use the terms "scale" or "path" in his analysis.

(2) Two girls mailed three letters.

The joint work of Jaap Van der Does and Verkuyl (1991,1995) reduces the large number of readings often assigned to these sentences to just one by adopting the scalar approach and the notion of Path. As a consequence, Van der Does and Verkuyl

(1991, 1995) took the $C_2$ reading as the basis depending on the assumption that $C_2$ comprises both C1 and D readings. The leading idea of the scalar approach used in Van der Does and Verkuyl (1991, 1995) is the empirical fact that a sentence like (2) does not give away which configuration is actualized and that the variant of $C_2$ seems the right way of expressing this. Taking $C_2$ as the basic reading for the noun phrases means that Van der Does and Verkuyl (1991, 1995) propose a logically weak interpretation for the noun phrases that captures the possible range of interpretations from a completely distributive reading to a completely collective reading. In order to formulate their "one-reading hypothesis"[56], Van der Does & Verkuyl (1991, 1995) formulated the PLUG framework to explain the interpretation in quantificational sentences, later developed as PLUG$^+$ to deal with aspectuality. [57]

Up to now, I provided background information on what the notion of Path refers to in the localistic tradition. A discussion of why Van der Does and Verkuyl (1991, 1995) resorted to the Paths in their analysis of quantification was also laid out in this section. In the following section, the PLUG framework will be explained in detail to understand how quantificational sentences can be explained through the use of this mechanism. Later on, in the following sections, I will propose a Path elimination method to arrive at a final interpretation for sentences.

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[56] Van der Does & Verkuyl use the term "one reading hypothesis" for their approach since plurals are not considered to be ambiguous, but are thought to have one reading that is indeterminate. This indeterminate reading refers to C2 in Scha's terminology. The "one reading hypothesis" is referred to as "the no-ambiguity strategy" in Schwertel (2005).

[57] PLUG is the shortened form for the PLUral Grammar.

2.1.1    <u>The PLUG Framework in Quantification</u>

The PLUG mechanism was formulated to account for the aspectuality of sentences as well as the quantificational information of the sentences. In this section I will discuss the basic structure of the system in terms of the quantificational information denoted by the sentence. The way how the PLUG framework was used for the aspectuality of sentences will not be our main concern in this dissertation.

The PLUG framework is based on the interaction of three functions which are called s, $\pi$ and $\ell$. These three functions involved in the composition of aspectuality and quantification are shown in (3) below.

(3)     Basic functions involved in PLUG

1. The successor function s

2. The Path function $\ell$

3. The Participancy function $\pi$

These functions will be defined and explained in detail in the following three subsections.

2.1.1.1 The Successor Function *s*

The Successor Function *s* is expressed by the verb: any non-stative verb produces a sense of progress and *s* is taken as providing it by yielding a structure from point 0 to some possible end-point, which provides information about the possible ways the predication has taken shape. In other words, starting form point zero the structure of

the path is gradually built up. The sense of progress in the Path is provided by means

of the time indices starting from a point of 0. The time indices in which the action is

supposed to take place form a well-ordered set $I$ of indices $i$. These time indices are

represented as the set of natural numbers.


## 2.1.1.2 The Path Function $\ell$


The Path-function $\ell$ regulates the relation between the internal argument $NP_2$ and the

verb. This function is a set of pairs consisting of indices and entities. The indices are

provided by the verb as the output of the $s$-function. The entities, on the other hand,

are provided by the internal argument. (4) presents the definition of the Path

Function in a notational form. The domain of $\ell$ is the set $I$, its co-domain $D_L$ is the set

of positions $p$ making up the internal argument denotation.


(4)     $\ell x : I \rightarrow D_L$ with $\ell x = \{<i, p> : [\text{AT}(p)(x)]]_{\text{M},i} = 1\}$


The definition provided in (4) characterizes the function $\ell$ as a set of pairs $<i, p>$ such

that $x$ is in the position $p$ at time index $i$, given a model M.[58] The term "position" is

used to indicate that $\ell$ defines a path in the sense of the localistic tradition in the

linguistic analysis of verbs expressing change.

For a sentence such as "Mary lifted four tables" the Path of the sentence can

be structured as given in (5). The Path provided in (5) shows how the relationship

---

[58] $x$ is the denotation for the external argument. The AT predicate in the definition in (4) localizes the external argument $x$ in a certain position with respect to the predication involved. Thus, $\ell x$ constitutes a "Path of $x$" keeping track of how $x$ relates to the members of the internal argument denotation as far as the satisfaction of the predicate is concerned.

between the external argument, "Mary", and the members of the internal argument

NP, "four tables", may be structured. (5) illustrates that three lifting events are

involved in the Path. This model illustrates that Mary is in a lifting predication for

$table_1$ and $table_2$ at time index i, whereas at time index i+1, a new collection is added

resulting in $table_1$, $table_2$, $table_3$.

(5)　NP:　　　　$\{\{t_1\}, \{t_2\}\}$　　　$\{\{t_1\}, \{t_2\}, \{t_3\}\}$　　　$\{\{t_1\}, \{t_2\}, \{t_3\}, \{t_4\}\}$

$\ell_{MARY}$

VERB　　　i　　　　　　　　　i + 1　　　　　　　i + 2

The Path given in (5) is formulated on a kind of a time line. It can also be formalized

as in (6) where 1, 2, 3 symbolize the time indices and $t_1$, $t_2$, $t_3$, $t_4$ represent index

dependent tables.[59] $<1\{\{t_1,t_2\}\}>>$, $<2\{\{t_1,t_2\}, \{t_3\}\}>>$ and $<3\{\{t_1,t_2\},\{t_3\},\{t_4\}\}>>$

indicate that $\ell_{MARY}$ distinguishes three positions at each of which the model satisfies

the lift predication applied to Mary. (6) shows that Mary is carrying out a lifting

event at time index 1 where she is carrying table 1 and table 2, at time index 2 table 3

is added and at time index 3 table 4 is added. In this way $\ell$ keeps track of the way in

which the individual members of the internal argument of the predicate are involved

in the predication.

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[59] An advantage of using index dependent NPs and time indices is that it allows us to make a differentiation between the table $_2$ as dependent on time index 1 and table $_2$ dependent on time index 2. In other words, although the same table undergoes predication, the difference between their time indices allows us to talk about two different events. Thus, the indices provide an opportunity for varying over all combinatorial possibilities. (i) shows two different ways of distinguishing two tables in this model. (a) indicates that table 1 at time index i is different from table 1at time index j. (b) indicates that table 1 at time index i is different from table 2 at time index i.

(i) a.　　$<i, \{t_1\}> \neq <j, \{t_1\}>$

　　b.　　$<i, \{t_1\}> \neq <i, \{t_2\}>$

(6)     <Mary, <1{{$t_1$, $t_2$}}>>

        <Mary, <2{{$t_1$, $t_2$}, {$t_3$}}>>

        <Mary, <3{{$t_1$, $t_2$},{$t_3$},{$t_4$}}>>


The example that we have been discussing up to now has a single individual, Mary, as its external argument. An example that has a plural NP as its external argument illustrates how well the analysis shows how each individual member constituting the external argument is involved in the predication. This will be discussed in detail in the following section on the participancy function $\pi$.


2.1.1.3 The Participancy Function $\pi$


The participancy function $\pi$ takes as its domain the external NP denotation assigning to each element $x$ in it a unique $\ell$. The relation of an external argument to its own path is shown as $\pi(x) = \ell_x$. Verkuyl (1988) distinguishes between two modes of function $\pi$: $\pi$ is either injective or constant. The difference between the two modes of interpretation is as shown in (7) below.


(7)     $\pi$-injective: $\ell_1 \neq \ell_2 \neq \ell_3$

        $\pi$-constant: $\ell_1 = \ell_2 = \ell_3$


(7) indicates that $\pi$ injective mode attributes different paths to each individual constituting the external argument. $\pi$-constant mode, on the other hand, indicates that the members of the external argument undergo the predication along the same

path. In other words, the injective mode is a representation of the principle of distributivity. In the π-constant mode, on the other hand, the individual paths of the members of the external NP denotations are blurred out. There is no individual path satisfying the predication. This is similar to the collective interpretation that we have been talking about so far.[60]

In order to clarify the two modes of the participancy function π, let us analyze the sentence given in (8) below which has a plural NP as its external argument.

(8)     Three girls lifted four tables.

When (8) is analyzed in the injective mode, each of the girls has her own distinct path with a variety of possible configurations. Some possible actualizations of (8) are provided in (9). Other configurations are also possible.

(9)     a. $\{girl_1\} \rightarrow \{<1,\{t_1,t_2,t_3,t_4\}>\}$

        $\{girl_2\} \rightarrow \{<2,\{t_3,t_4,t_5,t_6\}>\}$

        $\{girl_3\} \rightarrow \{<3,\{t_3,t_4,t_6,t_7\}>\}$

    b. $\{girl_1\} \rightarrow \{<1,\{t_1\}>,<2, \{t_2,t_3\}>, <3, \{t_4\}>$

        $\{girl_2\} \rightarrow \{<2,\{t_1,t_5,t_6,t_7\}>\}$

        $\{girl_3\} \rightarrow \{<3,\{t_3,t_5,t_6,t_7\}>\}$

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[60] Verkuyl uses the term "kolkhoz collective" or "totalizing interpretation" for the cases of π constant mode.

c. $\{girl_1\} \rightarrow \{<1,\{t_1\}>,<2, \{t_2\}\}$

$\{girl_2\} \rightarrow \{<1,\{t_3\}>\}$

$\{girl_3\} \rightarrow \{<1,\{t_4\}>\}$

(9a) shows some kind of distributivity where each of the girls lifted a group of four different tables collectively- probably one table on top of the other. The lifting events take place at different time indices for each girl and the index dependant tables illustrate that $table_3$ and $table_4$ were involved in three of the lifting processes whereas $table_6$ was involved in two lifting processes. (9b), on the other hand, illustrates a case where each of the girls lifted four tables but $girl_1$ lifted them separately whereas $girl_2$ and $girl_3$ lifted them as a collection. (9c) is quite different from the previous two interpretations. In (9c), it is not the case that the three girls each lifted 4 tables. It shows a situation where the girls lifted a total number of four tables. $Girl_1$ lifted $table_1$ and $table_2$ separately, whereas $girl_2$ lifted $table_3$ and $girl_3$ lifted $table_4$.

Based on these possible configurations for the distributive interpretations, Verkuyl (1997) reformulates the idea of distributivity / collectivity in a new sense as shown in (10) below. It shows the distributivity/ collectivity of the internal argument NP for a sentence like (8). (9a) formulates the internal argument of the sentence based on the unit set illustration from the left most end of the distributivity/ collectivity scale. (9c), on the other hand, uses the atomic distributivity on the right hand side of the given scale.

(10)                                                                                      {a}

                                                                  {a}……        {b}

                          {a,b,c}   …………         {b}…….       {c}

      {a,b,c,d}….. {d}      …………..        {c,d}…….      {d}

      Unit set                                                  Atoms

      Collective                                              Distributive

                          Distributivity / Collectivity Scale
      ⟵————————————————————————⟶
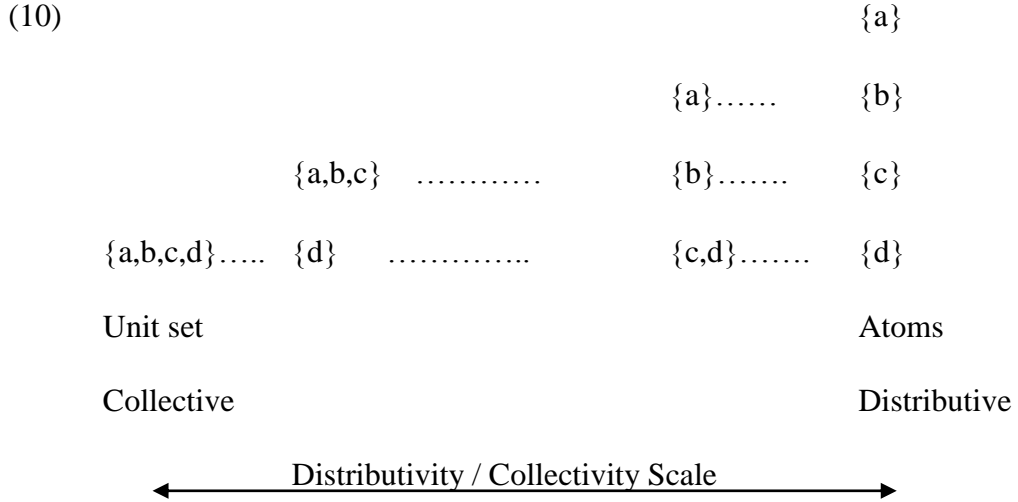
As for the $\pi$ constant mode, the basic idea is that each member of the external

argument has the same path for the predication. In other words, the members of the

external argument carry out the action denoted by the predicate together. This yields

a subject collective interpretation. (11) shows the $\pi$ constant mode for the sentence

"Three girls lifted four tables". Both (11a) and (11b) are instances of collective

readings. In (11a) all of the three girls are involved in the lifting predication where

the four tables are lifted as a collection at the same time. (11b) is different from (11a)

in that the tables are lifted separately by the group of girls working together at

different times.


(11)    a. $\{girl_1\} \rightarrow \{<1,\{t_1,t_2,t_3,t_4\}>\}$

        $\{girl_2\} \rightarrow \{<1,\{t_1,t_2,t_3,t_4\}>\}$

        $\{girl_3\} \rightarrow \{<1,\{t_1,t_2,t_3,t_4\}>\}$

        b. $\{girl_1\} \rightarrow \{<1,\{t_1,t_2\}>, <2,\{t_3\}>, <3,\{t_4\}>\}$

        $\{girl_2\} \rightarrow \{<1,\{t_1,t_2\}>, <2,\{t_3\}>, <3,\{t_4\}>\}$

        $\{girl_3\} \rightarrow \{<1,\{t_1,t_2\}>, <2,\{t_3\}>, <3,\{t_4\}>\}$

Based on the discussion of how paths are involved in the collectivity vs distributivity of a sentence, Verkuyl (1997) formulates his analysis in computational terms as in (12). The external argument is represented as "n" in dom ($\pi$) and the internal argument as "n" in ran($\pi$).[61]

(12)    Formulation of collectivity / distributivity (Verkuyl, 1997)

    a.      n =1 as in "Mary lifted a table". Here the difference between the distributive mode and the collective mode is irrelevant. These two collapse.

    b.      n $\geq$ 1 in dom($\pi$) as in "Three girls lifted a table". Here there are two possibilities:

        (i) n =1 in ran($\pi$) as in "Three girls lifted a table": COLLECTIVITY

        (ii) n $\geq$ 1 in ran($\pi$) as in "Three girls lifted four tables": DISTRIBUTIVITY

(12a) is about sentences having external arguments with only a single referent such as "Mary, the boy, the girl etc." For such sentences, there is just a single path for the member of the external argument. Based on the singularity of the path, Verkuyl assumes that the distinction between a collective and distributive interpretation is out of question. (12a) of Verkuyl's formulation provides a plausible explanation for sentences with single referent external and single referent internal arguments.

(12b) is about sentences having external arguments with multi referents such as "three girls, the boys, Mary and Lisa etc." (12b) indicates two options when the

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[61] "dom" refers to "domain" and "ran" refers to "range".

external argument is more than one single member. If the internal argument of the sentence is a singular NP, then the sentence ends up with a collective interpretation in Verkuyl's formulation. This is obvious for sentences such as "Three girls lifted a table". This is an illustration for kolkhoz collectivity where the three girls are involved in a lifting event together. That is, they are lifting the same table at the same time index.

The other option is formulated in (ii) in (12) above. This part of the formulation is about sentences where the number of the members constituting the internal argument is either bigger than or equal to 1. The first part- that is, cases where the number of the members of the internal argument is more than 1- is illustrated by sentences such as "Three girls lifted four tables." In this case, the unmarked reading is the distributive one. The second part- that is, where the number of the members of the internal argument equals to 1, is illustrated by sentences such as "Three girls lifted a table." In this case, the distributivity is a sample of "distributivity over time" where the three girls lift the same table but at different time indices.

A close analysis of Verkuyl's formulation reveals the fact that some modification is required to cover the whole range of data that we have been dealing with. Let us start with (12a).

(12a) ignores sentences where the external argument is single referent and the internal argument is multi referent as in "A girl tried on all the dresses". The sentence has an interpretation where a girl tried each dress on one after the other. I discussed similar examples and referred to such sentences as "distributivity over time" cases in Chapter 3. Although Verkuyl does not mention anything about this

kind of distributivity, such sentences can be explained using the Notion of Path effectively as shown in (13).

(13)    $\{girl_1\} \rightarrow \{<1, \{d_1\}>,<2, \{d_2\}>,<3, \{d_3\}>,<4, \{d_4\}>\}$

Similarly, a sentence such as "Mary lifted two tables" which has a single referent subject noun and a multi referent object noun might even have a collective reading where the tables are so light that Mary could lift the two together. This was referred to as the "collective object" reading in Chapter 3. This reading is given in the path form in (14) below.

(14)    $\{girl_1\} \rightarrow \{<1, \{d_1, d_2\}>\}$

When it comes to (12b), I want to point out that there is one more interpretation for a sentence such as "Three girls lifted four tables" which seems to be ignored in Verkuyl's formulation above. This sentence can be uttered in a situation where the three girls put the four tables on top of the other and are lifting the four tables all together. This is also a reading of kolkhoz collectivity as all the Paths for the three girls are identical as shown in (15) below.

(15)    $\{girl_1\} \rightarrow \{<1, \{t_1, t_2, t_3, t_4\}>\}$

    $\{girl_2\} \rightarrow \{<1, \{t_1, t_2, t_3, t_4\}>\}$

    $\{girl_3\} \rightarrow \{<1, \{t_1, t_2, t_3, t_4\}>\}$

Considering this interpretation to be an acceptable one, I propose to revise Verkuyl's formulation given in (12) as in (16). It is with this modification that Verkuyl's formulation can capture the missing interpretations that I have pointed out.

(16)    A Modification for Verkuyl's Approach

a.        (i) n =1 in dom($\pi$) and n = 1 in ran($\pi$) as in "Mary lifted a table". Here the difference between the distributive mode and the collective mode is irrelevant. These two collapse.

(ii) n =1 in dom($\pi$) and n > 1 in ran($\pi$) as in "Mary lifted two tables" DISTRIBUTIVE OVER TIME – COLLECTIVE OBJECT READING

b.        (i) n > 1 in dom($\pi$) and n = 1 in ran($\pi$) as in "Three girls lifted a table": COLLECTIVE or DISTRIBUTIVE OVER TIME

(ii) n > 1 in dom($\pi$) and n > 1in ran($\pi$) as in "Three girls lifted four tables":COLLECTIVE or DISTRIBUTIVE

The discussion about the two modes of interpretation shows us that the collectivity vs. distributivity of a sentence is a matter of which mode is realized rather than a wide scope vs narrow scope phenomena or different readings for the NP denotations in a sentence.

In this section, a discussion of the PLUG framework with respect to the quantificational information conveyed by a sentence was provided. Important concepts for this analysis were shown to be the notion of Path as well as the index dependency of the NPs and the use of time indices. The distributive and the collectivity of a sentence can be accounted for in terms of the $\pi$ injective and the $\pi$

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constant mode. In the next section, I will propose an elimination system for the possible paths of a sentence so as to reach a refined reading for that sentence. The elimination procedure will be analyzed separately for sentences with subject quantificational NPs and sentences with object quantificational NPs. For this elimination system I will make use of the paths discussed in the PLUG framework. The [+ / - COLL] features introduced in Chapter 3 will be used in the process of elimination.

## 3.0 The Elimination Procedure

In the previous sub-sections of this chapter, a discussion of the way Verkuyl & Van der Does approached quantificational sentences has been presented. It was shown that a quantificational sentence has a range of possible paths. I will propose in this section that each sentence is supposed to start out the computational procedure of sentence interpretation with these possible paths. It is only after the elimination of the impossible paths that the sentence gets its final possible interpretation. I will propose that the elimination procedure proceeds through the collectivity features associated with the constituents of the sentence. The Modified Plus Principle operated on the collectivity features of the constituents of the sentence as well. The next section will present a discussion of the four basic paths that were considered in the previous studies. The fact that these four basic paths are not adequate to deal with every possible interpretation of quantificational sentences is laid out in the following sections. The inadequacy of these four basic paths will lead us to the need to propose additional paths to account for the wide range of quantificational sentences.

