Genericity in Natural Language

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European Summer School in Language, Logic and Information 2005
Course Overview

Monday  Introduction
- The problem of Genericity
- Episodic/Characterizing sentences
- Carlson’s (1977) theory

Tuesday  Kinds
- Definite Generics
- Subkinds
- A-generics

Wednesday  Neo-Quantificational Analysis
- Generics and Adverbs of Quantification
- Stage-level/Individual level
- Focus and Genericity

Thursday  Genericity and Aspect
- Aspectual Class
- Stativity and Genericity
- Markers of Genericity

Friday  Rest
- Wrap-Up
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Katz/Zamparelli  Genericity
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Outline of the day

1. Kinds of kinds
   - The singular definite generic
   - Taxonomic subkinds

2. Indefinites in CS: the "A-generic"
   - Predicates accepted by the A-generic
   - Implications of A-generic for Bare Plurals
   - Summary
The idea that English Bare Plurals (BP) unambiguously denote kinds and that the type of predicate determines the quantificational properties of a BP subject/object is central for the theory of Carlson (1977).

However, BP do not exhaust the range of linguistic objects that can apparently be kind-denoting and/or appear in Characterizing Sentences (CS).

The exam of these cases reveals a more complicated picture, and ultimately gives reason to reevaluate and modify Carlson’s original theory.
Mass (uncountable) nouns behave like bare plural count nouns.

(1)  

a. Water is $\text{H}_2\text{O}$.  

b. Water was on the floor.

(2)  

a. Hydrogen is {common / widespread} frequency predicates  
b. Bronze was invented / first created 5000 years ago. verbs of creation (also episodic)  
c. Beer comes in many different types. subtype predicates

(3)  

a. Jack didn’t find gold $\neq$ there was gold Jack didn’t find  
b. Jones wants to buy furniture $\neq$ There is furniture that Jones wants to buy

These facts can be accommodated by assuming that bare mass nouns also natively denote kinds. Carlson’s theory applies to them without major modifications.
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The following sentences are near-synonyms, and illustrate other ways to kind reference.

(4)  
   a. [Tigers] are in danger of extinction. \textit{bare plurals}  
   b. [The tiger] is in danger of extinction. \textit{definite generic}  
   c. [This kind of animal] \textit{(pointing to a tiger)} is in danger of extinction. \textit{“kind” construction}  
   d. [A predatory cat], namely the tiger, is in danger of extinction. \textit{taxonomic subkind}  

Cases (b)-(d) are also discussed in Carlson 1977, but no conclusive proposal is advanced.
In English (in contrast with Romance languages), the plural definite article is not used for nouns that refer to kinds (5-a), but the *singular* definite generic article (SDG) with count nouns can be (5-b).

(5)  

a. [(??The) dogs] turned out to be the perfect companions for [(??the) ancient hunters].  

b. [The dog] turned out to be the perfect companion for [the ancient hunter].

(6)  

a. [The panda] has various subspecies / is almost extinct  

b. Many chinese biologists study [the panda].

The use of the SDG has various limitations both in the nominal restriction and in the range of predicates it accepts.
SDG: constraints on the restrictor

- Nominals which are “too general”.
  
  (7)  
  a. [The {toaster / ??gadget}] is very common in American households.  
  b. [The {parabula / ??curve}] is easy to draw.  
  c. [The {sphere / ??solid object}] is tridimensional.

- Nominals that refer to “non-canonical” objects.
  
  (8)  
  a. [The {Coke / ??green} bottle] is easy to recycle.  
     odd as a statement about green bottles in general  
  b. [The {??wounded / Bengali}] tiger is dangerous.  
  c. ??[The old shoe] is common in [the city river]

- Human kinds (cf. ‘human roles’).
  
  (9)  
  [The ?(perfect) thief / The ?(real) lawyer] looks like a gentleman.
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- Human kinds (cf. ‘human roles’).
  
  (9) [The ?(perfect) thief / The ?(real) lawyer] looks like a gentleman.
These limitations do not hold for bare-plural-based kinds:

(10)  
   a. Curves are easy to draw.  
   b. Gadgets are very common in American households.  
   c. Solid objects are tridimensional

(11)  
   a. Green bottles are simple to recycle.  
   b. Old shoes are common in city rivers.

(12) Thieves look like gentlemen.

In general, BP may be arbitrarily complex:

(13) [People who have taken medication X for more than 4 days] develop rushes.
How to characterize the class of SDG nominals, vs. bare plurals?

