

Binominal *each* and *tadan* In Uzbek

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Abstract. Language provides ways to express distributivity overtly, with words such as English *each*, but also covertly, when no one word can be regarded as contributing it. Both overt and covert distributivity occur in a wide variety of constructions. This study is about analysing the interpretations of the Uzbek distance-distributive quantifier *tadan*. As in many other languages, an Uzbek sentence containing a distance-distributivity marker can describe two distinct kinds of ‘distributive scenarios’: (i) a scenario where the distribution is over some plural entity and (ii) one where the distribution is over some plural event (Gil 1982, Choe 1987, Zimmermann 2002, Oh 2005).

Key words: Distance-distributivity, Distributivity, Event, Distributive Key, Distributive Share.

1. Introduction

For many speakers, the following sentence is ambiguous:

(1) The boys lifted three tables.

- The boys together lifted three tables. (collective reading)
- Each boy lifted three tables on his own. (distributive reading)

The use of the word *distributivity* generally indicates the application of a predicate to the members or subsets of a set or group, or to the parts of an entity. *Collectivity* is often understood in opposition to distributivity, as a property of predicates. A collective predicate applies to a plural entity as a whole, as opposed to applying to the individuals that form this entity.

As is well-known, the last reading can be forced by adding the distributive quantifier *each*, as in the following sentence:

- (2) Each boy lifted three tables.

When the sentence includes *each* as in (2), it has a distributive reading only.

It is common that the distributive quantifier attaches to its NP- restriction (boys), as we have seen in (2). However, this does not always need to be the case. In (3) the distributive element *each* occurs at a distance to its NP-restriction the *boy*. The interpretation of this sentence is the same as (2).

- (3) The boys lifted three tables each.

In this sense, (3) shows 'distance-distributivity.' The term 'distance-distributivity' comes from Zimmermann (2002).

It's not just English 'binominal *each*', which show distance-distributivity. Uzbek language also has a distance-distributivity marker (D-D marker), illustrated in (4):

- (4) Bolalar ikki - tadan quti tashidi. (Uzbek)
 boys two – Dist box carried
 lit. ‘ The boys carried two boxes each ‘

The particle *-tadan* in Uzbek has a property of marking distributivity. Given that it occurs at a distance to its NP-restriction it quantifies over, just like binominal *each*, Uzbek *-tadan* is also D-D marker.

The aim of this paper is to compare the distance distributivity marker *tadan* in Uzbek with English binominal *each* and investigate the similarities and differences. The remainder of this paper is structured as follows. Some semantic properties of *tadan* is outlined in section 2. The analysis, together with some worked-out examples, is presented in section 3. Finally, section 4 concludes the paper.

2. Semantic properties of *tadan*

2.1 Binominal *each*

Each is a distributive marker in English. It may appear in the determiner position, as shown in (5), the pre-verbal, adverbial position, as shown in (6), or the post-nominal position, as shown in (7). When appearing in the last position, it is often referred to as binominal *each*, following the terminology of Safir and Stowell (1988).

(5) Each girl saw two movies.

(6) The girls each saw two movies.

(7) The girls saw two movies each.

There are many terms for these three uses. Adnominal *each* has also been called shifted (Postal 1974), an anti-quantifier (Choe 1987), binominal (Safir & Stowell 1988), or ditransitive (Roberts 1987). Adverbial *each* has also been called floated (Choe 1987). Determiner *each* is also called prenominal (Safir & Stowell 1988).

Safir and Stowell argue that binominal *each* takes an NP-internal position, forming a constituent with the direct object NP. Their argument in favor of an NP-internal position for binominal *each* is based on two factors. First, if the VP does not contain a direct object, then *each* may not occur to the right of the verb, as seen in (8b). Given the contrast between (8a) and (8b), it may be the case that true adverbial *each* may occur VP initially, and (7) involves a distinct structure, with *each* as a subconstituent of NP.

