Universal quantifiers and generic expressions

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The sentence

(1) Every linguist sings.

is (at least) two ways ambiguous. The reading most commonly thought of is the one in which any linguist you can find will sing. This I will call the 'open class' reading, since the class of linguists referred to is open; if 1 is true, all tokens of the type **linguist** will be found to sing. This is the usual reading given to standard universal quantifiers, restricted or unrestricted, in logical form. It appears that the most suitable interpretation of an open class is a unbounded set: an open class is not necessarily an infinite set, but the interpretation of the quantified expression must not change truth-value as new members are (indefinitely) added to the set.

The second reading is less commonly noticed and is most easily evoked with a context which brings it out:

(2) There are seven linguists and three anthropologists in the room, and every linguist sings.

In this case, *every* is most likely to refer to the set of seven linguists in the room at the time of utterance (although it could also be a random open class assertion about linguists, which would be pragmatically very strange in this context). This reading I will call the 'closed class' reading, since one is referring to a set of fixed cardinality, even if the cardinality is somewhat vague:

(3) There are several linguists as well as many anthropologists in the room, and every linguist sings.

The closed class readings in 2 and 3 can be paraphrased as:

(4) ...and every one of the linguists sings.

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This makes the closed nature of the class clear from the definite determination of the domain over which the quantifier ranges.

The open vs. closed class distinction is not the same as the specific indefinite vs. nonspecific or 'Skolemized' distinction discussed with respect to indefinite quantifiers such as *some*:[1]

(5) Every man loves some (particular) woman. [specific]

(6) Every man loves some woman (but not necessarily the same woman). [nonspecific]

The open vs. closed class distinction describes a property of the domain over which the quantifier ranges. The specific vs. Skolemized distinction refers to the manner in which the subset of the domain is extracted by the quantifier, viz. whether the subset is defined absolutely (a specific reading) or by some other function (the Skolemized reading); this is usually represented in logical form by the order of application of quantifiers (and other operators) on a formula, i.e. scope.[2] Thus, the specific vs. Skolemized distinction describes a property of quantification, not of the domain quantified.

The different universal quantifiers *all, any, every* and *each* behave differently with respect to the open vs. closed class distinction. *All* and *any*[3] require the open class reading when followed by a bare noun, although the closed class reading is possible with the *...of NP* construction:[4]

(7a) All linguists sing.

(7b) All (of) the linguists sing.

(8a) Any linguist sings/can sing.

(8b) Any of the linguists ?sing/can sing.

Every, is ambiguous, as we have already seen, while *each* requires a closed class reading under both constructions:

(9a) Each linguist sings. [requires previous mention of a closed class of linguists]

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[1] I am referring here only to the Skolem type of nonspecific determination, not for the generic type. There is an unfortunate coincidence of terminology between nonspecific (Skolemized) vs. specific distinction and the generic vs. specific distinction; the latter will turn our to be crucial to the analysis of open-class vs. closed-class quantifier readings.

[2] Croft 1983 and Hobbs 1983 (independently) argue for a scope-neutral representation of quantification; see below.

[3] The universal *any*, not the polarity *any*, which will not be discussed in this paper.

[4] I have included versions of the *any* sentences with modals in order to avoid the problem involved with the relationship between *any* and nonmodal contexts.

(9b) Each of the linguists sings.

The open/closed class reading criterion can be added to those in Vendler 1967 for distinguishing among the universal quantifiers.

How are the open class and closed class readings to be interpreted? I will argue that the open class readings are generic expressions, which when used with a universal quantifier such as *all* characterize necessary conditions of the kind, unlike the bare plural construction, which characterizes normal or prototypical properties of the kind. I will begin by motivating the connection between the intuitive notion of 'generic' and the open class interpretation proposed above. I will then point out syntactic and semantic properties that open class interpretations of universally quantified expressions share with bare plurals and other 'bona fide' generics, and compare this analysis with the analysis of kind expressions given in Carlson 1977b.

