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TOTAL AND PARTIAL PREDICATES AND THE WEAK AND STRONG INTERPRETATIONS*

This paper introduces an interesting class of predicates that come in pairs, so-called *total* and *partial* predicates. It will be shown that such predicates contribute to an explanation for the weak and strong interpretations of donkey sentences. This paper proposes that the phenomenon of weak and strong interpretations is real, and that whether a sentence receives the weak or the strong interpretation depends on the predicate in the nuclear scope of the sentence. It also proposes that sum individuals are calculated at some level before the nuclear scope of the sentence is processed. Once the sum individuals are calculated, it will be decided whether the nuclear scope is true of at least one element of the sum individual (weak interpretation) or true of all elements of the sum individual (strong interpretation).

1. INTRODUCTION

Consider the following pair of examples:

(1) Are the toys dirty?

(2) Are the toys clean?

Suppose a situation in which a church runs a nursery for young children. As you know, little babies always put things in their mouths, so the person in charge of the nursery is making sure whether the toys are clean or not. In this situation, our intuition is that unless all of the toys are clean, the answer to (1) should be "Yes". That is, only some of the toys being dirty would be enough to answer "Yes". However, if the question is (2), the answer should be "No".

Even without any specific situation given, when only some of the toys are dirty, the most likely answer to (1) would be something like "Yes, some of them are dirty," while the most natural answer to (2) would be something like "No, not all of them are clean. Some of them are dirty."

Take a look at another pair of examples:

(3) Did you let your paintings get damaged during the fire?

(4) Did you keep your paintings intact during the fire?

Suppose that there had been a big fire in a town and a lot of people lost their belongings or had them damaged. Suppose further that a man who

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had quite a few valuable paintings had some of them burned during the fire. In this situation, the man's most likely answer to (3) would be something like "Yes. Some of them got burned." As to (4), the most natural answer seems to be something like "No. Some of them got burned."

What we can observe with these two pairs of examples is that the predicates in (1) and (3) seem to behave differently from the predicates in (2) and (4). That is, the former predicates tend to trigger the so-called 'sloppy' or 'existential' reading while the latter tend to derive the so-called 'strict' or 'universal' reading. What seems to happen here is that the plural NPs in these sentences are interpreted as sum individuals in the sense of Link (1983), but they differ as to whether the predicate must hold for just some elements of the sum individual for all elements of the sum individual in order for the sentence to be true. If the former is the case, then the sentence is said to receive the existential reading, but if the latter is the case, then it is said to receive the universal reading.

Based on this observation, I will propose in the following sections that there exist two interesting classes of predicates, namely, *total* and *partial* predicates, which occur in pairs, and that these predicates make a contribution to an explanation for the so-called existential and universal readings, or rather the so-called 'weak' and 'strong' interpretations, not only of definite NPs as observed above, but also of quantifiers.

It will also be argued that this relation between weak and strong interpretations and the two classes of predicates, the lexical properties of which seem to tend to induce one or the other interpretation, cannot be accounted for by strictly-obeyed principles but only by tendencies or preferences, but that these preferences are strong enough to be built into the semantics.

Before we lay out the main proposal of this paper, let's get a brief overview of several phenomena which will serve as background for it.

2. BACKGROUND

2.1. *The Proportion Problem and Weak and Strong Interpretations*

Kadmon (1987, 1990), following earlier authors such as Partee (1984) and Rooth (1987), observed that in addition to the symmetric reading we find asymmetric readings for donkey sentences. For example, consider (5) and (6):

(5) Most men who own a dog take good care of it.

(6) Usually, if a man owns a dog, he takes good care of it.

Probably the only reading for (5) and one available reading for (6) is the so-called man-dominant subject-asymmetric reading. In this reading, *most* or *usually* quantifies over dog-owning men, not over man-dog pairs, contrary to what has been originally suggested in Kamp (1981) and Heim (1982).

Not only the so-called 'proportion problem' (Kadmon 1987, 1990) but also the issue of weak and strong interpretations, which was already observed by Heim (1982, pp. 60–63) and Rooth (1987), arises here, given the availability of the asymmetric reading for (5) and (6). Reconsider (5):

(5) Most men who own a dog take good care of it.
   a. Most men who own a dog take good care of at least one dog they own.
   b. Most men who own a dog take good care of every dog they own.