## 3.1    Four Basic Paths of Verkuyl (1999a, 1999b)

Among many possible configurations, Verkuyl formalizes four basic Paths for the analysis of scope phenomena. These four paths are given in (17) below.

|   | distr. over the argument | | distr. over time |
|---|---|---|---|
| (17) (i) | $x_1 \rightarrow \{<1,\{k_1\}>\}$ | (ii) | $x_1 \rightarrow \{<1,\{k_1\}>\}$ |
| | $x_2 \rightarrow \{<1,\{k_2\}>\}$ | | $x_2 \rightarrow \{<2,\{k_1\}>\}$ |
| | $x_3 \rightarrow \{<1,\{k_3\}>\}$ | | $x_3 \rightarrow \{<3,\{k_1\}>\}$ |

|   | kholkhoz collectivity | | distr. over argument and time |
|---|---|---|---|
| (iii) | $x_1 \rightarrow \{<1,\{k_1\}>\}$ | (iv) | $x_1 \rightarrow \{<1,\{k_1\}>\}$ |
| | $x_2 \rightarrow \{<1,\{k_1\}>\}$ | | $x_2 \rightarrow \{<2,\{k_2\}>\}$ |
| | $x_3 \rightarrow \{<1,\{k_1\}>\}$ | | $x_3 \rightarrow \{<3,\{k_3\}>\}$ |

In the discussion of the PLUG framework, it was explained that the left hand side of the equation, that is- $x_1$, $x_2$, $x_3$, represent the members of the external argument.[62] On the right hand side, there is a set that contains a pair constituted with the time index of the event and the internal argument. Denotations of $k_1$, $k_2$ and $k_3$ are the representations of the members of the internal argument and the numerical representations in the right hand side indicate the time indices.

Based on these representations, let us show what these representations mean on a sample sentence like "All the girls lifted a table."

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[62] These paths can be used for sentences which have plural external arguments. For sentences having singular external arguments such as "A girl ate all the apples" cannot be represented with any of these paths. New paths will be proposed for such sentences in the coming sections.

(17i) shows a reading where each member of the external argument undergoes predication with a different member of the internal argument at the same time index. In other words, the sample sentence has an interpretation where each girl lifted a different table at the same time. There is a one-to-one correspondence between the girls and the tables lifted. This type of distributivity was referred to as "distributivity over the argument" in Chapter 3.

(17ii) represents the reading where each member of the external argument undergoes predication with the same member of the internal argument but at different time indices. In such a case, each girl lifted the same table but at different times. We referred to this type of distributivity as the "distributivity over time" cases in Chapter 3.

(17iii) is the representation where the members of the external argument undergo the predication with the same internal argument at the same time index. This means that, the girls lifted a table together. This reading is explained as the "kolkhoz collective" reading.

(17iv), on the other hand, illustrates a reading where each member of the external argument undergoes predication with a different member of the internal argument at different time indices. The sample sentence has an interpretation where each girl lifted a different table at different time indices. This interpretation is a combination of "distributivity over time" and "distributivity over argument" readings.

These interpretations show us that (17iii) is the only representation for a collective interpretation, whereas the others are different forms of distributivity. (17iii) denotes collectivity since it illustrates the $\pi$-constant function. In other words, the paths for each member of the external argument are same. (17i), (17ii) and (17iv)

denote distributivity since they are examples of π-injective function where the paths of the members of the external argument are not identical.

Although these paths are taken as the basic paths in Verkuyl's approach, the next section will make it clear that additional paths need to be proposed in order to cover the possible sentence combinations.

<center>3.2    Additional Paths</center>

I will discuss the additional paths under two titles: single referent subject NPs and multi referent subject NPs.  The NPs in the external argument positions can either be single referent or multi referent. Single referent nouns are not the same as singular nouns. (18) illustrates that a morphologically singular NP does not necessarily have a single referent. Although the subject NP *her çocuk* "every child" in (18) is morphologically singular, it has multiple referents.[63] This means that, on hearing a sentence such as (18), we have more than a single child representation in our mind.

(18)    Her çocuk bir balık tut-tu.

        every child one fish catch-past

         "Every child caught a fish".

Singular NPs can also have multi referents when used with numerals. (19) illustrates numeral quantifier phrases as the external argument. (18) and (19) are given as

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[63] The fact that *her çocuk* "every child" is associated with more than a single child is because of the universal quantifier *her* "every" preceding the singular NP. What I mean by the term "multiple referents" is that the quantificational NP has a universal quantifier that ranges over a set of children. I will use the term "multiple referent" for expository simplicity.

evidence for the fact that morphologically singular NPs can be associated with multi referents.

(19) Beş çocuk bir çadır kur-du.

five child one tent build-past

"Five children built a tent."

Furthermore, morphologically singular NPs can also be associated with single referents. (20) illustrates a sentence where we are referring to only a single woman.

(20)    Bir kadın şarkı söyle-di.

one woman song sing-past

"A woman sang songs."

On the other hand, a plural noun in the external argument can only have multi-referents as illustrated in (21) below. In other words, the plural noun *çocuklar* "children" in the external argument position of (21) can only be associated with more than a single child.

(21)    Çocuk-lar bir vazo kır-dı.

child-pl one vase break-past

"The children broke a vase."

In the following sections I refrain from using the terms "singular NP" and "plural NP" on purpose. In order to come up with all the possible paths, I will refer to

"single referent NPs" and "multi referent NPs" rather than "singular NPs" and "plural NPs".

Kaup, Kelter & Habel (2002) studied how the human mind represented entities. Their analysis is only on the referents of plural expressions. They hypothesize that multiple things can be mentally represented in at least two ways: a coarse representation and a fine-grained representation. In the coarse-representation, the individuals are conceived of as an integrated whole and are mentally represented as a single token. This is referred to as the "*assemblage representation*". In the fine-grained representation, the atomic individuals are mentally kept apart. Each atomic individual is represented by its own token. This is referred to as the "*atomic individual representation*." In consequence, multi referent NPs have either an assemblage interpretation which is parallel to our "collectivity" or an atomic individual interpretation that is parallel to our "disributivity". On the other hand, single-referent NPs have only the atomic individual interpretation.

Having discussed the referents of singular and plural nouns and how these are mentally represented, we can carry on with our analysis on the additional paths to be proposed.

3.2.1   Single Referent Subject NPs

The external argument of a sentence can be a singular noun having a single referent as shown in (22) below. The singularity of the external argument NP in (22) requires that there is a single external argument undergoing the predication. However, the four basic paths that we have laid out in (17) illustrate the presence of more than one element as the external argument of the sentence. The paths in (17) illustrate three

members, $x_1$, $x_2$ and $x_3$, as the external arguments. This means that such a sentence

cannot be schematized with the possible paths in (17) and that a new representation

for sentences with a single-referent external argument needs to be proposed.

(22)    Bir kadın her bebeğ-i emzir-di.

        one woman every baby-acc breast feed-past

        "One woman fed every baby."

An observation of the possible range of readings for such sentences presented in

Chapter 3 reveals that a sentence with a single referent external argument can have

either the "distributivity over time" reading or the "collectivity of objects reading".

The "distributivity over the external argument" reading was discussed to be logically

possible but not available in Turkish.[64] (23) and (24) are given as illustrations for

these sentences.

(23)    Bir birlik her kale-y-i kuşat-tı.

        one regiment every castle-acc surround-past

        "One regiment surrounded every castle."

        (i) Regimen A surrounded Castle 1, Castle 2, Castle 3 etc one after the other.

        $\Rightarrow$ distributive over time

(24)    Bir birlik bütün kale-ler-i kuşat-tı.

        one regiment all castle-pl-acc surround-past

        "One regiment surrounded all the castles."

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[64] Note that the so-called "inverse scope" reading which is a case of "distributivity over the external argument" interpretation is not possible in Turkish in contrast to English.

(i) The regiment surrounded the areas of Castles A,B,C etc. all together.

$\Rightarrow$ collectivity of objects at a certain time

(ii) The regiment surrounded all castles one after the other.

$\Rightarrow$ distributivity over time

The possible paths that I propose for sentences having single referent external arguments are presented in (25) and (26) below. (25) shows the path for the "distributivity over time" interpretation. In other words, the path shows that each internal argument undergoes predication together with the external argument but at different time indices. In such a case the internal argument is considered with the atomic individual representation. This illustrates cases such as a single girl painting the rooms one after the other at different time indices or a single woman feeding different babies one after the other at different time indices. (26), on the other hand, shows a predication where the members of the internal argument undergo predication collectively at the same time index. This is an illustration for a situation like a single regiment surrounding the three castles by forming a circle around these three castles all together. For this path the internal argument is conceived as having an assemblage representation.

(25)    $x_1 \rightarrow \{<1,\{k_1\}>, <2,\{k_2\}>, <3,\{k_3\}>\}$          distributivity over time

(26)    $x_1 \rightarrow \{<1,\{k_1, k_2, k_3\}>\}$          collectivity of objects

The paths shown in (25) and (26) above are proposed as additional paths to cover sentences with single referent subject NPs. The next section continues with extra

additional paths for multi-referent subject NPs.


3.2.2   <u>Multi Referent Subject NPs</u>


The external argument of a sentence can also be a multi referent noun as in (27) below.  The multi referent subject NP *bütün çocuklar* "all the children" can have an assemblage representation where all the children undergo predication together at the same time and an atomic individual representation where each child is conceived as undergoing the predication separately.


(27)    Bütün çocuk-lar bir çadır kur-du.

        all child-pl one tent build-past

        "All the children built a tent."


In order to come up with all the possible paths through which a sentence can be realized, we have to analyze different combinations of subjects and objects with atomic-individual and assemblage interpretations. Depending on this generalization, I will analyze different combinations of "atomic individual / assemblage" subject NPs and "atomic individual / assemblage" object NPs. (28) presents these different combinations.

(28)

| SUBJECT | OBJECT |
|---|---|
| 1.Atomic individual representation | 1.Atomic individual representation |
| 2. Assemblage representation | 2.Atomic individual representation |
| 3.Atomic individual representation | 3. Assemblage representation |
| 4. Assemblage representation | 4. Assemblage representation |

Atomic individual representation of the subject NP requires that each member is interpreted as undergoing the predication separately, thus having different paths. Assemblage representation of the subject NP, however, implies that the members of the external argument act as a group thus require identical paths which lead to the kolkhoz collective interpretation.

Atomic individual representation of the internal argument, however, requires that each member of the object is distributed to different paths. Assemblage representation, on the other hand, requires the members to be represented as a group in each path.

Based on the combinations presented in (28), we will propose the following paths for different combinatorial possibilities in the following paragraphs. Availability of identical time indices or different time indices in the paths will enable us to come up with a wide range of possible paths. (29) presents the possible paths for sentences with atomic individual subjects and atomic individual objects. The three paths given in (29) illustrate different paths for each member of the external argument. This is the result of the atomic individual representation of the members of the subject NP.

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(29)   a.      $x_1 \rightarrow \{<1,\{k_1\}>\}$

                $x_2 \rightarrow \{<2,\{k_2\}>\}$

                $x_3 \rightarrow \{<3,\{k_3\}>\}$

     b.      $x_1 \rightarrow \{<1,\{k_1\}>\}$

                $x_2 \rightarrow \{<1,\{k_2\}>\}$

                $x_3 \rightarrow \{<1,\{k_3\}>\}$

     c.      $x_1 \rightarrow \{<1,\{k_1\}>\}$

                $x_2 \rightarrow \{<2,\{k_1\}>\}$

                $x_3 \rightarrow \{<3,\{k_1\}>\}$

     d.      $x_1 \rightarrow \{<1,\{k_1\}>, <2,\{k_2\}>, <3,\{k_3\}> \}$

                $x_2 \rightarrow \{<1,\{k_2\}>, <2,\{k_3\}>, <3,\{k_1\}>\}$

                $x_3 \rightarrow \{<1,\{k_3\}>, <2,\{k_1\}>, <3,\{k_2\}>\}$

(30) gives the possible paths considering the subject NP with an assemblage representation and the object NP with an atomic individual representation. The assemblage representation of the subject NP requires the paths to be identical as shown below.

(30)   a.      $x_1 \rightarrow \{<1,\{k_1\}>\}$

                $x_2 \rightarrow \{<1,\{k_1\}>\}$

                $x_3 \rightarrow \{<1,\{k_1\}>\}$

b. $x_1 \rightarrow \{<1,\{k_1\}>, <2,\{k_2\}>, <3,\{k_3\}>\}$

$x_2 \rightarrow \{<1,\{k_1\}>, <2,\{k_2\}>, <3,\{k_3\}>\}$

$x_3 \rightarrow \{<1,\{k_1\}>, <2,\{k_2\}>, <3,\{k_3\}>\}$

The path associated with a combination of atomic individual subject NP and assemblage object NP is presented in (31) below. The atomicity of the subject NP is realized through different paths. The fact that the members of the internal argument are unified in the form of a group in the path reveals the assemblage interpretation of the object NP.

(31)     $x_1 \rightarrow \{<1,\{k_1, k_2, k_3\}>\}$

$x_2 \rightarrow \{<2,\{k_1, k_2, k_3\}>\}$

$x_3 \rightarrow \{<3,\{k_1, k_2, k_3\}>\}$

Finally, assemblage representation of the subject NP together with the assemblage representation of the object NP is schematized in the form of paths in (32).

(32)     $x_1 \rightarrow \{<1,\{k_1, k_2, k_3\}>\}$

$x_2 \rightarrow \{<1,\{k_1, k_2, k_3\}>\}$

$x_3 \rightarrow \{<1,\{k_1, k_2, k_3\}>\}$

Having considered all the possible combinations, we can list all the possible paths in (33) below. When this list is compared to the possible paths in Verkuyl's studies presented in (17) above, we can see that only (33a), (33b), (33c) and (33e) are indicated in the studies of Verkuyl. However, the other paths are not mentioned and

these constitute the additional paths that I propose to consider in the elimination

process that I will be claiming in the following sections of this dissertation.

(33)  a.  $x_1 \rightarrow \{<1,\{k_1\}>\}$          $\pi$-injective (distr. over time

  $x_2 \rightarrow \{<2,\{k_2\}>\}$          + distr. over argument)

  $x_3 \rightarrow \{<3,\{k_3\}>\}$

  b.  $x_1 \rightarrow \{<1,\{k_1\}>\}$          $\pi$-injective (distr. over argument)

  $x_2 \rightarrow \{<1,\{k_2\}>\}$

  $x_3 \rightarrow \{<1,\{k_3\}>\}$

  c.  $x_1 \rightarrow \{<1,\{k_1\}>\}$          $\pi$-injective (distr. over time)

  $x_2 \rightarrow \{<2,\{k_1\}>\}$

  $x_3 \rightarrow \{<3,\{k_1\}>\}$

  d.  $x_1 \rightarrow \{<1,\{k_1\}>, <2,\{k_2\}>, <3,\{k_3\}> \}$     $\pi$-injective (distr. over time

  $x_2 \rightarrow \{<1,\{k_2\}>, <2,\{k_3\}>, <3,\{k_1\}>\}$     + distr. over argument)

  $x_3 \rightarrow \{<1,\{k_3\}>, <2,\{k_1\}>, <3,\{k_2\}>\}$[65]

  e.  $x_1 \rightarrow \{<1,\{k_1\}>\}$          $\pi$-constant (subject coll.)

  $x_2 \rightarrow \{<1,\{k_1\}>\}$

  $x_3 \rightarrow \{<1,\{k_1\}>\}$

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[65] This representation is the enlarged form of the representation given in (35b).

f.        $x_1 \rightarrow \{<1,\{k_1\}>, <2,\{k_2\}>, <3,\{k_3\}>\}$      $\pi$-constant (subject coll.)

        $x_2 \rightarrow \{<1,\{k_1\}>, <2,\{k_2\}>, <3,\{k_3\}>\}$

        $x_3 \rightarrow \{<1,\{k_1\}>, <2,\{k_2\}>, <3,\{k_3\}>\}^{66}$

g.        $x_1 \rightarrow \{<1,\{k_1, k_2, k_3\}>\}$        $\pi$-injective (object coll.)

        $x_2 \rightarrow \{<2,\{k_1, k_2, k_3\}>\}$

        $x_3 \rightarrow \{<3,\{k_1, k_2, k_3\}>\}$

h.        $x_1 \rightarrow \{<1,\{k_1, k_2, k_3\}>\}$        $\pi$-constant (subject coll.

        $x_2 \rightarrow \{<1,\{k_1, k_2, k_3\}>\}$           + object coll.)

        $x_3 \rightarrow \{<1,\{k_1, k_2, k_3\}>\}$

i.        $x_1 \rightarrow \{<1,\{k_1\}>, <2,\{k_2\}>, <3,\{k_3\}>\}$

j.        $x_1 \rightarrow \{<1,\{k_1, k_2, k_3\}>\}$

After a proposal of additional paths, we can revise the PLUG framework by proposing an elimination procedure. The aim of this proposed elimination procedure is to turn the PLUG framework to a computational mechanism. This elimination procedure will apply on the possible paths of a sentence in order to come up with a final interpretation of the sentence. In this elimination procedure, the collectivity features of the VP and the external argument will be shown to have a crucial role to play. These collectivity features were introduced in Chapter 4 of this dissertation for the application of the Modified Plus Principle.

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[66] This representation is the enlarged form of the representation given in (35e).

## 3.3 <u>Computation of the Elimination Procedure</u>

The ten basic paths presented in (33) above will be taken as the basis of the elimination procedure. Each sentence will be supposed to start the elimination process with these potential paths. The sentence will get its final interpretation after the elimination process is completed. A question that needs to be answered at this point is "*What factors eliminate the potentially possible paths?*" The answer to this question will be laid out in the following section.

### 3.3.1   <u>Factors in the Elimination Procedure</u>

I start out with the assumption that every sentence potentially has the configurations presented in (33) above. However, as the examples in (34) show, all of these configurations cannot be realized for each sentence. (34a) cannot have the representations given in (33e)-(33j) as the possible readings. (33e) and (33f) are impossible since the same baby cannot be fed by a number of women at the same time index. (33e) and (33f) are the denotations where the activity is carried out in a collective fashion which is impossible for (34a). (33g) and (33h) are also impossible readings for the sentence in (34a) because the same woman cannot breast feed a number of babies at the same time. Finally, (33i) and (33j) are out since these representations are associated with single referent external arguments, but this is not the case for the sentence in (34a).

Similarly, (34b) is not compatible with the representations shown in (33a)-(33d) as well as (33g)-(33j).  (33a)-(33d) are out for the sentence in (34b) since it is impossible for a single soldier to surround a castle by himself. However, the

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representations presented in (33a)-(33d) all show that each individual external argument carries out the activity denoted by the verb separately. (33i) and (33j) which are associated with the single referent external arguments are also incompatible with (34b).

(34)    a. Her kadın bir bebek emzir-di.

        every woman one baby breast-feed-past

        "Every woman fed a baby."


        b. Bütün asker-ler bir kale kuşat-tı.

        all soldier-pl one castle surround

        "All the soldiers surrounded a castle."


The impossibility of some of these paths for some sentences leads us to the idea that the impossible paths are eliminated somehow. At this point I propose to use the collectivity features of the VP and the external argument in the elimination process. The collectivity features of both the VP and the external argument NP need to be considered in the elimination process. As we can recall from Chapter 4, the overall collectivity feature of the sentence was shown to be the outcome of an interaction between the collectivity features of the external argument and the collectivity features of the VP.[67] Furthermore, it was discussed in Chapter 4 that the operation of the Modified Plus Principle was based on the collectivity features of the constituents

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[67] Furthermore, the collectivity feature of the VP was shown to be the outcome of an interaction between the collectivity features of the internal argument and the verb. Also, the collectivity feature of the external argument was shown to be the outcome of an interaction between the collectivity features of the quantifier and the noun type.

in the sentence. The definition of the Modified Plus Principle is repeated in (35) below.

