The Non-strong-definiteness Condition on Distributivity

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Yoon-kyoung Joh. 2008. The Non-strong-definiteness Condition on Distributivity. *Language and Information 12.2*, 77–93. This paper examines a condition that licenses distributivity. Choe (1987) and Link (1998) have proposed an indefiniteness condition on distributivity. However, detecting counter-examples, Zimmermann (2002) has argued for a non-specificity condition. This paper primarily revises the indefiniteness/non-specificity condition. Observing that the systematic class of the exceptions belongs to weak definites proposed by Poesio (1994), I claim that the property that constrains distributivity is non-strong-definiteness. Based on Landman (2000), I further explain the non-strong-definiteness condition and argue that the condition does not need to be imposed on the grammar independently. The new condition naturally accounts for Spector's (2003) scopal asymmetry. Even more, defining donkey pronouns as weak definites, I cope with various properties of donkey sentences. (**University of Pennsylvania**)

Key words: distributivity, dependent plurals, anti-quantifiers, specificity, strong/weak definites, indefinites, donkey pronouns

1. Introduction

Various constructions produce a distributive interpretation. In (1), a dependent plural generates a distributive reading. In (2), an anti-quantifier yields the distributive sense. The sentences commonly derive the ∀∃-structure illustrated in (3). The formula in (3) describes the three essential components involved with distributivity. In this paper, following Choe (1987), I will call the element corresponding to X a Sorting Key (SrtKy) and the element corresponding to Y a Distributed Share (DstrShr), and R will simply be called a Relation.

> (1) *Unicycles* have <u>wheels</u>.
> $\forall x[x \leq \text{unicycles}(X) \rightarrow \exists y[\text{wheel}(y) \wedge \text{Have}(x, y)]]$

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† I started working on the account for the condition on distributivity when my advisor asked me to. However, this could not be part of my dissertation.

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(2) *Bicycles* have <u>two wheels</u> each.

$\forall x[x \leq \text{bicycles}(X) \rightarrow \exists y[\text{two wheels}(y) \wedge \text{Have}(x,y)]]$

(3) $\forall x[x \leq X] \exists y(R(x,y))$ [X: SrtKy, y: DstrShr, R: Relation]

Choe (1987)[1] claims that distributivity is projected when two conditions are met: the SrtKy must be semantically plural and the DstrShr must be indefinite. The former is relatively uncontroversial but the latter is not. Encountering exceptions, Zimmermann (2002) has revised the indefiniteness condition into a non-specificity condition. The main objective of this paper is to investigate the indefiniteness/non-specificity condition that has been proposed to restrict the DstrShr.

To do so, I will first look at previous studies that have advocated the indefiniteness condition and discuss counter-examples. Section 3 will discuss a proposal that has been put forth as an alternative to the indefiniteness condition, i.e., the non-specificity condition. However, it will be argued that the non-specificity condition also faces potential problems. In section 4, I will present a new condition on the DstrShr. In essence, I claim that not only indefinites but also weak definites license distributivity. However, contrary to the previous studies, I will argue that the condition follows from the basic function of distributivity rather than claiming that distributivity is projected based on the condition. In section 5 and section 6, I will discuss various properties that the non-strong-definiteness condition can explain. The condition immediately accounts for what Spector (2003) has called a scopal asymmetry. With the new condition, I will further deal with numerous issues involved with donkey sentences, by claiming that donkey pronouns are weak definites.

2. Indefiniteness Condition

Frey and Kamp (1986) note that indefinites, in general, are more likely to have distributive readings than definites. Choe (1987) makes the indefiniteness condition part of the grammar of distributivity as shown in (4). That is, distributivity can be evoked when there are an indefinite DstrShr and a semantically plural SrtKy.

(4) a. Sorting Key is semantically plural.
      English determiner 'each,' Korean 'kak-' and '-mata'. . .

   b. Distributed Share is indefinite.
      Korean 'ssik' German 'je' Polish and Russian 'po' and post nominal 'each'. . .

The indefiniteness condition accounts for the ungrammaticality of the sentences in (5). It has been shown that the sentences in (1) and (2) are perfectly grammatical. However, when the DsrtShr becomes definite as in (5), the sentences are unacceptable.

(5) a. *Unicycles have <u>the wheels</u>.

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[1] Choe (1987) defines the anti-quantifier as a particle that typically has scope under something else.

    b. *Bicycles have <u>the two wheels</u> each.