(5a) is the so-called weak interpretation, while (5b) is the strong interpretation of (5).

The issue of weak and strong interpretations arises when, for instance in (5), dog-owning men who own more than one dog behave in an inconsistent way toward their dogs. Suppose that there are 5 men, 3 of whom own 2 dogs each; each of these 3 takes good care of only one of his dogs. The other 2 men own one dog each and neither takes good care of his dog. In this situation, 3 men show inconsistent behavior toward their dogs. The question is whether (5) is true or false in this situation, hence whether (5a) or (5b) is the right interpretation of (5).

The phenomenon of weak and strong interpretations can also be observed in universally quantified donkey sentences. Consider (7):

(7) Every man who owns a dog takes good care of it.

Suppose we have a situation in which we have 5 men, 4 of whom own one dog each; each of these 4 takes good care of his dog. The fifth owns 2 dogs and takes good care of only one of his dogs. Given this, if sentence (7) receives the weak interpretation, then it would be true, while if it receives the strong interpretation, it would be false. Consequently, it can be observed that the issue of weak and strong interpretations arises also in universally quantified donkey sentences.

It is important to be clear about the relation between the proportion problem and the problem of weak or strong interpretations. The proportion problem is concerned with the question of which variables count for the evaluation of a quantifier structure. The problem of weak vs. strong interpretations is concerned with the question of how the variables that

do not count for the quantifier are interpreted, existentially or universally. Hence the problem of weak or strong interpretations is one level removed from the proportion problem.

In particular, the phenomenon of weak and strong interpretations shows up only in donkey sentences with asymmetric readings, so that the issue of weak vs. strong interpretations is irrelevant in a sentence with a symmetric reading. A sentence with an asymmetric reading typically has different truth conditions, depending on whether it gets the weak or strong interpretation. And yet, the reading of a sentence with a universal quantifier and with the strong interpretation is equivalent to a symmetric reading, since each single case is counted in this situation.[1] Suppose (7) receives the strong interpretation. Say we have 3 men who own 2 dogs each. In this situation, if we have at least one man who does not take good care of at least one of his dogs, (7) is false. In other words, only when all 6 available man-dog pairs verify the nuclear scope is (7) true. Therefore, the interpretation of a sentence with a universal quantifier, with an asymmetric reading, and with the strong interpretation can be said to be always tantamount to that of the sentence with a symmetric reading.

2.2. *Sum Individuals*

Based on the observation we made regarding the weak and the strong interpretations of a donkey sentence with an asymmetric reading, we could argue that some sort of sum, for example in (5), of the dog or dogs owned by each man, is calculated:

(5) Most men who own a dog take good care of it.
   a. Most men who own a dog take good care of at least one dog they own.
   b. Most men who own a dog take good care of every dog they own.

In other works, after we have established the sum of the dog(s) each man owns, we decide whether one dog (element) of the sum being taken good care of by its owner would be enough already to confirm the nuclear scope, or whether every dog (element) of the sum must be taken good care of by its owner.

I propose that the sum individuals, that is, the dog(s) each man owns

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[1] An anonymous referee pointed out that the reading of a universally quantified sentence with the strong interpretation and the symmetric reading of the same sentence could have distinct truth conditions. However, I think that is incorrect.

in (5), are calculated at some level before the nuclear scope of the donkey sentence is processed. We may paraphrase (5) as follows:

(5′) Most men who own a dog take good care of the dog or the dogs that they own.

Formally, we can represent this by means of a model-theoretic version of Neale's analysis (Neale 1990a, b), as follows:

(8) MOSTx ([man(x) ∧ ∃y[dog(y) ∧ own(x, y)]],
[take-good-care-of(x, σy[dog(y) ∧ own(x, y)])])

where σy ϕ stands for the sum individual of the y that satisfy ϕ (Link 1983).

The expression in (8) amounts only to the strong interpretation, that is, (5b). This could be considered one of the defects of Neale's analysis, since his theory cannot explain the existence of the weak interpretation, which is confirmed by the intuitions of quite a few linguists, including Heim, Rooth, Chierchia, Barker, and Kanazawa. I will suggest that sentences like (8) receive either the strong or the weak interpretation, depending on the interpretation postulate of the predicate in the nuclear scope of the sentence, here *take good care of*.

Once the sums of individuals are calculated as shown above, one would decide on whether the nuclear scope is true of at least one element of the sum individual – the weak reading – or true of all elements of the sum individual – the strong reading.