(35)   Plus-Principle

One minus value is sufficient to yield a $[-T_S]$ at the top (sentential level)

Proposing to use the same collectivity features as the underlying concepts for the Modified Plus Principle and the PLUG seems to be a natural outcome based on the fact that both the Modified Plus Principle and the PLUG framework are two different means to deal with the collectivity / distributivity distinction of a sentence. In the next section, I will propose an elimination procedure based on the inherent collectivity features of the constituents of a sentence to arrive at the possible readings that it can have. We will illustrate how the elimination process is carried out to yield a more refined interpretation of the sentence.

3.3.2   Elimination Rules

As mentioned above, each sentence is supposed to start out the elimination process with ten possible paths given in (33) which are re-written in (36) below.

(36)   a.   $x_1 \rightarrow \{<1,\{k_1\}>\}$                $\pi$-injective (distr. over time

$x_2 \rightarrow \{<2,\{k_2\}>\}$                    + distr. over argument)

$x_3 \rightarrow \{<3,\{k_3\}>\}$

b.      $x_1 \rightarrow \{<1,\{k_1\}>\}$                          $\pi$-injective (distr. over argument)

        $x_2 \rightarrow \{<1,\{k_2\}>\}$

        $x_3 \rightarrow \{<1,\{k_3\}>\}$


c.      $x_1 \rightarrow \{<1,\{k_1\}>\}$                          $\pi$-injective (distr. over time)

        $x_2 \rightarrow \{<2,\{k_1\}>\}$

        $x_3 \rightarrow \{<3,\{k_1\}>\}$


d.      $x_1 \rightarrow \{<1,\{k_1\}>, <2,\{k_2\}>, <3,\{k_3\}> \}$      $\pi$-injective (distr. over time

        $x_2 \rightarrow \{<1,\{k_2\}>, <2,\{k_3\}>, <3,\{k_1\}>\}$          + distr. over argument)

        $x_3 \rightarrow \{<1,\{k_3\}>, <2,\{k_1\}>, <3,\{k_2\}>\}^{68}$


e.      $x_1 \rightarrow \{<1,\{k_1\}>\}$                          $\pi$-constant (subject coll.)

        $x_2 \rightarrow \{<1,\{k_1\}>\}$

        $x_3 \rightarrow \{<1,\{k_1\}>\}$


f.      $x_1 \rightarrow \{<1,\{k_1\}>, <2,\{k_2\}>, <3,\{k_3\}>\}$      $\pi$-constant (subject coll.)

        $x_2 \rightarrow \{<1,\{k_1\}>, <2,\{k_2\}>, <3,\{k_3\}>\}$

        $x_3 \rightarrow \{<1,\{k_1\}>, <2,\{k_2\}>, <3,\{k_3\}>\}^{69}$


g.      $x_1 \rightarrow \{<1,\{k_1, k_2, k_3\}>\}$                  $\pi$-injective (object coll.)

        $x_2 \rightarrow \{<2,\{k_1, k_2, k_3\}>\}$

        $x_3 \rightarrow \{<3,\{k_1, k_2, k_3\}>\}$

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[68] This representation is the enlarged form of the representation given in (38b).
[69] This representation is the enlarged form of the representation given in (36e).

h. $x_1 \rightarrow \{<1,\{k_1, k_2, k_3\}>\}$      $\pi$-constant (subject coll.

     $x_2 \rightarrow \{<1,\{k_1, k_2, k_3\}>\}$      + object coll.)

     $x_3 \rightarrow \{<1,\{k_1, k_2, k_3\}>\}$

i. $x_1 \rightarrow \{<1,\{k_1\}>, <2,\{k_2\}>, <3,\{k_3\}>\}$      $\pi$-injective $_{obj}$

j. $x_1 \rightarrow \{<1,\{k_1, k_2, k_3\}>\}$      $\pi$-constant $_{obj}$

As is clear from the representations, the paths in (36a)-(36h) are associated with sentences having multi referent external arguments, whereas (36i) and (36j) are associated with sentences having single referent external arguments. Depending on this categorization, we can propose our first elimination rule as in (37) below.

(37)    Elimination Rule 1

     (i)      A single referent subject NP eliminates the paths in (38a)-(38h).

     (ii)      A multi referent subject NP eliminates the paths in (38i)-(38j).[70]

Suppose that a multi referent subject NP eliminated (36i) and (36j) leaving the paths in (36a)-(36h) as possible paths. The elimination procedure is supposed to continue with further elimination steps. The next step of the elimination process is directly a reflection of the Modified Plus Principle on the PLUG framework. The Modified Plus Principle states that a minus value of collectivity coming from any constituent of the sentence is sufficient to yield a minus value of collectivity for the overall

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[70] Recall that single referent subject NP does not refer to a morphologically singular NP and that multi referent subject NP does not refer to a morphologically plural NP.

sentence. This means that the sentence turns out to have a distributive interpretation. Using this property of the Modified Plus Principle in the elimination process leads to the second elimination rule as given in (38) below. This rule means that a [-COLL] feature of either the external argument or the VP eliminates the $\pi$-constant paths yielding an overall distributive interpretation.

(38)    Elimination Rule 2

A minus collectivity feature of either the external argument or the VP eliminates the denotation for the $\pi$-constant.

A direct outcome of the elimination rule 2 is that the paths for $\pi$-constant interpretations which refers to a kolkhoz collective reading is only possible if and only if both the external argument and the VP has a [+COLL] feature. This outcome can be presented in terms of Elimination Rule 3 as shown in (39) below.

(39)    Elimination Rule 3

Two plus collectivity features within a structure eliminates the $\pi$-injective.

What we get after the application of the Elimination Rule 2 is a distributive interpretation which can be denoted as (36a)-(36d) as well as (36g), and what we get after the application of the Elimination Rule 3 is a collective interpretation denoted as (36e), (36f) and (36h).

An analysis of these paths leads us to the need to propose a final elimination rule. (36a), (36b), (36c) and (36e) are structurally different from (36d), (36f), (36g), (36h). The difference lies in the internal argument representations. In (36a), (36b),

(36c) and (36e), each particular path is associated with a unique internal argument. This means that, for each path, there is only one single internal argument involved in the predication. However, in (36d), (36f), (36g) and (36h), more than a single internal argument noun are available in each path. As seen in the representations, each path has the internal arguments $k_1$, $k_2$, $k_3$ either in the atomic individual representation as in (36d) and (36f) or in the assemblage representation as in (36g) and (36h). Considering this observation, we propose Elimination Rule 4 which is given in (40) below.

(40)    Elimination Rule 4

   (i)      a. Internal arguments with a +COLL or a -COLL feature (that is-quantificational internal arguments) eliminate denotations having one object entity for all the paths.  [(36c), (36e)]

            b. Internal arguments with a -COLL feature eliminates the denotations illustrating an assemblage representation for the internal argument. [(36g), (36h), (36j)]

   (ii)     Internal arguments with a φ collectivity feature such as bare object NPs, specific / non-specific indefinite object NPs eliminate denotations having more than one object entity in a single path. [(36d), (36f), (36g), (36h)]

Elimination Rule 4 refers to the collectivity features of the internal argument. We have seen in Chapter 4 that the quantificational internal arguments enter the

computational mechanism operating within the framework of the Modified Plus Principle with + / - COLL features. Elimination Rule 4-(i-a) states that denotations in (36c) and (36e), which are associated with only a single object entity, $k_1$, in all the paths, are eliminated. The fact that a quantificational NP such as *her çocuk* "every child" or *bütün çocuklar* "all the children" requires the presence of more than one child is the reason behind the need to have such an elimination rule. Elimination Rule 4-(i-b) indicates that denotations in (36g) and (36h), which    illustrate assemblage representations for the internal argument, are eliminated if the internal argument of the sentence bears the –COLL feature. Otherwise, these paths are not eliminated and act as potential paths for the sentence.

Another possibility for the internal argument is to have a null (ϕ) collectivity feature. We have seen in Chapter 3 that bare object NPs, specific / non-specific indefinite object NPs are supposed to have a null (ϕ) collectivity feature. In such a case, Elimination Rule 4-(ii) states that denotations in (36d), (36f), (36g) and (36h), which have multi-referents in each path, are eliminated.

This elimination rule enables us to differentiate between the sentences presented in (41) below. The application of the Modified Plus Principle gives out an ambiguous interpretation for (41a). However, the same computational mechanism yields an unambiguous distributive reading for (41b). At this point I will consider the distributive interpretations of both (41a) and (41b) in order to illustrate how their distributive paths differ from each other. For both of these sentences Elimination Rule 1 eliminates (36i) and (36j) depending on the multi-referent subject NP in the sentences. Elimination Rule 2, in turn eliminates (36e), (36f) and (36h). Recall that a minus value of collectivity eliminates the π-constant paths of (36e), (36f) and (36h) in Elimination Rule 2. We have the paths in (36a), (36b), (36c), (36d) and (36g) as

possible paths for both of these sentences. Elimination Rule 4 (i-a) eliminates (36c)

for both of these sentences, since the internal arguments for both sentences are

quantificational NPs, therefore bears either a plus or a minus value of collectivity.

Finally, Elimination Rule 4 (i-b) differentiates between the two sentences. The

collectivity feature of the internal argument NP *bütün kaleleri* "all the castles" in

(41a) is +COLL whereas *her kaleyi* "every castle" in (41b) is –COLL. Elimination

Rule 4 (i-b) eliminates (36g) for the sentence in (41b). However, it does not operate

on (41a) since the internal argument of (41a) has a plus value. As a consequence,

(41a) ends the computation with (36a), (36b), (36d) and (36g) as possible paths.

(41b), on the other hand, can be interpreted with the denotations in (36a), (36b) and

(36d).

(41) a. $[_{+/-COLL}$ $[_{+/-COLL}$ Birlik-ler$][_{+COLL}$ $[_{+COLL}$ $[_{+COLL}$ bütün$][_{+COLL}$ kale-ler-i$]]$

$[_{+COLL}$ kuşat-tı$]]]$

regiment-pl all castle-pl-acc surround-past

"The regiments surrounded all the castles."

b. $[_{-COLL}$ $[_{+/-COLL}$ Birlik-ler$]$ $[_{-COLL}$ $[_{-COLL}$ $[_{-COLL}$ her$]$ $[_{-COLL}$ kale-y-i$]][_{+COLL}$

kuşat-tı$]]]$

regiment-pl every castle-acc surround-past

"The regiments surrounded every castle."

(42) is given to illustrate a sentence having an internal argument with a null ($\phi$)

collectivity feature. The sentence is supposed to start out the elimination process with

the application of Elimination Rule 1. *Her birlik* "every regiment" is a

quantificational NP and has multi-referents. This leads to the elimination of the denotations in (36i) and (36j). The collectivity feature of the VP in (44) is +COLL whereas that of the external argument is –COLL. Elimination Rule 2 eliminates the denotations for the $\pi$-constant, that is (36e), (36f) and (36h). The remaining paths are (36a), (36b), (36c), (36d) and (36g). The internal argument of the sentence has a null ($\phi$) collectivity feature, so Elimination Rule 4 (ii) applies and (36d) and (36g) are also eliminated. As a result, (36a), (36b) and (36c) are the final possible denotations for the sentence in (42).

(42)    [$_{\text{-COLL}}$ [$_{\text{-COLL}}$ Her birlik] [$_{\text{+COLL}}$ [$_{\phi}$ bir kale-y-i] [$_{\text{+COLL}}$ kuşat-tı]].

every regiment one castle-acc surround-past

"Every regiment surrounded a castle."

In summary, we have reached ten possible paths as representations of the truth-conditions that a proposition might have by combining the atomic individual vs. assemblage representations of the subject NP and that of the object NP. We have discussed that all of these paths cannot be appropriate for every sentence. The sentences are supposed to start out the elimination procedure with all these possible paths and the impossible paths are eliminated during the elimination process. We have proposed four elimination rules.

Elimination Rule 1 makes use of the single referent or multi referent nature of the external argument NP. Elimination Rule 2 and Elimination Rule 3 operate through the collectivity features of the external argument and the overall VP. These two elimination rules appear to operate in complimentary distribution. In other words, if one applies, the other does not. That is, a sentence with even one minus

value leads to the operation of Elimination Rule 2. For such a sentence Elimination Rule 3 is irrelevant. On the other hand, a sentence with two plus collectivity values leads to the application of Elimination Rule 3.In this case Elimination Rule 2 is irrelevant. Finally, Elimination rule 4 is associated with the features of the internal argument. It acts as a way to differentiate between sentences with quantificational object NPs and non-quantificational object NPs. Furthermore, Elimination Rule 4 distinguishes between the quantifier *her* "every" and *bütün* "all" in the internal argument position.

Figure 2 and Figure 3 lay out a flowchart for the operation of the elimination procedure. The sentence goes through the flowchart in Figure 2 if it has a single referent subject NP. Otherwise, it has to take the route of the flowchart in Figure 3 in the elimination procedure. The final outcomes in the flowcharts are also provided. In the next section, example sentences will be analyzed within the flowcharts provided above.
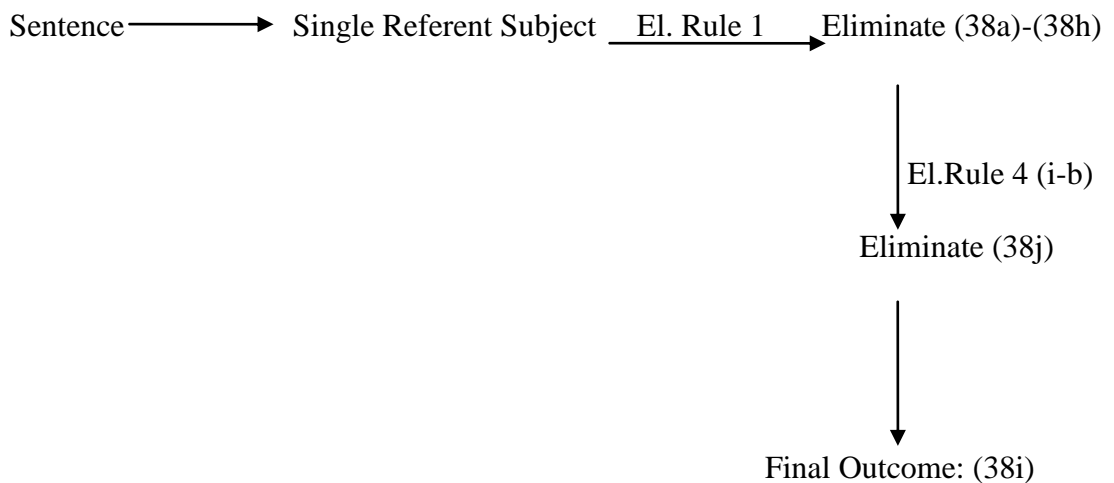
Sentence ⟶ Single Referent Subject ⎯ El. Rule 1 ⟶ Eliminate (38a)-(38h)

El.Rule 4 (i-b)

Eliminate (38j)

Final Outcome: (38i)

FIGURE 2     Elimination procedure flow chart (Single-referent subjects)

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Final Outcome: (38a), (38b), (38d)

Final Outcome: (38a), (38b), (38c)    Eliminate (38g), (38h)

El. Rule 4(i-b)

Eliminate (38d), (38f), (38g), (38h)    Eliminate (38c), (38e)

El.Rule 4(ii)    El. Rule 4(i-a)

Eliminate (38e), (38f), (38h)

El. Rule 2

Sentence ⟶ Multi Referent Subject    El. Rule 1 ⟶ Eliminate (38i)-(38j)

El. Rule 3

Eliminate (38a), (38b), (38c), (38d), (38g)

El.Rule 4(ii)    El. Rule 4(i-a)

Eliminate (38f), (38h)    Eliminate (38c), (38e)

El. Rule 4(i-b)

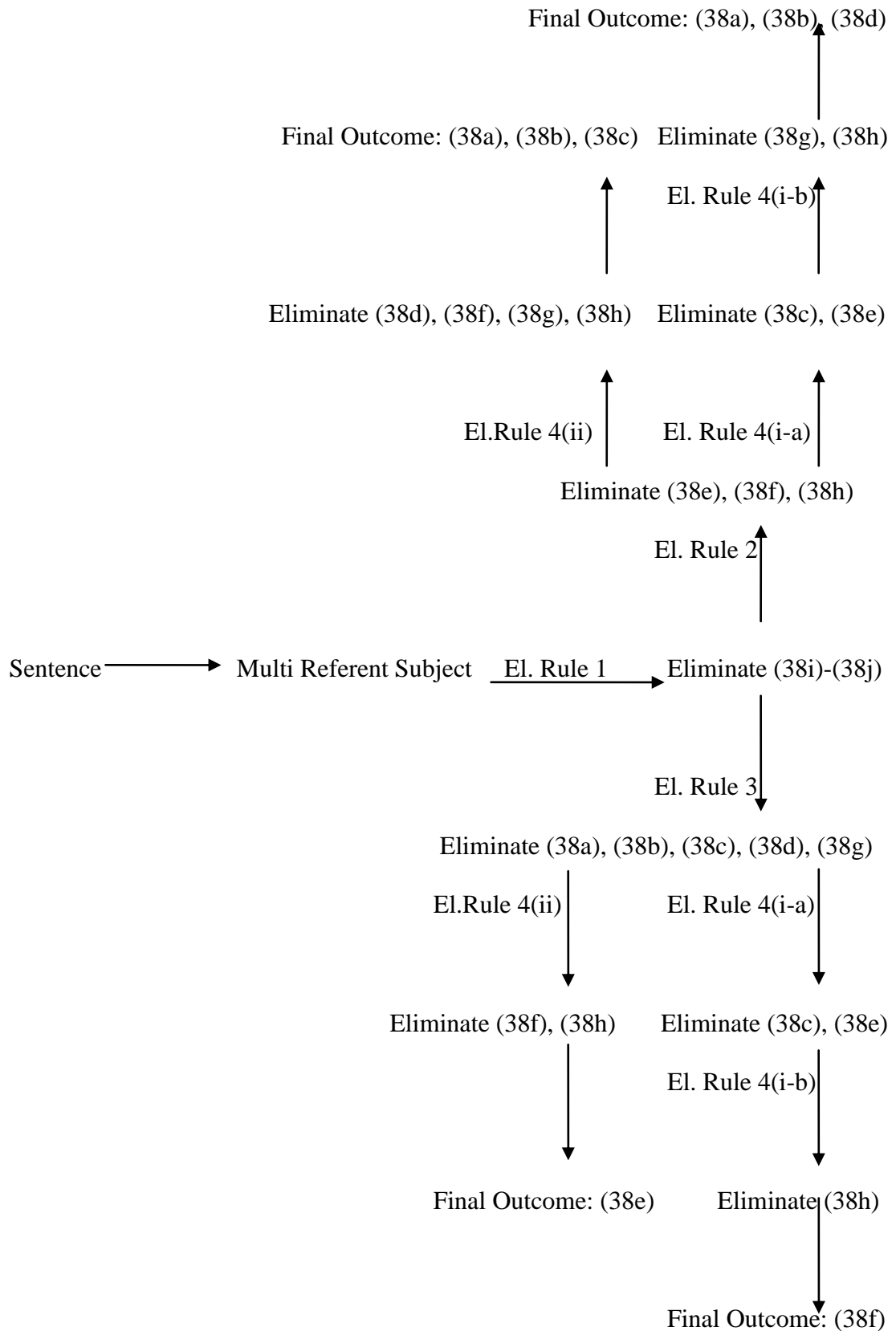Final Outcome: (38e)    Eliminate (38h)

Final Outcome: (38f)

FIGURE 3    Elimination procedure flow chart (Multi-referent subjects)

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### 3.3.3    Other Examples for the Application of the Elimination Rules

The application of the elimination procedure will be discussed under two sub-titles: elimination for sentences with multi referent subjects and elimination for sentences with single referent subjects. We will refer to the denotations of possible paths presented in (36) in the course of the elimination process.

