Generics and Exceptions:
A Reply to Cohen (2004)

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It is well known that exceptions are allowed in generics. Concerning this widely-agreed-upon phenomenon of exceptions in generics, Cohen (2004) argues that exceptions are allowed only if "homogeneity" is not violated. That is, the exceptions should not form a salient "chunk" of the domain of the generic. For this, he proposes two ways of mapping of cognitive mental representations, namely, "tree" and "geometric" representations. It will be argued in this paper, however, that choices between these two mental representations claimed to be involved in the interpretation process of generics are quite arbitrary, and that coun-terexamples also exist for the "homogeneity" requirement. Given this, the main purpose of this paper will be to discuss the problems of Cohen's theory. Its other purpose will be to try to delve into the funda-mental issue of the meaning of generics, and to suggest that generics, similar to metaphors, involve cognitive conceptualizations based on the language users' encyclopedic knowledge, world knowledge from experi-ences, common sense, beliefs, stereotypes, prejudices, etc.

Key words: generics, exceptions, homogeneity, mental representations, tree representations, geometric representations, cognitive con-ceptualizations

1. Introduction

As also discussed by Cohen (2004), it is generally accepted that ge-nerics tolerate exceptions. Consider the following examples:

(1) a. Tigers are ferocious.
  b. Birds fly.
  c. Apples are red.

(1a) is a true generic sentence despite the fact that there exist young ti-
gers who haven't learned how to kill and live on other animals. (1b) is
also a true generic sentence in spite of the existence of birds like pen-
guins, chickens, and ostriches. There are also yellow and green apples, in
addition to red apples, but (1c) is generally accepted as a felicitous ge-
neric sentence.

And yet, on the other hand, there also exist such sentences that do
not seem to tolerate exceptions, as follows:

    (2) a. ?Primary school teachers are female.
       b. ?People are over three years old.
       c. ?Chinese speak Mandarin.

That is, the property represented by the predicate of each of the above
sentences holds for the vast majority of entities in the domain of the ge-
neric, but none of them is a felicitous generic sentence. For example, in
(2a), the majority of primary school teachers are female, but the ex-
istence of a small number of male teachers is enough to reject the
sentence.

Also consider the following pair of examples from Cohen (2004):

    (3) a. ?Mammals are placental mammals.
       b. Mammals have a placenta.

Cohen states that both of the above sentences are truth-conditionally
equivalent whereas they are not equivalent in terms of felicity.

Then, what causes the difference in felicity between the sentences (1a,
1b, 1c, 3b), on the one hand, and the sentences (2a, 2b, 2c, 3a), on the
other hand? As an answer to this, Cohen proposes the "homogeneity"
requirement. According to him, exceptions in a generic sentence are al-
lowed only if "homogeneity" is not violated. That is, the exceptions
should not form a salient "chunk" of the domain of the generic.
Furthermore, in order to account for the difference between sentences
like (3a) and sentences like (3b), which are truth-conditionally equiv-
alent, but only one kind of which is felicitous, he also proposes two
ways of cognitive mental representations, namely, "tree" and "geometric"
representations.

It will be observed, however, that the "homogeneity" requirement does

have exceptions. Also, choices between the two mental representations claimed to be involved in the interpretation process of generics are quite arbitrary.

Given this, the main purpose of this paper will be to discuss the problems of Cohen's theory. Its other purpose will be .to try to delve into the fundamental issue of the meaning of generics, by suggesting that generics involve cognitive conceptualizations based on the language users' encyclopedic knowledge, world knowledge from experiences, common sense, beliefs, stereotypes, prejudices, etc.

This paper will be organized as follows: In section 2 Cohen's "homogeneity" requirement and tree vs. geometric mental representations will be reviewed, and in section 3 some problems of his account will be discussed. In section 4 an alternative analysis of generics will be presented.

2. Cohen's Generics Theory

2.1. Probability

Cohen (1999) proposes that generics, as in (4a, 5a), and frequency statements, as in (4b, 5b), express "probability" judgments:

(4) a. Birds fly.
    b. Birds usually fly.

(5) a. John jogs in the park.
    b. John sometimes jogs in the park.

He discusses the following eight puzzles of generics and frequency statements, which can be accounted for by assuming that generics and frequency statements are "probability" judgments.

(6) a. Generics and frequency statements may be true even in the absence of supporting instances.
    b. The truth value of a generic or a frequency statement wouldremain the same even if its domain were larger than it actually is.

c. Generic and frequency statements are parametric on time, but not on possible worlds.

d. Generics and frequency statements do not hold of temporary generalizations.

e. Generics and· frequency statements are true or false contingently.

f. Generics and frequency adverbs require their domain to be homogeneous in time.

g. Truth judgments of generics are uncertain and vary across individuals.

h. A generic may be unacceptable even if an overwhelming number of instances support the generalization it expresses.

Cohen also defines the truth conditions of generics and frequency statements, and the "probability," as the following:

(7) Truth conditions for generics and frequency statements:
    $Q(\psi, \phi)$ is true iff

    $P(\phi \mid \psi) > 0.5$ if Q=**gen**
    $P(\phi \mid \psi) > 0.5$ if Q=**usually**
    $P(\phi \mid \psi) = 0$ if Q=**never**
    $P(\phi \mid \psi) = 1$ if Q=**always**

(8) Probability:
    $P(\phi \mid \psi) = l$ iff for every admissible history H and every $\varepsilon > 0$, there is a history $H' \sqsubset H$, s.t. for every history H'', $H' \sqsubset H'' \sqsubset H$, the limiting relative frequency of ϕs among ψ will be within ε of l. (Here, a linear course of time is referred to as a "history.")