- “Natural”/ “well-established kinds” vs. “kinds” (possibly, novel ones).
- Lexical vs. Productive Nominals (Beyssade 2005).
- True Kinds vs. Individual Concepts (i.e. the nominalization of arbitrary predicates).
Two caveats on the restrictions on SDG:

- Technical discourse or a suitable context can make many impossible BSG restrictions possible. What counts as “canonical/well-established kind” is context dependent.

- Other definite determiners (especially demonstratives) can lead to a kind interpretation when it is used to refer to an entity (object or kind), introduced in the discourse:

  (14) If we do not do all we can to save the panda, [{this animal / the poor, cute teddy bear-like creature}] will soon become extinct.

- A definite can refer to a kind by mentioning its instances. Bare plurals cannot.

  (15) *Context: A cage containing only gorillas*

  a. [The animal in that cage] is almost extinct.
  b. ??[Animals in that cage] are almost extinct.
(16) [This animal / the furry pet under this table] [pointing to a tiger] is in danger of extinction / is not widespread any more.

But what is the level of abstraction?

(17) a. Dogs come in many, very different breeds.
    b. The dog comes in many, very different breeds.
    c. ?This dog [pointing to a dog] comes in many, very different breeds.
    d. ?This [pointing to a dog] comes in many, very different breeds.
    e. *Fido (my dog) comes in many, very different breeds.

How salient is the type/subtype?
SDG: Constraints on the predicate

SDG can go in argumental positions that select for kind entities.

(18)  
   a. [The lemur] evolved from [the tree shrew]
   b. Edison invented [the lightbulb]

They can also appear as arguments of object-level predicates in CS:

(19)  
   a. [The swan] lives up to 40 years in captivity
   b. [The lion] has a bushy tail

Frequency/quantity predicates give mixed results with SDG:

(20)  
   a. The tiger is rare / is common / is widespread / comes in several varieties
   b. *The tiger is {numerous / everywhere} in this region.
According to Krifka (2003), SDG cannot be used (in English) in characterizing sentences that express *rules or regulations*, including definitions (cf. Carlson 1995).

(21) a. ?The gentleman open the door for ladies
b. ?The bachelor is an unmarried adult male human being.
c. ?The period ends a written affirmative sentence

This particular restriction does not seem to be active in other languages (e.g. Italian). Also, improvements with *the perfect gentleman...* ("roles"?)

(22) a. Lo scapolo è un uomo non sposato
    the bachelor is a man not married
b. Il punto termina una frase affermativa scritta.
    the period ends a sentence affirmative written
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Frequency predicates with SDG (Kleiber 1990, Chierchia 1998)

(23) The rat is common/*numerous

(23) might suggest that the SDG has a “mass” behavior. Dayal (2004) proposes that it has the status of a collective noun (like “family”, “group”). Cf.

(24) The German customer bought 11000 BMWs last year.

However:

(25) a. {Water / *the rat} is abundant on Earth.
    b. {??Il topo / il gruppo} era numeroso (Italian)
       {??the rat / the group} was numerous
    c. *Dogs are numerous / millions
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The main difference between the SDG and the BP appears in combination with episodic predicates. The BP takes an *indefinite* existential reading, the SDG falls back in the object-level *definite* reading.

(26) The dog / Dogs bark(s)  
\textit{CS: quasi-universal reading}

(27)  
a. Dogs are barking right now.  
\textit{ES: }\exists = \text{"there are dogs barking r.n."}

b. The dog is barking right now.  
\textit{ES: definite }\not= \text{"there is a dog that is barking"}

The only exception is cases where the episodic predicate applies to a specimen of the kind as a “representative” for the whole kind. The property must be exceptional for members of that kind.

(28)  
a. The rat reached Australia in 1880

b. The quagga was last spotted in the wild in 1970.

(Carlson’s “Avant Guard reading”)
The (perhaps unsurprising) lack of an indefinite reading for SDG in episodic contexts, is problematic if SDG denote kinds just like BP and the existential reading is obtained “automatically” when an object level predicate applies to a kind.

(29)  
a.  \([\text{Dogs}]^k\) are asleep.
   b.  \(\lambda P \exists x^S [R(x^S, P) \land \text{asleep}(x^S)](\text{dogs}^k)\)
   c.  \(\exists x^S [R(x^S, \text{dog}) \land \text{asleep}(x^S)]\)

An indefinite existential reading seems to be obtainable from the plural count kind-referring nominals found in Italian and other Romance languages (see e.g. Italian).