### 3.3.3.1 Multi Referent External Arguments

The sentences from (43) to (47) are provided to exemplify the application of the elimination rules for sentences with multi referents. The external argument position is filled with a quantificational NP in each of these examples. The quantificational NPs have multi referents. Therefore, Elimination Rule 1 eliminates (36i) and (36j). The alternative paths left behind are in (36a)-(36h). The presence of at least one [-COLL] feature within the structure in the following sentences brings out the need to eliminate paths associated with $\pi$-constancy according to the Elimination Rule 2. The paths to be eliminated are (36e), (36f) and (36h). The paths left behind are (36a), (36b), (36c), (36d) and (36g). These are all instances of $\pi$-injectivity. The next step is related to the internal arguments of the sentences. The internal argument of these sentences all have a null ($\phi$) collectivity feature. This leads to the application of Elimination Rule 4 (ii) that requires a further elimination of (36d) and (36g). The final outcomes for these sentences are the denotations for (36a), (36b) and (36c).

(43) [$_{-COLL}$ [$_{-COLL}$ Her birlik] [$_{+COLL}$ [$_{\phi}$bir kale] [$_{+COLL}$ kuşat-tı]]].

    every regiment one castle surround-past

    "Every regiment surrounded a castle."


(44) [$_{-COLL}$ [$_{-COLL}$ Her kadın] [$_{-COLL}$ [$_{\phi}$ bir bebek] [$_{-COLL}$ emzir-di]]].

    every woman one baby breast feed-past

    "Every woman fed a baby."


(45) [$_{-COLL}$ [$_{-COLL}$ Her çocuk] [$_{-/+COLL}$ [$_{\phi}$bir şarkı] [$_{-/+COLL}$ söyle-di]]]

    every child one song sing-past

    "Every child sang a song."


(46) [$_{-COLL}$ [$_{-COLL}$ Her aile] [$_{-/+COLL}$ [$_{\phi}$bir çadır] [$_{-/+COLL}$ kur-du]]].

    every family one tent build-past

    "Every family built a tent."


(47)  [$_{-COLL}$ [$_{+COLL}$ Bütün kadın-lar] [$_{-COLL}$ [$_{\phi}$bir bebek] [$_{-COLL}$ emzir-di]]].

    all woman-pl baby breast feed-past

    "All women fed a baby."


It was pointed out in the previous paragraphs that Elimination Rule 2 and

Elimination Rule 3 operate in complementary distribution. In (43)-(47), Elimination

Rule 2 was in operation. The example in (48) illustrates the application of

Elimination Rule 3. In this case, Elimination Rule 2 cannot operate. At first,

Elimination Rule 1 eliminates the denotations in (36i) and (36j). The fact that both

the VP and the subject NP have +COLL features lead to the application of the Elimination Rule 3 and this results in the elimination of π-injective mode leaving the denotations in (36e), (36f) and (36h) behind. As a final step, Elimination Rule 4 (ii) applies because of the null (ϕ) collectivity feature of the internal argument. This eliminates (36f) and (36h) and leaves only the denotation in (36e) as the possible representation.

(48)   [$_{+COLL}$ [$_{+COLL}$ Bütün asker-ler] [$_{+COLL}$ [$_ϕ$bir kale] [$_{+COLL}$ kuşat-tı]]].

all soldier-pl castle surround-past

"All soldiers surrounded a castle."

An analysis of (49)-(51) shows that the external argument or the VP might have a [-/+COLL] feature as well. As the first step of the operation, Elimination Rule 1 eliminates the denotations of (36i) and (36j).

In (49), if the external argument enters the elimination process with a minus value, then we would expect the Elimination Rule 2 to operate which eliminates the π-constant mode, leaving the distributive readings. This means that (36a), (36b), (36c), (36d) and (36g) are left behind. Elimination Rule 4(ii) makes a further elimination of (36d) and (36g). Final outcome of the computation yields (36a), (36b) and (36c). (36a) is associated with the interpretation where the regiments surrounded different castles at different times. (36b) gives out an interpretation where the regiments surrounded different castles at the same time. This is the distributivity over the argument interpretation. Finally (36c) reveals the distributivity over time interpretation which means that the regiments surrounded the same castle but at different times.   If, on the other hand, it enters the elimination process with a plus

value, the Elimination Rule 3 operates resulting in an elimination of the π-injective modes, leaving (36e), (36f) and (36h). Elimination Rule 4(ii) continues the elimination process giving out a final outcome of (36e) which is associated with the kolkhoz collective interpretation meaning that the regiments surrounded the castle collectively. Similar explanations hold for (50) and (51) as well.

(49)  [$_{-/+COLL}$ [$_{-/+COLL}$ Bütün birlik-ler] [$_{+COLL}$ [$_{\phi}$bir kale] [$_{+COLL}$ kuşat-tı]]].

all regiment-pl castle surround-past

"All regiments surrounded a castle."

(50)  [$_{-/+COLL}$ [$_{+COLL}$ Bütün çocuk-lar] [$_{-/+COLL}$ [$_{\phi}$bir şarkı] [$_{-/+COLL}$ söyle-di]]].

all child-pl one song sing-past

"All the children sang a song."

(51)  [$_{-/+COLL}$ [$_{-/+COLL}$ Bütün aile-ler] [$_{-/+COLL}$ [$_{\phi}$bir çadır] [$_{-/+COLL}$ kur-du]]].

all family-pl one tent build-past

"All the families built a tent."

Up to now, how the elimination procedure operates was discussed and exemplified with sentences which have quantificational NPs as their external arguments. The elimination procedure yields correct outcomes for the interpretation of such sentences as well. In the pursuing paragraphs, sentences with quantificational object NPs will be considered. These sentences still have multi referent subject NPs. Therefore, the flowchart in Figure 1 will be followed throughout the elimination process.

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The sentences given in (52)-(56) all have a quantificational NP in their internal argument positions.  In the analysis of these sentences, (36i) and (36j) are eliminated by Elimination Rule 1. The fact that the VPs in (54)-(58) are [-COLL] puts Elimination Rule 2 into operation eliminating (36e), (36f) and (36h). Since the internal argument of the sentence is a quantificational NP, Elimination Rule 4 (i-a) operates and (36c) gets eliminated. Elimination Rule 4 (i-b), in turn, eliminates (36g). Finally, we get (36a), (36b) and (36d) as possible representations of the sentences. For the sentence in (52), the denotation of (36a) represents a situation where different regiments surrounded different castles at different time indices whereas in (36b) the regiments surrounded different castles at the same time index. (36d), on the other hand, means that the regiments individually surrounded the castles one after the other provided that all the regiments surround all the castles. All the sentences in (52)-(56) can be realized via the denotations in (36a), (36b) and (36d). However, it is at this point that we have to mention one more possible interpretation for such sentences. Although, the denotation in (36f) was eliminated because of Elimination Rule 2, it seems to be a possible reading for sentences having the quantificational NP in the internal argument positions. If the denotation of (36f) is analyzed carefully, it will be clear that although it has the property of $\pi$-constancy with respect to the paths of the external argument, it also reflects the property of $\pi$-injectivity with respect to the paths of the internal argument. In other words, it is also a denotation for the distributivity of the object NP over time indices. In short, we have to take the denotation of (36f) as an exceptional denotation which carries both properties of $\pi$-constancy and $\pi$-injectivity. The $\pi$-injectivity interpretation comes out only for sentences having the quantificational NP in the object position as seen

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below. For sentences that has the quantificational NP in the subject position as in

(43)-(51), the $\pi$-injective interpretation of (36f) remained inactive.[71]


(52)    [$_{\text{-COLL}}$[$_{\text{+/-COLL}}$Birlik-ler] [$_{\text{-COLL}}$ [$_{\text{-COLL}}$ [$_{\text{-COLL}}$ her] [$_{\text{-COLL}}$ kale-y-i]] [$_{\text{+COLL}}$ kuşat-

tı]]]

regiment-pl every castle-acc surround-past

"The regiments surrounded every castle."

(i) Regiment A, Regiment B, Regiment C etc, as a group, surrounded Castle

1, Castle

2, Castle 3 etc one after the other.

$\Rightarrow$ distributive over time

(ii) Regiment A surrounded Castle 1, Regiment B surrounded Castle 2,

Regiment C surrounded Castle 3 either at the same time or one after the other.

$\Rightarrow$ distributive over the subject


(53)    [$_{\text{-COLL}}$[$_{\text{+COLL}}$ Kadın-lar] [$_{\text{-COLL}}$ [$_{\text{-COLL}}$ [$_{\text{-COLL}}$ her][$_{\text{-COLL}}$ pasta-y-ı]][$_{\text{-COLL}}$ tat-tı]]]

woman-pl every pastry-acc taste-past

"The women tasted every pastry."

(i)      Merve, Müge and Ayşe tasted a chocolate pastry, a pastry with

caramel and a fruit pastry one after the other.      $\Rightarrow$ distributive over time

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[71] Due to pragmatic reasons the $\pi$-injective reading of (38f) is not observed for sentences as in (i) and (ii). Furthermore, for (ii), (38d) fails to be realized.

      (i)     Kadın-lar her bebeğ-i emzir-di.
              woman-pl every baby-acc breast feed-past
              "The women fed every baby."
      (ii)    Kadın-lar bütün bebek-ler-i doğur-du.
              woman-pl all baby-pl-acc give birth to-past
              "The women gave birth to all the babies."

(ii) Merve tasted a chocolate pastry, Müge tasted a pastry with caramel and Ayşe tasted a fruit pastry.

⇒ distributive over the subject

(54)  [-COLL[+ / -COLL Jüri heyet-ler-i][-COLL[-COLL[-COLL her][-COLL yemeğ-i]][-COLL tat-tı]]]

jury committee-pl every meal-acc taste-past

"The jury committees tasted every meal."

(i) The members of the jury tasted every meal one after the other.

⇒ distributive over time.

(ii) Jury 1 tasted the chicken menu, Jury 2 tasted the steak menu, Jury 3 tasted the vegetable menu etc.

⇒ distributive over the subject

(55)  [-COLL[+ COLL Çocuk-lar][-COLL [-COLL [-COLL her][-COLL şarkı-y-ı]][- /+COLL söyle-di]]]

child-pl every song-acc sing-past

"The children sang a song."

(i) İpek, Ege, Defne and Beril came together and sang song1, song 2, song 3, song 4 one after the other.

⇒ distributive over time.

(ii)    İpek sang song 1, Ege sang song 2, Defne sang song 3 and Beril sang song 4.

⇒ distributive over the subject

(56)　[$_{-COLL}$[$_{+/-COLL}$ Çift-ler][$_{-COLL}$ [$_{-COLL}$ [$_{-COLL}$ her ][$_{-COLL}$ şarkı-y-ı]] [$_{-/+COLL}$ söyle-di.]]]

couple-pl every song-acc sing-past

"The couples sang every song."

(i) The couples came together and sang song 1, song 2, song 3 etc one after the other.

$\Rightarrow$ distributive over time.

(ii) İzel-Ercan sang song 1, Oya-Bora sang song 2 etc.

$\Rightarrow$ distributive over the subject

The examples analyzed in (51)-(56) all have a minus value of collectivity for their VPs due to the presence of the quantifier *her* "every" within their internal arguments. This minus value was shown as the reason for the elimination of the denotations for the $\pi$-constant in (36). The following examples illustrate cases with the quantifier *bütün* "all" as part of the internal arguments.

The sentence presented in (57) has a [+COLL] feature for the overall VP and [+/-COLL] for the external argument. Due to the multi referent nature of the external argument (36i) and (36j) get eliminated. If the sentence is supposed to enter the elimination process with the feature of [-COLL] of the external argument, Elimination Rule 2 will apply and the minus value coming from the external argument will eliminate (36e), (36f) and (36h). The quantificational nature of the internal argument calls for the operation of the Elimination Rule 4 (i-a) in the next step. In consequence, elimination of (36c) is observed. As a following step, the flow chart leads us to the application of the Elimination Rule 4 (i-b). Since the internal argument NP has a [+COLL] feature, there is no elimination for this step. Finally, the

possible denotations for this sentence remain to be (36a), (36b), (36d) and (36g).
These denotations are all representations for the distributive readings of the sentence
where the sentence can be interpreted as the regiments surrounding different castles
at different times, different castles at the same time, the castles at different times
provided that they change places and surround each castle one after the other and all
the castles as a group at different time indices respectively.

The same sentence can also start out the elimination process with a [+COLL]
feature for the external argument. In this case, the elimination procedure continues
with the application of Elimination Rule 3 through which (36a), (36b), (36c), (36d)
and (36g) are left out. Application of Elimination Rule 4 (i-a) makes a further
elimination of (36e). (36f) and (36h) remain as the denotations for the collective
reading of the sentence. (36f) is the representation where the regiments come
together and surround the castles one by one whereas (36h) indicates that the
regiments act collectively in surrounding all the castles at the same time-probably by
encircling all the castles around.


(57) [$_{+/-COLL}$[$_{+/-COLL}$Birlik-ler[$_{+COLL}$[$_{+COLL}$[$_{+COLL}$bütün][$_{+COLL}$kale-ler-i]][$_{+COLL}$

    kuşat-tı.]]]

    regiment-pl all castle-pl-acc surround-past

    "The regiments surrounded all the castles."

    (i)      The regiments surrounded the areas of Castles A,B,C etc. all together.

    ⟹ collectivity of objects at a certain time

    (ii) The regiments surrounded all castles one after the other.

    ⟹ distributivity over time

(iii) Regiment 1 surrounded Castle A, Regiment B surrounded Castle B, Regiment 3 surrounded Castle C etc.

$\Rightarrow$ distributivity over the subject

The possible interpretations for the sentences illustrated in (58)-(61) can all be accounted for with the application of the elimination rules that we have proposed up to now.

(58)  $[_{-COLL}[_{+COLL}$Kadın-lar $[_{-COLL} [_{+COLL} [_{+COLL}$bütün] $[_{+COLL}$ pasta-lar-ı]]$[_{-COLL}$ tat-tı.]]]

woman-pl all pastry-pl-acc taste-past

"The women tasted all the pastries."

(i) Merve, Müge and Ayşe tasted a chocolate pastry, a pastry with caramel and a fruit pastry one after the other.

$\Rightarrow$ distributive over time

(ii) Merve tasted a chocolate pastry, Müge tasted a pastry with caramel and Ayşe tasted a fruit pastry.

$\Rightarrow$ distributive over the subject

(59) $[_{-COLL}[_{+/-COLL}$Jüriheyet-ler-i$[_{-COLL}[_{+COLL}[_{+COLL}$bütün]$[_{+COLL}$pasta-lar-ı]]$[_{-COLL}$tat-tı.]]]

jury committees all dish-pl-acc. taste-past

"The jury committees tasted all the dishes."

(i) The members of the jury tasted every meal one after the other.

$\Rightarrow$ distributive over time.

(ii) Jury 1 tasted the chicken menu, Jury 2 tasted the steak menu, Jury 3 tasted the vegetable menu etc.

$\Rightarrow$ distributive over the subject

(60)    $[_{+/-COLL}[_{+COLL}$Çocuk-lar$[_{-/+COLL}[_{+COLL}[_{+COLL}$bütün$][_{+COLL}$şarkı-lar-ı$]][_{-/+COLL}$ söyle-di.$]]]$

child-pl all song-pl-acc sing-past

"The children sang all the songs."

(i) Ayşe sang Song 1, Ahmet sang Song 2, Veli sang Song 3 etc at the same time.

$\Rightarrow$ collectivity of objects at a certain time[72]

(ii) İpek, Ege, Defne and Beril came together and sang song1, song 2, song 3, song 4 one after the other.

$\Rightarrow$ distributive over time.

(iii) İpek sang song 1, Ege sang song 2, Defne sang song 3 and Beril sang song 4 at different times.

$\Rightarrow$ distributive over the subject

(61)    $[_{+/-COLL}[_{+/-COLL}$ Çift-ler $[_{-/+COLL}[_{+COLL}[_{+COLL}$ bütün$]$ $[_{+COLL}$ şarkı-lar-ı$]]$ $[_{-/+COLL}$ söyle-di.$]]]$

couple-pl all song-pl-acc sing-past

"The couples sang all the songs."

---

[72] This interpretation is clearer when it is uttered as "Çocuklar bütün şarkıları aynı anda söyledi. Bu yüzden hiçbir şey anlamadım" (The children sang all the songs at the same time, so I could not understand anything.)

(i) Ayşe-Ahmet sang Song 1, Merve-Can sang Song 2, Simay-Berkay sang Song 3 etc at the same time.

$\Rightarrow$ collectivity of objects at a certain time

(ii) The couples came together and sang song 1, song 2, song 3 etc one after the other.

$\Rightarrow$ distributive over time.

(iii) İzel-Ercan sang song 1, Oya-Bora sang song 2 etc.

$\Rightarrow$ distributive over the subject

A final sentence that I want to discuss is given in (62) below. Although the sentences differ in terms of the quantificational elements in the internal argument NPs, they have identical interpretations with respect to collectivity / distributivity. Elimination Rule 1, Elimination Rule 2 and Elimination Rule 4 (i-a) apply to both of these sentences in the course of the elimination procedure. These steps eliminate (36c), (36e), (36f), (36h), (36i) and (36j). The remaining denotations are (36a), (36b), (36d) and (36g). It is at this point that we expect a difference in how the elimination process proceeds. (62a) has a [-COLL] feature for the internal argument NP *her bebeği* "ever baby". Therefore, Elimination Rule 4 (i-b) needs to operate. (36g) is also eliminated which leaves (36a), (36b) and (36d) as the final possible paths. This gives out a correct result for (62a). However, the internal argument in (62b) is *bütün bebekleri* "all the babies" which has a [+COLL] feature. This plus collectivity feature of the internal argument does not activate Elimination Rule 4 (i-b), so we would not expect (36g) to be eliminated for (62b). In other words, the computational mechanism would yield (36g) as a possible reading for the sentence which has an interpretation where each women breast feeds a number of babies at the same time

index. However, this interpretation is logically out. The problem is based on the

pragmatic requirement of the predicate "breast feed" with respect to requirement for

a one-to-to distributivity between the members of the external argument and the

internal argument.


(62)    a. [-COLL[+COLLKadın-lar][-COLL[-COLL[-COLL her] [-COLL bebeğ-i]] [-COLL emzir-

di]]].

woman-pl every baby-acc feed-past

"The women fed every baby."

b.[-COLL[+COLLKadın-lar][-COLL[+COLL[+COLLbütün][+COLLbebek-ler-i]][-COLL

emzir-di]]].

woman-pl every baby-accfeed-past

"The women fed all the babies."


To sum up this section, we have analyzed a number of example sentences by means

of the elimination rules that we proposed in this section. It was discussed that each

collective / distributive interpretation of the sentences can be accounted for once the

elimination procedures are applied. Up to now, we concentrated on only sentences

having multi referent subject NPs. Sentences having single referent subject NPs will

be analyzed in the following section.


3.3.3.2 Single Referent External Arguments


We have seen in the previous sections that the external arguments of sentences might

have single referents as well.  Some example sentences to be analyzed are presented

in (63a)-(63e). It was discussed that the possible interpretations for such sentences are the "distributivity over time" interpretation and the "object collectivity" interpretation. The interpretation pertaining to the "distributivity over the argument" reading was discussed to be impossible for these cases.

(63)    a. Bir birlik her kale-y-i / bütün kale-ler-i kuşat-tı.

        one regiment every castle-acc / all castle-pl-acc surround-past

        "One regiment surrounded every castle / all the castles."

    b. Genç kadın her bebeğ-i / bütün bebek-ler-i emzir-di.

        young woman every baby-acc / all baby-pl-acc feed-past

        "The young woman fed every baby / all the babies."

    c. Jüri heyeti her yemeğ-i / bütün yemek-ler-i tat-tı.

        jury team every food-acc / all food-pl-acc taste-past

        "The jury tasted every food / all the foods."

    d. Çocuk her şarkı-y-ı / bütün şarkı-lar-ı söyle-di.

        child every song-acc / all song-pl-acc sing-past

        "The child sang every song / all the songs."

    e. Bizim sınıf her çadır-ı / bütün çadır-lar-ı kur-acak.

        our class every tent-acc / all tent-pl-acc build-fut

        "Our class will build every tent / all the tents."

