

# Method for the Interpretation of the GS

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**Abstract** This paper suggests that the process of building a generic sentence (GS) should be separated from the process of determining its truth value. Building a GS is an establishment of information while judging its semantic value is rather linguistic part. Many of previous studies had missed it, and failed to explain the proper semantics of the GS. For the part of “building information,” I introduce the notion of “common knowledge” or “mutual knowledge,” which had been used for indicating the context of the presupposition, and reinterpret it as a set of knowledge built in a society or a culture group.

## 1. Goal and Questions

We judge our experiences and keep them as information in our mind. Each judgment or information is not only stored personally but also shared among people, and quite often it becomes a part of the common knowledge of a society temporarily or abidingly. This research draws a distinction between the establishment of a generic knowledge and the determination of its truth value, and claims that the context or a set of inter-subjective information should be necessarily counted among variables of the interpretation model for generic sentences.

The term “Generic Sentence (GS)” denotes a group of sentences which have generic reading. They do not describe particular events or temporal incidents; rather, they are statements of states, properties, or regular behaviors. The generic reading is similar to universal quantification in a way in that both describe prominent states in a world; however, they are different in that the domain of a GS includes only “general” individuals while the domain of . For example, the meaning of the GS (1a) below is not same with the universal sentence (1c). The word “ravens” in (1a) does not refer to all ravens in the world, rather it denotes normal or “general” ravens. That is why (1a) is considered to bear some analogy with (1c).

- (1) a. Ravens are black.
- b. *General* ravens are *generally* black.
- c. *All* ravens are black *all the time*.

(1a) shows two kinds of genericity at the same time. First, the sentence is not a statement about a particular raven, but about a species called “raven” in general. Also, what the statement describes is not an event or a happening. Rather, the blackness is a property which a raven in general has. The noun phrase which

shows the former characteristic is called “kind-referring NP” while the whole sentence which has the second type of genericity a “Generic Sentence,” the main object of this paper. The sentences below are also GSs in the meaning that they all show the properties of the subjects rather than describing an event.

- (2) a. Ravens are black.
- b. Albino ravens are white.
- c. The ravens in my house is not black.

The truth value of a GS is stable with a certain amount of counter examples. Although (2b) and (2c) are logically opposite to (2a) respectively, all of them can be true in a same context where most ravens are black, albino ravens are white, and the raven in my house is not black. It is called the “toleration of exceptions,” one of its most salient semantic characteristics. This “toleration of exceptions” has been an obstacle for establishing a decent analysis of GSs. For this reason Geurts (1988) describes a GS as “a kind of elastic universal claim.” We can change the examples to a pair of a GS and its particular counterfactual like below:

- (3) a. Roberta smokes.
- b. Roberta did not smoke yesterday.

(3a) has a generic reading, and (3b) is a particular sentence which describes a particular event rather than a property. What described in (3b) is not coherent with (3a), but the truth value of (3b) has no affect on the truth value of (3a): imagine the situation where Roberta, a smoker, could not smoke for a day because of a bad cold.

A GS describes a characteristic of an individual while a particular sentence (PS) describes an event which the individual participates with, however, we can hardly find a morphological or phonetic clue to decide whether a sentence has generic reading or particular reading, in that both readings correspond to the same form. For example the sentence “Roberta smokes” can denote a concrete experience where Roberta is smoking, or describe Roberta’s property that she was a smoker. It goes without saying that one of the biggest issues of the GS is the semantics of generic operator Gen, which is not realized phonetically (Katz & Zamparelli 2005). Although choosing one of two possible readings is made mostly by pragmatic means like the utterance situation or other context, each reading has distinct semantic properties so the way where a sentence gets one reading is to be treated semantically. This characteristic is called “genericness” by Declerck (1986), later called “genericity” and “non-accidental generalization” by Kratzer (1989). The genericity includes “stativity” in Carlson (1989), and “habitual” in many of the GSs are also, especially when their predicate is a dynamic verb.

With stativity and habitualness, regularity is an essential characteristic of GSs. Several studies such as Goodman (1955), Dahl (1975), and Krifka et

al.(1995) mentioned that a sentence without regularity can never be a GS, even though the denoted event is of high frequency. Also in the inductive approach, like Cohen (1996) and Carlson (1995:227), a GS is regard as true “not by virtue of there being any corresponding constituents of the world so described, but instead by virtue of there being some array of instances from which language users can abstract the stated regularities.”