The concepts of sum individual and weak and strong interpretations can also be applied to simpler sentences, namely, sentences with definite NPs, as observed earlier in section 1. Consider (9) and (10):

(9) The children (who ate pizza here last night) got food-poisoned.

(10) The children (who are playing in the garden) are eight years old.

These sentences may be paraphrased as follows:

(9′) got-food-poisoned (σx children (x))

(10′) are-8-years-old (σx children (x)).

Sentence (9) may already be considered true if only *some* of the children got food-poisoned. On the other hand, sentence (10) is true only if *all* of the children are eight years old. Therefore, we might say that (9) gets a weak reading while (10) gets a strong reading. Furthermore, *the children* in (9)

and (10) denotes a sum individual, as in my proposed analysis for donkey sentences.

Based on these concepts, I will propose now that some classes of predicates can be interpreted as weak or strong, according to certain principles to be elucidated below. It will be shown that these predicates have similar effects in donkey sentences and in sentences involving definite NPs, supporting the analysis of donkey sentences I indicated in (8).

3. Weak and Strong Predicates

3.1. *Total and Partial Predicates*

Let's consider the following pair of sentences:

(11) The glasses are spotted.

(12) The glasses are spotless.

Say that John and Mary invited some friends over to their house, and they are expecting them in an hour or so. Mary takes some glasses out of the cupboard and realizes that a couple of the glasses have spots on them. In this situation, she is likely to say (11) but not (12). All the glasses should be clean in order for her to be able to say (12), while some of the glasses being dirty could be enough for her to say (11).

Now consider the following pair of donkey sentences, which include predicates similar to the ones in (11) and (12):

(13) Most boys who had a baseball card in their pockets soiled it while playing in the mud.

(14) Most boys who had a baseball card in their pockets kept it clean while playing in the mud.

Given a situation in which there are 5 boys, each of whom has 10 baseball cards in his pockets and 3 of whom soil at least one of their cards while playing in the mud, sentence (13) seems to be true without any specific context given. Concerning (14), if we have 5 boys who have 10 baseball cards each in their pockets and at least 3 of them keep all of their cards clean while playing in the mud, then the sentence is true. However, if at least 3 out of the 5 boys do not keep at least one of their baseball cards clean, then the sentence seems to be false.

Consider another pair of quantified examples:

(15) Most farmers who owned a donkey let it get sick during the rainy season.

(16) Most farmers who owned a donkey kept it healthy during the dry season.

As for (15), without any specific context given, the preferred reading seems to be such that if a farmer who owned more than one donkey let only some of his donkeys get sick while keeping the other donkeys healthy, that seems to be enough for him to be counted as one of the confirming cases. On the other hand, our intuition about (16) seems to be such that if a farmer who owned more than one donkey kept only some of his donkeys healthy during the dry season while letting the other donkeys get sick, then we tend not to count him as one of the cases that confirm the statement.

Let's take one more pair of predicates into consideration:

(17) Are the windows open?

(18) Are the windows closed?

Suppose that a family is about to set out for a trip. The father is asking the children whether the windows in the house are closed or open. The preferred reading for (17) is such that some of the windows of the house being open seems to be enough for the children to be able to say "Yes" to the question. On the other hand, in the case of (18), if only some but not all of the windows of the house are closed, the children cannot answer "Yes". Only when all of the windows of the house are closed is the answer to (18) "Yes".[2]

Now consider the following pair of donkey sentences, which include predicates similar to the ones in (17) and (18):

(19) Usually, if a man has a garage with a window$_i$, he keeps it$_i$ open while he is at home.

(20) Usually, if a man has a garage with a window$_i$, he keeps it$_i$ closed while he is away.

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[2] Manfred Krifka (p.c.) and an anonymous referee point out that for the predicates *open* and *closed* the lexical distinction between 'total' and 'partial', which will be discussed shortly, doesn't seem to be as plausible as for predicates like *dirty* and *clean*. A test case might be 'Are the doors open?' and 'Are the doors closed?' in the context of a high security building which can only be entered through a series of three subsequent doors. Suppose that the outmost door is closed but the two inside doors are open. In this situation, we would not normally say that 'the doors are open.' What a sentence like 'The x are open' means, where x denotes potential openings of an enclosure, is rather: 'The enclosure of which the x are potential openings is open.' Note, however, that the intuitions may be inverted here: If the issue is for us to get in, the first question reads 'Are all the doors open?' (strong reading; if not we cannot enter) and the second one 'Is any of the doors closed?' (weak reading; if so we cannot enter).