Link (1998) further supports the claim that the DstrShr has to be indefinite with the examples in (6). He explains the indefiniteness condition as follows. In fact, the indefiniteness condition is perfectly natural and obvious, from the semantic point of view, since a scopeless definite NP is not really dependent quantificationally.

(6) a. Die Kinder bekamen jeweils viele/wenige Äpfel.
        'The children got (many/few) apples each time.'

      b. Die Kinder bekamen jeweils mindestens/höchstens drei Äpfel.
        'The children got at least/at most three apples ?each/each time.'

However, Link (1998) detects that there are marginal cases where a definite NP makes sense as a DstrShr and even produces distributivity as in (7). He notes that the sentences are particularly good when the DstrShr is a relational term like *father*. Zimmermann (2002) also comes up with an exception to the indefiniteness condition as in (8).

(7) a. ?Die Mädchen nannten je <u>ihren Vater</u> (als) ihren besten Freund.
        'The girls called their father each their best friend.'

      b. ?Die Schüler hatten je <u>den Bus</u> verpasst.
        'The students had missed the bus each.'

      c. Die Männer wählten je <u>das kleinere Übel</u>.
        'The men chose the lesser evil each.'

(8) Die Mädchen haben jeweils <u>die beste Freundin</u> (von sich) eingeladen.
     'The girls have invited the(ir) best friend each.'

In addition to the counter-examples associated with anti-quantifiers listed above, I have also observed counter-examples to the indefiniteness condition in previous studies on dependent plurals. As shown in (9), in fact, not only NPs with pronouns[2] but also those with the definite article can serve as the DstrShr.

(9) a. John and Mary invited <u>their mothers</u> to their place.

      b. All the boys brought <u>their fathers</u> along.

      c. All the boys forget <u>their books</u>.

      d. Those men married <u>the ex-wives</u> of their neighbors.

      e. The men are married to <u>the girls</u> across the hall.

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[2] Barker (2000) points out that a possessive is definite iff its possessor is definite. Thus, the phrases *their mothers* in (9a), *their fathers* in (9b), *their books* in (9c) will be treated as definite descriptions even though they can be used as first mentions.

3. Non-specificity Condition

Encountering such counter-examples discussed above, Zimmermann (2002) uses the notion of (non)-specificity to address the condition that constrains possible ranges of the DstrShr. Concerning the inverse scope reading of Inverse-linking Constructions, Fiengo and Higginbotham (1981) have employed the concept of specificity. They argue that the absence of the inverse scope reading of the sentence in (10) comes from the fact that the initial DP is specific and the fact that specific DPs form a barrier for extraction. Zimmermann (2002) borrows the notion of specificity to describe the condition on the DstrShr, especially focusing on the kinds of the DstrShr that can co-occur with the anti-quantifier *je(weils)*.

(10) This picture of everybody is now on sale.

Zimmermann (2002) contends that only NPs that are non-specific, not indefinite NPs, may serve as the DstrShr and yield distributivity, forming a constituent with anti-quantifier *je(weils)*. The essence of his claim is that not only indefinite NPs but also definite descriptions can function as the DstrShr as long as they are non-specific. He describes the DP *die beste Freundin* in (8) as a non-specific DP.

However, two problems are found with the non-specificity condition on the DstrShr on the basis of Enç (1991). First, Enç (1991) strongly argues that all the definites are specific, proposing that both definites and specifics require that their discourse referents be linked to previously established discourse referents. According to Enç (1991), there are no non-specific definite DPs. The second limitation of Zimmermann's (2002) non-specificity condition is that, in fact, specific indefinites can produce distributivity as shown in (11). Choe's (1987) condition allows all the indefinites to yield distributivity but what Zimmermann (2002) claims is that only the non-specific indefinites can generate distributivity. However, the example in (11) clearly shows us that specific indefinites are also fully capable of generating a distributive sense.

(11) Each husband had forgotten a certain date - his wife's birthday. (Enç, 1991)

Adjectives such as *certain*, *specific*, and *particular* make the noun phrases they modify specific. That is, NPs containing such adjectives are specific NPs. Thus, in (11), the NP *a certain date* can generally be treated as a specific indefinite. However, in contrast to what Zimmermann (2002) predicts, the specific indefinite NP is able to co-occur with *each* and takes narrow scope in (11). Enç (1991) claims that specificity has a wide scope tendency but allows for narrowest scope as well. Thus, at least in terms of Enç (1991), the non-specificity condition is not entirely satisfactory.