Elimination Rule 1 states that a single referent subject eliminates the denotations of (36a)-(36h) leaving only (36i) and (36j) as possible interpretations for these sentences. These two denotations are given in (64) below. The representation in (64a) illustrates a path where the members of the internal argument undergo predication individually. In other words, the internal argument is realized with atomic individual representation. However, the representation in (64b) shows a path where we have an assemblage representation for the internal argument. (64a) is the denotation for the "distributivity over time" interpretation and (64b) is the denotation for the "object collectivity" interpretation.

(64)  a.  $x_1 \rightarrow \{<1,\{k_1\}>, <2,\{k_2\}>, <3,\{k_3\}>\}$      (36i)

      b.  $x_1 \rightarrow \{<1,\{k_1, k_2, k_3\}>\}$                      (36j)

For the sentences having single referent subjects, Elimination Rule 2 and Elimination Rule 3 are not relevant elimination rules, because these are associated with the representations in (36a)-(36h). However, (36a)-(36h) cannot be possible representations for these sentences. Therefore, after the application of Elimination Rule 1, Elimination Rule 4 (i-b) follows. This states that, if the internal argument has a minus value of collectivity, the representation illustrating an assemblage reading-that is (64b) is eliminated. Otherwise, no elimination is observed and the sentence is interpreted ambiguously.

The operation of the elimination procedures is exemplified by the sentence presented in (65). The external argument of the sentence *bir bölük* "one squadron" has a single referent. Therefore, Elimination Rule 1 eliminates (36a)-(36h). (36i) and

(36j) are the only possible representations. As a next step, Elimination Rule 4 (i-b) gets activated. The fact that the internal argument *her kaleyi* "every castle" has a minus collectivity feature eliminates the denotation of (36j) and the final outcome of the sentence remains to be (36i) where the squadron surrounded the castles one by one, one after the other.

(65)  $[_{-COLL}[_{+/-COLL}$ Bir bölük$]$ $[_{-COLL}$ $[_{-COLL}$ $[_{-COLL}$ her$]$ $[_{-COLL}$ kale-y-i$]]$ $[_{+COLL}$ kuşat-tı$]]]$

one squadron every castle-acc surround-past

"A squadron surrounded every castle."

(i) Squadron A surrounded Castle 1, Castle 2, Castle 3 etc one after the other.

$\Rightarrow$ distributive over time

(66)- (69) are given to provide further examples to support my claim that the elimination procedures yield correct interpretations for quantificational sentences.

(66)  $[_{-COLL}[_{-COLL}$ Genç kadın$]$ $[_{-COLL}$ $[_{-COLL}$ $[_{-COLL}$ her$]$ $[_{-COLL}$ bebeğ-i$]]$ $[_{-COLL}$ emzir-di$]]]$

young woman every baby-acc breast feed-past

"The young woman fed every baby."

(i) Mary fed baby 1, baby 2, baby 3 etc one after the other.

$\Rightarrow$ distributive over time

(67)  $[_{-COLL}[_{+/-COLL}$ Jüri heyeti] $[_{-COLL}$ $[_{-COLL}$ $[_{-COLL}$ her] $[_{-COLL}$ yemeğ-i]] $[_{-COLL}$ tat-

tı]]]

jury committee every meal-acc taste-past

"The jury committee tasted every meal."

(i) The members of the jury tasted every meal one after the other.

$\Rightarrow$ distributive over time.


(68)  $[_{-COLL}[_{-COLL}$ Bir çocuk] $[_{-COLL}$ $[_{-COLL}$ $[_{-COLL}$ her] $[_{-COLL}$ şarkı-y-ı]] $[_{+/-COLL}$ söyle-

di]]]

one child every song-acc sing-past

"A child sang every song."

(i)       Levent sang Song1, Song 2, Song 3 etc. one after the other.

$\Rightarrow$ distributive over time.


(69)  $[_{-COLL}[_{+/-COLL}$ Bizim sınıf] $[_{-COLL}$ $[_{-COLL}$ $[_{-COLL}$ her] $[_{-COLL}$ çadır-ı]] $[_{+/-COLL}$ kur-

du]]]

 our class every tent-acc built-past

"Our class built every tent."

(i) The class built every tent one after the other.

$\Rightarrow$ distributive over time.


Up to now, we have been analyzing the interpretation of sentences that have the quantifier *her* "every" in the internal argument position. The following paragraphs will discuss an analysis of sentences with the quantifier *bütün* "all" in the internal argument positions. The sentences given in (70) and (71) can be interpreted with two

interpretations: object collectivity and distributivity over time. The sentences have to be analyzed with the representations in (36i) and (36j) due to the Elimination Rule 1. The internal arguments of these sentences have [+COLL] feature. Therefore, Elimination Rule 4 (i-b) fails to be activated and no further elimination occurs. As a result, the sentences end the computational process of elimination with an ambiguous interpretation. Both paths (36i) and (36j) are acceptable for the interpretation of these sentences.

(70)  [+/-COLL[+/-COLL Bir birlik] [+COLL [+COLL [+COLL bütün] [+COLL kale-ler-i]] [+COLL

kuşat-tı.]]]

one regiment all castle-pl-acc surround-past

"A regiment surrounded all the castles."

(i) The regiment surrounded the areas of Castles A,B,C etc. all together.

⇒ collectivity of objects at a certain time

(ii) The regiment surrounded all castles one after the other.

⇒ distributivity over time

(71)  [+/-COLL[+/-COLL Bizim sınıf][+/-COLL [+COLL [+COLL bütün][+COLL çadır-lar-ı]][+/-

COLL kur-du.]]]

our class all tent-pl-acc build-past

(i)      "Our class built all the tents."

⇒ collectivity of objects at a certain time

(ii) Our class built all tents one after the other.

⇒ distributive over time

The two sentences presented in (72) and (73) seem to pose problems for the application of the elimination procedure. The application of the Elimination Rule 1 and Elimination Rule 4 (i-b) results in the acceptability of both (36i) and (36j). However, the interpretations in (72i) and (73i) show that (36j) cannot be a possible interpretation for these sentences. This impossibility is again related to the pragmatic properties of the predicate "breast feed" and "sing". It is impossible for a single woman to breast feed all the babies at the same time. Similarly, a child cannot sing all the songs at the same time.

(72)  [$_{-COLL}$[$_{-COLL}$ Genç kadın[$_{-COLL}$ bütün bebek-ler-i emzir-di.]]

young woman every baby-acc breast feed-past

"The young woman breast fed every baby."

(i)    The young woman fed all babies one after the other.

$\Rightarrow$ distributivity over time

(73)  [$_{-COLL}$[$_{-}$ Çocuk [$_{-/+COLL}$ bütün şarkı-lar-ı söyle-di.]]

child all song-pl-acc sing-past

"The child sang all the songs."

(i)    The child sang all songs one after the other.

$\Rightarrow$ distributive over time.

In Chapter 4, sentences were analyzed within the framework of the Modified Plus Principle and this analysis gave us an opportunity to compute the overall interpretation of a sentence pertaining to its collectivity or distributivity. I suppose that the Modified Plus Principle is a means to arrive at a final interpretation of the

collectivity or the distributivity of the sentence. The Elimination Rules that I propose in this chapter are closely related to the operation of the Modified Plus Principle. The idea behind both the Modified Plus Principle and the Elimination Rules is that the collectivity features attributed to each constituent of the sentence contribute to the overall collectivity / distributivity of the sentence. It is in this respect that both of the newly proposed mechanisms take the principles of compositionality as their building blocks. The Elimination procedure takes the role of the time indices into consideration and provides a more detailed analysis of the different truth conditions that a proposition might have. The Modified Plus Principle does not consider the notion of time indices but is a means to give us an idea about the collectivity vs. distributivity distinction of a sentence.

Up to now I have attempted to show that an analysis which is based on the possible paths and an elimination procedure that applies on the possible paths can handle the collectivity / distributivity phenomena effectively. Throughout Chapter 4 and Chapter 5, we came up with a number of sentences that have an ambiguous interpretation and several sentences that have an unambiguous interpretation. In the next section, I will discuss the additional factors contributing to the overall collective / distributive interpretation of the sentence. The use of certain adverbs and tense differences will be shown to affect the interpretation of a sentence.

## 4.0 Other Factors Affecting the Interpretation of a Sentence

The examples that I have studied so far showed that some sentences may have ambiguous interpretation. In other words, these sentences have a potential to be interpreted either as collective or distributive. A question that comes up at this point

is "Are there other factors that shape the interpretation that a sentence can have with respect to collectivity / distributivity?" (74)- (81) present the ambiguous sentences that we have gone over in the previous parts of the dissertation. These sentences will be analyzed once more explaining that the use of certain adverbs and using different tenses are some means to arrive at a more refined interpretation of a sentence. These three factors will be discussed separately to show how they affect the sentence interpretation.

(74)    Bütün birlik-ler bir kale kuşat-tı.

all regiment-pl castle surround-past

"All regiments surrounded a castle."


(75)    Bütün çocuk-lar bir şarkı söyle-di.

all child-pl one song sing-past

 "All the children sang a song."


(76)    Bütün aileler bir çadır kurdu.

all family-pl. one tent build-past.

"All families can build a tent."


(77)    Bir birlikk bütün kale-ler-i kuşat-tı.

one regiment all castle-pl-acc surround-past

"A regiment surrounded all the castles."

(78)     Birlik-ler bütün kale-ler-i kuşat-tı.

         regiment-pl all castle-pl-acc surround-past

         "The regiments surrounded all the castles."


(79)     Bizim sınıf bütün çadır-lar-ı kur-du.

         our class all tent-pl-acc built-past

          "Our class built all the tents."


(80)     Çocuk-lar bütün şarkı-lar-ı söyle-di.

         child-pl all song-pl-acc sing-past

          "The children sang all the songs."


(81)     Çift-ler bütün şarkı-lar-ı söyle-di.

          couple-pl all song-pl-acc sing-past

          "The couples sang all the songs."


### 4.1     The Effects of Adverbs on Collectivity / Distributivity


As stated above the sentences presented in (74)-(81) are ambiguous sentences with

respect to collectivity. These sentences can be interpreted either distributively or

collectively depending on the context in which they are uttered. However, the

following discussion shows that the presence of certain adverbs such as "all together,

one by one etc" can limit the contexts that the sentences can be uttered. This means

that these adverbs act as eliminating factors for the possible paths that a sentence can

have.

The adverbs *beraberce, topluca, birlikte* "together" give the sentences a collective meaning. The examples illustrated in (82) and (83) give the meaning that the activities of going to school or the match were carried out as a collective action of the members of the external arguments. The grammaticality judgments show that the adverb *topluca* "as a group" is not acceptable for (82). The adverb *topluca* "as a group" requires that there are more than two members within the external argument. Thus, this results in the incompatibility of this adverb in (82) which has only two members as the external argument members. However, (83), which has a group word as its external argument permits the use of the adverb *topluca* "as a group".

(82)    İpek ve Ege beraberce / *topluca / birlikte okul-a git-ti.

İpek and Ege together school-dat go-past

"İpek and Ege went to school together."

(83)    Çocuk-lar beraberce / topluca / birlikte maç-a git-ti-ler.

child-pl together match-dat go-past-3rd per.

"The children went to the match together."

The adverbs *beraberce / topluca / birlikte* "together" in (82) and (83) show the collectivity of the members of the external argument. The collectivity of the members of the internal argument can also be indicated with the use of adverbs. (84) and (85) are given to illustrate the collectivity of the members of the internal arguments. The grammaticality judgments show that only the adverb *topluca* "as a group" can be used to refer to the collectivity of the internal argument members. The

adverbs *beraberce* and *birlikte* "together" do not denote a collectivity of the internal argument members.

(84) İpek eski oyucak-lar-ı-nı *beraberce / topluca / *birlikte kutu-y-a koy-du.

İpek old toy-pl-acc-poss together box-dat put-past

"İpek put her old toys in a box."

(85) Anne-m çiçek-ler-i *beraberce / topluca / *birlikte bir vazo-y-a koy-du.

mother-poss flower-pl-acc together one vase put-past

"My mother put the flowers all together in one vase."

The adverbs -*tek tek, birer birer, sırayla* "one by one"- point out the distributivity of the members of the external argument. (86) and (87) show that these adverbs are compatible with plural external argument sentences regardless of how big or small the group is. In other words, they can be used for sentences having only two members as its external argument as in (86) or for sentences having more external argument members as in (87).

(86) Levent ve Ozan tek tek / birer birer / sırayla şarkı söyle-di.

Levent and Ozan one by one song sing-past

"Levent and Ozan sang a song one by one."

(87) Çocuk-lar tek tek / birer birer / sırayla şarkı söyle-di.

child-pl one by one song sing-past

"The children sang a song one by one."

(88) and (89) illustrate that these adverbs can also be used to refer to the distributivity of the members of the internal arguments. For the sentence given in (88), the books in the internal argument position undergo predication one after the other, not all together. The same distributivity holds for the nuts in İpek's hand in (89) as well.

(88)    Ege kitap-lar-ı-nı tek tek / birer birer / sırayla masa-y-a koy-du.

    Ege book-pl-acc-poss one by one table-dat put-past.

    "Ege put his books on the table one by one."

(89)    İpek fındık-lar-ı tek tek / birer birer / sırayla ye-di.

    İpek nut-pl-acc one by one eat-past

    "İpek ate the nuts in her hand one by one."

The sentences analyzed from (82) to (89) show that they are unambiguously collective or distributive. This unambiguous interpretation results from the meanings contributed by the adverbs *beraberce, topluca, birlikte* "together" or *tek tek, birer birer, sırayla* "one by one". In the sentences presented in (82)-(89), quantificational elements were not used with an attempt to illustrate the meanings contributed by these adverbs in the sentences. In the following examples these adverbs will be analyzed within quantificational sentences.

The fact that the adverbs *beraberce, topluca, birlikte* "together" have an unambiguous collective interpretation whereas *tek tek, birer birer, sırayla* "one by one" have an unambiguously distributive interpretation leads us to predict that the former group of adverbs are compatible with quantificational sentences that have the

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[+COLL] feature for the overall sentence whereas the latter group of adverbs are suitable to be used with quantificational sentences that have the [-COLL] feature for the overall sentence. The examples given in (90) and (91) provide evidence that our predictions are borne out. The adverb *beraberce* "together" is compatible with an overall [+COLL] sentence such as (90). The adverb *tek tek* "one by one", however, cannot be used for this particular sentence. Similarly, the [-COLL] sentence in (91) allows the use of only the adverb *tek tek* "one by one" but not *beraberce* "together".

(90)    [+COLLBütün asker-ler beraberce / *tek tek bir kale kuşat-tı.

        all soldier-pl together / *one by one one castle surround-past

        "All the soldiers surrounded a castle together / *one by one."


(91)    [-COLLBütün kadın-lar *beraberce / tek tek bir bebek emzir-di].

        all woman-pl *together / one by one one baby feed-past

        "All the women fed a baby *together / one by one."


Another prediction that we can make with respect to the use of these adverbs in [+ / - COLL] sentences is that the use of these adverbs are expected to resolve the ambiguity of the sentence and gives out an unambiguously collective or unambiguously distributive interpretation for that sentence. An analysis of the sentences given in (92)-(95) reveals that this is correct. The use of the adverb *beraberce* "together" in the (a) sentences gives out an unambiguous collective reading whereas the use of the adverb *tek tek* "one by one" in the (b) sentences gives out an unambiguous distributive reading. It is with the meaning contributed by the

adverb that the ambiguity in the sentences is resolved leading to unambiguous interpretation.

(92)　a. Bütün birlik-ler beraberce bir kale kuşat-tı.

　　　all regiment-pl together castle surround-past

　　　"All regiments surrounded a castle together."

　　　b. Bütün birlik-ler tek tek bir kale kuşat-tı.

　　　all regiment-pl one by one castle surround-past

　　　"All regiments surrounded a castle together."

(93)　a. Bütün çocuk-lar beraberce bir şarkı söyle-di.

　　　all child-pl together one song sing-past

　　　"All the children sang a song together."

　　　b. Bütün çocuk-lar tek tek bir şarkı söyle-di.

　　　all child-pl together one song sing-past

　　　"All the children sang a song together."

(94)　a. Bir birlik bütün kale-ler-i topluca kuşat-tı.

　　　one regiment all castle-pl-acc surround-past

　　　"A regiment surrounded all the castles."

b. Bir birlik bütün kale-ler-i tek tek kuşat-tı.

one regiment all castle-pl-acc surround-past

"A regiment surrounded all the castles."


(95)  a. Çocuk-lar bütün şarkı-lar-ı beraberce söyle-di.

child-pl all song-pl-acc sing-past

 "The children sang all the songs."[73]


b. Çocuk-lar bütün şarkı-lar-ı tek tek söyle-di.

child-pl all song-pl-acc sing-past

 "The children sang all the songs."


When the notion of paths and the elimination procedures that I have proposed to

arrive at a final interpretation of the sentence is considered together with the effects

of these adverbs on sentences, we might propose that these adverbs have a crucial

role to play in the course of the elimination process. We propose that the role of these

adverbs in the elimination procedure is to disambiguate the ambiguous

quantificational NPs by eliminating either the +COLL feature or the –COLL feature

associated with that NP. The disambiguation of the ambiguous quantificational NP,

in turn, yields an unambiguous overall interpretation of the sentence. The fact that

the adverbs *beraberce, topluca, birlikte* "together" have an unambiguous collective

interpretation leads us to the expectation that these adverbs eliminate the –COLL

feature of the ambiguous quantificational NP. The fact that the adverbs *tek tek, birer*

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[73] The adverb *beraberce* "together" can refer to either the collectivity of the members of the external argument or the collectivity of the members of the internal argument. The meaning pertaining to the collectivity of the internal arguments means that all the songs are sang by possibly different children at the same time index. The meaning pertaining to the collectivity of the external arguments means that the children sang all the songs together.

*birer, sırayla* "one by one" have an unambiguous distributive interpretation leads us to the expectation that these adverbs eliminate +COLL feature of the ambiguous quantificational NP. (96) and (97) are provided to clarify this disambiguating effect of the adverbs.

The ambiguous quantificational NP is in the external argument position in (96) whereas it is in the internal argument position in (97). The subject *bütün birlikler* "all the regiments" in (96) and the object *bütün kaleleri* "all the castles" in (97) both have + / - COLL features. If these sentences are uttered without the adverbs *beraberce* "together" and *tek tek* "one by one", the ambiguous quantificational NPs enter the elimination procedure with +COLL feature as well as –COLL feature. Therefore, the sentence ends up with ambiguous interpretation. However, the presence of the adverbs act as an eliminating factor for either the +COLL or –COLL feature of the ambiguous NP. For the (a) sentences of (101) and (102), the adverbs, *beraberce / topluca* "together / as a group", eliminate the –COLL feature of the ambiguous quantificational NP and this NP enters the computational mechanism with only the + COLL feature.  For the (b) sentences of (96) and (97), the adverbs, *tek tek* "one by one", eliminate the +COLL feature of the ambiguous quantificational NP and this NP enters the computational mechanism with only the - COLL feature. As a result, these sentences end up with unambiguous readings of collective and distributive respectively.

(96)    a.    Bütün birlik-ler beraberce bir kale kuşat-tı.

              All regiment-pl together one castle surround-past.

              "All the regiments surrounded a castle together."

b.      Bütün birlik-ler tek tek bir kale kuşat-tı.

all regiment-pl one by one one castle surround-past

"All the regiments surrounded a castle one by one."


(97)    a.      Bir birlik bütün kale-ler-i topluca kuşat-tı.

one regiment all castle-pl-acc all together surround-past

"A regiment surrounded the castles all together."


b.      Bir birlik bütün kale-ler-i tek tek kuşat-tı.

one regiment all castle-pl-acc one by one surround-past

"A regiment surrounded the castles one by one."


The examples studied in this particular section show that certain adverbs such as *beraberce, birlikte, tek tek, sırayla* "together / one by one" are supposed to disambiguate the ambiguous quantificational NP by eliminating either the + or the − collectivity feature attributed to that NP.  In turn, the disambiguated quantificational NP enters the elimination procedure with only one collectivity feature and the sentence completes the computational procedure with a single interpretation. As a consequence, the use of these adverbs within ambiguous sentences seems to resolve the ambiguity of the sentence leading to unambiguously collective or unambiguously distributive interpretation.