## 2. Two Approaches for Interpreting GSs

One of the main goals of the semantics for GSs is to define what is “genericity.” The theories for genericity are divided in two groups: Rules and Regulations Approach (R&R) and Inductive Approach (IA), named from Carlson (1995). The primary goal of R&R is to clarify the sequence of derivation from upper rules or general knowledge to the lower rules or specific knowledge, while IA focuses on the proper formation of the upper knowledge with the inconsistent lower facts or knowledge. Given the two GSs  $p$ , “*Birds fly*,” and  $q$ , “*Tweety cannot fly*,” the question of R&R is about how  $q$  is driven from  $p$  while the concern of IA is how the particular instants such as  $q$  construct  $p$ . Carlson (1995) explains R&R as a realistic view, and IA as a nominalistic view in that R&R assumes the existence of laws independent of people’s recognition and IA regards the law as an induction of what happened. In this paper two approaches will be just briefly compared for it was already dealt with in Kim (2008).

The genericity is As Carlson (1989) mentioned, many of previous studies assumed that “generic propositions are derived from nongeneric propositions, rather than generic predicates being derived from nongeneric predicates.” And in several researches like Lawler (1972), Dahl (1975), and Carlson (1977a, b) the operator **Gen** played a role

Both R&R and IA think the meaning of a GS is its truth condition, and they both seem to have the same opinion about “regularity” as the main property of GSs. Their difference resides in the ways of assigning truth value to the GS.

This paper is a draft to suggest a sound starting point for the semantics of GSs, and aims to find proper explanations of idiosyncrasies of GSs such as “toleration of exceptions.” The proper semantics of GSs shall make clear several questions. Which properties the most satisfactory model would have? I summarize the issues discussed in the previous studies into three questions. Each is corresponds to (i) the difference between the truth values of a particular reading and a generic reading of the same sentence, (ii) different standards of tolerating exceptions among predicates, and (iii) the diversity of the truth values of the same GS according to contexts.

- (3) a. Why does the discrepancy happen between a particular sentence and a GS about same individual?
- b. Why are the ranges of tolerated exceptions different according to predicates?
- c. Why are the ranges of tolerated exceptions different according to contexts?

These questions are the most essential parts of the characteristics of GSs. In the section 2.1, I will discuss two approaches so called “Rules and Regulations” and “Inductive Approach.” Further I investigate the theories of Kratzer (1989) and Asher & Morreau (1995), and see what lacks in these approaches. A new interpretation model will be suggested in the section 3.

### **2.1 Rules and regulations vs. Inductive Approaches:**

The approaches of R&R share the idea that rules and regulations play a key role to decide truth value of a GS (Cohen 1995:224). The strong point of R&R has an advantage to explain sentences like below:

- (4) a. Cheju tangerine is 2 won per kilo.
- b. Drivers whose blood alcohol concentration is over than 0.05% are punished.

(4a) is true if the market sets the price of Cheju tangerine at 2 won per kilo, even when no one is actually buying the tangerine, as Carlson (1995) argued. So is (4b). Carlson explained that the sentences are judged to be true if a seller of Cheju tangerines has put the price, 2 won per kilo, on the tangerine, and if the Road Traffic Act is like described above. Thus, the two sentences above are true not because of the regulations derived from cumulative observation, but because of the law established by the National Assembly. R&R theorists believe that there are indeed rules so we relied on for assigning truth value to GSs.

Carlson (1995) explained that IA had been widely accepted in the tradition of quantification of state. But Vendler (1967:112) already noted the characteristics of GSs in the realistic view.

[...] the fact I know that Harvard is in Cambridge is behind a host of my actions that range from addressing letters to boarding buses. Yet none of these actions in particular can be qualified a *knowing*. ... it would be a mistake to think that this kind of *knowing* is related to the state sense in the way that catching dogs is related to the specific state of dogcatchers.

The comment above is even more realistic than Carlson’s (1989:175) description below:

[...] the evidence presented above suggests that a predicational analysis, in which a generic predicate is applied to the denotation of the subject, is either too restrictive an analysis or else simply wrong. One reasonable alternative would be to hypothesize that generic propositions are derived from nongeneric propositions, rather than generic predicates being derived from nongeneric predicates.

On the other hand, the advantage of IA is the fact that theories of this view easily explain the relationship between generic readings and its particular counterparts.

- (5) a. Roberta smokes (meaning that she is a smoker).  
b. Roberta smokes (now).

(5a) is a generic reading while (5b) a particular reading. IA effectively captures this relation by considering sum of the particular sentences like (5b) construct the abstract knowledge such as (5a). Cohen (1999), one of the prominent researchers of IA proposes “probability judgment” as a semantic of GS.

Although I agree with Cohen’s other ideas that the semantics of GSs “cannot be explained by linguistics alone” (Cohen 2004:529) and his psychological process, I oppose his theory of probability judgment where the proportion of true particular sentences affects the truth value of a corresponding GS.

The same phenomenon was noticed in Vendler’s argument.

Compare the two questions: *Are you smoking?* and *Do you smoke?* The first one asks about an activity, the second, a state. This difference explains why a chess player can say at all times that he plays chess and why a worker for the General Electronic Company can say, while sunbathing on the beach, that he works for General Electric.