(8) a. The men each decided to leave

b. *The men decided to leave each.

Another set of data Safir and Stowell present to support the proposed position of binominal *each* are given in (9)-(10), where the direct object undergoes movement:

- (9) a. How many girls each did the men see?
 b. One girl each was seen by the men.
- (10) a. *How many girls did the men see each?
 b. *One girl was seen by the men each.
 c. *One girl was seen each by the men.
 d. How many girls did the men each see?

The contrast between (9) and (10) again suggests that binominal *each* is a subconstituent of the object NP in (7). When *each* does not occur as a subconstituent of NP, it must occur in VP-initial position as in the adverbial *each* construction in (8a) and (10d).

As mentioned above, a sentence with binominal *each* has a distributive interpretation. Sentence (11) has the interpretation given in (12):

(11) The men bought two books each.

(12). $\exists X[\text{men}(X) \& \forall x[x \in X \rightarrow \exists Y[|Y|=2 \& \text{books}(Y) \& \text{bought}(Y)(x)]]]$

Sentence (11) is synonymous to (13), they are true of the same situations even though the position of *each* is different.

(13) Each man bought two balloons.

2.2 The *tadan*-construction

As I mentioned before, Uzbek language also has a distance-distributivity marker (D-D marker). The equivalents of English binominal *each* in Uzbek is numeral suffix *tadan* and usually occurs with a numeral-classifier sequence within a noun phrase, illustrated in (14).

(14) Bolalar ikki -tadan muzqaymoq sotib olgan .

boys two Dist ice-cream bought

lit. ‘The boys had bought two ice-creams each’

As I have already mentioned, *tadan* is usually attached to a numeral, however, it occurs with other NP- restriction.

(15) a. Ayollar ikki -tadan taqinchoq korishdi

women two- DIST jewel saw

lit. ‘The women saw two jewel each’

b. Ayollar bir-nech(a) -tadan taqinchoq korishdi.

women several -DIST jewel saw

lit. ‘The women saw several jewel each.’

c. *Ayollar biroz / ma’lum -tadan taqinchoq korishdi.

women some / certain -DIST jewel saw

lit. ‘The women saw some / certain jewel each.’

d. *Ayollar o’sha / bu -tadan taqinchoq korishdi.

women the / that -DIST jewel saw

lit. ‘The women saw the / those jewel each.’

e. *Ayollar ikkala / hamma -tadan taqinchoq korishdi.

women both / all -DIST jewel saw

lit. ‘The women saw both / all jewel each.’

The above examples show that *tadan* attaches cardinals and indefinite (several) NPs in (15a) and (15b). On the other hand, other indefinite NPs (some / certain) in (15c), definite NPs in (15d) and quantified plural NPs in (15e) are all excluded.

Interestingly, the *tadan*-construction in (16) is ambiguous, as opposed to the English sentence (3) which has only one interpretation. D-D marker *tadan* can distribute over individuals like English binominal *each*, but also over spatial or temporal occasions. Sentence (16) is ambiguous between a reading that distributes over individuals – the ones of which their plural subject consists, (16a) – and one that distributes over occasions (16b).

(16) Bolalar uch -tadan kitob o'qigan.
 boys three Dist book read

a. 'Each of the boys has read three books.'

$\exists Y[Y \text{ is a group of boys} \ \& \ \forall y[y \in Y \rightarrow \exists X[X \text{ is a set of three books} \ \& \ \exists e. y \text{ carried } X \text{ in } e]]]$

b. 'The boys have read three books each time.'