The most important intuitive fact about generics is that the assertions they make go beyond experience. That is, while our experience is of a finite number of specific entities, the generic expressions we make about properties of those entities are supposed to be satisfied by any entity of that kind, whether we know it or not. This is true even of generics with exceptions: if I say *Dogs have four legs,* this assertions is held to be "normally" or "typically" true of all dogs that ever come to be or come into my knowledge, not just of the dogs I happen to know—with appropriate qualifications for exceptions (e.g. in this case, accidental loss of a limb or a birth defect). It is this facet of genericity which is captured by the open-class interpretation.

The generic interpretation of bare plurals also has an open class interpretation only, while the 'existential' interpretation of bare plurals does not:

(10) Dogs have fur.

(11) Dogs were fighting in the empty lot.

Sentence 10 is supposed to apply to any and all dogs, while 11 describes a specific set of dogs, although the cardinality of the set is left completely vague beyond the fact that it is greater than one. The generic interpretation of the indefinite article *a* also has an open class interpretation only, while the nongeneric interpretation always refers to a closed class of cardinality one:

(12) A dog is a mammal.

(13) A dog bit me.

In 12, *a dog* is meant to be a "normal" or "typical" dog to be taken from the open class of dogs, not a closed set of dogs. In 13, however, there is a specific dog in mind, although it is not known to both the speaker and the hearer. (Even with the Skolemized *a*, there is a specific object in mind; it is merely relative to each

of the member of the subject set as in *Each boy ate a cookie*).[5] Thus the open vs. closed class distinction appears to correspond to the generic/specific distinction in bona fide generic expressions as well.

The universal quantifiers *all* and *any*, the two which require open class readings, behave semantically as necessary-condition counterparts to the typical-property generics, the bare plural and the generic indefinite article, respectively. While 14 asserts that member of the open class dogs typically have four legs, 15 asserts that they necessarily have four legs, and so is false; while 16 asserts that they necessarily must be mammals which is true:

(14) Dogs have four legs.

(15) All dogs have four legs.

(16) All dogs are mammals.

Sentence 17 says the same thing as 14 but in a slightly different way: it asserts that the typical member of the open class of dogs has four legs. On the other hand, 18 asserts that an arbitrarily chosen member of the class has four legs, and so is false, while 19 asserts that an arbitrarily chosen member of the class is a mammal, which is true:

(17) A dog has four legs.

(18) Any dog has four legs.

(19) Any dog is a mammal.

Being true of an arbitrarily chosen member of the set is equivalent to being true of the entire set; hence the universal character of *any*; but it is also true that being true of a typical member of the set is equivalent to being typically true of a set's members as a whole, and provides the parallelism between 14 and 17. This analysis of generic indefinite *a* and of universal or 'free-choice' *any* (Carlson 1981) has been developed in greater detail in Croft 1985. In the latter paper, generic *a* and *any* are modeled as arbitrary functions from descriptions into entities or sets/aggregates thereof,[6] with the latter possessing a meta-level defeasibility condition. Specific

[5]The argument just presented depends on particular analyses of the use of *a* in modal contexts, viz. that objects of belief and desire have their own identity, though not a real-world identity (McCawley 1979), and of cardinal quantifiers (Carlson 1977a:522), namely that cardinal quantifiers build up sets from unit—count, piece or measure—nouns rather than extracting subsets from sets. These analyses are not the standard ones and unfortunately their justification is too long to explicate here.

[6]I use the term 'aggregate' to refer to a construction in which there is no distinction between a member of a set and a set containing only one member. This construction appears to be a better way to analyze cardinality of NPs in the model we are developing here, which has NPs denoting individuals; see Moore (1981).

determiners are modeled as specific functions to entities (or aggregates thereof). The evidence presented here can be integrated into such a model by distinguishing a mapping into a open-class aggregate from a mapping into a closed-class one, and allowing bare plurals and universal quantifiers to map directly into the aggregates.