Zimmermann (2002) might respond to this by claiming that his non-specificity condition is only for the DstrShr of the anti-quantifier *jeweils* so that the example in (11) is not a big problem for his condition. Then, the limitation of the non-specificity condition is that it cannot apply to the full range of the distributivity phenomenon and thus the non-specificity condition cannot be considered as an improvement on

the indefiniteness condition discussed in the previous section. As a matter of fact, the indefiniteness has been proposed as a precondition on distributivity in general.

It seems that specificity is a notion that primarily sub-classifies indefiniteness, at least according to Enç (1991). Yet, what we really need is a notion that subdivides definiteness since facts that need to be explained are as follows. Indefinites can serve as the DstrShr whereas definites cannot in general but there are certain cases of definites that are fine as the DstrShr. The question is how we can systematically classify the definites that can function as the DstrShr.

4. Non-strong-definiteness Condition

Recently, there has been an interesting study that addresses the question at issue. Poesio (1994) first identifies a class of weak definites that do not have the referent uniqueness presupposition. Carlson and Sussman (2005) further claim that there is a sub-class of English definites that functions differently from ordinary definites, being much more akin to indefinites in their interpretations. They claim that there is a subtle but perceptible difference between (12) and (13).

(12) a. Mary went to *the store.*

b. I'll read *the newspaper* when I get home.

c. Open *the window,* will you please?

d. Fred listened to the Red Sox on *the radio.*

(13) a. Mary went to *the desk.*

b. I'll read *the book* when I get home.

c. Open *the cage,* will you please?

d. Fred listened to the Red Sox over *the headphones.*

They sharpen the distinction a little bit further by embedding such examples in the VP-ellipsis construction. In the example (14), Mary and Bob had to hear about the very same riot. However, it is clear that they could have heard about it on different radios. They attribute the reason to the distinction between strong definites and weak definites. That is, *the riot* has a strong definite reading whereas *the radio* has a weak definite reading.

(14) Mary heard about *the riot* on *the radio,* and Bob did, too.

The contrast in (15) further makes the point clearer. In (15a), Fred and Alice could go to different stores but, in (15b), they must have gone to the same desk. The contrast also comes from the reason that *the store* has a weak definite reading whereas *the desk* only has a strong definite interpretation.

(15) a. Fred went to *the store* and Alice did, too.

b. Fred went to *the desk* and Alice did, too.

Furthermore, Carlson and Sussman (2005) did a survey on the contrast as follows. Under the context in (16), the sentence (17) with a strong definite was judged to be unacceptable by most of the subjects. However, under the context in (18), the sentence (19) with a weak definite was accepted 73% of the time. The result of the survey also reveals that there is a distinction between strong definites and weak definites.

(16) Bill read Jane Austen's *Pride and Justice*, and Joe read *The Hitchhiker's Guide to the Galaxy* by Douglas Adams.

(17) Bill read the book and Joe did too.

(18) At breakfast, Samantha read the New York Times. Across the table from her, Frances was reading the Democrat and Chronicle.

(19) Samantha read the newspaper and Frances did too.

All the discussions above lead us to conclude that there is a subclass of definites that behaves like indefinites. One more crucial claim that Carlson and Sussman (2005) have made is that weak definites can take narrow scope with respect to other operators. This is one of the significant differences between weak definites in (20) and strong definites in (21). In (20), the possibility of distributive readings is clear while, in (21), distributivity is not allowed.

(20) a. Every professor went to the store.

   b. Four students were busy reading the newspaper.

(21) a. Every professor pulled the cart.

   b. Four students were busy watching the lawn mower.

Carlson et al. (2006), more specifically, characterize weak definites as follows. Weak definites require the truth-conditions of indefinites as equivalent to existentially quantified noun phrases. Yet, unlike indefinites, weak definites can only be scoped over. Furthermore, they claim that weak definite readings are more like property expressions than real indefinites.

This is the subclass of definites that we need to find. The counter-examples that need to be accounted for are definites that are quantificationally dependent and thus allow distributivity. Poesio (1994), Carlson and Sussman (2005) and Carlson et al. (2006) seem to identify the sub-class and call it a weak definite. Now, we have a way to systematically address the counter-examples discussed above.