Our intuition about (19), with respect to a subject-asymmetric reading, seems to be such that if a man has one garage with two windows, he would only need to keep one window in his garage open in order to qualify as a verifying case. As for (20), his keeping one window of his garage closed does not seem to be enough. Only when he keeps all the windows of his garage closed does he seem to qualify as a verifying case.

Now, one generalization we can make about the paired examples in (11)–(20) is that the existential or weak interpretation is preferred for sentences (11), (13), (15), (17), and (19) while the universal or strong interpretation is preferred for (12), (14), (16), (18), and (20). So it seems that one and the same semantic distinction is responsible for the strong vs. weak interpretation in simple predications of sum individuals and in donkey sentences. So what is the nature of this semantic distinction?

Rossdeutscher and Kamp (1992) classify certain predicates into two classes: 'universal' concepts, such as *healthy*, *clean*, and *closed*, and 'existential' concepts, such as *ill*, *dirty*, and *open*. For instance, if someone is said to be healthy, all of his body parts are assumed to be healthy, while if someone is said to be sick, only one part of his body's being sick suffices to confirm the statement. Alternatively: someone who is healthy is free of all sicknesses; to be ill means to have at least one illness. If a glass is said to be clean, then it is said to be clean all over, while if a glass is said to be dirty, then a spot or two on it would be enough to confirm the statement. If the windows of a room are said to be closed, every window in the room should be closed, while if the windows of the room are said to be open, then only one window's being open would suffice. Therefore, the predicates corresponding to the 'universal' concepts *healthy*, *clean*, and *closed* mean 'free of sickness', 'free of dirt', and 'free of openness', respectively.

I will call the 'universal' class of predicates *total* predicates and the 'existential' class *partial* predicates. Using '$\sqsubseteq$' as a symbol for the semantically relevant part relation (Moltmann 1991), the criterion for distinguishing total from partial predicates is the following:

(21) If P and Q are a pair of lexicalized antonyms,[3] it holds that
a. if $P(x) \wedge y \sqsubseteq x \rightarrow P(y)$, and
b. if $Q(x) \wedge x \sqsubseteq y \rightarrow Q(y)$,
then P is a *total* predicate and Q is a *partial* predicate, where $\sqsubseteq$ is the semantically relevant part relation.

[3] This clause expresses the requirement that total and partial predicates come as pairs of lexical entries. In other words, the existence of a corresponding lexicalized predicate, not just the trivial existence of a corresponding negative predicate, is required.

Based on this criterion, predicates like *healthy*, *clean*, and *dry* do indeed qualify as total predicates while predicates like *sick*, *dirty*, and *wet* are partial predicates. For example, suppose we are speaking about a towel. In order for us to be able to say that the towel is dry all parts of the towel should be dry. If only one part of the towel is wet, this would be enough for us to be able to say that the towel is wet. Similarly, suppose that we have a little boy who just came home from the playground. In order for us to be able to say he is clean, all parts of his body should be clean. If only his hands are dirty, this would already be enough for us to be able to say that the boy is dirty.

Now consider the verb *own*. For example, if you own a house, you own all parts of the house. If you own an apartment, this does not necessarily mean that you own the whole apartment complex which the apartment you own is part of, even if you own all parts of the apartment you own. This appears to qualify *own* as a total predicate with respect to the object argument. However, there does not seem to be a lexicalized partial counterpart of *own* which satisfies the definition in (21). Therefore *own* does not actually qualify as a total predicate. For the same reason, predicates like *lose something*, *take good care of something*, and *put something in somewhere* do not qualify as total predicates. Although these predicates satisfy part of the definition, their lexicalized counterpart partial predicates do not exist.

One thing that we can observe from the above discussion is that we need to elaborate on the part relation in the definition of total and partial predicates given in (21), since it is not clear what qualifies as a part of an entity in the definition. For example, if you have a towel and you say that the towel is wet, then it seems that just a tiny bit of the towel being wet would not be enough to make your statement true, depending on the context. In other words, if someone needs a totally dry towel to cover an expensive electronic machine, a small but noticeable part of the towel being wet would be enough for you to say that the towel is wet. On the other hand, if someone needs a towel to dry his body, some small wet spots in the towel might be ignored. And yet, if there is a rather biggish wet spot in it, you would say that the towel is wet. This is a matter of vagueness, but the distinction between total and partial predicates cannot be reduced to vagueness.

