

**Carlson 1977: *Reference to Kinds in English: Part 2***

**The Proposal (Chapter IV)**

**Bare plurals function as names of kinds**

- (1) Every man sleeps
- (2) ( $\forall x$ : x is a man) (x sleeps)

True iff John sleeps, Peter sleeps, Bill sleeps...and so on until we have exhausted the domain of men

- (3) Every kind of bird eats
- (4) ( $\forall x$ : x is a kind of bird) (x eats)

True iff orioles eat, sparrows eat, pheasants eat... and so forth.

- “Note that what we were (intuitively) using to assign values to x from the domain of kind of birds were bare plural NPs. These, then, I propose function grammatically as the names of kinds of things” (p. 99)
- Some grammatical arguments that bare plurals behave as proper names
  - So-called construction
    - (5) Slim is so-called because of his slender build
    - (6) Cardinals are so-called because of their color
    - (7) \*All cardinals are so-called because of their color
  - Mean though he is-construction
    - (8) Mean though Bill is, he hasn't the heart to do that
    - (9) Mean though bobcats are, they are still good pets
    - (10) ?? Mean though several bobcats are, they wouldn't harm our dogs
  - Vocatives...
    - (11) Fred! Lend me your ears
    - (12) Soldiers! Lend me your ears
    - (13) ?? Many friends! Lend me your ears
- Kind-predicates:
  - (1) Lions are widespread
  - (2) Kind people are rare
  - (3) Bald eagles are nearly extinct
  - (4) \*Fido is widespread.
  - (5) \*John is rare.
  - (6) \*That bald eagle is nearly extinct
  - (7) That kind of lion is widespread.
  - (8) That kind of eagle is nearly extinct.

## Ontology

- Two types of individuals  
  
Kinds: the kind DOG, the kind PEOPLE, the kind GRADUATE STUDENT...  
Object: Fido, John, Maria...
- Stages: spatiotemporal slices of individuals.  
Fido-at-noon-in-my-yard; John-at-1 o' clock-in class...
- Individuals tie stages together.
- **Realization** relation:            objects realize kinds  
   stages realize kinds and individuals

## Individual/Stage-level predicates

- Claim: BPs have a unified denotation (they are names of kinds).
- Observation 1: BPs may have two different interpretations.
- Observation 2: type of interpretation depends on the predicate. Some predicates select for the existential interpretation; some predicates select for the generic interpretation.

- (1) Firemen are intelligent.            (generic)
- (2) Firemen are available.            (existential)

- Question: How can we characterize these two different kinds of predicates? What is it in their denotation that brings about the interpretation of the BP?

- Intuitive characterization:

Predicates like **intelligent** 'say something' of individuals

Individual-level predicates; (Milsark 1974: 'properties': assumed to be permanent)  
**big, boring, intelligent, insane, orange, fat...**  
some PPs (**in short supply**) predicate nominals.

Predicates like **available** 'say something of stages' of individuals.

Stage-level predicates; Milsark 1974: 'states': in principle, transitory)

**sick, tired, hungry, drunk, open, naked, alert, awake...**  
most PPs (e.g., **on the corner**) the progressive, passive participles.

- Grammatical differences between the two types of predicates (Milsark 1974)
  - (3) (a) There were several policemen available  
(b) \*There were several policemen intelligent
  - (4) (a) Sm doctors are available  
(b) A doctor is available
  - (5) (a) \*Sm doctors are intelligent  
(b) \*A doctor is intelligent [bad on the  $\exists$  reading]

### Analysis – take 1

Assumptions:

- I am using an indirect translation method. English expressions are translated into expressions of a logical language (which will then be assigned an interpretation by the interpretation function).
- Sorted variables: Type indicated by subscript -- k (kinds), o (objects), i (individuals), s (stages).
- In some cases, I depart from Carlson's assumptions (e.g., following Montague, Carlson takes proper names to denote sets of properties. I just assume that they denote individuals.)
- To simplify the exposition, I disregard intensionality in what follows.

(i) Individual-level predicates

$$T(\mathbf{intelligent}) = \lambda x_i (\mathit{intelligent}'(x))$$

$$T(\mathbf{be\ intelligent}) = \lambda x_i (\mathit{intelligent}'(x))$$

Individual-level adjectives and predicate nominals combines with **be<sub>1</sub>**, which is semantically null.

[note: Carlson would translate **intelligent** simply as *intelligent'*, a constant that denotes a function from individuals to truth-values. My translation below is meant to make the types more transparent, but is obviously equivalent to that.]