<u>The Effect of Aspect on Collectivity / Distributivity</u>

The possible paths that were proposed to be used in the elimination procedure were discussed in the previous sections. The sentences were assumed to start the elimination procedure with the ten possible representations and at each step some of these representations are deleted in line with the proposed elimination rules.

Let us now compare the sentence pairs presented in (98) and (99) in terms of the application of the elimination process. The sentences in the (a) and the (b) sentences differ only in terms of tense and aspect. The (a) sentences illustrate the predication in past tense and perfective aspect whereas (b) sentences show the predications in present tense and imperfective aspect.

The operation of the elimination procedure for (98a) and (98b) follows the same route in the first three steps. Recall that as a first step Elimination Rule 1 applies. Due to the multi-referent nature of the external argument NP, the denotations in (36i) and (36j) are eliminated. In the second step, Elimination Rule 2 activates since the external argument bears the –COLL feature. At the end of this step, (36e), (36f) and (36h) are also eliminated. The next step activates Elimination Rule 4 (ii) because of the non-specific indefinite internal argument. This rule makes a further elimination of the denotations in (36d) and (36g). Finally, (36a), (36b) and (36c) remain as the possible representations for both (98a) and (98b). (36a) gives out a reading where every regiment surrounded a different castle at different time indices which shows the co-occurance of the distributivity over time and distributivity over the argument readings. (36b) is associated with a reading where the regiments surrounded different castles at the same time. This reading is an example for the distributivity over the argument reading. (36c), on the other hand, refers to a reading

where the regiments take turns in surrounding the same castle. Up to this point the elimination procedure operates in the same route for both sentences. However, the difference between the sentences is realized at this point. Although the elimination procedure comes to a stop for (98a), it has to continue one more step for (98b). The imperfective aspect of (98b) calls for one more elimination step. The imperfective nature requires the time indices to be identical in the paths. Therefore, (36a) and (36c) should be eliminated for this sentence as well. The final outcome for (98b) is the representation in (36b) which has a reading of distributivity over the argument. This reading is associated with an interpretation where the regiments are surrounding different castles simultaneously.

The difference between (99a) and (99b) can be explained in the same manner as (98a) and (98b).

(98)    a. Her birlik bir kale kuşat-tı.

         every regiment one castle surround-past

         "Every regiment surrounded a castle."


         b. Her birlik bir kale kuşat-ıyor.

         every regiment  one castle surround-pres

         "Every regiment is surrounding a castle."


(99)    a. Bütün kadın-lar bir bebek emzir-di.

         all woman-pl one baby feed-past

         "All the women fed a baby."

b. Bütün kadın-lar bir bebek emzir-iyor.

all woman-pl one baby feed-pres

"All the women are feeding a baby."

Let us analyze the single referent subject sentences which have quantificational internal arguments given in (100) and (101) below. A comparison of the (a) sentences with the (b) sentences in (100) and (101) shows that the unacceptable (a) sentences denote an action taking place at present whereas the acceptable (b) sentences denote activities that took place some time in the past.

(100)   a. ? [-COLL Bir kadın][-COLL her bebeğ-i emzir-iyor].

one woman every baby-acc feed-pres

"One woman is breastfeeding every baby."


b. [-COLL Bir kadın] [-COLL her bebeğ-i emzir-di].

one woman every baby-acc feed-past

"One woman fed every baby."


(101)   a. ? [-COLL Bir çocuk] [- / +COLL bütün şarkı-lar-ı söylü-yor].

one child all song-pl-acc sing-present

"One child is singing all the songs."


b. [-COLL Bir çocuk] [- / +COLL bütün şarkı-lar-ı söyle-di].

one child all song-pl-acc sing-past

"One child sang all the songs."

The elimination procedure for the (a) and the (b) sentences operates in the same route for two successive steps. In the first step, the denotations in (36a)-(36h) get deleted depending on the single referent nature of the external argument NP. Recall that for these sentences with single referent subjects, the second step in the elimination procedure is the operation of Elimination Rule 4 (i-b). This rule states that a –COLL feature of the internal argument NP eliminates the representation in (36j). It is for this reason that (36j) needs to be deleted for both (100a) and (100b). However, the fact that (100a) is imperfective in terms of aspect requires a unique time index in the path. However, the remaining representation after the elimination procedure is (36i) which has more than one time index. This shows that the unacceptability of the (a) sentences is based on the fact that the resulting denotation after the elimination procedure contradicts with the requirement of the imperfective aspectual nature of the sentence with respect to the time indices. (100b), on the other hand, is an acceptable sentence since perfective nature of the verb does not have a requirement with respect to the time indices. Therefore, (36i) appears to be a suitable representation for (100b). The same explanation holds for (101a) and (101b) as well.

In short, a discussion of the effect of the imperfective aspectual nature on the interpretation of a sentence with respect to the collectivity / distributivity notions was presented in this section. In addition to the collectivity features of each of the constituents within a structure, the aspectual nature of the predicate and the use of adverbs are expected to lead us to further elimination steps. This, finally, gives us a more refined interpretation of a particular sentence.

## 5.0 Chapter Summary

In this chapter of the dissertation we attempted to come up with a more refined analysis of how a sentence gets interpreted with respect to collectivity vs. distributivity. It is with the help of this analysis that possible truth conditions of a sentence can be accounted for. Considering the atomic nature and the assemblage nature of both the subject and the object NPs, we came up with ten possible paths. The sentence is supposed to start out the elimination procedure with all these possible representations and after the elimination process is completed the final reading(s) of the sentence can be achieved. The elimination procedure was discussed to be based on the collectivity features that we have attributed to the constituents of the sentence in Chapter 4. It was shown that the step by step application of these elimination rules yields the possible interpretations that a quantificational sentence can have. The operation of the elimination procedure was exemplified through a wide range of example sentences, and it was shown that the computational mechanism succeeds in providing the correct interpretation of the sentences.

CHAPTER 6

FURTHER EXTENSIONS AND CONCLUSIONS

1.0     Conclusions

In the preceding chapters, I have presented an account of quantificational sentences,

focusing on how these get their interpretations pertaining to their quantificational

character. Based on an analysis of a sample group of quantificational sentences, I

have argued for a few main conclusions.

The first consclusion is that the quantificational character of a sentence

cannot be only attributed to individual constituents forming the sentence. Rather, it is

more satisfactory to treat the issue in a compositional theory of semantics which is

centered around the idea that the meaning of a whole is computed on the interaction

of the meanings of its parts. Based on this basic generalization of the

compositionality principle, the quantificational nature of a sentence is seen as an

interaction of the individual contributions of the predicate, the quantifiers either in

the external argument or internal argument positions and the nouns complementing

these quantificational elements regarding their collective / distributive nature. With

respect to the bare internal arguments as well as indefinite specific and indefinite

non-specific internal arguments, it was concluded that these did not have an

influential role in changing the collectivity / distributivity values of a sentence. This

was supported by the fact that these internal arguments were argued to have a null

($\phi$) value as a collectivity feature when they enter the computational mechanism of the "Modified Plus Principle".

The second conclusion concerns the treatment of the quantifiers *her* "every" and *bütün* "all". Departing from formal semantics which treat all the quantifiers as equal, our analysis puts forward the idea that *her* "every" has a more decisive role in the interpretation of a sentence regarding its overall quantificational nature when compared to the quantifier *bütün* "all". The reason behind this difference between the quantifiers in having a more influential role in sentence interpretation is related to the intrinsic features that are associated with each quantifier. We have proposed that the quantifier *her* "every" brings in an unambiguous –COLL feature from the lexicon while the quantifier *bütün* "all" brings in an unambiguous +COLL feature. The computational mechanism of the Modified Plus Principle was discussed to be operating on these intrinsic features and it was discussed in detail that the presence of even a minus value feature yields an overall minus value for the sentence. Otherwise, the overall interpretation of the sentence turns out to have the plus value. The direct consequence of this is that the presence of the quantifier *her* "every" with its – COLL feature gives out an unambiguously distributive interpretation of the sentence regardless of its position in the sentence or the collectivity feature values of the other constituents forming the sentence. Compared to the behaviour of the quantifier *her* "every", the quantifier *bütün* "all" which is associated with the +COLL feature does not have a decisive role in the determination of the collectivity / distributivity of the sentence. In other words, for a sentence having a quantificational NP with *bütün* "all", it is the collectivity features of the other constituents that shape the overall interpretation of the sentence. If any other constituent within the structure brings in a –COLL, then an overall unambiguous distributive interpretation of the sentence will

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be predicted. If the other constituents have the +COLL feature, this will directly yield an unambiguous collective reading.

Third, our findings also imply a difference between the predicate types in terms of the decisive role that they play in the determination of the collectivity / distributivity of the sentence. More specifically, our findings show that distributive predicates have a more decisive role in determining the quantificational nature of a sentence than the collective or the ambiguous predicates. Our data reveals that the presence of a distributive predicate, which is associated with a –COLL feature, within a sentence renders an overall distributive interpretation of the sentence regardless of the other constituents. A comparison of the collective predicates which are associated with the +COLL feature and the ambiguous predicates which are associated with +/-COLL feature leads us to the conclusion that ambiguous predicates are more powerful than the collective predicates.  A collective predicate with the +COLL feature yields an overall +COLL interpretation if the external argument also has a +COLL feature. On the other hand, if the external argument bears the –COLL feature, the outcome that we get for the overall sentence is –COLL. This shows that a collective predicate does not have a decisive role on the determination of the collectivity / distributivity of the sentence and that the collectivity features of the other arguments shape the final interpretation of the sentence. When it comes to the ambiguous predicates that have +/-COLL features, we get an overall –COLL interpretation of the sentence if the external argument bears the –COLL feature. On the other hand, considering the fact that the external argument bears the +COLL feature, the outcome is computed to be +/-COLL. This implies that ambiguous predicates have a decisive role over the quantificational nature of a sentence if and only if it co-occurs with a +COLL external argument.

Otherwise, it seems to have no influencing role.  As a consequence, this has an important implication regarding the strengths of the predicate types in determinig the collectivity / distributivity of the sentence. We can arrive at a conclusion that distributive predicates are the most powerful predicates in computing the overall interpretation of the quantificational sentences. Ambiguous predicates and collective predicates follow the distributive ones in descending order. This hierarchy is shown in (1) below.

(1)     distributive predicates > ambiguous predicates > collective predicates

The analysis of a wide range of quantificational sentences that exemplify the presence of the quantificational NP either in the external argument position or the internal argument position revealed the fact that the internal argument of a sentence has an influential effect on the quantificational information conveyed by the sentence provided that the quantificational NP is in the internal argument position. Otherwise, the presence of a bare noun or an indefinite specific / nonspecific NP in the internal argument blocks the possible influence of the internal argument on the overall collective / distributive interpretation of the sentence. On the other hand, our analysis showed that the noun phrase in the external argument position regardless of its quantificational nature has an influential effect on the collectivity / distributivity of the sentence. In other words, both a quantificational external argument and a non-quantificational external argument are supposed to enter the computational process of Modified Plus Principle with their own collectivity features which implies that they always have a direct influence on the overall collectivity feature of the sentence. This observation has an important consequence in showing the more powerful nature

of the external argument when compared to the internal argument of the sentence. The external argument contributes to the collectivity / distributivity of the sentence in any way, but the same does not hold for the internal argument.

Why does the bare noun or an indefinite specific / non-specific NP-but not the quantificational NP- block the percolation of the collectivity feature of the indefinite internal argument to the overall collectivity feature of the VP? Following Arslan Kechriotis (2006), we might assume the presence of a DP layer where the indefinite *bir* "a /an" is base generated. The indefinite *bir* "a / an" is in the Spec of DP and the head D° bears the feature [-definite] as shown in (2). The syntactic structure for the NP *bir kale* "a castle" is given as illustration in (2).

(2)
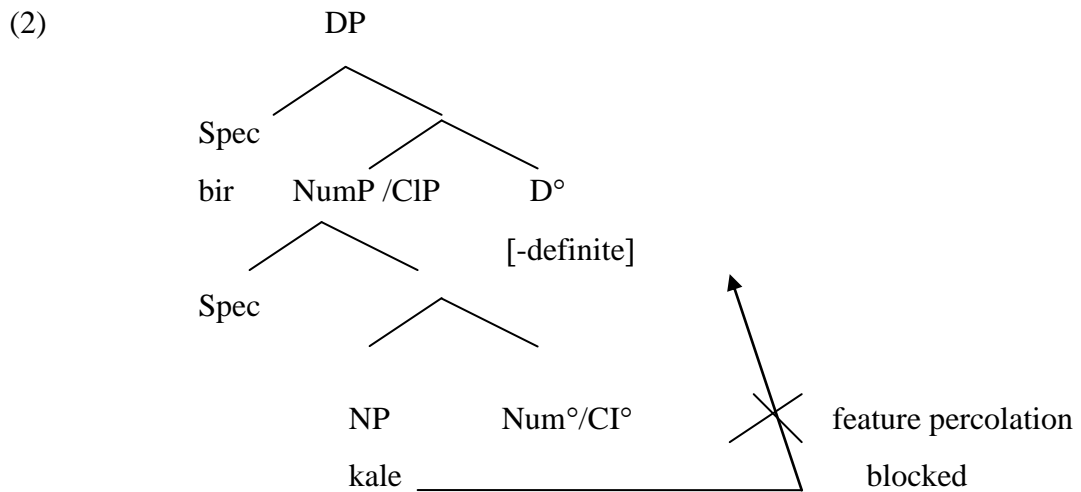


Assuming a DP layer for the indefinite internal argument, we may claim that the collectivity features of the indefinite internal argument cannot percolate up to the VP due to the possible blocking effect of the DP layer. However, the QP in the internal argument position does not have a blocking force, thus, the collectivity features of the quantificational NP can percolate up and enter the computational mechanism of the Modified Plus Principle to yield an overall feature for the VP.

So far, the studies of quantificational sentences treated distributivity in a unique manner: as a distribution of the quantified NP over the noun phrase serving as the distributee. With the findings of this dissertation, we argue that distributivity should be treated under a broader perspective. It is claimed that the notion of distributee is not limited to the noun phrases present in the sentence. The time indices provided by the verbs are also proven to be possible candidates to act as the distributees which the quantificational NPs can distribute over. Thus, we conclude that an analysis of distributivity / collectivity cannot be handled properly without any reference to time indices and that the time indices should be used as an integral part of the studies of quantification. Depending on this generalization, we proposed to categorize the distributivity types based on the possible distributees and concluded that distributivity over arguments should be treated separately from distributivity over time and distributivity over the adjunct.

The most important contribution of the dissertation is that we developed a computational approach to quantificational sentences which enables us to predict the correct quantificational character of a sentence once the collectivity features assigned to each particular constituent of the sentence are known. Whereas many existing theories to quantification rely on the properties of the isolated constituents in the sentence, our approach of the "Modified Plus Principle" places importance on the interaction of these isolated values. The elimination procedures discussed in Chapter 5 illustrates the importance of the time indices within a study of quantification. It acts as a continuation of the computational mechanism that operates on the "Modified Plus Principle" enabling us to see between the lines. In other words, with the help of these elimination procedures, we can see how the event denoted by the predicate is

actually carried out in the real world. These elimination procedures also give some ideas about to the interpretation of quantificational sentences in general.

## 2.0     Implications on Sentence Generation

Feature based analysis of quantificational sentences have been carried out in the literature on quantification up to now. The basic feature based analysis is that of Beghelli & Stowell (1994, 1997) which is based on the semantic features that the quantificational elements carry on them. In their analysis only quantifiers are assumed to be associated with semantic features such as [+Wh], [+Dist] and [+Neg]. Quantifiers are assumed to move to designated positions where their operators are hosted and the semantic features of these quantifiers are checked through Spec-Head agreement with the relevant operator in the position that the quantificational element moves. The analysis of Beghelli & Stowell implies that this checking procedure is sensitive to the inherent semantic features of the QPs involved.

In an analysis of scope in Hungarian, Szabolcsi (1997) argues that QPs in Hungarian occupy specific feature checking positions. Szabolcsi discusses that the Hungarian data straightforwardly support Beghelli & Stowell's general assumption that each quantifier type moves to its own characteristic position to check some feature. The traditionally distinguished positions that she uses correspond quite closely to the specifier positions of the featural categories in Beghelli & Stowell (1994, 1997).

Similarly, Brody & Szabolcsi (2003), who analyzed Hungarian data in terms of scope relations, follow a similar feature based analysis of scope like Beghelli & Stowell (1997) and Szabolcsi (1997). The underlying assumption of their analysis is

that they define the notion of scope in terms of feature domination of the quantificational elements. In other words, in their analysis quantificational phrases are categorized on a similar basis to that of Beghelli & Stowell, differing only in the fact that c-command definition of scope is replaced with a feature domination approach where the inherent features of certain quantifiers are claimed to outrank the features of other quantifiers. Thus, the scopal relation between the quantificational elements is a matter of feature domination.

In all these feature based analyses, certain features have been attributed to quantificational elements. However, my approach in this dissertation differs from these approaches in that a new semantic feature, namely a feature on collectivity, is proposed to be assigned not only to quantificational elements but also verbs and nouns as well.

The model that we are building in the dissertation is based on similar grounds in that we also make use of a similar semantic feature labeled as [+/- COLL]. The point that our approach departs from the approach of Beghelli & Stowell is that although Beghelli & Stowell's analysis is determiner-based, our analysis is not restricted to only the determiners. In other words, Beghelli & Stowell claims that only the determiners are associated with the semantic features of [+Wh], [+Dist] and [+Neg]. The nouns and the verbs are not specified for these semantic features in their analysis. However, the nouns and the verbs are also taken into consideration in this study and are also assigned the semantic feature of [COLL] in addition to the determiners. In other words, a semantic feature of collectivity is added to each lexical entry in the lexicon including the nouns, verbs and the determiners. This [COLL] feature is responsible for giving the quantificational information to the quantifiers, nouns and verbs. It is in this respect that our model is a unifying model which places

equal importance on the semantic contributions of the determiners, their complements and the verbs in a sentence. Previous studies on quantification were restricted to the properties of either the quantifiers or the verbs in the sentence.
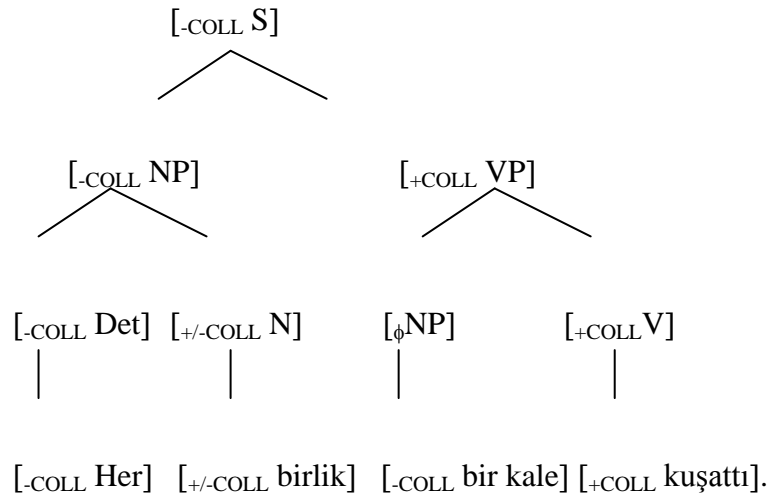
Our model describes an interpretation algorithm that uses the syntactic analysis of a sentence together with the featural specifications of the words regarding their collectivity. We claim that in the course of the interpretation process, the words are taken from the lexicon together with their collectivity features. These features are assumed to be visible at the syntactic level where Merge operations are carried out in a bottom-up style. The application of the Modified Plus Principle needs to be proceeding together with the Merge operations in the bottom-up syntactic formation of the sentence. In order to explain this requirement let us analyse the sentences given in (2) and (3) as to how the sentences get their interpretations pertaining to collectivity / distributivity. As mentioned above, each lexical entry brings its own collectivity feature to the syntactic combination procedure. As a consequence, the verb *kuşatmak* "surround" brings a [+COLL] feature on being a collective predicate, singular object NP *bir kale* "one castle" is supposed to bring in a [-COLL] feature to the interpretive mechanism. However, we have discussed the fact that the bare nouns, indefinite specific / non-specific internal arguments do not have a changing role in the interpretation of the sentences. Based on this observation, we concluded that internal arguments except quantificational NPs were associated with a $\phi$ feature which does not change the overall interpretation of the sentence in the computational process. The requirement for the operation of the Modified Plus Principle to proceed together with the syntactic Merge operations comes out right at this point. Although the indefinite non-specific internal argument *bir kale* "one castle" is inherently associated with the [-COLL] feature, its syntactic combination with the verb of the

sentence triggers the ϕ feature to be operative for the internal argument in the operation of the Modified Plus Principle. Considering a separate semantic level for the operation of the Modified Plus Principle where the semantic features of the constituents combine with each other yields incorrect results. In such a case, the feature of the indefinite non-specific internal argument would only see the feature of the verb, without having any knowledge as to the predicative nature of the constituent that it is combining with. Consequently, the internal argument will enter the computational process with its collectivity feature which will yield incorrect results.[74] On the other hand, if these features are visible at the syntactic level, the internal argument will receive the information that the constituent which it is combining with has a predicative nature and consequently its inherent semantic collectivity value will be eliminated leaving an ineffective ϕ feature for the computational process.

