An Introduction to Generics in English

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The Plan

1. General Introduction
2. Kind-Referring Genericity
3. Characterizing Genericity

Much (but not all) of this is distilled from “Genericity: An Introduction”
Generics: Two Types

- Two quite distinct phenomena have historically been called “generic”

1. Reference to a kind

2. Expressions of general regularities
The black-capped chickadee winters in central Alberta.

The black-capped chickadee is not extinct.
The first example offers a property of the kind/genus, The Black-Capped Chickadee.

- (It also makes claims about individual black-capped chickadees...but what?)

The second example: ‘the black-capped chickadee’ *must* refer to a kind.

- (It does *not* say anything about any individual black-capped chickadee.)
Not always reference to a Kind

- The black-capped chickadee in the far cage needs more seed.

Obviously here ‘the black-capped chickadee’ does not refer to a kind, but rather to some particular black-capped chickadee.
In English, what sort of expressions can refer to genera?

- Definite NPs (as before)
- Bare plurals? *Black-capped chickadees winter in Alberta.*
- Bare singulars (mass nouns): *Gold is a yellowish metal.*
- Some proper names? *Poecile atricapillus*
- Taxonomic uses? *All dinosaurs are extinct.*
- Anything else??
Reference to Kinds

A fundamental question for philosophers:

• What are the truth-makers for such sentences?
  • Sometimes looks like predicating a property directly of a kind
  • Other times it seems that some individual is the truth-maker:

  *We are trying to photograph endangered animals*...
Reference to Kinds

- We photographed the grizzly in Jasper two summers ago.

- We photographed the polar bear in Nunavut last summer.
Another philosophical question:

- What kinds are there?
  - Natural kinds, of course
  - Artifactual kinds? Konrad Zuse invented the electronic calculator.
  - “Accidental” kinds? The Coke bottle has a narrow neck vs. The green bottle has a narrow neck

- (does this last mean that kinds are “conventional” / “socially determined”?)
Characterizing Generics

- A potato contains vitamin C and amino acid
- Potatoes contain protein
- The potato contains thiamin

Does not express a specific episode or isolated fact, but reports a kind of “general property” ...a regularity that summarizes groups of particular episodes or facts.
Lions have manes

Predicates the property of having manes “generically” to lions.

Means: it is generally true that lions have manes. (Only adult male lions have manes, and maybe some are sick or have had their mane cut off, etc....)
Generics – two types

- The first type of “genericity” is a feature of NPs
- This second type of “genericity” is a feature of entire sentences
- The two types can occur together because one common regularity holds across individuals of a kind, and so the regularity is predicated of the kind.
Generics – two types

- When referring to kinds, we abstract away from instances, whereas when we use characterizing sentences we abstract away from particular events.

- A general law or regularity about members of a kind is naturally stated as holding of the kind.
A **BAD** attitude (engendered by elementary logic textbooks)

- Generic sentences are “strictly speaking” false
  - But are acceptable because they are ‘close enough’ to being true.

Most of our knowledge of the world is encoded in these generic sentences. So this is not a useful attitude.

Anyway, if right it would predict that fewer exceptions means “more true”
Another **BAD** attitude (engendered by some ‘ordinary language’ philosophers and by some fancy logicians)

- Such generics are *neither* true *nor* false.
- (maybe are directions to guide our belief formation ability)

But then they couldn’t be embedded in propositional attitudes or longer generic sentences.
The Second Bad Attitude

- Denies that *Snow is white* is either true or false!! (Tarski & Davidson are rolling over in their graves!)

- Denies that our information about the world is *knowledge*, but instead claims it to be “how to direct our actions and inferences”
Second Bad Attitude

- Would deny generics can be embedded
  - Usually, if a person smokes after dinner, he also drinks brandy before bed
  - Countries that do not honor women’s rights also do not honor general human rights
  - A cat is healthy if it chases an object when it is moved in front of its eyes
  - People who work late nights do not wake up early
  - People who do not like to eat out, do not like to eat out

(isn’t this last one necessarily true? and hence true, and hence not “neither true nor false”)
Characterizing Generics

- Some questions
  - What are the linguistic forms that such genericity can take (in English)?
  - What is the underlying logical form of such statements?
  - What sort of truth-conditions are relevant to these statements?
  - What sort of inferences do people make with such statements?
  - What sort of formal system should be adopted for characterizing genericity?
Generic NPs and Kind-Reference

(Part 2…remember?)
What sort of NPs are Generic?