(6)  $T(\mathbf{John\ is\ intelligent}) = \mathit{intelligent}'(j)$

(ii) Stage-level predicates

$$T(\mathbf{available}) = \lambda x_s (\mathit{available}'(x))$$

Note: there are no DPs that denote stages. Thus, we can't combine **available** directly. Carlson: stage-level adjectives combine with **be<sub>2</sub>**, whose denotation maps sets of stages to sets of individuals that have stages that the adjective is true of. Disregarding intensionality:

$$T(\mathbf{be}_2) = \lambda P \lambda x_i (\exists y_s (R(y,x) \ \& \ P(y)))$$

$$T(\mathbf{be\ available}) = \lambda x_i (\exists y_s (R(y,x) \ \& \ \mathit{available}'(y)))$$

(7)  $T(\text{John is available}) = \exists y_s (R(y, j) \ \& \ \text{available}'(y))$

(iii) Additionally, we have predicates that can only apply to kinds:  
**to be widespread, to be rare, to be common, to be extinct, invent** (wrt to object position)

$T(\text{widespread}) = \lambda x_k (\text{widespread}'(x))$  [selects for kinds]

(8) Lions are widespread  
widespread' (d)

(9) \*John is widespread  
→ Type mismatch.

### What this gives us

- The different interpretations of BPs are determined by the denotation of the predicate. ☺

(i) BP + individual-level / kind- level predicate: generic interpretation (kind-predication)

(14) Dogs are intelligent  
Intelligent' (d)

(15) Dogs are widespread  
Widespread' (d)

When we predicate something of a kind, we don't specify which / how many realizations (if any) satisfy the predicate.

Analogy: the battalion

(16) The battalion was wiped out (true iff all members were wiped out) [cf. *dogs are mammals*]

(17) The battalion is tired now (can be true if most members are tired) [cf. *dogs bark*]

(18) The first battalion handles ammunition (can be true if a minority of the members handle ammunition) [cf. *turtles are long-lived*]

(19) The battalion shifted its position slightly (doesn't entail anything about members)

(20) The first battalion has served its country for 200 years (the predicate may be true of the battalion even though it is false for any of its members) [cf. *Lions come from Asia and Africa*]

(ii) BP + stage-level predicate: existential interpretation ( $\exists$  quantifier introduced by the predicate.)

(21) Firemen are available.  
 $\exists y_s (R(y, f) \ \& \ \text{available}'(y))$

[Noted in class: a problem with introducing  $\exists$  quantification through **be - the available firemen**]

- The habitual/episodic distinction characterized in terms of the individual/ stage level distinction. This will give us the correlation habitual → generic; episodic → existential. ☺

(22) Bill ran

This sentence is ambiguous between a habitual and episodic interpretation.

Carlson: The tense morpheme is not responsible for the ambiguity, since sentences like **Bill will run; the doctor ordered Bill to jog and the couple considered attending church** are ambiguous in the same way. "It is the predicate itself that in some way contains the ambiguity"

Systematic ambiguity:

(23)  $T(\text{run}_{\text{characteristic}}) = \lambda x. (\text{run}''(x))$

**Bill ran** (habitually)  
Run''(b)

(24)  $T(\text{run}_{\text{happening}}) = \lambda x_i \exists y_s (R(y, x) \& \text{run}'(y))$

**Bill ran** (on at least one occasion)  
 $\exists y_s (R(y, b) \& \text{run}'(b))$

BPs:

(25) Dinosaurs ate kelp.

ate'(d)(kelp) (habitual + generic)  
 $\exists y_s (R(y, d) \& \text{ate}''(y))$  (episodic + existential)

- Scope facts taken care of. ☺

$\exists$  quantifier associated with the existential use of BPs is very low, since it is part of the denotation of the predicate. This explains:

- only narrow scope with respect to operators

(26) Dogs are here and dogs are not here.

[see Carlson's derivation in page 136-138]

$T(\text{be here}) = \lambda x_i (\exists y_s (R(y, x) \& \text{here}'(y)))$

$T(\text{dogs are here}) = \exists y_s (R(y, d) \& \text{here}'(y))$

Dogs are not here

**not [dogs are here]**

**T (not [dogs are here])** =  $\sim \exists y_s (R(y, d) \& \text{here}'(y))$

$\exists y_s (R(y, d) \& \text{here}'(d)) \& \sim \exists y_s (R(y, d) \& \text{here}'(d))$

"We find exactly the same result we would find if we were to put a person's name in for the bare plural" (*Fred is here and Fred is not here*) (Carlson, p. 135) Note that we would get the same translation for **dogs [1 not [t<sub>1</sub> are here]]**

(26') Some dogs are here and some dogs are not here.