When we make a probability judgment, we consider not only the sequence we have actually observed, but possible forms this sequence might take in the future. That is, generics and probability statements are evaluated also with respect to possible future histories, where relevant instances occur. Furthermore, not just every possible history is considered, but only "admissible" histories are considered. "Admissible" histories need not be infinite as argued by von Mises (1957). And yet, they are required to be sufficiently long, so that the relative frequency of ϕs among ψ in the admissible will have enough time to come within ε of

the probability. They are also required to continue the relevant part of the actual history. In other words, only histories in which things happen pretty much the way they occur in the actual world will be admissible. Hence, generics and frequency statements are not parametric on possible worlds, just on time.

With the following examples, let us try to discuss what the "probability" means a bit more clearly:

(9) Mary handles the mail from Antarctica.

(10=5a) John jogs in the park.

What (9) claims is not necessarily such that Mary has actually been handling mail from Antarctica. It is possible that no mail has arrived from Antarctica so that Mary has never handled any mail from Antarctica. Notwithstanding, what (9) claims is that she is likely to do so. Therefore, a generic sentence like (9) should be evaluated not with respect to only actual histories, but with respect to possible relevant histories.

Also, as for (10), suppose that John has been jogging in the park twice a week for 2 years. Suppose further that he broke his leg two months ago, so he hasn't been jogging in the park since then. Given this situation, (10) is still a suitable generic statement. In this situation, a history composed of, say, past two months and the following two months would not be admissible, since it is neither long enough to come within ε of the probability, nor likely to continue the relevant part of the actual history.

In sum, Cohen (1999) proposes that generics and frequency statements being "probability" judgments explains their eight characteristics listed in (6).[1]

2.2. Homogeneity

Cohen (1999) also proposes that only those histories which are in line with the "homogeneity" maintain the relevant properties of the actual

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1) For lack of space, Cohen's explanations for the eight puzzles based on the "probability" won't be discussed here. For detailed discussion on this, refer to Cohen (1999).

world. "Homogeneity" is defined as follows:

(11) A reference class ψ is homogeneous with respect to a property ϕ, iff there is no *suitable* set of properties Ω such that:
  i. Ω induces a partition on ψ, i.e., $\forall x\colon \psi(x) \rightarrow \exists! \omega \in \Omega\colon \omega(x)$.
  ii. $\exists \omega \in \Omega\colon P(\phi \mid \psi \wedge \omega) \neq P(\phi \mid \psi)$.

That is, a reference class ψ is homogeneous iff there is no "suitable" subset of ψ s.t. the probability of ϕ given this subset is different from the probability of ϕ given ψ as a whole.

Cohen (1999) further discusses ways to partition the domain of a generic or a frequency adverb. He states that one natural way to partition a domain is according to "time." He calls histories which continue the relevant part of the actual history and are homogeneous with respect to "time," "F-admissible" histories. He argues that when evaluating generic and frequency statements with respect to F-admissible histories, they both obey the homogeneity constraint.

He further proposes that there are other ways to partition a domain. He claims that frequency adverbs require their domain to be homogeneous only with respect to the time partition, whereas generics require homogeneity with respect to a great number of other partitions as well. He calls this stronger criterion for admissibility "G-admissibility."

He suggests that at least in so far as generics are concerned, the suitability of a partition is a pragmatic one. That is, a partition is suitable to the extent that it is considered *salient*, given the context and the language user's model of the world. He suggests several ways to partition a domain, such as partition of *space*, of *age*, of *gender*, etc.

Consider the following two examples from Cohen (1999, 2004):

(12) a. Israelis speak English. (Cohen, 2004)
     b. Fido chases cats. (Cohen, 1999; 2004)

First, as for (12a), Cohen argues that it both means and requires that, "wherever you go in Israel, whichever group of Israeli society you associate with, a member of this community will be likely to speak English" (Cohen, 2004, p. 532). In other words, if there exists a town or a group of Israeli society where English is rarely spoken, (12a) would not be justified. (12a) is an example of partition of *space*.

Also for (12b), in order to be justified, Fido must not only chase many cats but also many different cats of varying sizes, colors, ages, and kinds. For examples, if Fido chases only, say, Russian Blue cats or sick cats, then the generalization by (12b) is not well supported. This could be an example of partition of *kind*.

Similarly, Cohen (2004) defines "homogeneity presupposition" as in (13):

(13) The generic **gen**(ψ, ϕ) presupposes that exactly one of the following holds:
    a. for every psychologically salient partition Ω on ψ, and for every $\psi' \in \Omega$, $P(\phi \mid \psi')$ is high,
    b. for every psychologically salient partition Ω on ψ, and for every $\psi' \in \Omega$, $P(\phi \mid \psi')$ is low.

That is, "**gen**(ψ, ϕ) is true iff the conditional probability of ϕ given ψ is high (specifically, greater than 0.5)." Furthermore, "generics (but not adverbs of quantification) carry a *homogeneity presupposition*. The generic **gen**(ψ, ϕ) presupposes that its domain, ψ, is homogeneous, in the following sense: for any psychologically salient criterion by which ψ may be partitioned into subsets, the conditional probability of ϕ ought to be roughly the same given every such subset of ψ" (Cohen, 2004, p. 531).

2.3. Tree and Geometric Mental Representations

We have discussed above that generics require their domain to be homogeneous, and that a suitable salient partition of a domain is selected, given the context and the way the world is viewed. In other words, the domain of the generic quantifier must be homogeneous with respect to the predicated property and a set of salient partitions.