(3)     Her birlik bir kale kuşat-tı.

        every regiment one castle surround-past

        "Every regiment surrounded a castle."

---

[74] Although an analysis where the indefinite non-specific internal argument enters the computational process with its own collectivity feature does not seem to pose any problems for the sentence given in (2), its counterpart with the quantifier bütün "all" given in (i) below cannot be explained in that way. Such an analysis will predict an overall –COLL interpretation of the sentence which means that the sentence has an unambiguous distributive reading. However, the sentence clearly has a collective reading where the regiments surround the castle together in addition to a distributive reading where the regiments are involved in different surrounding events. This ambiguity in the reading is achieved correctly if we assume that the indefinite non-specific internal argument is associated with the ϕ feature as shown in (ii).

(i)      *[$_{-COLL}$[$_{+/-COLL}$[$_{+COLL}$Bütün] [$_{+/-COLL}$birlik-ler]] [$_{-COLL}$[$_{-COLL}$bir kale] [$_{+COLL}$kuşat-tı]]].
        all regiment-pl one castle surround-past
        "All regiments surrounded a castle."

(ii)     [$_{+/-COLL}$[$_{+/-COLL}$[$_{+COLL}$Bütün] [$_{+/-COLL}$birlik-ler]] [$_{+COLL}$[$_{ϕ}$bir kale] [$_{+COLL}$kuşat-tı]]].

$[_{-\text{COLL}}\ S]$

$[_{-\text{COLL}}\ NP]$      $[_{+\text{COLL}}\ VP]$

$[_{-\text{COLL}}\ Det]$ $[_{+/-\text{COLL}}\ N]$    $[_{\phi}NP]$     $[_{+\text{COLL}}V]$

$[_{-\text{COLL}}\ Her]$   $[_{+/-\text{COLL}}\ birlik]$   $[_{-\text{COLL}}\ bir\ kale]$ $[_{+\text{COLL}}\ kuşattı]$.
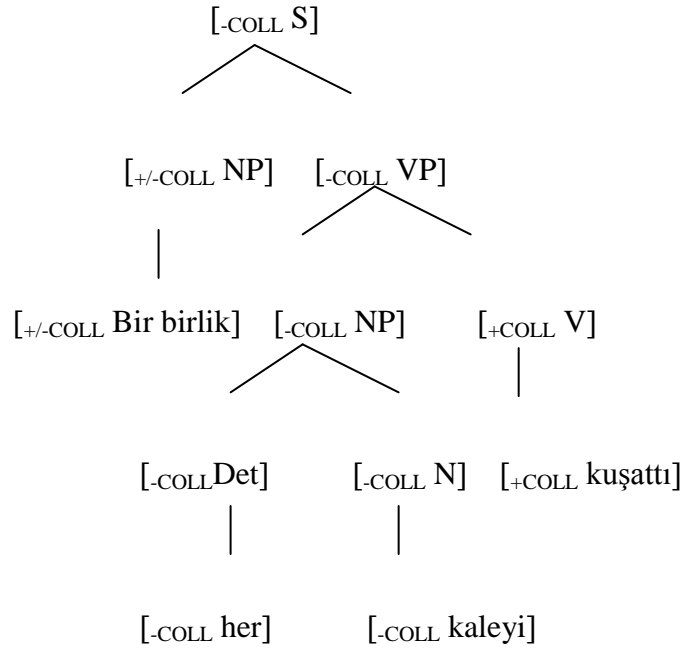
(4) illustrates an example where the quantificational NP is in the object position of the sentence. Each lexical entry brings its own collectivity feature to the computational process as discussed above. The internal argument NP *her kaleyi* "every castle" has an overall –COLL feature and due to its quantificational nature it can enter the computational process with its own collectivity feature even if it is combining with the verb of the sentence. Recall that the collectivity feature associated with the indefinite specific/ non-specific internal argument was eliminated causing the internal argument to enter the computational process with a ϕ feature for the sentence in (3) above. Furthermore, the indefinite external argument *bir birlik* "a regiment" can enter the computational procedure with its own collectivity value since it is now combining with the value of the VP which does not trigger a ϕ feature for the external argument. Recall that its combination with the collectivity feature of the verb triggered a ϕ feature for the indefinite internal argument in (2) above.


(4)     Bir birlik her kale-y-i kuşat-tı.

        One regiment every castle-acc surround-past

        "One regiment surrounded every castle."

[-COLL S]

[+/-COLL NP]    [-COLL VP]

[+/-COLL Bir birlik]    [-COLL NP]    [+COLL V]

[-COLL Det]    [-COLL N]    [+COLL kuşattı]
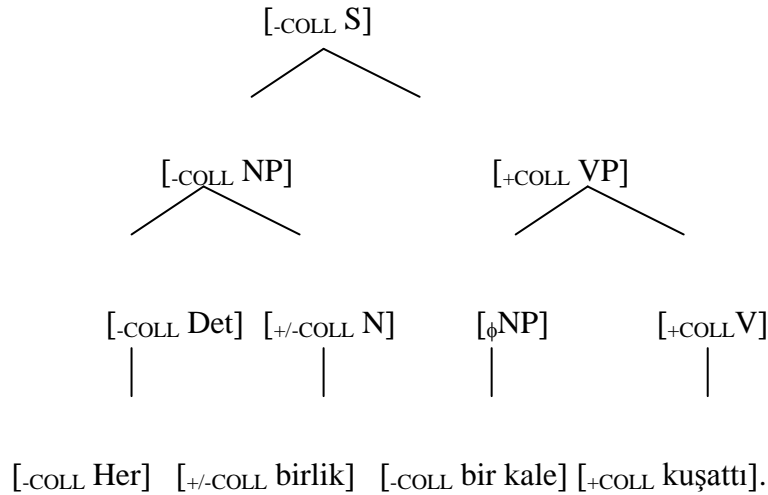
[-COLL her]    [-COLL kaleyi]

Having claimed that these collectivity features are visible at the syntactic level where constituents undergo Merge operations, the next step is to see where the proposed elimination procedure is actualized to yield the final possible paths through which a sentence can be realized. Recall that we have proposed ten different possible paths that a sentence is supposed to have when it enters the computational procedure of the Modified Plus Principle. Four elimination rules were proposed in Chapter 5 of the dissertation. Elimination Rule 1 is associated with the external argument of the sentence, Elimination Rule 4 is associated with the internal argument of the sentence and Elimination Rule 2 and Elimination Rule 3 which were discussed to be in complementary distribution are accocited with the collectivity values of the external argument and the overall VP. The ten possible paths are mental representations on which our proposed elimination rules operate. These elimination rules are also claimed to be operative in the syntactic level where Merge operations are carried out. This claim is based on the fact that Elimination Rule 1 and Elimination Rule 4 are associated with the NP in the external argument position and the NP in the internal

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argument position respectively. These elimination rules need to see the syntactic merge operations to ensure the application of the elimination rules on the relevant collectivity values of the NPs in the internal and external argument positions. In other words, the elimination rules must be in operation having the knowledge about which NP is in the external argument position and which in the internal argument position. For a clarification of how the elimination procedure operates, let us analyse the example sentences in (3) from this perspective.

(3) is re-written below in (5) and the proposed paths are given in (6) to illustrate how the elimination procedure operates step by step.

(5)  Her birlik bir kale kuşat-tı.

every regiment one castle surround-past

"Every regiment surrounded a castle."



(6)  a.  $x_1 \rightarrow \{<1,\{k_1\}>\}$         $\pi$-injective (distr. over time

$x_2 \rightarrow \{<2,\{k_2\}>\}$                  + distr. over argument)

$x_3 \rightarrow \{<3,\{k_3\}>\}$

b.  $x_1 \rightarrow \{<1,\{k_1\}>\}$                        π-injective (distr. over argument)

$x_2 \rightarrow \{<1,\{k_2\}>\}$

$x_3 \rightarrow \{<1,\{k_3\}>\}$


c.  $x_1 \rightarrow \{<1,\{k_1\}>\}$                        π-injective (distr. over time)

$x_2 \rightarrow \{<2,\{k_1\}>\}$

$x_3 \rightarrow \{<3,\{k_1\}>\}$


d.  $x_1 \rightarrow \{<1,\{k_1\}>, <2,\{k_2\}>, <3,\{k_3\}> \}$π-injective (distr. over time

$x_2 \rightarrow \{<1,\{k_2\}>, <2,\{k_3\}>, <3,\{k_1\}>\}$        + distr. over argument)

$x_3 \rightarrow \{<1,\{k_3\}>, <2,\{k_1\}>, <3,\{k_2\}>\}$


e.  $x_1 \rightarrow \{<1,\{k_1\}>\}$                        π-constant (subject coll.)

$x_2 \rightarrow \{<1,\{k_1\}>\}$

$x_3 \rightarrow \{<1,\{k_1\}>\}$


f.  $x_1 \rightarrow \{<1,\{k_1\}>, <2,\{k_2\}>, <3,\{k_3\}>\}$        π-constant (subject coll.)

$x_2 \rightarrow \{<1,\{k_1\}>, <2,\{k_2\}>, <3,\{k_3\}>\}$

$x_3 \rightarrow \{<1,\{k_1\}>, <2,\{k_2\}>, <3,\{k_3\}>\}$


g.  $x_1 \rightarrow \{<1,\{k_1, k_2, k_3\}>\}$                π-injective (object coll.)

$x_2 \rightarrow \{<2,\{k_1, k_2, k_3\}>\}$

$x_3 \rightarrow \{<3,\{k_1, k_2, k_3\}>\}$

h.      $x_1 \rightarrow \{<1,\{k_1, k_2, k_3\}>\}$            $\pi$-constant (subject coll.

        $x_2 \rightarrow \{<1,\{k_1, k_2, k_3\}>\}$             + object coll.)

        $x_3 \rightarrow \{<1,\{k_1, k_2, k_3\}>\}$

i.      $x_1 \rightarrow \{<1,\{k_1\}>, <2,\{k_2\}>, <3,\{k_3\}>\}$       $\pi$-injective $_{obj}$

j.      $x_1 \rightarrow \{<1,\{k_1, k_2, k_3\}>\}$             $\pi$-constant $_{obj}$

The order of the application of the elimination rules does not have an influence in changing the result that we obtain at the end, so this means that the elimination procedure can start with any of the elimination rules. Let us apply Elimination Rule 1 which is associated with the external argument of the sentence as a first step. The multi referent nature of the subject NP *her birlik* "every regiment" eliminates the denotations of (6i) and (6j). Recall that Elimination Rule 2 and Elimination Rule 3 were discussed to be in complementary distribution which means that only one of them can apply for a single sentence, not both at the same time. Considering the presence of the –COLL feature of the external argument NP in the syntactic structure below, we expect Elimination Rule 2 to operate which eliminates the $\pi$-constant denotations in (6e),(6f) and (6h). Finally, Elimination Rule 4 which operates on the collectivity feature of the internal argument is put into operation. The requirement for these elimination procedures to be operative at the syntactic level comes out right at this point. We have discussed in the previous paragraphs that each lexical entry brings its own collectivity feature to the structure. Accordingly, the indefinite internal argument NP *bir kale* "one castle" is also supposed to bring its collectivity

feature –COLL to the structure. However, we have also discussed that the knowledge that it is combining with a predicative nature triggered the neutralization of this collectivity feature yielding a $\phi$ feature for the operation of the Modified Plus Principle. Elimination Rule 4 (ii) operates on this neutralized $\phi$ feature making a further elimination of (6d) and (6g). If these elimination rules were operating separately from syntax, it would lead us to a wrong conclusion. In such a case, the elimination rule would operate on the –COLL feature of the lexical entry *bir kale* "one castle" which would trigger the application of Elimination Rule 4(i) and this would yield incorrect final outcomes for the sentence. As a consequence, the resulting possible readings of the sentence are (6a), (6b) and (6c).

In summary, our study implies that each lexical entry bears a collectivity feature of its own in addition to other semantic features which were discussed in previous studies. The constituents forming a sentence bring in their collectivity features to the interpretation algorithm which has a compositional nature. The Modified Plus Principle operates on these features in line with the syntactic Merge operations. These semantic features are claimed to be visible in the syntax which is supported by the fact that the indefinite internal arguments and indefinite external arguments do not enter the computational process in an identical manner. The knowledge coming form the syntactic Merge operation that an indefinite NP in the internal argument position is combining with a verb to yield a VP acts as a trigger in neutralizing the collectivity value of the indefinite internal argument to a $\phi$ feature. On the other hand, such a change does not take place for the indefinite external argument since it is not combining with a verb which triggers this change. Thus, it also enters the computational process with its collectivity feature coming from the lexicon. Furthermore, the operation of the elimination procedures are also claimed to

be carried out at a level where syntactic Merge operations take place. Both the Modified Plus Principle and the Elimination Rules must see the syntactic merge operations that a sentence undergoes in order to yield correct interpretations for the sentences.

## 3.0      Further Questions

While the exploration of quantificational sentences with the quantifiers *her* "every" and *bütün* "all" in this dissertation provides a unified computational mechanism, it is only one step in the more general goal of establishing a broader approach that can account for all the quantificational elements in the languages. Several additional directions for this research are listed below.

## 3.1      Cross-Linguistic Variation

In this dissertation, I have focused exclusively on Turkish quantificational sentences. However, the applicability of the proposed approach to other languages has not been mentioned in the previous chapters at all. The applicability of the approach to other languages will take us to the point where we can assert that the denotations of the quantifiers are identical in all the languages which will lead us to the conclusion that interpretation of quantifiers is not a language specific issue. In the following paragraphs, I will attempt to see whether our basic prediction regarding the decisive effect of the quantifier "*every*" is borne out in other languages as well.

Most of the studies regarding the quantificational sentences are based on quantifiers in English. Taking a few English quantificational sentences as examples, I

will attempt to apply the "Modified Plus Principle" to see whether the approach is applicable to English as well. The examples that are analyzed within the framework of the "Modified Plus Principle" underneath are taken from different studies on quantification with the native speaker judgements provided below.

(7)     Every boy named a planet.

      (i)     "for every boy, there is a possibly different planet that he named."

<div align="right">(Szabolcsi, 2001)</div>

(8)     Every girl built a raft.

      (i)     "for every girl, there is a possibly different raft that she built."

<div align="right">(Brisson, 1998)</div>

(9)     All the girls built a raft.

      (i)     "for every girl, there is a possibly different raft that she built."

      (ii)    "there is a raft such that all the girls built it together."

<div align="right">(Brisson, 1998)</div>

(10)    All the boys surrounded a fort.

      (i)     "there is a fort that the boys surrounded."

<div align="right">(Beghelli & Stowell, 1997)</div>

The example sentences presented above in (7)-(10) have the quantificational NPs in their external argument positions. The first two examples illustrate cases with the quantifier "every" co-occuring with a distributive and an ambiguous predicate respectively. The last two examples, on the other hand, are illustrations for the quantifier "all" co-occuring with an ambiguous and a collective predicate respectively. The collectivity features assigned to each constituent of the sentences

and the application of the Modified Plus Principle is presented in (11)-(14) below. The overall value for (11) and (12) is computed to be –COLL which means that the sentence has an overall distributive interpretation. This is in line with the predictions of our study. The presence of the distributive quantifier "every" yields an unambiguous distributive interpretation of the overall sentence as predicted. (13) and (14) also provide supporting evidence to make our predictions true. We have discussed that the quantifier "all" is not as powerful as the quantifier "every" in making a deduction of the collectivity /distributivity value of the overall sentence. For sentences with "all" it is the feature of the VP that has an assertive power on the overall interpretation of the sentence. (13) and (14) also supports this generalization since the overall ambiguous interpretation of (13) is the reflection of the ambiguity of the VP, whereas the overall collective interpretation of (14) is reflection of the collectivity of the VP. The computational procedure for these quantificational sentences yields correct results.

(11)    $[_{-COLL}[_{-COLL}[_{-COLL}$Every] $[_{-COLL}$boy ]][$_{-COLL}[_{-COLL}$named] [$_{\phi}$ a planet]]].

(12)    $[_{-COLL}[_{-COLL}[_{-COLL}$Every] $[_{-COLL}$girl ]][$_{-/+COLL}[_{-/+COLL}$built] [$_{\phi}$ a raft]]].

(13)    $[_{-/+COLL}[_{+COLL}[_{+COLL}$All] $[_{+COLL}$girls ]][$_{-/+COLL}[_{-/+COLL}$built] [$_{\phi}$ a raft]]].

(14)    $[_{+COLL}[_{+COLL}[_{+COLL}$All] $[_{+COLL}$boys ]][$_{+COLL}[_{+COLL}$surrounded] [$_{\phi}$ a fort]]].

The previous examples provide supporting evidence for one of the most important implications of our study. The more powerful nature of the quantifier "every" with respect to its decisive role in interpreting a sentence is exemplified in (11) and (12) clearly. Sentences placing the quantificational NP in the internal argument position

of the sentences also need to be looked at to see if our predictions are true for those structures also.

(15) is taken as an example where the quantificational NP is in the internal argument position of the sentence. As the interpretation given underneath the sentence illustrates, the sentence is ambiguous.

(15)    A boy read every book.

    (i) "there is a boy who read every book"

    (ii) "a different boy read every book"[75]

(Beghelli & Stowell, 1997)

Previous accounts of quantification associates the reading in (15i) to the narrow scope of "every" denoted as $\exists > \forall$ and (15ii) to the wide scope of "every" denoted as $\forall > \exists$. It must be noted at this point that both scope construals refer to a distributive interpretation. The difference between the two is a matter of the distributivity types denoted by the sentences. The reading presented in (15i) refers to the distributivity over time interpretation, whereas the reading presented in (15ii) refers to the distributivity over argument interpretation.

The application of the Modified Plus Principle on this sentence is presented in (16) below. Our computational mechanism yields an overall –COLL interpretation for the sentence which means that the sentence is expected to have only the distributive interpretation. Our predictions are true at this point since the the sentences were discussed to be associated with either ditributivity over time interpretation or ditributivity over argument interpretation.

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[75] This is the interpretation taken directly from Beghelli & Stowell (1997).

(16)   $[_{-COLL}[_{-COLL}$A boy$]$ $[_{-COLL}[_{+/-COLL}$read$]$ $[_{-COLL}[_{-COLL}$every$]$ $[_{-COLL}$book$]]]]$.

The difference between Turkish and English comes out right at this point. The Turkish counterpart of (15) is presented with its possible readings in (17) and shows that such a sentence can only be interpreted with the distributivity over time reading.

(17)   $[_{-COLL}[_{-COLL}$Bir çocuk$]$ $[_{-COLL}$ $[_{-COLL}[_{-COLL}$her$]$ $[_{-COLL}$kitab-ı$]]$ $[_{+/-COLL}$oku-du$]]]]$.

   one child every book-acc read-past

   "One child read every book"

   (i) "there is a boy who read every book"

   (ii) "* a different boy read every book"

The distributivity over the argument which is a possible option for the English sentence is not an appropriate interpretation for the Turkish counterpart. This implies that although the Modified Plus Principle enables us to predict whether a sentence can have an overall collective or distributive interpretation in general, it does not differentiate between the possible types of distributivity, which seems to be a matter of language specific properties. For (15) and (17), the Modified Plus Principle correctly predicts an overall distributive interpretation for both sentences. However, it must be due to language specific properties that only distributivity over time interpretation is realized for the Turkish sentence whereas both distributivity over the argument and the distributivity over time readings are appropriate for the English counterpart. What causes this difference among languages is a question that is left as subjects of further studies.