**T (some dogs)** =  $\lambda P \exists x_i (\text{dog}'(x) \& P(x))$

**T (some dogs are here)** =  $\exists x_i (\text{dog}'(x) \& \exists y_s (R(y, x) \& \text{here}'(y)))$

**Some dogs are not here**

Reading 1: **not [some dogs are here]**

**T (not [some dogs are here])** =  $\sim \exists x_i (\text{dog}'(x) \& \exists y_s (R(y, x) \& \text{here}'(y)))$

Reading 2: **[some dogs 1 [not [t<sub>1</sub> [ be here]]]]**

**T (1 [not [t<sub>1</sub> [ be here]]])** =  $\lambda x \sim (\exists y_s (R(y, x) \& \text{here}'(y)))$

**T ([some dogs 1 [not [t<sub>1</sub> [ be here]]])** =  
 $\exists x_i (\text{dog}'(x) \& \sim (\exists y_s (R(y, x) \& \text{here}'(y))))$

- Narrowest scope

(27) **T (to be everywhere)** =  $\lambda x_i \forall y^i (\text{place}'(y) \rightarrow \exists z^s (R(z, x) \& \text{At}'(z, y)))$

(28) Dogs are everywhere

(29)  $\forall y^i (\text{place}'(y) \rightarrow \exists z^s (R(z, d) \& \text{At}'(z, y)))$

Cf. with

(30) Some dogs are everywhere

(31) **T (some dogs)** =  $\lambda P \exists x (\text{dog}'(x) \& P(x))$

(32)  $\exists x (\text{dog}'(x) \& \forall y^i (\text{place}'(y) \rightarrow \exists z^s (R(z, x) \& \text{At}'(z, y))))$

- Pronominalization cases taken care of ☺

(33) I see eagles every day, even though they are nearing extinction.

“In both cases what I see and what is nearing extinction is the same kind of entity—eagles. It is the fact that we can only ‘see’ stages of things that gives rise to the existential reading in the first clause” (p. 158)

### Problems/Issues (Chapter V)

- Two facts in need of explanation

(i) Gap in the paradigm: in English, we don’t find predicates that apply only to objects, with the exclusion of kinds and stages. “The basic fact that keep in mind seems to be that whatever may be meaningfully predicated of an object may also be meaningfully said of a kind” (p. 248) What explains this gap?

(ii) We have been assuming that some verbs in English – the ones that give rise to both habituals and episodic readings—have two lexical entries. Since this ambiguity is systematic, it would be desirable to derive it in a principled way.

- And a problem

On its most salient reading, (34) says that for most (?) individual dogs x, x obeys x’s master.

(34) Dogs obey their masters.

We have no way of deriving that reading with the current set-up. Instead we would get: “Dogs obey dogs masters”, which doesn’t link individual dogs with their own masters.

If we translate **their** as a free variable we get

(i)  $\lambda x (x \text{ obeys } y\text{'s master})$  (d)

which would give us ‘dogs obeys dogs’ masters’ if g (y) yields the kind ‘dogs’.

If we QR **dogs**, we get the bound variable interpretation:

(ii) **[Dogs 1 [t<sub>1</sub> obey their<sub>1</sub> master]]**

T (1 [t<sub>1</sub> obey their<sub>1</sub> master]) =  $\lambda x (x \text{ obeys } x\text{'s master})$  (see Heim and Kratzer, p.p 246-247)

Which again would give us ‘dogs obeys dogs’ masters.

### Analysis – take 2: Generalization Operators

#### Part 1: A mapping from object-level to kind-level predicates: G’

- Let’s tackle the problem first.

(35) Goldfish like everyone who likes them.

Reading 1: Goldfish like everyone who likes goldfish.

Automatically accounted for our current system.

(36)  $(\lambda x_k [x \text{ likes everyone who likes } x]) (g)$

[translating the pronoun as a free variable if that variable is mapped to the kind goldfish by the variable assignment would give us the same result]

Reading 2: any (?) goldfish x likes everyone who likes x.

This reading requires that a given goldfish likes those people that like that goldfish (and not necessarily any others). So this reading seems to involve a predicate that ranges over objects.

(37)  $\lambda x_o [x \text{ likes everyone who likes } x]$

But that predicate cannot combine with the denotation of the BP!

- Intuition: we come to know that (37), on reading 2, is true by a process of inductive generalization, i.e., by observing individual goldfish.

“We observe that Goober likes everyone who likes here, Milton likes everyone who likes him, Alice likes everyone who likes here... and so on until we have observed enough goldfish to decide we can make a valid generalization. The generalization might be cast in the form ‘goldfish like everyone who likes them’, meaning that we have observed a sufficient number of objects of who the predicate holds to attribute that property generally to the kind” (p. 267)

- Claim:

There are predicates in English that apply only to objects: object-level predicates.

The process of induction described above is represented in the semantics by a VP operator that maps object level predicates to kind-level predicates.