$\exists e. \forall e' [e' \in e \rightarrow \exists Y[Y \text{ is a group of boys} \ \& \ \exists X[X \text{ is a set of three books} \ \& \ Y \text{ carried } X \text{ in } e']]] \ (|e| > 1)$

Before we get into these interpretations a couple of terms are to be introduced for ease of exposition: Distributive Key and Distributive Share. Following Choe 1987, Zimmermann 2002 and subsequent literature, the phrase denoting the distributed objects will be called the Distributive Share (DistShare), and the phrase denoting the set over which distribution takes place is called the Distributive Key (DistKey). DistKey refers to the argument over which the distribution occurs, that is, the argument whose part-whole structure the distribution uses. DistShare refers to the argument that is distributed over the DistKey, that is, the argument which takes low scope. As for the interpretation in (6a) the DistKey is *uchta kitob* 'three boxes' and for the interpretation (6b), DistKey is event, that is, the distribution occurs over event.

2.3. D-D marker *-tadan* in various position

In Uzbek, the D-D marker *-tadan* usually occurs with a numeral-classifier sequence within a noun phrase. D-D marker *-tadan* can occur in various positions. It can be attached object NP or both subject and object NP in the same time.

Given in (17), which has *-tadan* in the object position has two possible interpretations

(17) Ikkita bola uch -tadan quti tashidi.

Two boy three Dist box carried

lit. 'Two boys carried three boxes-Dist.'

a. Two boys carried three boxes each.

$\exists Y[Y \text{ is a group of two boys} \ \& \ \forall y[y \in Y \rightarrow \exists X[X \text{ is a set of three boxes} \ \& \ \exists e. y \text{ carried } X \text{ in } e]]]$

b. Two boys together carried three boxes (where happened more than one instance of this, simultaneously or one after another)

$\exists e. \forall e' [e' \in e \rightarrow \exists Y[Y \text{ is a group of two boys} \ \& \ \exists X[X \text{ is a set of three boxes} \ \& \ Y \text{ carried } X \text{ in } e']]] \ (|e| > 1)$

As seen from these interpretations, in the *tadan*-construction, the distribution can be over individuals (as in (17a)) or events (as in (17b)). When the distribution is over individuals it means each of two boys carried different set of three boxes. On the other hand, the distribution is over events, boys together carried three boxes more than one time.

In (18), which has *-tadan* in both the subject and the object position, has only one possible interpretation, the event-distributive reading which has event as the DistKey:

(18) Ikki -tadan bola uch -tadan quti tashidi.

two Dist boy three Dist box carried

lit. 'Two boys –Dist carried three boxes - Dist

Two boys together carried three boxes (where happened more than one instance of this, simultaneously or one after another)

$\exists e. \forall e' [e' \in e \rightarrow \exists Y[Y \text{ is a group of two boys} \ \& \ \exists X[X \text{ is a set of three boxes} \ \& \ Y \text{ carried } X \text{ in } e']]] (|e| > 1) (=17b).$

If *tadan* – construction occurs in both subject and object position the distribution can be over only events.

In (17a), 'two boys' takes higher scope and 'three boxes' which contains *tadan* takes lower scope. Given the interpretations above, events also can take higher scope than the argument containing *tadan*, as in (17b) and (18), though events are not overtly realized in the sentence. Given these, we can get the following generalizations:

(19) Properties of the *tadan* -construction:

- a. The NP which contains *tadan* (the *tadan* -NP) is always the DistShare; it can not be the DistKey. (lower scope requirement of the *tadan* -NP)
- b. The DistKey can be either a (regular) plural NP or an event.

3. ANALYSIS

In traditional approaches to compositionality (e.g. Heim and Kratzer 1998), meanings combine when they are expressed by siblings in a constituency tree. I follow here Oh's new account of the *ssik*-construction. She argues that the Korean sentence (20) has two possible interpretations given in (21). In one reading, 'two men' is the DistKey (two men-distributive reading), and in the other reading, event is the DistKey (event-distributive reading). The LF representation of the sentence for the two men-distributive reading is presented in (22).

(20) Namca twu-myeng-i sangca sey -kay-ssik-ul wunpanhayssta
 man two -Cl -Nom box three-Cl-Dist-Acc carried

lit. 'Two men carried three boxes-Dist'

(21) a. Two men carried three boxes each.

