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Title	Noun Phrase Interpretations and Situation
Author(s)	水野 史土 (Fumito Mizuno)
<i>Citation</i>	Theoretical and applied linguistics at Kobe Shoin, No.6 : 123-130
Issue Date	2003
Resource Type	Bulletin Paper / 紀要論文
Resource Version	
URL	
Right	
Additional Information	

# Noun Phrase Interpretations and Situation

Fumito Mizuno

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## Abstract

Common noun phrases have more than one interpretation. Ever since Carlson (1977), kind interpretation and object interpretation are assumed to be the two basic interpretations. Japanese bare nouns are more complex, since Japanese lacks overt determiners and nouns are ambiguous between existential interpretation and definite interpretation. Not only that, common noun phrases can be used as if they were proper nouns, for example, *shushoo* 'prime minister' can be used to refer to the specific individual. This paper discusses these various interpretations of noun phrases and how interpretations are determined in a given situation. My proposal is that the situation determines the interpretations of common noun phrases. Adding the notion of situation into the Derived Kind Predication (DKP), proposed by Chierchia (1998), relations of existential interpretation, definite interpretations and unique, proper-noun like interpretations of common noun phrases are explained uniformly and straightforwardly.

## 1. Introduction

Noun phrases are interesting since they are ambiguous, that is, they get more than one interpretation. Common nouns have a kind interpretation and an object interpretation, while proper nouns have only an object interpretation. (Here, the terms *kind* and *object* are used, following Carlson (1977), Chierchia (1998).) For example, a bare noun *kuruma* 'car' is interpreted either as kind, as shown in (1a), or as object, as shown in (1b).

- (1) a. *kuruma-wa takai*  
car-TOP expensive  
'Cars are expensive.'
- b. *kuruma-o katta*  
car-ACC bought  
'I bought a/the car(s).'

In (1a), *kuruma* refers to a kind, that is, properties shared by cars, while in (1b), *kuruma* refers to an object. Carlson (1977) claims that the actual interpretation of English bare plurals is

determined by predicates, and Gunji (2000) claims that Carlson's (1977) claim is also valid in Japanese bare noun phrases.<sup>1</sup>

In this paper, we consider only object interpretations, and predicates are restricted to stage-level predicates, which require object interpretations of noun phrases. Following Chierchia (1998), we assume here that nouns are basically interpreted as kind. Thus we need a mechanism that shifts kind-denoting nouns to object-denoting nouns. Chierchia (1998) hypothesizes Derived Kind Predication (hereafter DKP), which enables us to get object-denoting nouns from kind-denoting nouns.<sup>2</sup> The definition of DKP is shown in (2).

(2) *Derived Kind Predication (DKP)*

If P applies to objects and k denotes a kind, then

$$P(k) = \exists x[\cup k(x) \wedge P(x)] \quad (\text{Chierchia, 1998})$$

Here, the operator  $\cup$  is used, which is a function from a kind to a corresponding predicate. This operator is defined in Chierchia (1998) as follows.

(3) Let d be a kind. Then for any world/situation s,

$$\cup d = \begin{cases} \lambda x[x \leq d_s], & \text{if } d_s \text{ is defined} \\ \lambda x[\text{FALSE}], & \text{otherwise} \end{cases}$$

where  $d_s$  is the plural individual that comprises all of the members of the kind.

(Chierchia, 1998)

We will not consider the details of the definition. I basically follow Chierchia (1998), and I discuss how situation plays an important role for the application of DKP.

Also it is well known that Japanese lacks overt determiners and that bare noun phrases appear freely in argument positions (Chierchia, 1998; Kurafuji, 1999). Therefore, Japanese bare noun phrases are ambiguous between existential interpretations and definite interpretations, as shown in the translation of (1b). One of the topics in this paper is to propose that definite interpretations derive from existential interpretations, with the aid of situation. In section 2., we will discuss this topic.