Another significant way in which open class interpretations of universally quantified expressions behave like generics is in their acceptability with so-called restrictive if/when clauses. First discussed by Carlson 1979, and generalized by Farkas 1982 and Farkas and Sugioka 1983, restrictive if/when clauses are interchangeable if- or when-clauses which restrict the application of a predicate to an argument to the cases in which the condition holds (a) for the objects realizing a kind argument (20), (b) the stages realizing an object argument (21), or (c) the stages realizing the objects realizing a kind argument (22):[7]

(20) Wolves are intelligent if/when they have blue eyes.

(21) John is nice if/when you are nice to him.

(22) Lizards are pleased if/when the sun shines.

The entity level (kind, object, stage) of the predicate of the restrictive if/when clause must match that of the main clause,[8] and with one exception, the level of the predicate must be lower than that of the subject. The exception is at the kind level (23, from Farkas 1982:33); the rule applies at the object level, which matters to the argument here (24):

(23) Small fish are widespread if/when big fish are rare.

(24) *John is intelligent if/when he has blue eyes.

Open class interpretations of universally quantified expressions allow restriction at object level, while closed class interpretations do not:

[7] All of these examples are from Farkas 1982:27,33.

[8] Farkas and Sugioka (1983:247) exhibit the following as a counterexample to the claim that there is a semantic restriction of the equality of the levels of the main clause and if/when clause predicates:

(80) John has light-blond hair if/when he is at the seaside.

However, in the only contexts in which I find this sentence acceptable (and only marginally so), the main clause should be translated to a stage predicate. The first context is that in which the appearance of John's hair changes to light-blond at the seaside; but if the main clause means "John's hair appears light-blond..." then it is certainly a stage predicate. Likewise, in the intepretation in which John's hair turns light-blond at the seaside because he swims a lot while he is there, the predicate of "John's hair turns light-blond" is also a stage predicate. At any rate, it does not matter to the particular argument at hand, in which what does matter is the level of the predicates relative to the level of the subject of the clause.

At any rate, a reanalysis of restrictive if/when clauses which accounts for all of the cases presented here will be found at the end of this paper.

(25) All boys are intelligent if/when they have blue eyes.

(26) *All the boys in our class are intelligent if/when they have blue eyes.

(27) Any boy is intelligent if/?when he has blue eyes.

(28) *Any of the boys in our class is intelligent if/when he has blue eyes.

This also suggests that the open class interpretations should be interpreted as generics, applying at the kind level, whereas the closed-class interpretations should be interpreted as objects, allowing only stage-level if/when clauses:

(29) All of the boys in our class are nice if/when you are nice to them.

An additional, stronger piece of evidence that *all*, *any* and open-class *every* should be treated alike, and like the generic bare plural and generic indefinite *a*, is their common behavior in the so-called "universal *any*" or "free-choice *any*" contexts (Carlson 1981). Free-choice *any*, the *any* that is not polarity-sensitive, cannot occur in certain contexts. Carlson characterizes those contexts as being those where stage predicates either occur (30) or are entailed (31; for further complications see Carlson 1981):

(30) *Anyone entered the room.

(31) *John managed to find any barn-owl.

The domain of free-choice *any* is an open class, as we have argued above, and it so happens that *all*, open-class *every* and the (open-class) bare plural and generic indefinite also are excluded from these environments:[9]

(32) *All oxen entered the corral.

(33) *Every ox entered the corral.

(34) *Oxen entered the corral.

(35) *An ox entered the corral.

(36) *John managed to find all geese.

(37) *John managed to find every goose.

(38) *John managed to find geese.

(39) *John managed to find a goose.

[9]In judging these sentences, ignore the closed-class *every* and existential bare plural and indefinite readings.

In the contexts where free-choice *any* is allowed, the open class quantifiers and the generic bare plural and indefinite are allowed as well (again, ignore the closed-class and existential readings):

(40) Any/every/an owl hunts mice.
(All) owls hunt mice.

(41) Bob likes any Russian/all Russians/every Russian/Russians/a Russian.

(42) Any/every/a dog is reasonably intelligent.
(All) dogs are reasonably intelligent.

(43) Any/every/a cat is a mammal.
(All) cats are mammals.