- The **Lion** is a predatory cat
- **Lions** are predatory cats
- **Gold** is a precious metal
- The World Wildlife Organization decided to protect a **large cat**, namely the Siberian Tiger
- A **metal**, namely titanium, moved up sharply on the world market yesterday

*(These last two are “taxonomic”)*
• What is the “logical form” of NPs that are generic?
• (This is maybe not as logically exciting as the similar question about generic sentences, but there are a number of interesting facets to the question…. especially, what is the relation between “ordinary individuals” and generic NPs?)
The Natural Hypothesis...

- Generic NPs refer to Kinds
- Kinds are abstract objects that are “related to” physical things
  - by the “exemplification relation”?  
  - by any other relations?
- Investigating the variety of generic NPs may throw some light on this
Kind-Selecting Predicates

- Predicates such as **die out, be extinct** select for kind-denoting subject terms
- Predicates such as **invent** select for kind denoting direct object terms
  - The dodo/Dodos/*A dodo is/are extinct
  - Shockley invented the transistor /
    *a transistor / *transistors
  
  (Last two ok as taxonomic generic NPs)
Making reference to kinds

- It is **not** possible to form kind-referring NPs with just *any* nouns (Vendler 1967, Nunberg & Pan 1975, Carlson 1978, Dahl 1985)
  - *The German shepherd* is a faithful dog
  - *The Coke bottle* has a narrow neck
  - ?? *The German fly* is a lazy insect
  - ?? *The green bottle* has a narrow neck
Making reference to kinds

On the other hand:

- A green bottle usually has a narrow neck
- Green bottles usually have a narrow neck

So, the underlined NPs cannot refer to kinds (can they?) in these generic sentences.
Making reference to kinds

• Basically, the noun (or complex N´) must somehow be “semantically connected with” a **well-established kind**

• When does a language/society promote an NP to be kind-referring?
  – Are kinds created/destroyed by our use of language??
and equally difficult to explain: “generic predication” (characterizing genericity) has to be in some way essential to the subject, unless the subject directly refers to a kind:

The madrigal is polyphonic
The madrigal is popular
Madrigals are polyphonic
Madrigals are popular
A madrigal is polyphonic
?? A madrigal is popular

“essential”
“accidental”
Generic predications

good, if an individual madrigal
An ambiguity in reference?

• How many animals are in the zoo?
  – Seven?
  – Eight?
  – Thirteen?
  – (something else?)
An Ambiguity in taxonomy...

• But what is it an ambiguity in??
  – Endangered species are common
  – Endangered species are rare

(due to Barbara Partee)
How to refer to kinds….

(it’s complicated)
The many ways to refer to kinds

- Reference is not simple; at least reference to kinds is not simple
- A **direct** reference to kinds occurs in
  - The dodo is extinct
- But there are **many** sorts of “indirect” reference, and they are characterized by differences in the VP (or culture??)
- These differences are **very** difficult to understand, but here’s a classification
Characterizing & Distinguishing
Reference to kinds

- Characterizing Property
  Interpretation
  - The potato contains vitamin C

- Distinguishing Property
  Interpretation
  - The Dutchman is a good sailor
  - Dutchmen are good sailors
Collective property reference to kinds

• Collective Property Interpretation
  • Linguists have more than 8000 books in print
  • The German consumer bought 11,000 BMWs last year
Average property reference to kinds

- Average Property Interpretation
  - German teenagers watch 4 hours of TV daily
  - The American family contains 2.1 children
Kind Reference: Internal Comparison Interpretation

- The wolves are getting as we travel north
- The wolf gets bigger as we travel north
- Wolves get bigger as we travel north
More indirect reference...

• Representative Object Interpretation
  • In Jasper we filmed the grizzly
  • Look children: this is the reticulated giraffe
  • Quiet!! -- The lion is roaming about!
Some more indirect reference...

- **Avant-garde Interpretation**
  - *Man* set foot on the Moon in 1969
  - *Man* learned to solve cubic equations in the 13th C.
Comments on Interpretations

- Direct Kind Interpretations can involve a taxonomy
  - The dinosaurs are extinct
- With Characterizing Interpretations, indefinite can be used with the same meaning
  - A potato contains vitamin C

Unlike the Average Interpretation, the expectation is that all/most/the typical instances will manifest the property
Distinguishing Interpretations are different from both Characterizing and Average ones

Note that the corresponding sentences with indefinites are false

- Italians are good skiers vs. An Italian is a good skier
- Frenchmen eat horsemeat vs. A Frenchman eats horsemeat

(indefinites mean something like “A typical or randomly chosen ---- will (probably)….”)

Distinguishing means

- The Dutch are known to have good sailors
- The Dutch distinguish themselves from comparable nations by having good sailors
More comments...