Not only that, common noun phrases have another interpretation. In some cases they can refer to a specific individual. In other words, common noun phrases can be used as if they were proper nouns. For example, *shushoo* 'prime minister' is used to refer to Junichiro Koizumi, as shown in (4).<sup>3</sup>

- (4) Shushoo-ga            kita  
       prime minister-NOM came  
       'The prime minister came.'  
       = 'Junichiro Koizumi came.'

In section 3., I argue that this interpretation derives from object interpretation, and that in this case also situation plays an important role.

<sup>1</sup> Carlson (1977) introduces two types of predicates, individual-level predicates and stage-level predicates. See Carlson (1977) and Krifka, Pelletier, Carlson, ter Meulen, Chierchia, and Link (1995) for details.

<sup>2</sup> Chierchia (1998) proposes that kind interpretation is the basic interpretation, and that object interpretation is derived from kind interpretation.

<sup>3</sup> At the time of this writing, the prime minister of Japan is Junichiro Koizumi.

## 2. Existential Interpretation and Definite Interpretation

It is well known that Japanese noun phrases are ambiguous between the existential interpretation and the definite interpretation. In this section, we will consider the existential interpretation and the definite interpretation of noun phrases. Consider the sentence (5).

- (5) Sensei-ga kita  
 teacher-NOM came  
 ‘A/The teacher came.’

As the translation shows, (5) can be interpreted either existentially or definitely.

I claim that the ambiguity between the existential interpretation and the definite interpretation are dependent on situation, and that when a situation is given, interpretations of noun phrases are determined.<sup>4</sup> That is, situation disambiguates the interpretations of noun phrases. Usually, noun phrases get existential interpretation, and when situation makes it possible to specify the referent uniquely, the existential interpretation is turned into the definite interpretation.

Now we will consider the semantic interpretations of (5). The step of computation is shown in (6).<sup>5</sup>

- (6) Sensei-ga kita. (=5)
- a.  $\Rightarrow \exists x[\cup \text{teacher}(x) \wedge \text{came}(x)]$  (existential interpretation)  
 ‘A teacher came.’
- $\Downarrow$  by DKP (2)
- b.  $\Rightarrow \lambda s [\iota x[\cup \text{teacher}(x) \wedge \text{came}(x)]](s_1)$  (definite interpretation)  
 ‘The teacher came.’

By applying DKP (2), we get the interpretation (6a). This is the existential interpretation. With the aid of situation, we can get the interpretation (6b) from (6a). This is the definite interpretation.

When does the definite interpretation arise? In order to get the definite interpretation, potential referents must be specified by the situation. In the case of (5), a situation such as (7) satisfies this requirement.

- (7)  $s_1$  : Students are in the classroom, and waiting for the teacher, who is in charge of this class.

In the situation where the potential referents are specified, the existential interpretation is no longer available, only the definite interpretation is allowed. For this reason, Chierchia’s (1998) DKP, shown in (2) is insufficient. I propose a modification of DKP as shown in (8), where situation is added.

- (8) *DKP (with situation)*  
 If P applies to objects and k denotes a kind, then in a given situation  $s_i$   
 $P(k) = \lambda s [\exists x[\cup k(x) \wedge P(x)]](s_i)$

<sup>4</sup>We assume in this paper that situation consists of time, location, and a set of participants.

<sup>5</sup>Here,  $\iota x$  represents the function which picks up the largest set of x. Possibly the number of the members is only one.

(8) accounts for the interpretations of noun phrases uniformly and straightforwardly; noun phrases generally get existential interpretation (9a), while in a situation where the referent(s) are specified, noun phrases are interpreted as definite (9b).<sup>6</sup> That is, situation feeds the conversion from  $\exists$  operator to  $\iota$  operator.

(9) Sensei-ga kita. (=5)

a.  $\Rightarrow \lambda s [\exists x [\cup \text{teacher}(x) \wedge \text{came}(x)]](s_1)$  (existential interpretation)  
'A teacher came.'