Given this, Cohen (2004) proposes two ways of conceptual mental representations, i.e., two ways of partitioning of the generic domain. One is *featural* or *tree* representation, and the other, *geometric* or *multidimensional space* representation. For the former, for example, the concept of each species of mammal can be represented with a set of features such as HAS A MANE, CARNIVOROUS, HAS A PLACENTA, LACTATES, WARM BLOODED, etc. With a feature HAS A PLACENTA, mammals can be partitioned into two parts, placental mammals includ-

ing lions, foxes, rats, etc. and marsupials including kangaroos, marsupial foxes, marsupial rats, etc.

Consider the following example, recited from section 1:

(14=3) a. ?Mammals are placental mammals.
b. Mammals have a placenta.

The nominal predication in (14a) induces a tree representation based on the feature HAS A PLACENTA, and partitions mammals into two parts, placental and non-placental mammals. Consequently, the generic domain violates the homogeneity, and (14a) is infelicitous. Comparing this example to (14b), Cohen argues that these two sentences are truth-conditionally equivalent. However, (14b) induces a geometric representation while (14a), a tree representation. That is, the domain of the generic in (14b) is partitioned in terms of size, age, ferocity, etc., so that no violation of homogeneity occurs.

Some concepts, such as *mammal*, can be represented either as a tree or as a multidimensional space. And yet, as also discussed by Sattath and Tversky (1977), Cohen (2004) points out that some concepts are represented naturally as trees while some others are naturally as multidimensional spaces. For example, the concept *movie* is mentally represented as a tree: comedy, horror, thriller, love story, drama, science fiction, Western movies, etc. The concept *book* is also represented as a tree. Books could be partitioned into encyclopedia, mystery, adventure, science fiction books, etc., but also into paperbacks and hardcover, as in the following example, which obviously violates the homogeneity requirement:

(15) ?Books are paperbacks.

On the other hand, for instance, the concept *nationality* is mentally represented as a multidimensional space along four dimensions: Cold War political alignment, economic development, geography, and culture.

(16) a. ?Americans are middle class.
b. ?Israelis live on the coastal plain.

(16a) is an example of a representation along economic development,

while (16b) is along geography. As for (16a), although most Americans are classified as middle class, there also exist low class and high class Americans. For (16b), there are also those Israelis who live in inlands such as Nazareth, Jerusalem, Beer Sheba, etc.

Cohen also suggests that whenever a generic predicates a property of some concept, and the predicate contains reference to a value on a scale, the concept is represented as a multidimensional space. The followings are some of those examples:

(17) a. ?Buildings are less than 1000 feet tall.
     b. ?Animals weigh less than two tons.

(18) a. ?People are over three years old.
     b. ?Crocodiles die before they attain an age of two weeks.

In (17a, b), the domains of buildings and animals are represented as a multidimensional space, with "height" and "weight" as a dimension, respectively. As for (18a, b), the domains are partitioned in terms of "age" dimension. Obviously, for each example, given such a partition, the domain is not homogeneous. Hence, the homogeneity requirement is violated, and the sentence is infelicitous.

2.4. Summary

To summarize, Cohen (2004) is proposing that the exceptions in generics are allowed only if homogeneity is observed. He is further proposing that the domain of a generic is represented either as a tree or a multidimensional space, depending on the nature of the task and the structure of the stimuli.

For example, if subjects are asked to judge the degree of dissimilarity between two concepts, say, *cat* and *cow*, on the basis of the distance between them in the multidimensional space, it is impossible to construct a space where the points corresponding to species of *mammals* must all be close to one point (since both are *mammal*) yet may be very far from one another. Hence, given this task, the tree representation is expected to be suitable.

Based on these representations, he argues that the felicity or infelicity of all the above examples can be accounted for.

3. Problems of Cohen's Account

First, consider the following Cohen's pairs of examples:

(19) a. ?Mammals are placental mammals.
     b. Mammals have a placenta.

(20) a. ?Bees are workers.
     b. Bees collect pollen.

As for (19a), as discussed above, Cohen argues that the domain of the generic is represented as a tree. That is, mammals are partitioned into placental mammals and marsupials, which leads to the violation of homogeneity and the infelicity of the sentence. On the other hand, the domain of the generic in (19b) is represented as a multidimensional space. That is, mammals are partitioned according to the size, age, etc., which leads to the observation of homogeneity and the felicity of the sentence.

According to Cohen, a similar analysis is applied to (20a, b). In (20a), bees are partitioned into the queen, drones, and workers, which violates homogeneity, although bees are mostly composed of workers. As for (20b), it triggers a geometric representation, which satisfies homogeneity.

Given this, Cohen suggests that one might argue that verbal/adjectival predication may result in a characterizing generic, whereas generic nominal predication is restricted to direct kind predication. Providing some counterexamples to this suggestion, however, he argues that nominal predication generics and verbal/adjectival generics have the same logical form, compatible with Montague's (1973) theory.[2] That is, both are characterizing generics and involve the generic quantifier, and the difference between their interpretations can be accounted for only pragmatically, via the homogeneity presupposition.

In other words, according to Cohen's account, the difference in felicity between (19a, 20a) and (19b, 20b) is determined by which partition is salient given the context. As for the factors that affect which partition or representation is salient and suitable, they could be summarized as the intrinsic nature of the concept or domain, the nature of the task, the

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2) For detailed discussion on this issue, refer to Cohen (2004, pp.538-541).

structure of the stimuli, and other pragmatics factors.