One can draw a finer line in distinguishing "generic" from "specific" or "stage" contexts, where open-class readings are not allowed, in the habitual/specific-event distinction in tenses. In English the bare present has only a habitual present interpretation, the progressive taking the specific present interpretation. On the other hand, the English past tense is ambiguous between the habitual and specific-event reading. Open-class readings of the universal quantifiers and generic constructions are allowed only in the habitual readings, rendering the present progressive bad and the past unambiguously habitual (except with the closed-class and existential readings, of course):[10]

(44) Any/every/a hog eats garbage.
(All) hogs eat garbage.

(45) *Any/*every/*a hog is eating garbage.
*(*All) hogs are eating garbage.

(46) ?Any/every/a dinosaur ate kelp.
(All) dinosaurs ate kelp.

This fits with the intuition that habitual readings of verbs render them into "generic" actions as opposed to specific events.[11]

[10]This was brought to my attention by Salikoko Mufwene; cf. also Davison 1980:12.

[11]The open-class interpretations of the universal quantifiers other than *any* and the bare plural and indefinite generic do not occur in the modal contexts where free-choice *any* occurs, without meaning something different from *any*, or without having the existential reading:

(a) Anyone *vs.* Everyone could be in that room.

(b) John is looking for any unicorn *vs.* every unicorn *vs.* unicorns.

Presumably, the analysis of *any* (and generic *a*, which shares *any*'s behavior) as an arbitrary

We conclude that the virtually identical distribution of *all, any,* open-class *every,* the generic bare plural and the generic indefinite is further support for treating them identically in the grammar. However, this is in conflict with the analysis of kinds and generic expressions proposed by Carlson (1977b, 1979); the remaining part of this paper will present a revision of Carlson's analysis and an attempt to integrate the phenomena Carlson describes with the phenomena we have just described.

The interpretation of "generic" and "specific" predicates corresponds quite straightforwardly to nonstage predicates and stage predicates. However, the interpretation of generic (open-class) and specific (closed-class) arguments does not at all fit Carlson's analysis of arguments. Carlson uses the kind/object/stage distinction he developed for predicates to apply to arguments as well. His distinctions are not identical to the open-class/closed-class distinction, since object level arguments can occur in open-class or closed-class expressions. Thus, it is difficult to see how to fit in the evidence given above for the parallel behavior of the various generic (open-class) argument expressions.

However, there are asymmetries in Carlson's system which suggest the direction for a solution. First, there are no (underived)) stage arguments, only object and kind arguments. The object/kind argument distinction is developed largely to capture the fact that there are predicates, the kind predicates, which require bare plurals (or generic *the N* constructions) for arguments. This Carlson achieves by restricting the type of an argument to match the type of the predicate. But this in turn requires the type of an argument to match the type of the predicate in all other cases, which forces Carlson to create operators to lower the level of arguments, **R**, and **R′**, and raise the levels of predicates, **Gn** and **Gn′**. (Farkas (1982:40-45), combines **Gn** and **Gn′** and **R** and **R′**.) This allows Carlson to lower the level of a bare plural kind argument to a stage-level existential bare plural. However, Farkas 1982 argues against a unified analysis of the generic and existential bare plurals, pointing out that Romanian has distinct forms for each construction, thereby removing one of the major motivations for the **R**-type operators. Also, the use of the **R′** operator to lower object-level arguments to stage-level arguments in order to be applied to stage-level predicates seems ad hoc, simply a notational residue of the fact that there are no basic stage-level arguments. There is evidence for an operator like **Gn′** to raise the predicate level, namely the conversion of stage-level (specific) predicates to non-stage-level (generic) predicates by means of a habitual/generic

function provides a clue to this, although I have no prcise explanation for the interaction of arbitrary specification functions with modality.

I also presume it is the arbitrary-function of *any* which disallows its use in even closed class interpretations of the domain in specific-event contexts:

(c) John ate *any/every one/some of the chocolate truffles.