↓ by DKP with situation (8)

b.  $\Rightarrow \lambda s [\iota x [\cup \text{teacher}(x) \wedge \text{came}(x)]](s_1)$  (definite interpretation)  
'The teacher came.'

Since the situation  $s_1$  is introduced simultaneously with the  $\exists$  operator, the  $\exists$  operator is obligatorily turned into an  $\iota$  operator. That is, when a given situation uniquely determines the potential referent(s), the definite interpretation is forced and the existential interpretation is no longer available. Bare noun phrases are lexically ambiguous between existential interpretations and definite interpretations, but when we put them into a situation, ambiguity vanishes.

Interestingly, in a situation (7), only the bare form *sensei* 'teacher' is appropriate (at least preferable). For example, (10) is inappropriate.

(10) # Tannin-no sensei-ga kita  
in charge of-GEN teacher-NOM came  
'The teacher of the class came.'

In (10), the referent is uniquely determined both by the situation  $s_1$  and the linguistic expression *tannin*, hence (10) is redundant. The reason why (10) is inappropriate is that they violate the maxim of quantity, proposed by Grice (1975). This supports the idea that bare noun phrases having the specific referent in a given situation are unambiguously interpreted as definite. If bare noun phrases are unambiguously definite, overt expressions that remove ambiguity are redundant and unnecessary.

### 3. Uniqueness

In section 2. we have seen how the interpretations of common noun phrases are explained, by introducing the notion of situation. In this section we will see that common noun phrases can be used as if they were proper nouns. I claim that my proposal in section 2. also accounts for such uses of common noun phrases.

<sup>6</sup>In fact, specifying the referent is a difficult problem. Consider the sentence (i).

(i) Yesterday the dog got into a fight with the neighbour's dog.

(Cooper, 1996)

In (i), there are two dogs but still we can use 'the dog' to refer to a specific individual (in this case, probably the speaker's dog). The example (5) also has this problem, since in the given situation, it is predictable that there are teachers other than the teacher in charge of this class. It is amazing that we can specify the referent in such cases. In addition to situation, other factors such as the speaker's expectation may play a role. This is an interesting topic, but remains to be solved. I leave this topic for another paper.

### 3.1 Situation Independent Uniqueness

When a common noun phrase refers to an object which can be uniquely specified, such a noun phrase is used to refer to a specific object, in the same way as a proper noun. Here is an example.

- (11) Fukanzenseiteiri-o            shoomeishita hito-wa    tensai da  
 Incompleteness theorem-acc proved            person-TOP genius is  
 ‘The person who proved the Incompleteness theorem is a genius.’

We can interpret (11) as ‘Kurt Gödel is a genius.’ How is such an interpretation obtained? The step of computation is shown in (12).<sup>7</sup>

- (12)            Fukanzenseiteiri-o shoomeishita hito-wa tensai da.    (=11)

- a.  $\Rightarrow \exists x[\cup\text{proved\_ICT}(x) \wedge \text{genius}(x)]$   
 ‘There is a person who proved the ICT and is a genius.’

↓ by DKP (2)

- b.  $\Rightarrow \iota x[\cup\text{proved\_ICT}(x) \wedge \text{genius}(x)]$   
 ‘The person who proved the ICT is a genius.’

↓ by world knowledge

- c.  $\Rightarrow g$ , such that  $[\cup\text{proved\_ICT}(g) \wedge \text{genius}(g)]=1$ , that is, Kurt Gödel  
 ‘Kurt Gödel is a genius.’

By applying DKP (2), we get the interpretation (12a). Since we know the fact that the prover of a theorem is a unique individual, and the referent is determined independently of situation, we get the interpretation (12b).<sup>8</sup> Furthermore, since the prover of the Incompleteness theorem is Kurt Gödel, we get the interpretation (12c).