The question is whether the definites underlined in (22) are weak definites. Carlson and Sussman (2005) suggest VP-ellipsis as a test for classifying weak definites. If a definite DP has a sloppy reading in a VP-ellipsis context, the definite is regarded as weak. On the other hand, if only the strict reading is available, then the definite is classified as a strong definite. Applying the VP-ellipsis test to the

examples concerned, we can find that they allow a sloppy reading. Based on it, I claim that the definites that were considered as counter-examples to the indefiniteness condition are grouped as weak definites systematically.

(22) a. John and Mary invited their mothers to their place and Jenny and Alex did so too.

b. All the boys brought their fathers along and all the girls did so too.

c. All the boys forgot their books and all the girls did so too.

d. Those men in green married the ex-wives of their neighbors and those men in purple did so too.

e. The men in the building are married to the girls across the hall and the men in the next building are so too.

The fact is that a distributive interpretation is available when there is an indefinite or a weak definite element in the sentence. Thus, the condition that restricts the possible range of the DstrShr is not indefiniteness but both indefiniteness and weak definiteness. The two distinct properties can be paraphrased as non-strong-definiteness, in a word. That is, only strong definites do not license distributivity. The discussion so far can be summarized as the table in (23).

(23)

Indefiniteness	Definiteness	
	Weak Definiteness	Strong Definiteness
Non-strong-definiteness		
Distributivity		No Distributivity

However, I claim that the non-strong-definiteness condition does not merely describe the facts involving distributivity but fundamentally comes from what distributivity is. In the following, putting a detailed analysis for each construction of distributivity aside, I will briefly discuss the basic function of distributivity to the extent that shows us that distributivity is the product of pluralization and the non-strong-definiteness condition mirrors the possibility of the application of the pluralization operator.

Choe (1987) notes that distributivity is number dependency. That is, both dependent plurals and anti-quantifiers multiply the DstrShr depending on the SrtKy. In (24a), there are as many wheels as there are unicycles. In (24b), there are twice as many wheels as there are bicycles. In (25a), to get the total number of fathers, one father must be multiplied by the number of the children. In (25b), to get the total number of flowers, 5 flowers must be multiplied by the number of the boys.

(24) a. Unicycles have wheels.

b. Bicycles have two wheels each.

(25) a. The children brought their fathers along.

　　b. The boys received 5 flowers each.

From the examples above, it is clear that both dependent plurals and anti-quantifiers multiply the predicate they attach to in terms of the SrtKy. Landman (2000) addresses it more formally. He reduces distributivity to plurality based on the fact in (26).[3]

(26) Fact: If P is a set of atoms, then $\alpha \in {}^*P$ iff $\forall a \in$ AT $(\alpha) : a \in P$

In terms of it, we can treat not only dependent plurals but also anti-quantifiers as plurality markers and formally translate them into a *-operator. That is, dependent plurals and anti-quantifiers pluralize the predicate they attach to. When the pluralized predicate applies to another semantically plural noun (or adverbial) phrase, it generates a distributive reading as illustrated below.[4] In (27), the *-operator applies to a set of atoms and the group-forming operation takes place when the predicate that the *-operator applies is apparently plural to shift the sum into an impure atom.

(27) a. Unicycles have wheels.
　　　　　(UNICYCLE) $\in$ *(WHEEL)
　　　　　$>> \forall x \in$ UNICYCLES $: x \in$ WHEEL

　　　b. Bicycles have two wheels each.
　　　　　(BICYCLE) $\in$ *($\uparrow$(TWO-WHEELS))
　　　　　$>> \forall x \in$ BICYCLES $: x \in\uparrow$ (TWO-WHEELS)

Based on Landman (2000), I would like to claim that distributivity is projected by the pluralization operator that is evoked by a distributive particle that can be either overt or covert. The pluralization operator multiplies the predicate it operates on (the DstrShr) in terms of the SrtKy.[5] Then, the reason for the non-strong-definiteness condition on the DstrShr seems simple. The DstrShr has to be

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[3] Distributivity has been treated as a scopal matter and it is indeed an issue of the structure where the universal quantifier takes scope over the existential quantifier. Yet, what I am demonstrating here is that the scope of the two quantifiers is derived from the pluralization operation, based on Landman (2000).

[4] The distributive reading of the (b) sentences is generated in the same way as the distributive sense of the (a) sentences. The only difference is that the pluralization is evoked by a covert distributive particle in (b) sentences.

　　(1) a. Bicycles have two wheels each.

　　　　b. Bicycles have two wheels.

　　(2) a. Unicycles have one wheel each.

　　　　b. Unicycles have a wheel.