$\exists Y[Y \text{ is a group of two men} \ \& \ \forall y[y \in Y \rightarrow \exists X[X \text{ is a set of three boxes} \ \& \ \exists e. y \text{ carried } X \text{ in } e]]]$

b. Two men together carried three boxes (where happened more than one instance of this, simultaneously or one after another)

$\exists e. \forall e' [e' \in e \rightarrow \exists Y[Y \text{ is a group of two men} \ \& \ \exists X[X \text{ is a set of three boxes} \ \& \ Y \text{ carried } X \text{ in } e']]] \ (|e| > 1)$

(22) [two men [D [1[IP t1 [1 [VP three boxes-ssik [2 [VP t1 carried t2]]]]]]]]

She obtained two generalizations from the possible interpretations of the *ssik*-construction. One was the lower scope requirement of the *ssik*-NP; it can not be interpreted as the DistKey. Given this lower scope requirement, she propose *ssik* as a 'distributive polarity item (DPI)' which must remain within the scope of the D(istributivity)- operator.

(23) Distributive Polarity Item Ssik:

Ssik must be within the scope of the D(istributivity)-operator at LF.

Another crucial point in the proposed analysis is the following:

(24) Quantifier Raising (QR) creates an argument for the D-operator.

In the *ssik*-construction, the D-operator is present at LF, and an argument undergoes QR for the D-operator.

In this analysis, considering many similarities of Korean *ssik* and Uzbek *tadan* I adopt Oh's analysis for D-D marker *tadan*.

Let us first consider the run-of-the-mill examples below:

- (25) Ikkita bola uch -tadan quti tashidi.
 Two boy three Dist box carried
 lit. 'Two boys carried three boxes-Dist.'

In this example the *tadan* –construction (the distributive share) occupies the position of the direct object of the verb, and it has two interpretation.). In one reading, 'two boys' is the DistKey (two boys-distributive reading) in (26a), and in the other reading, event is the DistKey (event-distributive reading) in (26b).

- (26) a. Two boys carried three boxes each.

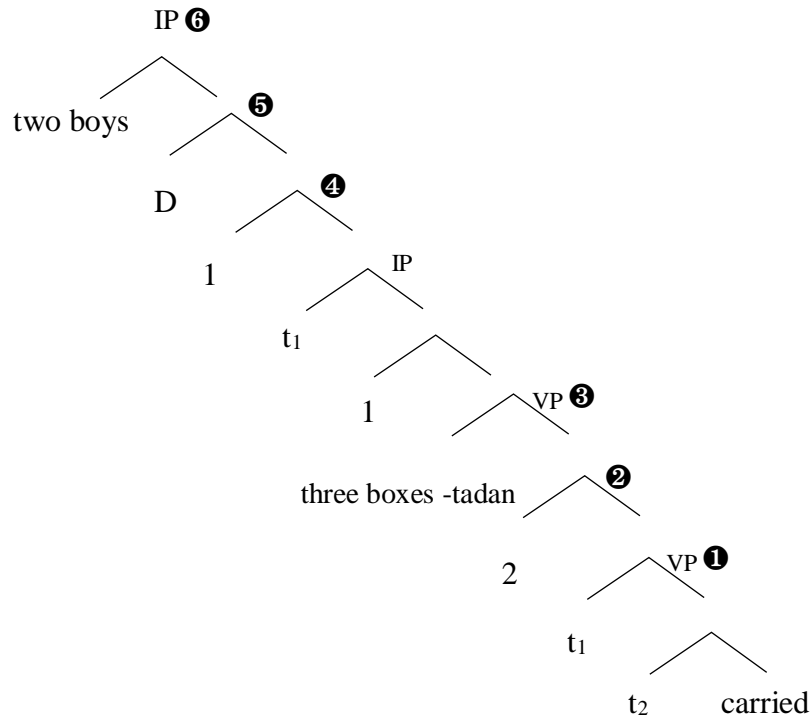
$\exists Y[Y \text{ is a group of two boys} \ \& \ \forall y[y \in Y \rightarrow \exists X[X \text{ is a set of three boxes} \ \& \ \exists e. y \text{ carried } X \text{ in } e]]]$