And yet, the problem is that, given these affecting factors, the process of selecting the representation doesn't seem clear. To show this, first, let us consider the following Cohen's example:

(21) ?Bees are sexually sterile.

According to Cohen (2004), (21) triggers the sex dimension. That is, bees are partitioned into female bees (the queen), male bees (drones), and neuter bees (workers). Hence, although most bees are sexually sterile neuter bees, female bees and male bees are not sexually sterile, which leads to a violation of the homogeneity requirement.

However, compare (21) to the following similar example:

(22) Bees are sexually fertile.

A couple of questions arise with (22). One is what the sentence means, and the other is in what way the domain of the generic is represented. As for the first question, its prominent reading seems to be such that bees multiply enormously, and its marginal reading is the opposite meaning of (21), i.e., *not sexually sterile*.[3] Moving on to the second question, given the marginal reading, is the domain represented as a tree or a multidimensional space? If it is represented as a tree as in (21), then (22) should also be infelicitous, since the partition of all sexually sterile workers exists. However, (22) is a felicitous generic sentence. On the other hand, if it is represented as a multidimensional space, then what dimension is involved? A size or age dimension? Or what dimension? When it comes to size, drones are the biggest and workers are the smallest, so the partition of the domain by a size dimension also leads to the infelicity of (22).

If (22) cannot trigger a size dimension, then what dimension can be triggered? A diligence dimension? An age dimension? A diligence dimension won't work, since very diligent workers are sexually sterile while not-diligent or not-so-diligent drones and the queen are sexually

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3) This marginal reading of (22) seems to provide little information, since (almost) all species are sexually fertile and reproduce themselves to survive. Hence, it is not clear whether (22) with this reading could function as a meaningful sentence.

fertile. An age dimension is also questionable, since age is related to fertility.

With respect to the prominent reading, it is also unclear which representation and/or dimension is selected. For example, say, a tree representation is selected, and again a community of bees are partitioned into the queen, drones, and workers. Given this, it is not really clear whether it satisfies homogeneity or not. Furthermore, it seems that this partition is not plausible given the prominent reading in the first place. The same argument also applies to the partition based on geometric representation.

Also consider the following example from Cohen (2004):

(23) Penguins are present in Antarctica.

The fact is that penguins live in Australia, South Africa, the West coast of South America, and the Galapagos Islands as well as in Antarctica. And yet, it is well known to people that penguins live in Antarctica while it is relatively unknown that penguins also live in the other places. Hence, for those who are aware of the ubiquity of penguins, the felicity of (23) with a generic reading, not with an existential reading, could possibly be questioned.

Compare (23) to the following sentence:

(24) Penguins are present in Australia.

Also for (24), those people who have never left Australia and who are familiar with only the penguins in Australia will interpret (24) as a felicitous generic sentence. Otherwise, however, (24) will be interpreted as an infelicitous generic sentence. And yet, even for those who know that penguins also live in places other than Antarctica, (23) could be interpreted as a felicitous generic sentence, as confirmed by the intuitions of my informants. Then, several questions arise. Where does this difference between (23) and (24) come from? Which representation is involved in the interpretation of these sentences? Is the homogeneity requirement at work here?4)

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4) Concerning the issue that truth judgments of generic sentences are often uncertain and vary across individuals, Cohen (1999) argues that because perceptions of the saliency of partitions vary across cultures, languages, and individuals, judgments could vary. However,

Leaving behind the first question, let us consider the second and third questions. Suppose that (23) and (24) trigger a tree representation, and that the domain of penguins is partitioned into different families of penguins such as Magellanic, Humboldt, Gentoo, Rockhopper, Macaroni, Galapagos, African, Little, Fiordland, Snares Island, Yellow-eyed, Erect-crested, Emperor, Adelie, and Chinstrap penguins. Then, both should be bad, since both violate homogeneity. In other words, in Antarctica, only Emperor, Adelie, Gentoo, and Chinstrap penguins are present, whereas in Australia, Little, Fiordland, Snares Island, Yellow- eyed, Erect-crested, and Rockhopper penguins are present.

For those who are not familiar with these technical terms, the domain of penguins could be partitioned into, say, Antarctic, African, Australian, and South American penguins. And yet, given this partition, the homogeneity is again not satisfied in (23) and (24), and both of the sentences should be bad.

And yet, as discussed above, in general, (23) is read generically while (24) is not. Then, should we assume that (23) and (24) trigger a geometric representation? An age dimension? Or a size dimension? Given either partition Ω, it seems that for every $\psi' \in \Omega$, $P(\phi \mid \psi')$ seems to be quite consistently a certain number in both (23) and (24). That is, homogeneity seems to be satisfied, and both (23) and (24) seem to be good as generic sentences. However, the fact is that it is not the case. The upshot of all this is that (23) and (24) also cannot be accounted for by Cohen's analysis based on homogeneity and mental representations.

Have a look at another example:

(25) Bulgarians are good weightlifters.

What mental representation is triggered by (25), according to Cohen's analysis? First, assume that (25) triggers a tree representation. But, the question is what featural partition is possibly triggered here? With respect to occupations, favorite sports, or weightlifters vs. non-weightlifters? None of these seems to apply here. Then, what else could apply?

If so, what about a geometric representation? Consider a size dimension. Can we judge that with respect to a size dimension, for every $\psi' \in \Omega$, P

this does not explain the difference between (23) and (24).

$(\phi \mid \psi')$ is high, or for every $\psi' \in \Omega$, $P(\phi \mid \psi')$ is low? What about an age dimension? It seems that both "size" and "age" are correlated with weightlifting abilities. And yet, it seems unclear whether the homogeneity requirement is satisfied in (25), given either a size or an age dimension? It also seems unclear whether this kind of partition could be triggered in the interpretation process of (25), in the first place.