Note that the interpretation (12c) is not the (direct) result of DKP (2). The fact that the prover of a theorem is uniquely determined is independent of the knowledge of the actual prover of the Incompleteness theorem. Those who don’t know the fact that the prover of the Incompleteness theorem is Kurt Gödel are unable to obtain the interpretation (12c), but still, they can get the interpretation (12b). Without the knowledge of the actual prover of the Incompleteness theorem, we can use ‘fukanzenseiteiri-o shoomeishita hito’ to refer to the specific person.

In sum, the interpretation (12b) is obtained from the application of DKP (2), which is a semantic operation, and the interpretation (12c) comes from our world knowledge, an area of pragmatics.

In these cases situation is not important, since for any given situation the prover of the Incompleteness theorem is uniquely determined and the referent is stable in any given situation. But it does no harm to introduce situation, as in (8). In these cases, any situation maps to the same referent.

<sup>7</sup>Here, *ICT* is the abbreviation for *Incompleteness theorem*.

<sup>8</sup>Note that the number of referents is not fixed at one. There are cases where a unique set of objects is determined, instead of a unique object, for example, *nijuu rasen-no hakkensha* ‘the discoverers of the Double Helix’ refers to ‘James Watson and Francis Crick.’ In such cases, the largest set is chosen as the referent, by the semantics of the  $\iota$  operator.

### 3.2 Situation Dependent Uniqueness

In section 3.1, we have seen cases where a referent is uniquely determined independently of situation. In this section we will consider cases where a referent is uniquely determined, but dependent on situation: nouns such as *daitooryoo* 'president' and *shushoo* 'prime minister'. Consider the sentence (13).

- (13) *Shushoo-ga kita*  
 prime minister-NOM came  
 'The prime minister came.'

With the knowledge in (14), we can interpret the sentence (13) as (15).

- (14) The prime minister is Junichiro Koizumi.

- (15) The interpretation of (13)  
 Junichiro Koizumi came.

This interpretation is obtained in the following computation steps, shown in (16).

- (16) *Shushoo-ga kita.* (=13)
- a.  $\Rightarrow \exists x [{}^U\text{prime\_minister}(x) \wedge \text{came}(x)]$   
 'A person who is a prime minister came.'
- $\Downarrow$  by DKP (2)
- b.  $\Rightarrow \iota x [{}^U\text{prime\_minister}(x) \wedge \text{came}(x)]$   
 'The person who is a prime minister came.'
- $\Downarrow$  by world knowledge
- c.  $\Rightarrow k$ , such that  $[{}^U\text{prime\_minister}(k) \wedge \text{came}(k)]=1$ , that is, Junichiro Koizumi  
 'Junichiro Koizumi came.'

In this case, however, the story is not so easy. Unlike in the case of (11) discussed in section 3.1, the knowledge in (14) is dependent on situation, since (14) is true at present but there is no guarantee that it will always be true (and in fact it will probably become false in a few years). In the limited situation we can interpret the sentence (13) as (15). Therefore, situation plays an important role for converting the  $\exists$  operator to the  $\iota$  operator (in the computation shown above, (16a) to (16b)). By applying the modified version of DKP (8), this interpretation is derived, as shown below.

- (17) *Shushoo-ga kita.* (=13)
- a.  $\Rightarrow \lambda s \exists x [{}^U\text{prime\_minister}(x) \wedge \text{came}(x)](s_2)$   
 'A person who is prime minister came.'
- $\Downarrow$  by DKP with situation (8)
- b.  $\Rightarrow \lambda s [\iota x [{}^U\text{prime\_minister}(x) \wedge \text{came}(x)]](s_2)$   
 'The person who is prime minister came.'
- $\Downarrow$  by world knowledge

- c.  $\Rightarrow k$ , such that [ $\cup$ prime\_minister(k)  $\wedge$  came(k)]=1, that is, Junichiro Koizumi  
'Junichiro Koizumi came.'

In (17),  $s_2$  is a situation shown in (18).