[5] In (27), the pluralization operator only pluralizes the element it directly attaches to and it is not specified how the relation-denoting expression *have* can be factored in. I would like to note that the pluralization operator must be more complex to express the relation of the two elements in the sentence. However, this paper puts the complicated issue aside and focuses on showing that distributivity is in fact an asymmetric two-sum operation.

an element that can be multiplied. What it means is that anything that carries the (referent) uniqueness presupposition cannot be the DstrShr.

Indefinites obviously do not have the uniqueness presupposition. Poesio (1994) characteristically defines weak definites as definites that do not have the uniqueness presupposition. On the other hand, Barker (2005) argues that weak definites have the presupposition on relation uniqueness rather than on referent uniqueness. Carlson and Sussman (2005) do not specifically mention the absence of the referent uniqueness presupposition when they describe weak definites but the VP-ellipsis test they propose in fact indirectly supports it. The sloppy reading in a VP-ellipsis is only possible when there is no uniqueness presupposition. Thus, it can be concluded that, in fact, the weak definites in (22) do not carry the referent uniqueness presupposition. As they commonly show us that weak definites do not presuppose unique referents, it is natural that only the strong definites with the uniqueness presupposition cannot yield distributivity.

That is, what makes indefinites and weak definites form a natural class, as opposed to strong definites, is that the former (indefinites and weak definites) does not carry the referent uniqueness presupposition while the latter does. Thus, the underlying theme of the non-strong-definiteness condition can be stated as follows. Any element that carries the referent uniqueness presupposition cannot license distributivity since distributivity, in its nature, requires multiple referents.

Since it is straightforward that the non-strong-definiteness condition on distributivity follows from the very function of distributivity, i.e., multiplying, the condition only has a descriptive purpose and does not need to be stated independently. In the following, I will further illustrate various properties that the distinction between strong definites and weak definites can explain.

5. Spector's (2003) Observation on Scopal Asymmetry

Spector (2003) observes what he calls a "scopal asymmetry" between (28a) and (28b). For (28a) to be true, it is sufficient that each boy has read a single book. Yet, for (28b) to be true, there must be several books such that all the boys have read them. That is, (28a) allows a dependent plural reading, a one-to-one distributive reading, while (28b) does not.

(28) a. Tous les garçons ont lu des livres.
        All the boys have read books.

      b. Des livres ont été lus par tous les garçons.
         Books have been read by all the boys.

The non-strong-definiteness condition gives us a straightforward answer to the contrast observed above. In (28a), the second NP *des livres* is a weak definite. It has widely been discussed that the definite article *des* in French is weaker than the definite article in other languages. Vergnaud and Zubizarreta (1992) identify the NP with *des* as type-denoting. It seems that the type-denoting definites are weak definites in our term. That is, *des livres* in (28a) is a weak definite. whereas, in

(28b), the second NP *tous les garçons* is strongly definite. Therefore, the dependent plural reading is available in (28a) while it isn't in (28b).

The same contrast is found in English data from Kroch (1974). The sentence in (29a) has a dependent plural reading since *girls from NYC* is indefinite and there is a plural antecedent *all of these men*. However, the sentence in (29b) does not have a dependent plural reading since the potential DstrShr *all of these men* is strongly definite.

(29) a. All of these men are married to girls from NYC.

   b. Girls from NYC are married to all of these men.

The strong definiteness of the phrase *all of these men* in (29b) can be evidenced in the following VP-ellipsis test that Carlson and Sussman (2005) suggest for the distinction between strong definites and weak definites. The VP-ellipsis construction in (30) only has the strict reading and thus it can be concluded that the phrase *all of these men* is strongly definite.

(30) Girls from NYC are married to all of these men and girls from Philadelphia are so too.

The point gets clearer with examples in (31), ones slightly modified from (29). (31a) has a dependent plural reading whereas (31b) does not. Both structural cues (two plural elements in the same sentence) and lexical or pragmatic cues (standard customs of marriage) force us to have a dependent plural reading for both sentences in (31) but, in fact, only (31a) has the dependent plural reading. In (31a), the weak definite *their boys* allows the one-to-one distributive reading but the strong definite *all the boys* in (31b) blocks it.

(31) a. Girls from NYC are married to their boys.

   b. Girls from NYC are married to all the boys.

The evidence for the claim that the definite in (31a) is weak whereas the definite in (31b) is strong can be found in the same way above. The sentence in (32a) allows a sloppy reading but the sentence in (32b) does not.