All in all, again, it is not clear how (25) could be explained by Cohen's theory. As well known, it is obvious that only a small portion of the whole Bulgarians do weightlifting, not alone being good weightlifters. Nevertheless, (25) is read generically. How? It seems that (25) is a rather uniquely generalized generic sentence in the sense that based on the existence of a small number of outstanding Bulgarian weightlifters, say, the Olympic medalists, the speaker is generalizing that Bulgarians in general are innately good at weightlifting.

Also take a look at the following example from the lyrics of a popular song:

(26) Girls just wanna have fun.

Obviously, some might question the validity of (26). And yet, many people would accept it as it is. Since it is not a sentence whose validity can be proved objectively, it is quite unclear how the concepts, homogeneity and mental representations, play a role in the interpretation process of (26). Furthermore, again, the variability in judgment of (26) doesn't seem to be accounted for by the variability in perceptions of the saliency of partitions as Cohen argues.

The following generic sentences are similar to (26), in the sense that it is not clear which partition is triggered and how homogeneity is satisfied:

(27) a. People want to have a lot of money. (Cohen, 2004)
     b. Women are more emotional than men.

Again, some might question the validity of (27a, b), but most people would accept them as valid generic statements. It could be argued, for example, that (27a) triggers a tree representation, and that the domain is partitioned into, say, businessmen, schoolteachers, clergymen, etc. In case of clergymen, the probability is much lower than in the other cases,

which leads to the violation of homogeneity. Hence, for those who question the validity of (27a), a tree representation might be triggered. However, this could be a quite subjective judgment. Some might argue that people are all the same who they are and what they do. Then, for these people, a tree representation could also be triggered, and homogeneity is satisfied.

Furthermore, the domain could be partitioned into, say, people who live in Korea, Japan, Vietnam, America, Switzerland, etc., or into Oriental people, Occidental people, etc., or into yellows, whites, blacks, etc. Given any of these partitions, homogeneity could be judged satisfied. Also, (27a) could be argued to trigger a geometric representation and satisfy homogeneity. For example, the domain could be partitioned along economic status, education, or social status dimension.

Then, is only one of many possible partitions selected given the context, or is it possible that several salient partitions are selected at the same time depending on the context? Furthermore, could one or more tree representation partitions and geometric representation partitions be triggered at the same time? Regardless of whether the answers for these questions are positive or negative, it makes us wonder whether homogeneity and mental representations are plausible notions to account for the interpretation of the above data.

As discussed above, choices between the two mental representations, tree and geometric, claimed to be involved in the interpretation process of generics are quite arbitrary. Choices among a variety of dimensions of geometric representation, i.e., age, size, ferocity, economic status, etc., also seem to be quite ad hoc. It makes us really wonder whether the process of partitioning and homogeneity checking could be involved in the interpretation of generics.

We have also seen examples that cannot be explained by the concepts, homogeneity and mental representations, which further makes us question the validity of Cohen's account.

4. An Alternative Analysis

Cohen's proposal based on homogeneity and two ways of mental representations seems *prima facie* a persuasive theory which systematically accounts for the phenomenon of generics and exceptions. We have

observed above, however, that generics is just another natural language phenomenon that does not seem to function based on a simplistic mechanism.

Then, what is involved in the interpretation as well as production process of generic sentences? And, how can we explain the difference between the acceptable and unacceptable generic sentences discussed above?

As an answer to these questions, we'd like to propose that a process of "conceptualization" is involved in generics, similar to the process involved in metaphors, in line with the cognitive semantic view by Lakoff *et al.* (Lakoff & Johnson, 1980; Lakoff, 1987; Lakoff & Turner, 1989; Lakoff, 1990; Lakoff, 1993; Lakoff, 1999). As for metaphors, it could be argued that a process of conceptualization from one concept domain to another concept domain is involved. In a similar way, we'd like to argue that generics is the product of another conceptualization process.

That is, we propose that the language users "conceptualize" the intrinsic properties of a group of entities, based on their encyclopedic knowledge, world knowledge from experiences, common sense, beliefs, stereotypes, prejudices, etc. In this process, "salient" properties of groups of entities are "highlighted" and "generalized." Hence, only if a property is "salient" enough based on the language users' knowledge and experience from various sources, it can be conceptualized as an intrinsic property that represents a whole group of entities. In other words, it doesn't seem to matter whether the property applies only a small portion of the whole group of entities or a majority of the group, as far as the property is "salient" enough.

Furthermore, again, similar to the case of metaphors, these properties could also be conventionalized. That is, there are generic sentences which are well conventionalized, whereas there could be generic sentences which are quite new. As for the latter case, the language users might need to make a judgment on the spot whether the conceptualization works based on their knowledge and experience from a variety of sources.

Then, in the following subsections, we will discuss the process of conceptualization involved in generics, for convenience, roughly dividing it into six cases differentiated by six different sources of conceptualization.

4.1. Encyclopedic Knowledge

First, let us consider various "bee" examples:

(28) Bees collect pollen.

(29) a. Bees are diligent.
  b. Bees are hardworkers.
  c. ?Bees are workers.

The generic sentence (28) describes a salient activity of bees. It is known that only workers, not the queen or drones, collect pollen. And yet, it doesn't seem to matter whether the pollen collectors should take up the majority part of a whole bee community or not, since the property of collecting pollen has been so conceptualized as a salient property or activity of bees in general.