(30)  
L’ altra settimana [i ladri / ??il ladro] hanno/ha
   the last week [the burglars / the burglar] have/has
   svaligiato la mia casa.
   robbed the my house
   “Last week burglars robbed my house”
The existence of existential readings for the SDG and the plural DG is particularly interesting, because it opens the possibility that stages of kinds might actually differ from stages of objects.
Kinds of kinds
Indefinites in CS: the “A-generic”
References

Objects
*tokens / particulars*

Kinds
*types / classes*

**Indefinites**

- Fido
- These people
- Dogs in this cage
- Dogs
- This kind of tool
- Fido at time t
- People here now

**Predicates**

- is/are a dog/dogs
- know French
- is/are intelligent / warm-blooded
- is/are widespread / everywhere has/have three subkinds
- know French are mammals / intelligent
- spot(s) foxes
- smoke(s), roar(s)
- is/are available

**Taxonomic subkinds**

- Dogs
- The brown bear
- This kind of tool

**Generics**

- spotted Foxy
- reached the top
- are/is currently in my yard
- is drunk, available
- is standing here

**Stages** (temporal)

- Dogs
- This kind of tool
- The horse (?)
Kinds of kinds
Indefinites in CS: the "A-generic"
References

Object (tokens / particulars)

Kinds (types / classes)

Individuals (atemporal, unbounded)

Stages (temporal)

Fido
These people
Dogs in this cage

is/are a dog/dogs
know French
is/are intelligent / warm-blooded

spots/foxes
smoke(s), roar(s)
is/are available

Dogs
The brown bear
This kind of tool

is/are widespread / everywhere
has/have three subkinds

know French
are mammals / intelligent

spot(s) foxes
smoke(s), roar(s)
is/are available

became easily extinct
are invented regularly
evolve constantly

Fido at time t
People currently here

Dogs
This kind of tool
The horse (?)

spotted Foxy
reached the top
are/is currently in my yard
is drunk, available
is standing here

Dogs
The brown bear
This kind of tool

became extinct 20M years ago
was/were just invented
is still evolving

Katz/Zamparelli
Genericity
Taxonomic Subkinds

(31) a. [Most crustaceans] evolved separately
b. [Every car sold in the USA] undergoes thorough crash tests
c. [This animal] is almost extinct
d. Professor Ogilvy invented [a new hydrogen pump].

Here the quantifiers/determiners in the bracketed DPs tend to range over subkinds of thing. This can be made explicit using words like kind / type / species / sort / model, etc.:

(32) a. [Most species of crustaceans] evolved separately
b. [Every model of car sold in the USA] undergoes thorough crash tests
c. [This kind of animal] is almost extinct
d. Professor Ogilvy invented [a new type of hydrogen pump].
The common noun alone (or the NP, in a DP framework) appears to be ambiguous between an object-level and a kind-level interpretation.

The use do kind of / type of ... etc. (the kind construction, Wilkinson 1995, Zamparelli 1998) disambiguates in favor of kinds.

The ambiguity of common nouns does not require a quantifier (see kind-denoting predicate nominals)

(33)  
   a. Being [dogs], [Fido and Lara] are [mammals]  
   b. [These Australian marsupials] are [mammals] (e.g. kangaroos and wallabies are subtypes of mammals)

With simple common nouns the ambiguity is much more perceivable with words that belong in a taxonomic (biological, functional, ...) hierarchy.
Example: “animals”:

```
animals
  --
  carnivores  omnivores  herbivores
    |         |         |
  felines  |  bears   |  ruminants
    |         |         |
  cat  --
          |
  tiger  lion  leopard
          |
  black  ...  wolf  fox  ...
```
An account of the subkind reading requires common nouns to have denotations either in the *object* or in the *kind* domain:

- **N as properties of objects**

  \[
  \text{[dog]}^w_t \mapsto \{\text{Fido, Lassie, Rin Tin Tin, Pluto, \ldots}\}
  \]

  This is the denotation used for e.g. *Every dog was chewing a bone*

- **N as properties of kinds**

  \[
  \text{[dog]}^w_t \mapsto \{\text{German shepherd}^k, \text{Bobtail}^k, \text{Golden Retriever}^k, \ldots\}
  \]

  This is the denotation used for e.g. *Every dog has been selected for its special features.*
Note that uncountable (mass) nouns must also have a denotation in the domain of (countable) subkinds:

(36) a. Every mineral water has different sodium contents.
\[
\text{\llbracket water\rrbracket} = \{\text{Perrier}^k, \text{Ferrarelle}^k, \text{Evian}^k, \text{Gaudianello}^k, \ldots\}
\]

b. Most wines are made with black grapes.
\[
\text{\llbracket wine\rrbracket} = \{\text{Cabernet}^k, \text{Merlot}^k, \text{Pinot Noir}^k, \ldots\}
\]

c. Some woods have soft grain
\[
\text{\llbracket wood\rrbracket} = \{\text{pine wood}^k, \text{oak wood}^k, \text{sapient pear wood}^k, \ldots\}
\]
Objects can have more than one taxonomic subkind hierarchy (e.g. depending on biology, size, function, etc.)

\[(37)\text{ }[\text{dog}] = \{\text{German shepard}^k, \text{Bobtail}^k, \text{Golden Retriever}^k, \text{Labrador}^k, \text{Pitbull}^k, \ldots \}\]

\[(38)\text{ }[\text{dog}] = \{\text{company dogs}^k, \text{watch dogs}^k, \text{hunting dogs}^k, \text{truffle dogs}^k, \ldots \}\]

Context selects. As Carlson observes, subkinds cannot overlap, not even across different taxonomies.

\[(39)\text{ }\text{Assume: Fido is an animal, a mammal, a dog, a German shepard, a watch dog. He is in that room.}\]

\[(40)\text{ a. } \#\text{There are three kinds of animal in that room. } [a \text{ mammal, a dog, a German shepard}]\]
\[\text{b. } \#\text{There are two kinds of dog in that room. } [a \text{ German shepard, a watch dog}]\]
**Question:** does every object have subkinds?

- **A1:** No, just those that naturally belong in taxonomies:
  
  (41)  
  a. Every hydrogen has slightly different nuclear properties.  
  b. Most dodos has evolved together.

- **A2:** Yes, but in some (pragmatically difficult) cases it might be difficult to get them by simply quantifying over the common nouns. The alternative is using the kind construction:
  
  (42)  
  a. Every type of hydrogen has slightly different nuclear properties.  
  b. Every kind of dodo has evolved together.

(43) \( [\text{kind of hydrogen}] = \{ \text{hydrogen which has been extracted from water, hydrogen which has been derived from methane, hydrogen that is free in the universe, ...} \} \)

An answer depends on the analysis of the kind construction (Zamparelli, in progress)
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Kinds in the Determiner Phrase

Where do kinds come from?

**A1**: Common Nouns denote kinds (or sets of subkinds); they are converted to sets of objects at a higher layer (Zamparelli 1995/00, Krifka 95, see also McNally and Gemma 2004, McNally 2015, Grimm and McNally 2015).

\[(44)\]

```
StrongDP
<e> / <<et>t>
```

```
Q
PredP
< e^o,t>
```

```
Num
KindP
<e^k> / <e^k,t>
```

Problem: compositionality of kinds.

\[(45)\] [carps which have been fished three times] become stressed
McNally (2015):

- the innermost layer of DP has a non referential meaning which corresponds most closely to *distributional meanings*.
- Reference appears higher up (see also Carlson 2009 on the relation between ‘kinds’ and ‘concepts’)

But the question of how to properly interface formal and distributional semantics remains open (see the DSALT workshop, and McNally/Umbach workshop this week).
The “A-generic”

CS based on object-level predicates can easily have indefinites with overt articles as subjects.

(46)  
a. A decent bookshelf has steel shelves  
b. A dog has four legs

The indefinite is singular in the cases considered here (the A-generic construction), but this is not a necessity:

(47)  
a. Two roosters compete for supremacy  
b. Three people in a long-distance boat trip always end up fighting
A-generic is excluded with predicates that only apply to kinds:

(48) a. A dog was selected in prehistoric times.  
    \( \not= \) dogs were selected in prehistoric times
b. A dinosaur is extinct.  
    \( \not= \) dinosaurs are extinct
c. A cockroach becomes bigger as one travels South.  
    \( \not= \) Cockroaches become bigger as one travels South.
A-generic is possible only with certain frequency predicates:

(49) a. A bear with blue eyes is {common / rare / ?frequent / *widespread / *numerous}
    b. Finding a bear with blue eyes is {common / rare / ?frequent / *widespread / *numerous}

Longobardi (2001): perhaps such predicates are not good tests for kind-denotation.

Hypothesis: “A bear with blue eyes is common” can be interpreted as “The event of finding a bear w.b.e. (within certain spacial interval) is common/frequent/*numerous”
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Hypothesis: “A bear with blue eyes is common” can be interpreted as “The event of finding a bear w.b.e. (within certain spacial interval) is common/frequent/*numerous”
Syntactically, the A-generic does not seem to be available in non-subject positions:

(50)  a. In vacation I (always) pick a mushroom. ≠ ... mushrooms
    b. As a hobby, I photograph a bird ≠ ... birds

(51)  a. A real movie star resembles Marilyn Monroe.
    b. Marilyn Monroe resembles a real movie star.