(32) a. Girls from NYC are married to their boys and girls from Philadelphia are so too.

   b. Girls from NYC are married to all the boys and girls from Philadelphia are so too.

However, the contrast is observed only when world knowledge generally enables us to get the one-to-one distributive reading. As opposed to the marrying relation described above, the sentences with the verb meet in (33) do not have the dependent plural reading, regardless of the strong or weak definiteness of the direct object, because the event of meeting does not enforce the one-to-one relation between the agent and the theme.

(33) a. Some girls from NYC met their boys.

   b. Some girls from NYC met all the boys.

6. Donkey Pronouns As Weak Definites

The fact that weak definites allow distributivity can further lead us to approach various issues related to donkey pronouns in a principled manner. One of the questions involved with donkey pronouns is the uniqueness presupposition. Cooper (1979), Parsons (1978) and many others have claimed that the quantificational domain of (34) is assumed to be restricted to farmers having at most one donkey. That is, they argue that the donkey pronoun is a definite description that denotes a unique donkey per farmer.

(34) Every farmer who owns a donkey beats it.

Refuting Cooper (1979) and Parsons (1978), however, Heim (1982) convincingly argues against the uniqueness presupposition of donkey pronouns with the following example. In a context where a store sells a sage plant not individually but only by flats of nine, (35) can be uttered felicitously. Thus, Heim (1982) concludes that donkey pronouns are definite pronouns but the uniqueness presupposition is not required.

(35) Everyone who bought a sage plant here bought eight others along with it.

Heim (1982) proposes the unselective binding of quantifiers and the variable-hood of donkey pronouns. Therefore, the quantifiers of donkey sentences quantify over pairs of individuals to generate symmetric readings. This gives us an account for the sage plant example since, for every pair of person and sage plant in a buying relation, it holds that the person in the pair bought eight others along with the sage plant in the pair. However, Partee (1984), Kadmon (1987), Barwise (1987) and Chierchia (1992) and many others have pointed out that the unselective binding approach cannot handle the asymmetric readings of donkey sentences.

Thus, Heim (1990) treats donkey pronouns as E-type pronouns and relativizes the uniqueness presupposition as to minimal situations. In this approach, the sage plant sentence is interpreted as follows: every minimal situation s that includes a person and a sage plant that he bought is extensible to another situation s' where the person in the situation s bought eight others with the sage plant in the situation s. However, Chierchia (1992) points out that her way of treating the uniqueness presupposition of donkey pronouns is insufficient when it comes to the subject-asymmetric reading.

I would like to argue that analyzing donkey pronouns as weak definites can deal with the non-uniqueness property of donkey pronouns most naturally since, as discussed above, weak definites characteristically do not have the uniqueness presupposition. The claim that weak definites do not carry the referent uniqueness presupposition is evidenced by the fact that the weak definite *its author* can be used in sentence (36). In sentence (36), there are possibly as many different authors as the books. In other words, the definite description *its author* in (36) does not refer to a unique person. If the books involved are a, b, and c, then the authors involved can be three different persons.

(36) Every book was signed by its author.

In addition to giving us the benefit of accounting for the non-uniqueness of donkey pronouns, regarding donkey pronouns as weak definites can further address various issues associated with donkey pronouns/sentences. The crucial issues involved with donkey pronouns are summarized in Kwak (1996) as follows. First, as Kadmon (1987) has observed, a conditional donkey sentence may be ambiguous in three ways whereas a relative clause donkey sentence is unambiguously asymmetric to a head noun. Second, Heim (1990) and Chierchia (1992; 1995) point out that the proportional readings of the conditional donkey sentence are disambiguated by the topic structure. Third, as Rooth (1987), Schubert and Pelletier (1989), Chierchia (1992; 1995), and Lappin and Francez (1994) note, donkey pronouns may have either the ∀ reading or the ∃ reading. Fourth, Rooth (1987) observes that negated donkey sentences have only the ∀ reading. That is, donkey pronouns are ambiguous in positive donkey sentences but not in negated sentences.

What I would like to briefly discuss in the following is that characterizing donkey pronouns as weak definites can essentially address all the properties with regard to donkey pronouns/sentences listed above. First, the weak definite donkey pronouns intrinsically explicate the possibility of the distributive reading in the relative clause donkey sentences such as (34) because, as claimed before, not only indefinites but also weak definites are allowed to serve as the DstrShr. That is, in (34), the weak definite donkey pronoun *it* serves as the DstrShr with respect to the distributive antecedent *every farmer who owns a donkey* and they are in the beating relation.