The diligence has also been conceptualized as a salient inherent property of bees in general, based on the language users' encyclopedic knowledge, so that we have a generalized statement like (29a) and (29b). According to Cohen's analysis, we might have to expect that (29b) triggers a geometric representation, and that the whole bee group is partitioned into, say, very diligent bees, so-so diligent bees, idle bees, etc., based on the degree of diligence. Hence, (29b) should be bad, since it violates homogeneity. However, this kind of partition doesn't seem to be presupposed here.

As for (29c), it is infelicitous, since the property of being a worker has never been conceptualized as a salient property of bees in general. On the other hand, if the hearer is ignorant of these partitions and names of a bee community, i.e., workers, drones, and the queen, it seems that the sentence could be read as a felicitous generic sentence, with a similar meaning to (29b).

Consider more "bee" examples:

(30) a. Bees are sexually fertile.
  b. Bees lay two to three thousand eggs a day during their multiplication period from April to July.
  c. ?Bees are sexually sterile.
  d. Worker bees are sexually sterile.

First, as discussed above, (30a) has two readings. One reading is such that bees multiply enormously, and the other reading is that bees are not sexually sterile. As also pointed out in a footnote earlier, the latter reading is quite marginal with little information in the sense that all kinds of animals are obviously sexually fertile to multiply and survive. In the same sense, (30c) sounds odd. It is interpreted to mean something like that all bees are sexually sterile, so that they need some outside help or some other means to maintain their species, which is not, however, supported by our knowledge. Although the fact is that most members of a whole bee community are workers, which are sexually sterile, (30c) is not a felicitous generic sentence. It is because being sexually sterile has never been conceptualized as a salient property of bees in general.

On the other hand, the former prominent reading of (30a) basically describes a property of the queen bee, which lays an enormous number of eggs as specifically described by (30b). (30b) is an actual description of bees in an encyclopedia. The fact is that only the queen lays eggs or is sexually fertile in a bee community. And yet, this activity of laying an enormous amount of eggs or this property of being sexually fertile by the queen bee is generalized as a salient property of bees in general by a process of conceptualization based on the language users' encyclopedic or world knowledge through experiences.

Now, consider "penguin" examples:

(31) a. Penguins are present in Antarctica.
     b. Penguins are present in Australia.
     c. Penguins are present in South Africa.
     d. Penguins are present in the West coast of South America.
     e. Penguins are present in the Galapagos Islands.

All these sentences could be read existentially. However, (31a) could be read generically for those who have conceptualized Antarctica as the salient main habitat of penguins. Also, for those who have lived, for example, in the Galapagos Islands all their lives, and don't know much about other habitats of penguins, (31e) could be read generically. These differences are caused due to cultural differences and lack of knowledge on the part of the language user.

The following set of "tiger" examples show a similar result:

(32) a. Tigers live in Africa.
    b. Tigers live in India.
    c. Tigers live in Asia.
    d. Tigers live in Siberia.

The ubiquity of tigers leads the sentences to be read existentially. But, they could be interpreted to have a taxonomic generic reading. That is, the "tigers" in (32a, b, c, d) refers to a kind of tigers, i.e., African tigers, Indian tigers, Asian tigers, or Siberian tigers, respectively.

Also, the first sentence might be read generically, depending on the situation, since Africa could be regarded as the most salient habitat of tigers in general. Also, similar to (31), for those who have lived in a certain area all their lives, and don't know much about other habitats of tigers, (32b, c, d) could also be read generically.

Consider more examples from Cohen (1999, 2004):

(33) a. Mammals have a placenta.
    b. ?Mammals are placental mammals.

(34) a. ?Primary school teachers are female.
    b. ?Primary school teachers are female teachers.

First, although Cohen treats only (33b) as an infelicitous sentence, both generic sentences in (33) could be judged infelicitous if the hearer is familiar with the two distinct mammals, i.e., placental and marsupial mammals, as confirmed by my informants. At the same time, the former could be judged better than the latter. The reason seems to be that the expression "placental mammals" presupposes the existence of other kinds of mammals. And yet, if the hearer does not have any encyclopedic knowledge about placental or marsupial mammals, (s)he cannot really judge the felicity of (33a, b). It is because none of the properties has been conceptualized as a salient property of mammals in general.

Comparing the pair (33a, b) to (34a, b)[5], in the latter pair, the degrees of felicity seem to be the same for both of them. The reason might be that we are familiar with the fact that male primary school teachers al-

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5) (34b) is my own example, which is tantamount to (33b).

so exist, although the number is very small.

All in all, in (33) and (34), contrary to Cohen's argument, (a) and (b) don't seem to show much difference in felicity. The issue is whether the language user has conceptualized the given property as a salient property of mammals or primary school teachers in general.

Consider three more infelicitous examples from Cohen (1999, 2004):

(35) ?Books are paperbacks.

(36) ?Chinese speak Mandarin.

(37) ?Israelis live on the coastal plain.

First, for (35), we are familiar with the fact that there exist hardcover books. Being a paperback is not a salient property of books at all. As for (36), Mandarin is not an official language of China or anything. It just happens that to communicate with other Chinese people who speak other dialects, recently, a large number of Chinese speak Mandarin. Hence, speaking Mandarin is not an inherent or salient property of Chinese people, and, of course, there are many Chinese who do not speak Mandarin. For (37), if the language user does not have any encyclopedic knowledge about the habitations of Israelis, (s)he cannot judge its felicity. On the other hand, even if (s)he knows that most Israelis live on the coastal plain although some also live on other areas of the land, (s)he cannot accept (37) as a felicitous generic sentence. It is just common that people tend to concentrate on a specific part of a country, say, around a river, on the foot of a mountain, on a plain, in a big city, etc. Hence, it is not a salient property of Israelis in general that most of them live on a specific part of a land.