What we can conclude from this observation is that the part relations discussed above cannot be subsumed under simple mereological or set-theoretical part relations. Therefore, we will adopt a situation-dependent notion of part structures (Moltmann 1991), which not only seems to be well suited to our analysis, but also has advantages over both mereolog-

ical and set-theoretical part relations. Let's elaborate on this theory with some examples from Moltmann's paper:

(22) All of the ground was speckled with leaves.

(23) a. All of the students collaborate.
b. All of the students found a solution.

Moltmann (1991) notes that *all* in (22) does not quantify over any physical parts of the ground, but only over 'contextually relevant parts'.

Suppose you just heard from a friend of yours that one of his parents has been hospitalized due to a serious heart problem, and you were asked if your parents were healthy. You had happened to call your parents two days earlier and had heard that your mother was laid up with a cold and your father was suffering from a toothache. In this situation, normally you would say that your parents are healthy. In other words, what seem to count as relevant sicknesses here are only the serious ones. A dislocated shoulder or a twisted ankle would not count as a serious sickness in this situation. On the other hand, for a basketball player who is asked if he is healthy enough to play in a game, a dislocated shoulder or a twisted ankle would count as a serious sickness which would make him say that he is not healthy.

Sentences (23a, b), which involve plural quantification, illustrate the context dependency of the part relation more clearly. Sentence (23a) can be interpreted in several ways, depending on the context. It is possible that each student collaborates with other students, in one situation. In another situation, the students are partitioned into subgroups, and collaboration occurs only among members of each of the subgroups, not among members of different subgroups. (23b) can be interpreted in such a way that each student found a solution individually. In another situation, it is possible that the students are partitioned into certain subgroups and each subgroup found a solution as a group.

In sum, the part relation used in (21) is a situation-dependent part relation in the sense of Moltmann (1991), so that the criterion for distinguishing total from partial predicates, and total and partial from other predicates, will depend on each given situation.

Now let us go back to our main topic in this subsection, namely, the distinction between partial and total predicates. The phenomenon which we observe in sentences with partial predicates seems to be based on an avoidance of overspecificity. In other words, the price of being too specific in our speech is usually so high that we tend to settle for a general meaning or interpretation. As I mentioned earlier, this avoidance of overspecificity

is not strictly observed in all situations. For instance, let's say there are 20 students in a class and only one of them is sick. In this situation, one would not say that the students are sick. This is a matter of vagueness.

One the other hand, suppose that there is a working mother who has four children. One morning, she finds that two of her children are feverish and calls her boss to stay home. In this situation it is more natural for her to say "My children are sick" than for her to say "Two of my children are sick." Similarly, if only one of your hands is dirty, you will tend to say "My hands are dirty" rather than "One of my hands is dirty."[4] I should reiterate that the phenomenon of avoidance of overspecificity is not a strictly obeyed rule, but rather a general tendency. Yet it is a widely observed natural language phenomenon, as confirmed by the results of two surveys I conducted.[5]

In sum, we have found that classifying certain predicates into two types, total and partial predicates, helps provide an account for the phenomenon of weak and strong interpretations. Due to certain lexical properties, total predicates tend to derive the strong interpretation, while partial predicates tend to trigger the weak interpretation in a neutral context. Hence the former could also be called strong predicates and the latter weak predicates.

However, this observation does not suffice completely to provide an account for the strong/weak distinction, since not all predicates can be classified as total or partial predicates. In the remainder of this section, we will see how other sorts of predicates can be classified into other categories in a way that contributes to a more comprehensive explanation.

Before closing this subsection, it might be helpful to give a table of the total and partial predicates I know of:[6]

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[4] It should be pointed out, though, that there must be some reason to pick out the larger entity. For instance, in the 'mother' example, for the mother, *the children* denotes a relevant entity whose parts share many properties.

[5] For detailed discussion of the data and the statistical results of these questionnaire experiments, refer to Kang (1994).

[6] In table (24), the two predicates *filled* and *dressed* in the partial column could be argued to qualify as total predicates rather than partial predicates.