- **Average vs. Collective Interpretations**
  - *The Canadian family* used less water this year than last

- **Internal Comparison Interpretation**
  - ??*A wolf* is getting bigger as we travel north
    (cf. *The road is getting rougher as we travel north*)
  (involves a comparison of the specimens of a kind along a certain dimension of their occurrence…but the comparison is still attributed to the kind)

- **Representative Objects**
  - *The fox* broke into the chicken house again
  - *Mr. Fox* broke into the chicken house again
• Avant-garde Interpretations
  • *Man* set foot on the Moon in 1969
  • ?? *Man* broad-jumped over 8.8m in 1968
  • ????*Man* ate 128 pretzels in one hour in 1976

  • ??*The American* set foot on the Moon in 1969
  • ??*The Primate* set foot on the Moon in 1969
Notions, Concepts, Pseudo-kinds

- In medieval times, the child didn’t exist
- In medieval times, people didn’t have the notion of ‘child’
- Can’t use children or the children
- Notion-reference distinguished from kind-reference by The notion of--, The concept of...
Conclusion About Kind-Reference

- We’ve surveyed a number of cases of reference to kinds.
- What’s striking is how different the background facts about the world can be and still give rise to kind-reference.
- There ought to be some moral here about the proper methodology for applying logical tools to natural language phenomena.
Characterizing Genericity

(Part 3…remember?)
Characterizing Sentences

- Do not report specific or isolated facts, but express a kind of general property
  - a regularity summarizing groups of particular episodes or events or facts or states of affairs
- Much of our commonsense knowledge of the world is expressed by generic sentences
Characterizing sentences

- Potatoes contain vitamin C
- The lion has a mane
- Chris has a beer after work

Not only distinct from individual or particular predications, but also from explicit quantificational sentences

- Each potato contains vitamin C
- Most potatoes contain vitamin C
- All potatoes from Alberta taste good
- Ivan always drinks wine with dinner
Generic sentences can contain generic NPs

- As can be seen from many of the example sentences, the two types of genericity can occur together
  - The potato is highly digestible
  - Potatoes are served whole or mashed as a cooked vegetable
  - The lion has a mane
  - The Ivy-League Humanities professor wears a tweed jacket
Exceptions to Generic Sentences

- One of the notable features of generic sentences is that they are “exception-tolerating”
  - Ivan might omit wine from a few of his meals
  - Some lions do not have manes
  - Some potatoes are indigestible

- It is this feature that piques the interest of many logically-oriented linguists and philosophers
What are relevant “cases”?

- Different types of generic sentences call for different cases to be relevant
  - Tabby (usually) lands on her feet
  - Marvin (normally) beats Sandy at ping-pong
  - Bears with blue eyes are (normally) intelligent
  - A grade school student is (typically) a child
  - People who have a job are (usually) happy
  - People who live far from work (usually) drive
How many exceptions?

– Snakes are reptiles
– Telephone books are thick
– Guppies give live birth
– Lions have manes
– Italians are good skiers
– Frenchmen eat horsemeat
– Unicorns have one horn
Even a “vague” quantifier fails

Consider Generally or In a significant number of cases. The following are false, yet would be true if quantified by such a quantifier

- Leukemia patients are children
- Seeds do not germinate
- Books are paperbacks
- Prime numbers are odd
- Crocodiles die before they are two weeks old
- Bees are female
Intensionality

There is an “intensional” aspect to characterizing genericity:

• This machine crushes oranges
• Mail for Antarctica goes in this box
• Members of this club help one another in emergencies
• Children born in Rainbow Lake, Alberta, are left-handed
• Pandas have three legs
Intensionality and Generics

- Shows complete implausibility of trying to capture genericity with an extensional quantifier, no matter how vague or probabilistically-determined.
- Generic sentences are akin to scientific laws: “accidental generalizations” are not true characterizing generic sentences.
Some Ambiguities

- John drinks beer
  - Beer is John’s favorite alcoholic beverage (habitual)
  - John does not object to drinking beer (dispositional)
- Typhoons arise in this part of the Pacific
  - Typhoons in general have a common origin in this part of Pacific
  - There arise typhoons in this part of the Pacific
- A computer computes the daily weather forecast
  - Computers in general have the task of computing daily weather…
  - The daily weather forecast is generated by a computer
- Cats runs across my lawn every day
  - Cats in general run across my lawn every day
  - Every day, a cat runs across my lawn
Stress and ambiguity in generics

- Leopards usually attack monkeys in trees
- Leopards usually attack monkeys in trees
- Leopards usually attack monkeys in trees
- Leopards usually attack monkeys in trees
- Leopards usually attack monkeys in trees

- Bullfighters are often injured

- We call the members of the implicit comparison class “restricting cases”. They are the background against which the characterizing statement is made.
“Leopards usually attack monkeys in trees”
“Bullfighters are often injured”
Some notation: the operator GEN