Lastly, consider some more examples of infelicitous generic sentences from Cohen (1999, 2004):

(38) a. ?Fruits are round.
    b. ?Furniture has four legs.
    c. ?Tables have four legs.
    d. ?Americans are middle class.
    e. ?Buildings are less than 1000 feet tall.
    f. ?Animals weigh less than two tones.

    g. ?Shoes are size 7 and above.

All of the above sentences are describing a trivial property of the majority of each group of entities. Consequently, none of the properties has much chance to be conceptualized as a salient or intrinsic property of the generic NP. In most cases, the property shared by the majority of a group has more chance to be regarded as a salient property of the group, but it is neither a necessary or sufficient condition.

4.2. World Knowledge from Experiences

The following two groups of sentences are recited from above:

(39=31) a. Penguins are present in Antarctica.
          b. Penguins are present in Australia.
          c. Penguins are present in South Africa.
          d. Penguins are present in the West coast of South America.
          e. Penguins are present in the Galapagos Islands.

(40=32) a. Tigers live in Africa.
          b. Tigers live in India.
          c. Tigers live in Asia.
          d. Tigers live in Siberia.

As discussed in the previous subsection, each of the above sentences could be read generically depending on the language users' world knowledge from experiences. That is, for those who know only the area of their living, all these sentences could be read generically, due to their limited world knowledge.

Consider some more examples:

(41=27a) People want to have a lot of money. (Cohen, 2004)

(42=27b) Women are more emotional than men.

These two generalized sentences are not based on objective facts. Notwithstanding, they could be judged as felicitous sentences, although

some might question their validity. Both (41) and (42) are describing a salient property of people and women in general, respectively, conceptualized from the language user's world knowledge from experience.

The following example is again not a description of an objective fact.

(43) Piano lessons are boring.

Its validity could be questioned, but it seems to be a quite generally acceptable sentence, in that piano practicing is a kind of mechanical, repetitive, non-creative, and time-consuming activity. Consequently, it seems that the language users have conceptualized the property of being boring as a salient property of piano lessons, based on their world knowledge from experiences and/or stereotypes.

Consider another similar example:

(44) Rich men are promiscuous.

The language user could make such a generalization about rich men based on his or her experiences. Of course, it could be refuted by other people based on their experiences. However, it seems to be quite common that rich men are stereotyped as playboys due to human nature. Rich men have money, and there are women who like money.

Concerning the following sentence, the felicity judgment could vary:

(45) Roses are red.

Note that "rosy color" is lexicalized in both English and Korean. That is, roses are conceptualized to have a red color. Notwithstanding, some might question the validity of the sentence, since there are roses of many other colors such as yellow and white. And yet, some others might retort this by saying, "Roses are red in general, you know."

The following is a similar example, to which the same argument as the one for (45) applies:

(46) Apples are red.

Most apples are red, but there are also yellow and green apples. And yet, "apple color" is also lexicalized to be closely related to "red color."[6]

Closing this subsection, have a look at some more interesting examples:

(47) a. Italians are good artists.
    b. Bulgarians are good weightlifters.
    c. Blacks are good athletes.

The numbers of good Italian artists, Bulgarian weightlifters, and black athletes are quite small, respectively. And yet, these people's outstanding abilities are salient enough to be generalized as properties of the whole groups of people. For example, there are quite a few world-famous Italian artists, which leads to the generalization that Italians in general have an innate artistic ability which excels those of other peoples. Similarly, a considerable number of the world-famous top-class athletes are black, based on which people tend to generalize that blacks innately have excellent athletic abilities.

4.3. Common Sense

Have a look at the following generic sentences, which are describing salient properties of the subject NPs conceptualized from the language users' common sense:

(48) Men are physically stronger than women.

(49) Cats are more intelligent than rats.

(50) Humans are thinking animals.

These examples might look uninformative. And yet, this kind of common sense statements could play a role in a conversation, similar to statements like "Enough is enough" and "It could be right or wrong."

4.4. Personal Beliefs

There could also be generic statements which are conceptualized

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6) For example, a cosmetics brand also has a color named "juicy apple" for a lip gloss product.

based on the language users' personal beliefs, as the following:

(51) a. Women are more intelligent than men.
     b. Women are wiser than men.

(52) a. Dogs are more faithful than men.
     b. Dogs are better companions than human friends.

(53) Koreans are more diligent than any other people in the world.

(54) Pigs are better pets than any other animals.

These statements are often based on personal conceptualizations. Hence, their validity cannot easily be judged based on objective facts, and they tend to be accepted as interesting, worth-considering, and/or insightful generalizations. And yet, they could be doubted or refuted. Also, similar to the process of conventionalization of novel metaphors, these statements seem to be able to go through a process of becoming widely-accepted.

4.5. Stereotypes

Consider the following examples:

(55=43) Piano lessons are boring.

(56) a. Russians drink strong liquors.
     b. Koreans and Italians are hot-blooded.

(57) a. Women like rich men.
     b. Men like pretty women.
     c. Rich men are promiscuous.

(58) a. Blondes are dumb.
     b. Brunettes are smart.

(59) a. Lawyers are sharks.
     b. Lawyers are shrewd.

(60) a. Politicians are sly.
    b. Politicians are liars.

Generic sentences of this category could overlap with those con-
ceptualized by world knowledge from experiences. These sentences are
based on run-of-the-mill stereotyped conceptualizations. And yet, some of
them are also conceptualizations from experiences. The objective validity
of these sentences are not of great concern.