The weak point of Rules and Regulation Approach is crucially related with the question: “Where is the rule of GSs” and “what is its nature?” And the weak point of Inductive Approach is related with the question: “why is the discrepancy between sum of particular events and the abstract law?”

## 2.2 Reviewing Kratzer (1989) and Asher & Morreau (1995):

Two of the most representative theories of R&R are Kratzer (1989) and Asher & Morreau (1995). Both researches are the variants of the possible world semantics. Kratzer introduces Situation Semantics of Barwise & Perry (1983) and the concept of “lump”; in Asher & Morreau the information GSs have is defeasible, and the domain of consideration is normal entities.

Kratzer (1989) introduce a possible situation  $s$  along with a possible world  $w$  and a proposition  $p$ .  $s$  is a part of a world  $w$ , and the truth value of  $p$  is

determined in  $s$  as well as in  $w$ . Kratzer introduced the notion of “lumping” to calculate the relation between two propositions,  $p$  and  $q$ ,

Kratzer mentioned that “while generic propositions are weak lumpers, they are strong lumpees. Whenever a proposition is true in a world it will lump all the non-accidental generalizations of that world.” (Kratzer 1989:639) Although many GSs show this tendency, Kratzer missed that not all universal quantifications are proved as a GS. GSs are related to the “spotted” regulation.

Asher & Morreau (1995) is based on the possible worlds and it sets the informational state  $s$  additionally in order to derive the truth value of a GS from a model including existing GSs. Their model with defeasible Modus Ponens seems to be a descriptive model.

Fact 4:

(i) Let  $\phi$  and  $\psi$  be monadic  $L_{>}$  predicates and let  $\Gamma$  be a set of  $L_{>}$  sentences.

Let  $(\Gamma \cup \{\forall x(\phi > \psi), \phi(t)\})^{\rightarrow}$  be  $\vdash$ -consistent, and let the set  $P$  of propositions of normalization be  $\{\|\phi(t)\|\}$ . Then:

$\Gamma, \forall x(\phi > \psi), \phi(t) \mid \approx_p \psi(t)$ .

(ii) Let  $\Gamma \cup \{\forall x(\phi > \psi), \phi(t)\} \vdash \psi(t)$ , and let the set  $P$  of propositions of normalization be  $\{\|\phi(t)\|\}$ . Then:

$\Gamma, \forall x(\phi > \psi), \phi(t), \neg\psi(t) \mid \square_p \psi(t)$ .

This Fact 4 describes “the patterns of Defeasible Modus Ponens and Irrelevant Information.” (Asher & Morreau 1995:324)

However, Asher & Morreau (1995) does not answer the way of getting truth-condition of a GS either. They gave a derivation rule, not a rule judging its truth or falsity. So their theory cannot be a complete theory.

- (7) a. Which building is the tallest in the US?  
 b. Empire State Building is.  
 c. Sears Tower is.

Which one is the correct answer to (7a)? It depends on the time of asking. If we are living in 1960s, (7b) is a true sentence; while it is false and (7a) is true. Does this change come linguistically? It’s because of the change in the world and therefore information.

Time must be considered for the truth value of a GS. It will act like a variable in the truth function.

### 3. Information States

There are two main reasons for the fact that the genericity of a generic sentence has been intriguing to people: the first is of linguistic part, that the truth condition of a GS is not fixed; and the other one is practical one that GSs have a very important function in a real world when communicating knowledge in a society.

The latter part, socio-linguistic function of GSs, provokes the need of socio-linguistic theories for the proper semantics of GSs.

### **3.1 The belief system and Knowledge:**

The term “information structure” is originated from Chafe (1976). Krifka (2006) commented that the original notion of common ground is related to Stalnaker (1974), Karttunen (1974), and Lewis (1979) as a set of presuppositions. The notion of Information Structure of Chafe (1976) is rather temporary state in terms of both time and space.

Moreover, as for the theories of common ground, it is neither a common knowledge of a society nor an abiding “truth”. But I think there are certain grounds, which people lean on when they judge whether a proposition or information is true. Although the grounds may not be objective, they are individual either for the most of the time. They can be inter-subjective. Therefore, the notion “common ground” or “mutual knowledge” in this paper is wider than Chafe’s and can be regarded as rules or regulations.

### **3.2 Establishing information and its judgment**

The GS is an utterance of the proposition which is established in common ground or mutual knowledge. So, assigning the truth value to a GS is straightly related to whether the propositions can be derived from the common ground. I proposed the questions below as these seem to establish the knowledge in the common ground.

- (8) a. Why does the discrepancy happen between a particular sentence and a GS about same individual?
- b. Why are the ranges of tolerated exceptions different according to predicates?
- c. Why are the ranges of tolerated exceptions different according to contexts?