(24)

Total Predicates	*Partial Predicates*
healthy	sick
closed, stopped up, blocked	open, opened up, penetrated, leak
clean, kept clean	dirty, soiled
spotless	spotted
in good order	out of order
kept intact	damaged, broken, burned
dry	wet
rejected	accepted
fail	pass
perfect, flawless	faulty, flawed
complete	incomplete
finished	in progress
thorough	limited, careless, negligent
level, smooth, even	rough, rugged(?)
straight	curved(?)
empty	fill(ed)(?)
naked	dressed(?)
move away from	move towards
run out, used up, out of, gone, want, lack, devoid of, deficient	exist, in existence, left, remain
out of stock	in stock
innocent, clear of (from)	guilty
turn out, turn off	turn on
clear, obvious	obscure, vague

3.2. *Negation of Total and Partial Predicates*

As we will see in the following, total and partial predicates seem to behave similarly in downward monotone contexts as well as in upward monotone contexts. First, consider a couple of examples of negated predications on plural definite NPs:

(25) The glasses are not clean. (I.e., at least some of the glasses are dirty.)

(26) The glasses are not dirty. (I.e., none of the glasses is dirty.)

Intuitively, (25), which contains a total predicate in a downward monotone

context, seems to prefer a strong reading, whereas (26), which includes a partial predicate in the same context, appears to prefer a weak reading. Consequently, sentences (25) and (26) seem to be equivalent to sentences (27) and (28), respectively:

(27) The glasses are dirty.

(28) The glasses are clean.

In other words, total predicates in upward monotone contexts are equivalent to their partial counterparts in downward monotone contexts, and partial predicates in upward monotone contexts are equivalent to their total counterparts in downward monotone contexts.

We find the same preferences for quantified sentences. First, a couple of examples with a partial predicate in a downward monotone context:

(29) Most farmers who have a donkey do not let it get sick during the dry season.

(30) Most boys who have a baseball card in their pockets do not soil it while playing in the mud.

We can observe from (29) and (30) that if a quantified sentence has a partial predicate in a downward monotone context in its nuclear scope, an existential interpretation is preferred on an asymmetric reading. In the above sentences, in order for a farmer or a boy to qualify as a verifying case, it should not be the case that he lets any of his donkeys get sick during the dry season, or that he soils any of his baseball cards while playing in the mud.

Now, take a look at a couple of examples combining a total predicate with a negative quantifier:

(31) No farmer who has a donkey keeps it healthy during the rainy season.

(32) No boy who has a baseball card in his pocket keeps it clean while playing in the mud.

With (31), the preferred reading seems to be such that if a farmer who has more than one donkey keeps all of his donkeys healthy during the rainy season, he will be counted as a verifying case. What (31) states is that no such farmer exists. The preferred reading for (32) is such that if a boy who has more than one card in his pocket keeps all of his cards clean, then he will qualify as a verifying case.

In sum, we can generalize that total and partial predicates seem to behave in the same way in downward monotone contexts as in upward monotone

contexts, with respect to their preferred interpretations. Another interesting observation we can make regarding (31) and (32) is that donkey sentences with the determiner *no* prefer to receive the universal interpretation when they have a total predicate in their nuclear scope, contrary to Rooth's (1987) generalization and Kanazawa's (1994) theory.

3.3. *Normal Stative and Episodic Predicates*

In this subsection, we will see how those predicates that are neither total nor partial can be classified into weak or strong predicates, depending on which reading they favor. The pair of predicate classes we are going to examine here are *stative* and *episodic* predicates.[7] First, let's reconsider the following two sentences with definite NPs which were discussed in section 2:

(9) The children (who ate pizza here last night) got food-poisoned.

(10) The children (who are playing in the garden) are eight years old.

As discussed earlier, sentence (9), which contains an episodic predicate, *may* be true even if not all of the children got food-poisoned. On the other hand, sentence (10), which contains a stative predicate, is not true unless all of the children are eight years old. If only some of the children are eight years old while the others are not, then the sentence would be false. Now consider another sentence with an episodic predicate:

(33) The children built the raft.

As Link (1983) points out, sentence (33) may be true if only some of the children participated in building the raft. Say we have a group of five children. Two of the five children knew how to make a raft and actually worked to build the raft, while the other three just watched the first two build it. In this situation, you could utter sentence (33) truthfully.[8]

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[7] I consider individual-level predicates and stative predicates on the one hand, and stage-level predicates and episodic predicates on the other hand, to be the same predicate types, respectively, without discriminating them. Furthermore, since the stative and episodic predicates considered here are the complement predicates of total and partial predicates, I call them *normal* episodic and stative predicates for convenience.