People seem to enjoy generalizing things. For example, as in (56), ra-
cial and ethnic properties are frequently generalized. Stereotyped proper-
ties of people with specific occupations are also common, as in (59) and
(60).

In sum, generics of this category are proposed to be based on stereo-
typed salient properties of groups of entities.

4.6. Prejudices

Have a look at the following examples:

(61) a. Koreans eat dogs.
    b. Chinese people eat monkeys' brains.

(62) Japanese people are brutish.

(63) AIDS patients are homosexuals.

(64) Homeless people are lazy people.

Generic sentences of this category are often based on conceptualizations
from prejudices. For example, for (61a), there are no statistics on how
much percentage of Koreans eat dogs, but the chances are that far less
than a half of Koreans eat dogs. Notwithstanding, it is believed by some
foreigners that Koreans eat dogs in general.

Example (61b) could also be explained in a similar way. Only a small
portion of Chinese people eat monkeys' brains, which is a rare cuisine.
And yet, this property could be generalized to the whole Chinese people
as their salient property.

When it comes to (62), based on the militaristic and chauvinistic char-

acteristics of past Japanese histories and/or the recent situations of Japanese middle and high school violences, some people could conceptualize brutality as a salient property of Japanese people in general. And yet, the brutish activities have been committed by only a small number of Japanese. Besides, it is true that these activities have happened and are happening everywhere, and by all the peoples in the world.

In the last two generic sentences (63) and (64), the cause-and-effect relations are conceptualized as salient relations between AIDS patients and homosexuals, and homeless people and lazy people, respectively. The fact is, however, that these cause-and-effect relations do not really exist.

4.7. Other Examples

Consider the following examples, which are a bit different from the previous examples:

(65) a. Americans are going through emotional trauma after the 911 incident.
b. Iraqis are working hard to rebuild their country after the war.
c. Koreans are now watching this major golf match at home via satellite.
d. Koreans are now watching this World Cup Soccer match at home via satellite.

Different from the previous examples, these sentences are not based on conceptualizations of salient intrinsic properties of a group of entities. They are describing a temporary property of each group of entities. For each case, the temporary property seems to apply to a majority or all of the entities of the group. However, for the last two sentences, some might argue that the bare plurals are interpreted existentially. And yet, it seems also possible that if they are interpreted generically, they are describing the wide availability of the televised sports program to all Korean people in various different areas.

In these examples, bare plural NPs are used to refer to the whole groups of entities, and temporary properties about the groups are being described.

4.8. Meaning of Generics

As discussed in section 2, Cohen argues that generics and frequency statements are "probability" judgments, and that the difference between generics and frequency statements is that the latter require homogeneity with respect to partitions on "time" while the former, with respect to other partitions as well as partitions on "time".

However, as we have observed in the previous sections, generics are not quite "probability" judgments. That is, it is neither a sufficient nor a necessary condition for a generic sentence that the predication applies to all or most entities of the domain with some reasonable exceptions. We have seen cases of generics above in which only a small portion of the generic domain actually has the property described by the predicate.

As proposed above, generic statements reflect the language users' conceptualization mechanisms based on their encyclopedic knowledge, world knowledge from experiences, common sense, beliefs, stereotypes, prejudices, etc. Furthermore, generic sentences are proposed to be "salient" property statements of groups of entities. The language users conceptualize certain properties as the salient properties of certain groups of entities based on a variety of sources of knowledge and information. Generic statements could reflect the conceptualization mechanism of humans in general, of different language communities, of different cultures, of different individuals, and etcetera.

People tend to make generalizations about objects, events, states of affairs, and so on. Generic statements are one way of making such generalizations. In these generalizations, prominent or salient properties of groups of entities are picked out by the process of conceptualization. Hence, generics could be regarded as reflections of human thoughts and experiences.

5. Conclusions

In the above sections, we have discussed Cohen's (1999, 2004) theory of generics with his important theoretical concepts, i.e., homogeneity and mental representations, and have also discussed some problems of his theory. The main point we have tried to show in these discussions is that although Cohen's proposal seems *prima facie* a persuasive theory

which systematically accounts for the phenomenon of generics and ex-
ceptions, neither this phenomenon nor most other natural language phe-
nomena can be adequately accounted for by such a rather simplistic
mechanism as Cohen's.

Then, as for the issue of what process is involved in the production
and interpretation of generics, we have proposed that a process of
"conceptualization" is involved in generics, similar to the process in-
volved in metaphors, in line with the cognitive semantic view by Lakoff
et al. That is, we have proposed that the language users "conceptualize"
the intrinsic properties of a group of entities, based on their encyclope-
dic knowledge, world knowledge from experiences, common sense, be-
liefs, stereotypes, prejudices, etc. In this process, "salient" properties of
groups of entities are "highlighted" and "generalized." Consequently, only
if a property is "salient" enough based on the language users' knowledge
and information from various sources, can it then be conceptualized as
an intrinsic property that represents a whole group of entities.

In section 4, in order to show the process of formulating salient prop-
erties by conceptualizations, we have tried to discuss as many examples
as possible, dividing them into six different categories depending on
what knowledge or information source contributed to the conceptualiza-
tion process. As we have shown, the six different categories could over-
lap with each other, and they are in no way an exhaustive list.

All in all, although the alternative analysis might seem quite vague
with quite a few holes to be filled, we'd like to argue that it seems to be
pointing to the right direction in the search for a persuasive account for
the phenomenon of generics.

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