The weak definite donkey pronoun further accounts for the difference between the relative clause donkey sentence and the conditional donkey sentence, noted by Kadmon (1987). He states that the relative clause donkey sentence in (37.a) has only one reading where *most* quantifies over donkey-owning farmers. However, he claims that the conditional donkey sentence in (37.b) has two more readings. In addition to the asymmetric reading as to *farmers* of (37.a), the sentence in (37.b) has an asymmetric reading as to *donkeys* such that most donkeys that are owned by a farmer are beaten and a symmetric reading such that, for most pairs of farmer and donkey standing in an owning relation, it is true that a farmer beats a donkey.

(37) a. Most farmers who own a donkey beat it.

b. If a farmer owns a donkey, he usually beats it.

The reason why (37.a) has only one reading while (37.b) can have three possible readings seems to depend on how many elements in the sentence can serve as the DstrShr. The relative clause donkey sentences such as (37.a) is unambiguous since there is only one weak definite that can be pluralized with respect to the quantified noun phrase that serves as the distributive antecedent. On the other hand, the conditional donkey sentences such as (37.b) are ambiguous since there are two weak definites that can be the DstrShr with respect to the adverbial antecedent that is interpreted as plural. The two asymmetric readings are distributive readings that are generated when either of the pronouns serves as the DstrShr with respect to the adverbial *usually* in (37.b). The reason why the symmetric reading is possible

seems to be the same as the reason why a cumulative reading is possible when there are two possible DstrShr's as in (38).

(38) Three boys invited four girls.

Landman (2000) notes the same readings (two kinds of asymmetric readings and a symmetric reading) when there are two numerals in such a sentence as (38). The sentence in (38) has a forward distributive reading such that each of the three boys invited (a possibly different group of) four girls. It also has an inverse distributive reading such that each of the four girls was invited by (a possibly different group of) three boys. He further claims that (38) has a symmetric cumulative reading such that there is a sum of inviting events that occurred between three boys and four girls.

Second, Heim (1990) and Chierchia (1992; 1995) have pointed out that the topic structure can disambiguate the readings involved with the conditional donkey sentences. Chierchia (1992) illustrates the point with the examples in (39). In (39.a), *a dolphin* is a topic and the topic structure prefers an asymmetric reading as to dolphins such that most dolphins that are trained by a trainer do incredible things. On the other hand, in (39.b) where the topic is *a trainer*, the asymmetric reading is oriented to trainers such that most trainers from here that train a dolphin make it do incredible things.

(39) a. Dolphins are truly remarkable.
          If a trainer trains a dolphin, she usually makes it do incredible things.

      b. Trainers from here are absolutely remarkable with all sorts of animals. For example, if a trainer from here trains a dolphin, she usually makes it do incredible things.

Kwak (1996) further claims that topic structure that is evoked by the *(n)un* marker in Korean also determines a preferred reading. The reason for the disambiguation can be attributed to the fact that topic definites are strong definites. Once a definite description is construed as a topic, it is globally unique and cannot serve as the DstrShr. Thus, in each of the sentences in (39), there is only one element that can serve as the DstrShr just like relative clause donkey sentences. It explains why there is only one distributive reading in (39) even though the sentence usually has three readings.

Third, many previous studies note the ambiguity of the donkey pronoun between the $\forall$ reading and the $\exists$ reading. Chierchia (1992) claims that the donkey pronoun in (40.a) has the $\forall$ reading while Schubert and Pelletier (1989) argue that the donkey pronoun in (40.b) has the $\exists$ reading. Chierchia (1992) argues that donkey pronouns are ambiguous while Lappin and Francez (1994) claim that donkey pronouns basically have the $\forall$ reading but, when the context or the world knowledge makes it impossible, it is forced to be interpreted existentially.

(40) a. Most farmers who own a donkey beat it.

      b. Most farmers who own a donkey ride it to town.

Chierchia (1992) further presents examples where the donkey pronouns only have the ∃ reading as in (41). However, Lappin and Francez (1994) claim that the ∃ readings of donkey pronouns in (41) can be shifted to the ∀ readings, as in (42).

(41) a. Every man who has a credit card will pay his bill with it.

    b. Every man who has a dime in his pocket will put it into the meter.

    c. Every man who has a hat will wear it to go to the stadium.

(42) a. Every man who has a credit card will pay a service charge for it.

    b. Every man who has a dime in his pocket will inspect it.

    c. Every man who has a hat will wear it at least once.