Semantically, A-generics seem to be mostly used to state definitions, or express rules or regulations (Lawler 1973, Burton-Roberts 1977)

(52)  a. A table has four legs.
    b. To be a table is to have four legs.
    c. A table must have four legs to be a real table.

Krifka (2013): A-generic is mainly used to talk about language, not reference:

(53)  A *wampimuk* is a mythical beast popular in distributional semantics.
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BP-based CS seem to allow a wider range of meanings:

(54)  a. A madrigal is polyphonic / ??popular  
b. Madrigals are polyphonic / popular

(55)  a. An Italian restaurant is expensive / ??closed tonight.  
      (Greenberg 2002) 
b. Italian restaurants are expensive / closed tonight.

Like BP, A-generics are non monotonic:

(56)  a. Berber lions are well-adapted to cold weather.  \n      Lions are well-adapted to cold weather. 
       \n      b. A Berber lion is well-adapted to cold weather.  \n      A lion is well-adapted to cold weather.
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(56)  
  a. Berber lions are well-adapted to cold weather. \notimplies  
      Lions are well-adapted to cold weather.  
  b. A Berber lion is well-adapted to cold weather. \notimplies  
      A lion is well-adapted to cold weather.
A-generic can be accompanied by an adverb of quantification (Lewis 1975: *always, usually, rarely, never, . . .*). The quantification force of the sentence varies depending on the adverb:

(57)  

a. A sentence always contains a noun.  \( \Rightarrow \)  
All sentences contain a noun.  
b. A sentence usually contains a verb.  \( \Rightarrow \)  
Most sentences contain a verb.  
c. A sentence rarely contains a hash sign.  \( \Rightarrow \)  
Few sentences contain a hash sign.  
d. A sentence never contains two periods.  \( \Rightarrow \)  
No sentence contains two periods.
Lewis’ (1975) analysis of adverbs of quantification as *unselective quantifiers* can apply to these cases:

(58) a. A sentence always contains a noun. ⇒
    ALWAYS x [x is a sentence][∃y, y is a noun and x contains y]

b. A sentence usually contains a verb. ⇒
    OFTEN x [x is a sentence][∃y, y is a verb and x contains y]

c. A sentence never contains two periods. ⇒
    No x [x is a sentence][∃y, y are two periods and x contains y]

The indefinite *a sentence* must be analyzed as introducing a *free variable* which is bound by the adverbial.

Possibility of a *covert* adverbs of quantification, (GEN) with a “quasi-universal” meaning.
Lewis’ (1975) analysis of adverbs of quantification as *unselective quantifiers* can apply to these cases:

(58)  
\[ \begin{align*}  
    a. & \quad \text{A sentences always contains a noun. } \Rightarrow  
        \text{ALWAYS } x \quad [x \text{ is a sentence}] [\exists y, y \text{ is a noun and } x \text{ contains } y] \\
    b. & \quad \text{A sentences usually contains a verb. } \Rightarrow  
        \text{OFTEN } x \quad [x \text{ is a sentence}] [\exists y, y \text{ is a verb and } x \text{ contains } y] \\
    c. & \quad \text{A sentences never contains two periods. } \Rightarrow  
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Possibility of a *covert* adverb of quantification, (GEN) with a “*quasi-universal*” meaning.
Relevance of A-generic for BP

- A-generic can appear with CS based on episodic and lexically characterizing predicates (*smokes, is intelligent*), but not with predicates that only apply to kinds (*is extinct*).
  ⇒ A-generics are not kind-denoting

- In CS, A-generics have the quantificational variability of BP.
- Quantificational variability was one of the main reasons against a quantificational analysis of BP and in favour of a uniform analysis as kinds.
- A-generics show that there must be an alternative explanation to quantificational variability than the use of kinds:
  - the quantificational approach proposed by Lewis plus the idea that indefinites introduce free variables.
- The same method could be applied to BP, if they are also treated as indefinites that introduce free variables.
  ⇒ The idea that BP unambiguously denote kinds is undermined.
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Summary

- The singular definite generic article and its restrictions;
- The subkind meaning of NPs
- The kind construction
- The A-generic: Nominals that have quantificational variability but not kind-reference
Homework

- Are all determiners possible in the kind construction? *(A dog of this kind, this kind of dog)*

- *For speakers of Romance languages:* in what cases are bare plurals possible in your language? Test various syntactic positions.
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