[8] Note, though, that the following sentence seems to work differently from sentence (33):

(i) John, Mary, Bill, Sue, and Bob built the raft.

Intuitively, this sentence, in which the participants are identified, seems to be felicitous only in situations in which all five children actually participated in the event of building the raft.

But one possible problem with this example is that (33) is interpreted to have the collective reading. Sentences with the collective reading usually seem to receive the weak interpretation. Therefore, it is suggested that factors other than the predicate category play a role for assigning the weak or the strong interpretation to sentences with normal episodic predicates like (33). Let's take a look at another sentence with an episodic predicate:

(34) The children walked to school.

Sentences like (34) with predicates that express changes of state for the subject NPs tend to induce a strong interpretation. The following example, which contains an episodic predicate, also seems to induce a strong reading.[9]

(35) The frozen pies were put into the refrigerator.

Now take a look at some comparable donkey sentences:

(36) Usually, if a farmer owns a donkey, he takes good care of it.

(37) Usually, if a farmer sees a donkey, he pets it.

Let's consider sentences (36) and (37) with respect to a farmer-dominant asymmetric reading.[10] Our intuition tells us that the weak interpretation is possible for sentence (37), which has an episodic predicate in the matrix. Let's say that we have five farmers. It is possible for a farmer to see one donkey or more than one donkey at a time. Of the donkeys he sees, how many he pets doesn't seem to matter, as long as he pets at least one of the donkeys he sees. If for at least three of the five farmers it is the case that each of them pets at least one of the donkeys he sees whenever he sees any, the sentence seems to be true.

On the other hand, sentence (36), whose matrix predicate is a stative, seems to prefer the strong interpretation. For example, if we have five farmers who own three donkeys each, and if each of them takes good care of only one of his donkeys, then the sentence appears false with respect to the farmer-dominant reading. In this case, there is no point in uttering (36) if most of the farmers take good care of some donkeys they own, but do not take good care of others.

Thus it seems that only for sentences with definite plural NPs like (33) and donkey sentences, in which the members of the sum individual are referred to as a team or a unit without being individually identified, the weak interpretation is available, depending on the predicate.

[9] This example is due to Lee Baker (p.c.).

[10] According to Krifka (1992, 1993), if *a donkey* in (36) and (37) is in focus, both of the sentences would get a farmer-dominant asymmetric reading.

But consider the following donkey sentence with an episodic predicate:

(38) Most men who had been possessing an illegal gun brought it to the police station during the voluntary reporting period.

According to our intuition based on our world knowledge, it seems to be natural for sentence (38) to get the strong interpretation rather than the weak interpretation.

Have a look at two more pairs of quantified sentences, which are taken from the linguistic literature:

(39) a. Usually, if a man has a daughter, he loves her.
b. Usually, if a man owned a slave, he owned his offspring.

(40) a. Usually, if a man has a quarter in his pocket, he puts it in the meter.
b. Usually, if a man has a TV dinner in the fridge, he eats it.

The predicates in the nuclear scope of (39a, b) are stative predicates, whereas those in (40a, b) are episodic predicates. What I'd like to argue here is that normal stative predicates are strong predicates in the sense that they will normally trigger the strong interpretation for sum individuals. Concerning normal episodic predicates, as we have discussed above, factors other than the predicate category itself, including contextual factors, clearly seem to play a role in deriving the weak or the strong interpretation for sum individuals. Hence we cannot really classify normal episodic predicates as weak predicates.[11]

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[11] As in sentence (34), one factor that seems to determine the interpretation of normal episodic predicates is whether they can be understood as (abstract) movement verbs in the sense of Gruber (1965):

a. (Abstract) movement to a specified goal:
y walks to x: y moves to x
z puts y to x: y moves to x
y eats x: x moves into y's inside

b. No (abstract) movement:
x pets y
x sees y
x feeds y

In cases like (a) the strong interpretation is basic, while in cases like (b) the weak interpretation is basic.