This study also tried to find out the procedure of meaning interpretation and selected the questions which proper semantics for GSs should answer. Selected basic question and answer are summarized like below:

A. What is the reason for which “exceptions in real life” are admitted when a GS is verified?

The verification of a GS itself is not linked straightly with the instances in real life. Rather, the truth value is determined with respect to a common ground previously established. It means that the existent circumstances or instances hardly give an effect to the truth value in a direct way. A possible way the instances have effect on truth value may be the case that the significantly enough recognition of

exceptions change the corresponding knowledge in the common ground and therefore change the truth value in verification.

- B. i. The exception of generic statements of proper noun and the exception of the generic NP can be treated in the same way?
- ii. If it is not, what is the difference between two?
- iii. Is there a unified approach to explain various rates in allowing exceptions?

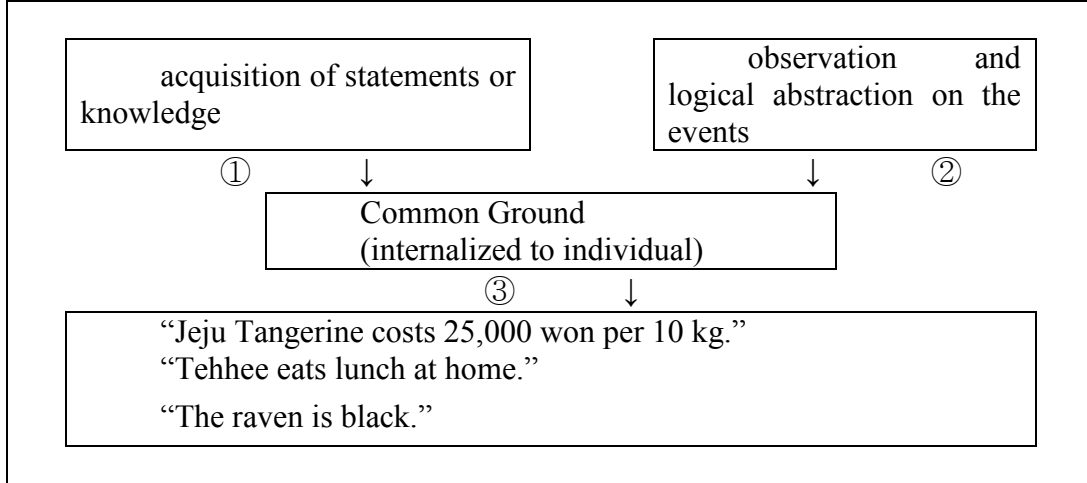
B asks whether the individual variable *x* should be treated in the same manner to the treatment of the stage variable *s*. While Carlson (1995) treats them in the same way, Cohen (1993) does not. In this thesis I think the two entities should be treated differently, yet the reason is not same as Cohen. My proposal is based on the idea that the property of the alternatives in knowledge construction and the property of the alternatives in determination of truth value are different. It means that in knowledge construction alternative situations show regular distribution at each stage, while the sub-types of a particular kind are in various levels so it is not possible to reduce truth value of the whole or proposition into the sum of each situation. The answer for (B-iii) is same to the answer of (A).

C. Why is the truth value of a sentence differentiated according to a speaker and circumstances?

The reason for changing the truth value for a GS is that common grounds are constructed differently according to the society and the culture. The difference of common grounds yields the difference in evaluating truth condition as well as in the interpretation.

In this way I drew a line between construction of the GS and judgment of truth value, and also I tried to explicate the origin of the “allowing exceptions” lies in cognition when constructing knowledge. And this process was also presented like below:

The hypothetical diagram about the GS as a consequence of acquiring the information



#### 4. Conclusion

This paper investigated the characteristics of GSs, and aimed to provide a proper semantics for them. First, I examined several interpretation models from previous studies, and saw whether they can explain the unique property of GSs called the tolerance of exceptions. Although GSs are also (i) representing static events, (ii) based on the lexically non-stative predicates, and (iii) intensional as well as inconsistent as Carlson(1995) have mentioned, the property of “allowing exceptions” seems to be the most important part in interpreting the GS so I restrict my concern to it.

This thesis has three main discourses. In the first part, I examined previous studies and the strong and the weak points of “rule and regulations” and “inductive approach” views. Secondly, I introduced the formal semantic notion of generic operator **Gen** which plays a crucial role in binding stage variables, and examine Cohen(1997)’s theory more. The purpose of this attempt is that valuable insight of the inductive approach theory could be added within the framework of the rules and regulation theory. Finally, I differentiate the construction of the GS as a generic knowledge from the judgment of truth on GSs, which was presupposed by the idea that the GS is a presentation of information. I also present it in a form of a diagram. For this idea to be developed, the theory of Peirce on sign and the semantics of stereotype are applied. I proposed an approach which can explain the “allowing exceptions” phenomena in interpreting GSs.

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