(18)  $s_2$  : January 31st, 2003, Japan

In situation  $s_2$ , the prime minister is Junichiro Koizumi

Therefore, (8) is also applicable for this case. (8) accounts for why the interpretation (17b) is available. Furthermore, the referent of 'shushoo' in the given situation  $s_2$  is 'Junichiro Koizumi,' we get the interpretation (15).<sup>9</sup>

One might say that the uniqueness of the referent of 'shushoo' is lexically determined, situation dependently. That is, the referent of 'shushoo' must be a unique individual. However, this prediction is wrong. If this prediction were right, 'shushoo' would always be interpreted as referring to the uniquely specified individual. It is true that in a situation where the time and the place is fixed (such as the case shown above, January 31st, 2003, Japan) the referent of 'shushoo' is uniquely determined. But there are cases where the referent(s) are not uniquely determined, as shown in (19).

- (19) Mukashi shushoo-ni           atta  
in past   prime minister-DAT met  
'I met a prime minister.'

In (19), the time and the place of situation is not specified, only specified as 'before now.' Thus the potential candidate for the referent of 'shushoo' is not uniquely determined. That is, uniqueness does not come from the lexical information. Rather, it comes from situation. This illusion of uniqueness probably comes from the fact that in usual situations uniqueness is satisfied.

The mechanism used in this section is the same as the one used in section 2. Both phenomena are explained by applying the DKP with situation (8). The difference between noun phrases such as *sensei* 'teacher' discussed in section 2., and noun phrases such as *shushoo* 'prime minister' is, the former is usually interpreted as existential while the latter is usually interpreted as definite. That is, (8) is valid both for *sensei* and *shushoo*, and since *shushoo* usually refers to a unique referent in a given situation, it is usually interpreted as definite.<sup>10</sup>

The difference between definite interpretation and uniqueness interpretation comes from the default setting. Noun phrases such as *gakusei* and *sensei* usually get existential interpretations, while noun phrases such as *daitooryoo* and *shushoo* usually get unique interpretations.

#### 4. Summary

This paper discussed the interpretations of common noun phrases, and how the situation determines their interpretation. In section 2., I proposed the modified version of DKP (8), which

<sup>9</sup>The knowledge (14) and the situation  $s_2$  (18) are independent. In situations such as (i) or (ii), the referent of 'shushoo' is uniquely determined, even if we don't know actually who it is.

(i) January 1st, 1903

(ii) January 1st, 2103

In (i), probably many people don't know who was the president. In (ii), only fortune-tellers know. But still, we can consider 'shushoo' to be referring to a specific person.

<sup>10</sup>Relational nouns such as *mother*, *secretary* behave similarly, in that the referent(s) are uniquely determined when the resource is determined.

differs from Chierchia's (1998) in that the former includes the notion of situation. By applying the modified version of DKP, definite interpretations derive from existential interpretations, and we have seen that it is situation that triggers shifting from  $\exists$  operator to  $\iota$  operator. In section 3., we have seen that common noun phrases can be used as if they were proper nouns, and that such uses also derive from existential interpretations, and that these uses are also triggered by situation.

Definite interpretation discussed in section 2., and unique, proper-noun like interpretation discussed in section 3. share the properties shown below.

- (20) a. Situation determines the referent(s) of noun phrases.  
       In order to get the appropriate interpretation of noun phrases, we have to consider the given situation.
- b. When situation determines the unique referent(s), the existential interpretation is no longer available.  
       Bare noun phrases are lexically ambiguous, but given a situation, ambiguity vanishes.

These apparently quite different two interpretations, definite interpretation and uniqueness interpretation, are basically the same. They differ how often they get definite interpretations, and because of the difference in frequency, the default interpretations of them are different. For this reason, these two interpretations have often been considered quite different.

We do not consider thoroughly how the specification of the referents is established. The formalization of this mechanism is an interesting topic, but remains to be done. This mechanism suggests that factors other than situation, such as the speaker's expectation, are also crucial (see footnote 8). We have to leave this problem as a further issue.

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**Author's E-mail Address:** fumi@sils.shoin.ac.jp

**Author's web site:** <http://sils.shoin.ac.jp/~fumi/>