- b. Two boys together carried three boxes (where happened more than one instance of this, simultaneously or one after another)

$\exists e. \forall e' [e' \in e \rightarrow \exists Y[Y \text{ is a group of two boys} \ \& \ \exists X[X \text{ is a set of three boxes} \ \& \ Y \text{ carried } X \text{ in } e']] \ (|e| > 1)$

First, the LF representation of the sentence for the two men-distributive reading is presented in (27a):

(27) a.



[two boys [D [1[IP t1 [1 [VP three boxes-tadan [2 [VP t1 carried t2]]]]]]]]

b. [[two boys]]: $\lambda R \exists M [\text{boys}(M) \ \& \ |M|=2 \ \& \ R(M)]$

[[three boxes]]: $\lambda P \exists B [\text{boxes}(B) \ \& \ |B|=3 \ \& \ P(B)]$

[[D]]: $\lambda Q \lambda X:|X|>1.[\forall x[x \in X \rightarrow Q(x)]]$

① $\text{carried}(x)(y)$

② $\lambda x. \text{carried}(x)(y)$

③ $\exists B [\text{boxes}(B) \ \& \ |B|=3 \ \& \ \text{carried}(B)(y)]$

④ $\lambda y. \exists B [\text{boxes}(B) \ \& \ |B|=3 \ \& \ \text{carried}(B)(y)]$

⑤ $\lambda X:|X|>1.[\forall x[x \in X \rightarrow \exists B [\text{boxes}(B) \ \& \ |B|=3 \ \& \ \text{carried}(B)(x)]]]$

⑥ $\exists M[\text{boys}(M) \ \& \ |M|=2 \ \& \ \forall x[x \in M \rightarrow \exists B[\text{boxes}(B) \ \& \ |B|=3 \ \& \ \text{carried}(B)(x)]]]$

In the structure, three boxes-*tadan* remains within the scope of the D-operator, satisfying the licensing condition on *tadan* as a DPI. (27b) shows the compositional interpretation in detail. At the end, we get the interpretation in (27)

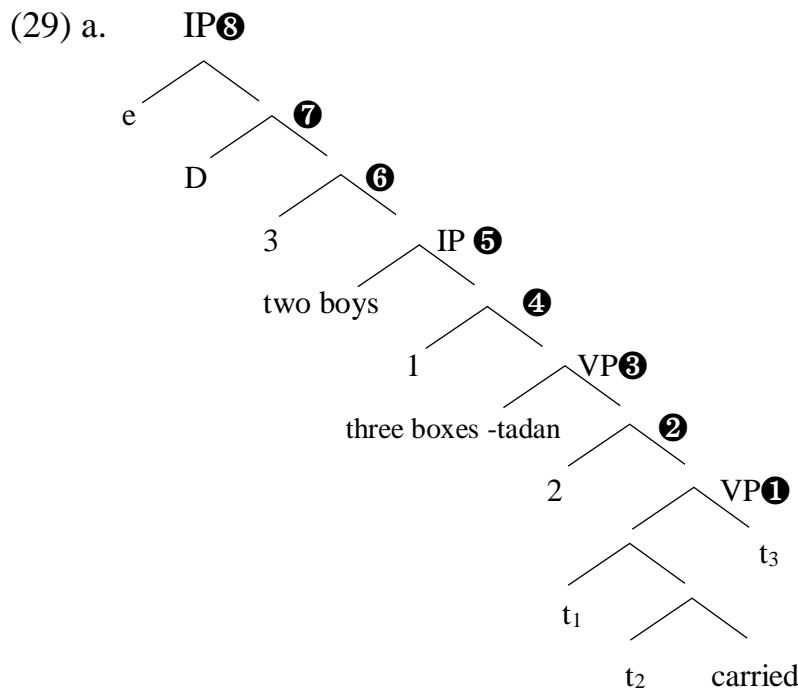
⑥: There is a group of two boys and for each member x of the two boys, there is a set of three boxes B and x carried B .