Barker's (1992) 'domain narrowing' could also be mentioned as one of the factors that seem to play a role for some cases with normal episodic predicates that trigger the weak interpretation. Barker proposes that depending on context and the content of the *if*-clause, the domain of application of quantificational statements is narrowed to relevant situations. In a situation in which domain narrowing is applied, not all of the instances of a case are relevant

3.4. *Negation of Normal Stative and Episodic Predicates*

Normal stative and episodic predicates in downward monotone contexts behave in the same way, contrary to total and partial predicates in the same contexts. To see this, first have a look at some simple sentences with plural definite NPs:

(41) a. The children are not making a toy plane.
b. The children did not go to school today.

(42) a. The children are not from Texas.
b. The children do not like jazz.

As for (41a, b), which include a normal episodic predicate, in order for them to be true, it should not be the case that any of the children is participating in making a toy plane or went to school today. The same can be said for (42a, b). In order for them to be true, it should not be the case that any of the children comes from Texas or likes jazz.

The examples confirm my generalization, namely, that sentences with either a normal episodic or a normal stative in negation contexts receive the weak interpretation. We can see that this generalization also applies to quantified sentences, as illustrated by the following two sentences containing normal episodics:

(43) Usually, if a man sees a donkey, he does not pet it.

(44) Usually, if a man puts a quarter in the slot machine, he does not win money with it.

As for (43), on a man-dominant asymmetric reading, in order for a man to qualify as a verifying case, it should not be the case that he pets any of the donkeys he sees in any instance. The same can be said for (44). If it is the case that a man wins any money by putting any of the quarters he has in the slot in any instance, the man is not a verifying case. A couple of examples with a normal stative follow:

(45) Usually, if a man owns a donkey, he does not cherish it.

(46) Usually, if a man owns a house, he does not maintain it well.

Intuitively, we get the existential interpretation for both of the above sentences with respect to an asymmetric reading. On a man-dominant reading,

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instances for the quantification in the sentence. Therefore, according to Barker, only the relevant instance(s) of a case confirming the nuclear scope would be enough to verify the case, and the weak interpretation is explained.

for instance, if it is the case that a man who owns more than one donkey cherishes any of his donkeys, he does not count as a verifying case in sentence (45). As for (46), if it is the case that a man who owns two houses maintains one of them well even though he neglects the other, he is not a verifying case.

We have observed earlier that donkey sentences based on the determiner *no* seem to prefer the universal interpretation when the predicate of the matrix clause is total, contrary to Rooth's and Kanazawa's generalizations. In order to see how donkey sentences of the same type behave when the predicate of the matrix is a normal stative or episodic, let's consider a couple of examples which involve a negative nominal quantifier instead of an adverbial quantifier:

(47) No parent with a son still in high school has ever lent him the car on a weeknight.

(48) No man who owns an heirloom takes good care of it.

In (47), which has an episodic in the matrix, we see that any parent with one or more sons still in high school who has ever lent at least one of his/her sons the car on a weeknight will count as a verifying case; if there is at least one such parent, then the sentence would be false. This also seems to be the case for sentence (48), which contains a stative predicate. Any man who owns one or more than one heirloom and takes good care of at least one of his heirlooms will verify the nuclear scope; and the existence of at least one such man would falsify the sentence.

Therefore both of the sentences seem to get the weak interpretation, and to confirm Rooth's and Kanazawa's generalizations. This could be stated as a general rule for downward monotone contexts. That is, in downward monotone contexts, both normal stative predicates and episodic predicates are interpreted existentially. In this they contrast with total and partial predicates, which behave differently in downward monotone contexts, as we discussed above. That is, total predicates are interpreted universally while partial predicates are interpreted existentially.

3.5. *Summary*

In this section, I have classified predicates into weak and strong predicates depending on which reading they prefer. Furthermore, I have classified weak and strong predicates into the following eight distinct predicate categories:

(49)

Contexts \ *Predicates*	*Weak predicates*	*Strong predicates*
Upward Monotone	partial (normal episodic)	total normal stative
Downward Monotone	partial normal stative/episodic	total

A predicate which falls into one of the categories given in the right column of the diagram in (49) normally prefers the strong interpretation, while a predicate which belongs to a category in the left column may trigger the weak interpretation, which could be explained by an avoidance of over-specificity in natural language use.

Concerning normal episodic predicates, which are placed in parentheses in the above diagram, recall that factors other than the predicate category seem to affect the interpretation they prefer, so that we cannot reliably classify them as weak predicates.

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