Another important outcome of the analysis was discussed to be the difference between the distributive predicates and the collective / ambiguous predicates regarding their decisive role in sentence interpretation. It was discussed that distributive predicates which are only associated with the –COLL feature yields an overall distributive interpretation of the sentence no matter what the collectivity features of the other constituents are. (18) and (19) present supporting evidence for our generalization. The verbs "breastfeed" and "pick up a flower" are distributive predicates which have –COLL features. The application of the Modified Plus principle reveals the fact that the overall collectivity feature of the sentence is a reflection of the distributive nature of the verb.

(18)   $[_{-COLL}[_{+COLL}[_{+COLL}\text{All}]$ $[_{+COLL}\text{women}]][_{-COLL}[_{-COLL}\text{breast fed}]$ $[_{\phi}\text{ a baby}]]]$.

(i) The women fed different babies.

$\Rightarrow$distributivity over the argument

(ii) The women fed the same baby at different time indices.

$\Rightarrow$distributivity over time

(19)   $[_{-COLL}[_{+COLL}[_{+COLL}\text{All}][_{+COLL}\text{girls}]][_{-COLL}[_{-COLL}\text{picked up}][_{\phi}\text{a flower(for their}$ mother)]]]$.

(i) The girls picked up different flowers. $\Rightarrow$distributivity over the argument
(20) and (21), on the other hand, support our finding that the collective / ambiguous predicates are not as powerful as the distributive predicates in the sentence interpretation. (20) presents sentences with collective whereas (21) with ambiguous predicates. In (20a) and (20b) it is the quantificational subject NP that shapes the overall collectivity / distributivity of the sentence. For (21a), the quantificational

subject NP has the decisive role in the sentence interpretation. However, in (21b) the collectivity feature of the verb-that is +/-COLL- is reflected to be the overall collectivity feature of the sentence. As a consequence, our finding regarding the strengths of the collective verbs, distributive verbs and ambiguous verbs with respect to each other is also supported by the English quantificational sentences as well.

(20)   a. $[_{-COLL}[_{-COLL}[_{-COLL}Every][_{+/-COLL}regiment]][_{+COLL}[_{+COLL}surrounded][_{\phi} a$ castle]]].

(i) For every regiment there is a different castle that they surrounded.


 b. $[_{+/-COLL}[_{+/-COLL}[_{+COLL}All][_{+/-COLL}regiments]][_{+COLL}[_{+COLL}surrounded][_{\phi} a$ castle]]].

(i) For every regiment there is a different castle that they surrounded.

(ii) There is a castle that all the regiments surrounded together.


(21)   a. $[_{-COLL}[_{-COLL}[_{-COLL}Every][_{-COLL}child]][_{+/-COLL}[_{+/-COLL}sang][_{\phi} a song]]]$.

(i) For every child there is a different song that they sang.


b. $[_{+/-COLL}[_{+COLL}[_{+COLL}All][_{+COLL}children]][_{+/-COLL}[_{+/-COLL}sang][_{\phi} a song]]]$.

(i) For every child there is a different song that they sang.

(ii) There is a song that all the children sang together.


In addition to English, German, Russian, Japanese and Chinese are among the languages that seem to provide supporting evidence for the powerful nature of the quantifier *her* "every". (22)-(25) illustrate the scope construal of the quantifiers in

these languages respectively. The scopal interpretations of sentences are taken

directly from the cited references.


(22)    (i) Jeder Student hat ein-en Roman gelesen.

Every student has one-acc novel read.

"Every student read one novel."

$\Rightarrow$ one > every (dist. over time), every > one (dist. over argument)


(ii) Ein Student hat jede-n Roman gelesen.

One student has every-acc novel read.

"One student read every novel."

$\Rightarrow$ one > every (dist. over time), every > one (dist. over argument)

(Stepanov & Stateva, 2005)


(23)    (i) Každyj mal'čik potseloval neskol'kih devoček.

Every boy-nom kissed several girls-acc.

"Every boy kissed several girls."

$\Rightarrow$ every > several (dist. over argument), several > every (dist.over time)


(ii) Neskol'ko mal'čikov potselovali každuju devočku.

Several boy-nom kissed every girl-acc.

"Several boys kissed every girl."

$\Rightarrow$ every > several (dist. over argument), several > every (dist.over time)

(Antonyuk, 2006)

(24)    Dareka-ga dono neko-mo nadeta.

Someone-nom every cat stroke.

"Someone stroke every cat."

⇒someone > everyone (dist.over time)

<div align="right">(O'Grady, 2006)</div>

(25)    You yi-ge xuesheng du le meiyiben shu.

Exist one-CL student read Asp every book.

"A student read every book."

⇒someone > everyone (dist.over time)

<div align="right">(O'Grady, 2006)</div>

The German example in (22i), where jeder "every" is in the external argument position and the one in (22ii), where jeder "every" is in the internal argument position, have ambiguous interpretations.  The reading where "one" takes scope over "every" refers to a reading of a single student having read the books at diffeent times. This reading corresponds to our "distributivity over time" interpretation. On the other hand, the other reading where "every" scopes over "one" refers to a one-to-one correspondence between the boys and the books. This reading corresponds to our "distributive over the argument" interpretation. Consequently, the two scopal interpretations refer to a distributive reading differing only in the types of distributivity. The inherent semantic -COLL feature of *jeder* "every" must be yielding this overall distributive interpretation. The same explanation holds for the Russian examples given in (23). The two scopal readings correspond to the two different types of distributivity readings. For the Japanese example in (24) and the

Chinese example in (25), the reading where "someone" scopes over "everyone" is obtained. This interpretation corresponds to our "distributivity over time" reading. The difference of these examples from (22) and (23) is that the distributivity over the argument interpretation is missing for these languages. Consequently, what these crosslinguistic examples reveal is that it is the presence of the quantifier "every" that leads to an overall distributive interpretation. However, this overall distributive interpretation can be expressed as distributivity over time or distributivity over the argument in different languages. An indepth analysis of the reasons behind this crosslinguistic difference is left as the topic of further studies.

Up to now, I attempted to see whether data from other languages can be explained with the newly proposed Modified Plus Principle. The examples that I have gone over were only representative examples to see whether our prediction regarding the decisive nature of the quantifier "every" is also borne out in other languages. It seems that our predictions are correct and that the interpretation algorithm that we have developed will work for these languages as well. However, language specific cases such as the restriction of languages on allowing different distributivity types or topicalization cases of some languages which seem to have a changing effect on the scopal interpretations need to be looked at and analysed in detail in the further studies.

As a consequence, if our findings are supported by further crosslinguistic data in further studies, this will enable us to assert that quantifiers as well as the different types of predicates and nouns are associated with identical semantic representations with respect to collectivity / distributivity in every language. Considering the semantic featural specifications of the lexical entries to be identical for all languages has a general implication that language specific cases must be stemming from either

structural differences between languages or the presence of language specific
conditions.


## 3.2     Applicability to Other Quantifiers


In this dissertation our focus was only on the so-called distributive quantifier *her*
"every" and the universal quantifier *bütün* "all". The application of the Modified Plus
Principle was shown on different combinations of examples which have these two
quantificational elements in either the external argument positions or the internal
argument positions. Other quantifiers such as *çoğu* "most", *yarısı* "half of", *-den
fazla* "more than …", *bazı* "some" etc. were not considered in the analysis up to now.
If our approach can be shown to apply to sentences having quantifiers other than *her*
"every" and *bütün* "all", this will provide more supporting evidence in favor of our
computational mechanism. So, in the following paragraphs I will provide a
discussion to illustrate that the application of the Modified Plus Principle can be
extended to sentences with other quantificational elements.

      The quantifiers that will be considered in this section are *bazı* "some", *yarısı*
"half of", *çoğu* "most", *-den fazla* "more than", *bir kaç* "a few" and the numeral
quantifiers. The first two of these quantifiers *bazı* "some" and *yarısı* "half of" will be
treated separately from the others since these show a similarity in that both take
morphologically plural complements. On the other hand, the remaining quantifiers
*çoğu* "most", *-den fazla* "more than" including the numeral quantifiers are
complemented by morphologically singular nouns.

3.2.1   <u>Supporting Evidence with Other Quantifiers</u>

The quantifiers *bazı* "some" and *yarısı* "half of" are similar to each other with respect to the requirement that they place on their complements. Both of these quantificational elements require their complements to be morphologically plural as illustrated in (26) and (27) below. Turning the nouns complementing the quantificational elements to singular forms renders the sentences ungrammatical as shown in (26b) and (27b).

The quantifiers *bazı* "some" and *yarısı* "half of" are structurally different from each other in that the previous precedes its complement whereas the latter follows its complement as in (26a) and (27a). The quantifier *bazı* "some" modifies its complement *askerler* "soldiers" in a prenominal position while the quantifier *yarısı* "half of" modifies its complement *askerler* "soldiers" in a postnominal position.

(26)    a. Bazı asker-ler bir kale kuşat-tı.

        some soldier-pl one castle surround-past

        "Some soldiers surrounded a castle."


        b. * Bazı asker bir kale kuşat-tı.

        some soldier one castle surround-past

        "*Some soldier surrounded a castle."


(27)    a. Asker-ler-in yarısı bir kale kuşat-tı.

        soldier-pl-poss half one castle surround

        "Half of the soldiers surrounded a castle."

b. *Asker-in yarısı bir kale kuşat-tı.

soldier- poss half one castle surround

"*Half of the soldier surrounded a castle."

Recall that for the application of the Modified Plus Principle, collectivity features were assigned to each constituent of the sentence including the quantifiers. Based on this requirement we need to assign features of collectivity for the quantifiers *bazı* "some" and *yarısı* "half of" in these sentences. Depending on the meaning of these quantifiers, I assume that these quantificational elements are associated with the [+COLL] feature. (28)-(31) illustrate the operation of the Modified Plus Principle on a range of sample sentences having the quantificational NP in the external argument positions co-occuring with different predicate types. The Modified Plus Principle correctly predicts that (28) has a collective reading where the soldiers surrounded a castle together, that (29) and (30) have ambiguous readings where the surrounding activity and the tent bulding activities can be either distributive or collective and that (31) has a distributive reading where the women fed a baby separately.

(28)    [+COLL[+COLL[+COLLBazı] [+COLLasker-ler]] [+COLL[ɸbir kale] [+COLLkuşat-tı]]].

some soldier-pl one castle surround-past

"Some soldiers surrounded a castle."

(29)    [+/-COLL[+/-COLL[+COLLBazı] [+/-COLLbirlik-ler]] [+COLL[ɸbir kale] [+COLLkuşat-tı]]].

some regiment-pl one castle surround-past

"Some regiments surrounded a castle."

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(30)  [-COLL[+COLL[+COLLBazı] [+COLLkadın-lar]] [-COLL[ϕbir bebek] [-COLLemzir-di]]].

some woman-pl one baby feed-past

"Some women fed a baby."


(31)  [+/-COLL[+COLL[+COLLBazı] [+COLLçocuk-lar]] [+/-COLL[ϕbir çadır] [+/-COLLkur-

du]]].

some child-pl one tent build-past

"Some children built a tent."


Similarly, we get correct predictions from the application of the Modified Plus Principle when the quantificational NP with *bazı* "some" is in the internal argument position as illustrated in (32)-(34) below. We can compute correctly that (32) and (33) have an unambiguous reading where a woman fed the babies in turns and where one teacher built the tents in turns. This refers to the "distributivity over time" interpretation that we have discussed in Chapter 3 of the dissertation. With the Modified Plus Principle we computed an overall +/-COLL feature for the sentence in (34). The sentence has an ambiguous interpretation where the regiment either surrounded the castles one after the other which corresponds to the "distributivity over time" cases or surrounded the castles at once which gives the "object collectivity" reading.


(32)  [-COLL[-COLLBir kadın][-COLL[+COLL[+COLLbazı][+COLLbebek-ler-i]][-COLLemzir-

di]]].

one woman some baby-pl-acc feed-past

"A woman fed some babies."

(33)  [−COLL[−COLLBir öğretmen][+/−COLL[+COLL[+COLLbazı][+COLLçadır-lar-ı]][+/−COLLkur-du]]].

one teacher some tent-pl-acc build-past

"A teacher built some tents."


(34)  [+/−COLL[+/−COLLBir birlik ][+COLL[+COLL[+COLLbazı][+COLLkale-ler-i]] [+COLLkuşat-tı]]].

one regiment some castle-pl-acc surround-past

"A regiment surrounded some castles."


The discussion so far revealed the fact that our approach provides correct predictions with the quantifier *bazı* "some". Let us now have a look at the quantifier *yarısı* "half of" to see whether the computational mechanism can also be extended to account for this quantificational element. The quantifier *yarısı* "half of" is also assumed to be associated with a +COLL feature in the computational mechanism. (35)-(38) provide further evidence that the Modified Plus Principle yields correct interpretations for these quantificational sentences as well.


(35)  [+COLL[+COLL[+COLLAsker-ler-in] [+COLLyarısı]] [+COLL[ϕbir kale] [+COLLkuşat-tı]]].

soldier-pl-poss half of one castle surround-past

"Half of the soldiers surrounded a castle."

(36)   [+/-COLL[+/-COLL[+/-COLLBirlik-ler-in] [+COLLyarısı]] [+COLL[ϕbir kale] [+COLLkuşat-
       tı]]].

       regiment-pl-poss half of one castle surround-past

       "Half of the regiments surrounded a castle."


(37)   [-COLL[+COLL[+COLLKadın-lar-ın] [+COLLyarısı]] [-COLL[ϕbir bebek] [-COLLemzir-
       di]]].

       woman-pl-poss half of one baby feed-past

       "Half of the women fed a baby."


(38)   [+/-COLL[+COLL[+COLLÇocuk-lar-ın] [+COLLyarısı]] [+/-COLL[ϕbir çadır] [+/-COLLkur-
       du]]].

       child-pl-poss one tent build-past

       "Half of the children built a tent."


As a consequence, the examples provided in this section showed that the mechanism

that I propose for the interpretation of quantificational sentences is not limited to the

quantifiers *her* "every" and *bütün* "all". Examples with the quantifiers *bazı* "some"

and *yarısı* "half of" also provide evidence in favour of the Modified Plus Principle

approach.


### 3.2.2   Counter Examples with Other Quantifiers


The quantifiers *bazı* "some" and *yarısı* "half of" were shown to place a co-occurence

restriction on their complements regarding their morphological singularity or

plurality. These quantificational elements were discussed to require their complements to be morphologically plural. The reason why we could not categorize the quantifiers -den fazla "more than", bir kaç "a few" and the numeral quantifiers together with bazı "some" and yarısı "half of" is based on the difference of the co-occurence restrictions that these quantificational elements place on their complementing nouns. Unlike bazı "some" and yarısı "half of", the quantifiers -den fazla "more than", bir kaç "a few" and the numeral quantifiers require their complements to be morphologically singular as illustrated in (39)-(41). The (a) sentences where the quantifiers are complemented by morphologically singular nouns are acceptable while the (b) sentences where the complements are morphologically plural are not interpretable.

(39)     a. Beşyüz-den fazla asker bir kale kuşat-tı.

       five hundred-than more soldier one castle surround-past

       "More than five hundred soldiers surrounded a castle."


       b. * Beşyüz-den fazla asker-ler bir kale kuşat-tı.

       five hundred-than more soldier-pl one castle surround-past

       "More than five hundred soldiers surrounded a castle."


(40)     a. Bir kaç asker bir kale kuşat-tı.

       a few soldier one castle surround-past

       "A few soldiers surrounded a castle."

b. *Bir kaç asker-ler bir kale kuşat-tı.

a few soldier-pl one castle surround-past.

"A few soldiers surrounded a castle."

(41)    a. Beşyüz asker bir kale kuşat-tı.

five hundred soldier one castle surround-past

"Five hundred soldiers surrounded a castle."

b. *Beşyüz asker-ler bir kale kuşat-tı.

five hundred soldier-pl one castle surround-past

"Five hundred soldiers surrounded a castle."

(42)-(44) illustrate the operation of the computational mechanism for these sentences.

(42)    *[$_{-COLL}$[$_{-COLL}$[$_{+COLL}$Beşyüz-den fazla] [$_{-COLL}$asker]] [$_{+COLL}$[$_{\phi}$bir kale] [$_{+COLL}$kuşat-tı]]].

five hundred-than more soldier one castle surround-past

"More than five hundred soldiers surrounded a castle."

(43)    *[$_{-COLL}$[$_{-COLL}$[$_{+COLL}$Birkaç] [$_{-COLL}$asker]] [$_{+COLL}$[$_{\phi}$bir kale] [$_{+COLL}$kuşat-tı]]].

a few soldier one castle surround-past

"A few soldiers surrounded a castle."

(44)    *$[_{-COLL}[_{-COLL}[_{+COLL}$Beşyüz] $[_{-COLL}$asker]] $[_{+COLL}[_{\phi}$bir kale] $[_{+COLL}$kuşat-tı]]].

five hundred soldier one castle surround-past.

"Five hundred soldiers surrounded a castle."

Our approach predicts an overall –COLL feature for the sentences which is not correct. The problem with these examples is related to the co-occurance restriction of these quantifiers on their complements. Although these determiners are associated with a group interpretation, they are not in agreement with their complements in terms of plurality. We have observed in the previous paragraphs that these quantifiers obligatorily take singular nouns as their complements. This lack of agreement between the semantic meaning of the quantifier and the morphological nature of its complement results in the inapplicability of our interpretive algorithm to sentences having these quantificational elements.

In contrast to these sentences, the mechanism gives correct predictions when a group denoting noun complements these quantifiers as shown in (45) below. The fact that a group denoting noun is associated with a +/-COLL feature leads to a correct prediction of the Modified Plus Principle.

(45)    $[_{+/-COLL}[_{+/-COLL}[_{+COLL}$Birkaç] $[_{+/-COLL}$birlik]] $[_{+COLL}[_{\phi}$bir kale] $[_{+COLL}$kuşat-tı]]].

A few regiments one castle surround-past.

"A few regiments surrounded a castle."

Although these quantifiers seem to pose some problems to our computational mechanism, this seems to be related to only these quantificational elements in Turkish. Other quantificational elements in Turkish were shown to support the

approach of the Modified Plus Principle. Furthermore, the counterparts of these so-called problematic quantifiers are unproblematic in English sentences as illustrated in (46a)-(46c) below. The requirement of these quantifiers regarding morphological plurality of their complements leads to the correct results of the application of the Modified Plus Principle.

(46)    a. [+COLL[+COLL[+COLLMore than] [+COLL five hundred soldiers]] [+COLL[+COLLsurrounded] [φ a castle]]].

b. [+COLL[+COLL[+COLLA few] [+COLLsoldiers]] [+COLL[+COLLsurrounded] [φ a castle]]].

c. [+COLL[+COLL[+COLL Five hundred] [+COLLsoldiers]] [+COLL[+COLLsurrounded] [φ a castle]]].

As a consequence, these examples clarified the need to treat these quantificational elements exceptionally in Turkish. As the unproblematic English counterparts illustrate, this is a language specific matter which is limited to certain quantifiers. Possible solutions with respect to these exceptional quantifiers are kept as a topic for further studies.

## 4.0    Final Conclusions

This dissertation is by no means the result of a finished project. My intention has been to investigate a computational mechanism that will enable us to compute the possible readings that a quantificational sentence can have. To achieve this aim, I concentrated on only two quantifiers *her* "every" and *bütün* "all" in Turkish. Our

analysis revealed that the interpretation algorithm proposed in the thesis can handle the quantificational data with *her* "every" and *bütün* "all". Nevertheless, analysis of other quantificational elements within this interpretation algorithm begs further study in the field.

As a last point, I would like to point out that the implications of the claims made in this study need to be investigated for the scrambling and passivization cases in Turkish, as well. A further analysis on these topics is most likely to present further insight into the nature of quantificational sentences in Turkish as well as cross-linguistically.

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