To account for the event-distributive reading, Oh (2006) suggest a new approach to events:

(28) An event argument can be present in the LF structure.

Percus (1998, 2000) proposes that situation pronouns be present at LF (see Percus 1998 or 2000 for detailed arguments). His analysis of the situation pronouns suggests the possibility that implicit arguments can be realized as explicit ones. In favor of this possibility, then, Oh also assumed that events are present as explicit arguments at LF.

The event-distributive reading of (27), I propose (29a) as the LF structure. In (29a) lies in the argument undergoing QR for the D-operator; and in (29a), it is the event argument which I assumed to be present in the LF. The LF and the intermediate steps for a compositional interpretation are presented in (29b).



[e [D [3[IP two boys [1 [VP three boxes-tadan [2 [VP t₁ carried t₂ in t₃]]]]]]]]]]

b. [[two boys]]: $\lambda R \exists M$ [boys(M) & |M|=2 & R(M)]

[[three boxes]]: $\lambda P \exists B$ [boxes(B) & |B|=3 & P(B)]

[[D]]: $\lambda Q \lambda X: |X| > 1. [\forall x [x \in X \rightarrow Q(x)]]$

① carried(x)(y)(v)

- ② $\lambda x. \text{carried}(x)(y)(v)$
- ③ $\exists B [\text{boxes}(B) \ \& \ |B|=3 \ \& \ \text{carried}(B)(y)(v)]$
- ④ $\lambda y. \exists B [\text{boxes}(B) \ \& \ |B|=3 \ \& \ \text{carried}(B)(y)(v)]$
- ⑤ $\exists M [\text{boys}(M) \ \& \ |M|=2 \ \& \ \exists B [\text{boxes}(B) \ \& \ |B|=3 \ \& \ \text{carried}(B)(M)(v)]]$
- ⑥ $\lambda v. \exists M [\text{boys}(M) \ \& \ |M|=2 \ \& \ \exists B [\text{boxes}(B) \ \& \ |B|=3 \ \& \ \text{carried}(B)(M)(v)]]$
- ⑦ $\lambda X:|X|>1. [\forall x[x \in X \rightarrow \exists M [\text{boys}(M) \ \& \ |M|=2 \ \& \ \exists B [\text{boxes}(B) \ \& \ |B|=3 \ \& \ \text{carried}(B)(M)(x)]]]]]$
- ⑧ $\exists e \forall x[x \in e \rightarrow \exists M [\text{boys}(M) \ \& \ |M|=2 \ \& \ \exists B [\text{boxes}(B) \ \& \ |B|=3 \ \& \ \text{carried}(B)(M)(x)]]]]]$

At last, we get the interpretation in (29b) ⑧: There is an event and for every member of the event, that is, for every sub-event, there is a group of two boys M and a set of three boxes B, and M carried B in the sub-event.

In (29), since an event argument is present in the LF structure, it can undergo QR for the D-operator. Note that *tadan* remains within the scope of the D-operator also in (29), satisfying the licensing condition. With *tadan* in the object position, the sentence (25) has two possibilities of QR:

QR of 'two men,' the subject, or QR of the event argument, which result in two men- distributive reading and event-distributive reading respectively.

5. CONCLUSION

In this paper, we have investigated the semantic behavior of D-D markers, mainly discussing the *tadan*-construction in Uzbek, and proposed a compositional analysis to derive the possible interpretations. By analyzing D-D markers as DPIs and adopting a QR approach, the proposed analysis can successfully derive the possible interpretations in a compositional way and account for the properties of the construction in a simpler way.

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