(38) Goldfish like everyone who likes them.

(39)  $G' ([\lambda x (x \text{ likes everyone who likes } x)]) (g)$

Note: “We are not going to specifically attempt to say which function G represents”. The only requirement is that if G (P) holds of some kind, then, there must be some realization of that kind of which P holds (p. 268). So roughly: (39) is a function from kinds to truth-values that maps a kind x to 1 iff sufficiently many realizations of x likes everyone who likes them.

- We have then two types of kind-predication

Direct kind-predication: Kind-level predicates

(40) Dogs are widespread

(41) Widespread' (d)

Derived kind-predication: Object-level predicates mapped to kind-level predicates by G.

(42) Dogs are intelligent



(43)  $G' (\lambda x (\text{intelligent}' (x)) (d))$

- This accounts for the gap in the paradigm: there are no predicates that can only be applied to objects since predicates that basically apply to objects can always be shifted up by  $G'$ .

Part 2: a mapping from stage-level to individual-level predicates:  $G$ .

[Note: I will skip Carlson's argument that makes the reference to the intensional context created by generic readings – see p. 271 and ff.]

- How can we account for the systematic ambiguity of verbs like **run**, **eat**, **smoke** and so on.
- Proposal:

These verbs denote predicates that basically apply to stages.

There's a VP operator that maps stage-level predicates to individual-level predicates:  $G$ .

- Basic intuition:

"If someone makes the claim that Bill smokes cigarettes, that person in some not clearly understood way is saying something about what Bill does on given occasions; what sort of activity Bill-stages participate in. It is clear that Bill-stages actually smoking serve as the basis for such a statement, and that the truth or falsity of the statement is verified in the end only by examination of Bill stages" (p. 274)

This process is represented in the semantics by  $G$ .

- Notes about  $G$

It only applies to verbs (adjectives like **available** cannot be shifted up)

Again, we don't specify what function  $G$  is. The generalization process is "a cognitive process and will not be entirely represented in the grammar" (p. 274)

- The habitual reading

(44) John ran (habitual)

(45)  $G (\lambda x_s (\text{smoke} (x)))$

- The episodic reading

Now, a verb like **smoke** is a predicate that basically applies to stages. "If we left this predicate unchanged and added a subject, we would obtain an undefined formula, as the subject is in all cases, the property set of some individual, and not a stage"

Existential quantification over stages is now introduced by a translation rule (page 276)

**A note on Bare Plurals that do not refer to kinds**

- There are some BPs that do not seem to refer to kinds:

- (9) Parts of that machine
- (10) People in the next room
- (11) Books that John lost yesterday

- They don't pattern like the BPs we have been looking at so far. For instance:

(12) \*People in the next room are common/numerous/widespread.

(13) Betty is looking for books she lost yesterday.

(14) \*Dogs in the next cage are intelligent.

But:

(15) Parts from the airplane are everywhere.

- "I am going to suggest that there is possibly no necessary and sufficient set of grammatical criteria that will serve to separate those bare plurals that denote kinds from those that denote only a set of objects."

(16) Alligators in the New York sewer system.

Doesn't seem kind-denoting. But "suppose that all the alligators in the New York sewer system were not those that just happened to be there at a given time, but constituted almost a race of alligators, those descended (say) from baby alligators originally bought by New Yorkers as pets and flushed down the toilets" (p. 321)

### Summary of the system

- Three types of entities, connected via the realization relation

Individuals: Kinds and Objects

Stages

- There are predicates that only apply to kinds: **to be widespread, to be extinct...**

(46) Dinosaurs are extinct

(47) Extinct' (d)

- There are predicates that basically apply to objects: **to be intelligent, to be happy, to be strong...**

(48) John is strong

(49) Strong' (j)

These predicates can be mapped to kind level by the generalization operator G'

(50) Dogs are strong

(51) G' ( $\lambda x_o$  (strong'(x)) (d)

- There are predicates that basically apply to stages: **run, eat, smoke...**

They can be mapped to individual-level by the generalization operator G.

(52) John ran (habitually)

(53) G ( $\lambda x_s$  (ran'(x))

Or they can predicate something of stages via the realization relation

(54) John ran (yesterday)

(55)  $\exists y$  [R(y, j) & ran' (y)]

- Note: "A reasonable conjecture to make at this point is that any given predicate is basically a predicate over just one sub-class of entities (...) There is reason to think that this conjecture may very well be false in that there are may be predicates in the language which apply basically to the range of individuals" (p. 306)

(56) John is popular

(57) Dogs are popular.

Unlike in the case of **dogs are intelligent**, the truth of (59) doesn't depend on the truth of falsity of the predicate with respect to individual dogs.