Characterizing sentences have **three parts**, joined by an intensional operator GEN...a kind of unselective quantifier

- a “matrix” (a main clause) which makes the main assertion of the sentence
- a “restrictor clause” which states the restricting cases relevant to the matrix
- a “variable list” that is governed by GEN

The “tripartite analysis”!
The general (generic?) form of generic sentences

$$\text{GEN}[x_1 \ldots x_i; y_1 \ldots y_j](\text{Restrictor}[x_1 \ldots x_i];$$

$$\text{Matrix}[^{\{x_1\} \ldots \{x_i\}}_{y_1 \ldots y_j}] )$$

- unselective quantifier
- variables bound existentially, with scope just in matrix
- variables bound by GEN
- means $x_1 \ldots x_i$ may or may not occur in matrix
Examples

– Typhoons arise in this part of the Pacific
  • GEN[x](x are typhoons; \( \exists y[y \text{ is t-p-o-P} \& x \text{ arise in } y] \))
  • GEN[x](x is t-p-o-P; \( \exists y[y \text{ are typhoons} \& y \text{ arise in } x] \))

– John drinks beer
  • GEN[x,y,s](x=John \& y \text{ is beer} \& y \text{ in } s \& x \text{ in } s; x \text{ drinks } y \text{ in } s)

– John drinks beer
  • GEN[x,s](x=John \& x \text{ in } s; \( \exists y[y \text{ is beer} \& x \text{ drinks } y \text{ in } s] \))
But GEN is really just notation…

- What does it mean?
- What is/are truthmaker(s) for generic statements?
- What sort of formal semantics is relevant to generic statements?
What is an underlying semantics?

- Relevant Quantification?
  - Whales give birth to live young
    - $\forall x[\text{whale}(x) \land R(x) \rightarrow \text{g-b-t-l-y}(x)]$
  - Whales are sick
    - $\forall x[\text{whale}(x) \land R(x) \rightarrow \text{sick}(x)]$
What’s an underlying semantics?

- **Arbitrary Objects**
  - subject terms refer to an “arbitrary object”
  - (Good?) enforces a close link between two types of genericity
  - (Bad?) doesn’t cover whole range
    - Mary smokes when she is nervous
  - (Background requirement?) how to distinguish between accidental generalizations and real generics?
What’s the semantics for GEN?

- **Prototypes**
  - Cats have tails $\Rightarrow$ The prototypical cat has a tail $\Rightarrow$
    $\forall x (\text{PROTO(Cat)}(x) \rightarrow$
    $\exists y (y \text{ is a tail} \& x \text{ has } y))$
  - What’s a Prototype??
    - One understanding of a prototype is supposed to be a “realistic object”; so a prototypical human will have hair, and hence will have hair of some particular color. If there is no one prototypical color, then there will be many different prototypical humans, one for each color.

Prototypical child(?)

Prototypical Man(?)
Prototypes and compositionality

Many researchers (because of work by Smith & Osherson, 1981) think that PROTO is not a compositional operator.

- PROTO(fish)
- PROTO(pet)

PROTO(pet fish)
Prototypes....

- A more modern version of Prototypes
  - A “statistical” package with attribute-value pairs:
    - For each property that a member of that kind can have, a “probabilistic” value as to how important it is that an exemplar have that attribute
More on prototypes and generics

- Consider also
  - Ducks have colorful feathers
  - Ducks lay bluish-white eggs

(This is very difficult for any theory of generics)
Another semantics for GEN?

- **Stereotypes** (not features of the world, but rather of our perception of it)
  - A lion has a mane [true]
  - A lion is male [false even though this is a superset of the ones with manes]
  - A lion is a five-year old male [false even though this is a subset of the ones with manes]

- Isn’t it **false** that
  - Snakes are slimy

   even though that is the stereotype for snakes?
Yet another semantics for GEN?

- **(Modal) Conditionals**
  - **Birds fly** (a characterizing generic)
  - Is related to: if x is a bird, then x flies
  - But need to account for exceptions: in any of the most normal possible worlds, every bird flies
  - But that’s not quite right either, since we wouldn’t want all the penguins to be flyers at once, or all the ducks to be egg-layers. Maybe more like: for any bird, in each world where that bird is normal, it flies?

- Seems relevant for intensionality, for law-likeness, dispositionals, etc.
Semantics for GEN

- The modal conditional approach, when mixed with the related default reasoning approach, is my favored way to go. I’ll talk about that at tomorrow’s Semgroup.

- Related reading:
  - Pelletier & Asher 1997 “Generics & Defaults”
  - Asher & Pelletier 2012 “More Truths about Generic Truth”
There’s more to be said…. 

But we won’t do that now!!

Thanks, and…

THE END!!