However, a crucial point I would like to make with regard to the examples above is that, regardless of whether the donkey pronouns have the ∀ reading or the ∃ reading, they can all be referred back to by a plural pronoun. For instance, (41a) can be followed by (43a) while (42a) can be followed by (43b). In both cases, the donkey pronoun that refers to *a credit card* is understood as a plural in the following sentences. That is, the examples in (43) show us that, regardless of the ∀ reading or the ∃ reading, the donkey pronoun *it* (the DstrShr) can commonly be referred back to by the plural pronoun.

(43) a. They are the common method of paying a bill these days.

    b. They can give you a headache when not properly taken care of.

I claim that the ambiguity of the donkey pronoun between the ∀ reading and the ∃ reading merely comes from the fact that the weak definite donkey pronoun is pluralized under the scope of the semantically plural antecedent in the process of generating distributivity. In fact, in the domain of plurals, the ambiguity between the ∀ reading and the ∃ reading is expected. That is, overall, what is involved with the donkey pronoun is plural, but, under certain circumstances, the plural reading is restricted to yield a singular meaning. This is possible since the plural includes atomic entities. For example, when Bill has plural hats as described in (44), the plural pronoun that refers back to it can have either the ∃ reading or the ∀ reading. In (45a), Bill would wear one of his hats to go to a stadium and thus the pronoun has the ∃ reading. However, in (45b), Bill would ordinarily bring all of his hats and thus the pronoun is universally interpreted. This ambiguity is expected since the plural domain includes not only the plural entities but also atomic entities.

(44) Bill has many hats.

(45) a. He wears them to go to a stadium. ('one of them')

    b. He brings them to go to see his sister. ('all of them')

In fact, previous studies such as Chierchia (1995) mentions the plural property of the donkey pronoun and Lappin and Francez (1994) try to incorporate plurality in the analysis of the donkey pronoun. However, they cannot derive it in a principled manner. Kwak (1996) points out that the reason why a singular indefinite NP and a singular donkey pronoun can denote plural individuals remains puzzling. This is the puzzle that my account can give a direct and natural answer. Donkey pronouns as weak definites can serve as the DstrShr and be pluralized to yield distributivity.

Fourth, Rooth (1987) makes the generalization that donkey pronouns have only the universal reading in negated sentences. It seems to me that the generalization is very natural once we assume that donkey pronouns are weak definites and thus do not have the uniqueness presupposition. Any element that has no uniqueness presupposition and that is under-specified with number, in general, has the "any" reading when negated as in (46), (47) and (48) just like the donkey pronoun in (49). The sentences in (46) show us that an indefinite has the universal reading under negation and the sentences in (47) tell us that a modified indefinite also has a universal reading under negation. The sentences in (48) also reveal that a weak definite has the $\forall$ reading when negated.

(46) a. She does not have a book. (indefinite)

      b. She does not have any book.

(47) a. Mary did not meet a man I introduced to her. (modified indefinite)

      b. Mary did not meet any man I introduced to her.

(48) a. They did not bring their friends. (weak definite)

      b. They did not bring any of their friends.

(49) a. Every man who has a silver coin in his pocket will not put it into the meter.

      b. Every man who has a silver coin in his pocket will not put any of it into the meter.

7. Conclusion

I have primarily discussed that not only indefinites but also weak definites license distributivity. I have also explained what makes indefinites and weak definites form a natural class as opposed to strong definites. Distributivity is plurality and what is pluralized in the process of deriving distributivity is the DstrShr that is under the scope of a plural antecedent. Therefore, the element that can serve as the DstrShr has to be something that can be multiplied. Characteristically, weak definites do not presuppose unique referents just like indefinites. In this sense, the reason why only the strong definites block distributivity is simple. Strong definites presuppose unique referents and thus they cannot be multiplied. Thus, I have claimed that the non-strong-definiteness condition needs not to be stated separately since it follows straightforwardly from the function of distributivity.

With the non-strong-definiteness condition, I have further accounted for Spector's scopal asymmetry. Moreover, by defining donkey pronouns as weak definites, I have addressed the central issues of donkey pronouns/sentences: the non-uniqueness of donkey pronouns, the difference between relative clause donkey sentences and conditional donkey sentences, the disambiguation by the topic structure, the ambiguity of donkey pronouns between the universal reading and the existential reading, and the non-ambiguity of donkey pronouns under negation.

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