In a reported event, the objects involved are specific (even if not known to the speaker), and so the arbitrary selection function is semantically incoherent with the designation of the objects of a reported event.

aspect; but the **Gn** operator also seems to be merely notational bookkeeping, due to another asymmetry in the system: "There is no predicate of English I [Carlson, and myself too] am aware of which felicitously applies to an NP such as 'Fido' that does not also apply to an NP such as 'this kind of animal' (assuming Fido to be an animal)" (Carlson 1979:60). I doubt that these paradigmatic regularities of predicate-argument matching—no stage-level arguments, and no individual-level predicates which cannot also be kind-level predicates—are accidental, and they suggest that perhaps one too many levels is present. Indeed, the three-level system and the operators used for it hide an interesting set of constraints on the cooccurrence of different levels of predicates (stage and non-stage) and arguments (open-class and closed-class), which, along with the evidence presented in this paper, strongly favor a two-level analysis.

There is a parallel between the behavior of "generic" vs. "specific" predicates and arguments—that is, non-stage vs. stage predicates and open-class vs. closed-class arguments—and plural vs. singular predicates and arguments (cf. the analysis of predicates as (quantifiable) relations proposed in Croft 1984). Plural arguments require plural predicates[12], while singular predicates require singular arguments—the latter constraint is a sort of 'contrapositive' of the former. Consider the following examples:

(47) John $\text{kissed}_{\text{singular}}$ Mary.

(48) John $\text{kissed}_{\text{plural}}$ Mary.

(49) The boys $\text{kissed}_{\text{plural}}$ Mary.

(50) *The boys $\text{kissed}_{\text{singular}}$ Mary.

Since English does not indicate number of events grammatically, I have used subscripts to indicate the different interpretations. Sentence 47 denotes an event with a single kissing relation, while 48 denotes a plural kissing relation corresponding to John's repeatedly kissing Mary. Sentence 49 denotes a plural relation consisting of each boy kissing Mary; this event must be plural because of the plurality of the subject argument; hence 50 is unacceptable. Thus, the situation described by the utterance may be plural due to the plurality of an argument or the iteration of the action, or to both.

Likewise, generic arguments require generic predicates, while specific predicates require specific arguments (again the 'contrapositive' constraint):

(51) Owls see in the dark.

(52) John sees in the dark.

[12]We are excluding collectives, which are aggregates of individuals which function as units; see Croft 1984.

(53) John is watching the mouse.

(54) *Owls are watching the mouse. [generic bare plural interpretation]

A generic predicate can have a generic or a specific argument, as in 51 and 52; but a generic argument must have a generic predicates, as in 51 but not in 54.[13] An event may be generic because one of its arguments is generic, or because of the genericity of the predicate, or both.[14]

Additional grammatical parallelism is found typologically in that the same aspectual form is frequently used for both iterative and generic/habitual functions, just as the same form is used for English generic and plural nouns (namely, the plural form of the noun). We would like to capture the parallel behavior in terms of a parallel analysis in which generic predicates are interpreted as open-class, viz. the iterations of the action are open-class, and specific predicates are interpreted as closed-class. To do so requires a revision of the representation of argument and predicate types proposed by Carlson.

Let us analyze the possible types of arguments and predicates as follows:

1. Generic (open-class)
2. Specific (closed-class)
   (a) Plural

[13]Modifications of this hypothesis has to be made for transitive and ditransitives, which have more than one argument: if there is at least one generic/plural argument, then the predicate must be generic/plural, while if the predicate is specific/singular, then all the arguments must be specific/singular.

[14]This is the effect that is being captured by Lewis' (1975) unselective quantifiers; but Lewis does not capture the systematic constraint we have just described. To be complete, however, this is how I would analyze Lewis' alleged counterexamples, listed below:

(a) A man who owns a donkey always beats it now and then.

(b) A quadratic equation usually has two different solutions.

The interpretaton Lewis provides for (a) is "...every continuing relationship between a man and his donkey is punctuated by beatings" (Lewis 1975:4). Sentence (a) has both a generic argument and a generic predicate; Lewis' interpretation can be obtained by considering the adverb *always* to be characterizing the generic argument and *now and then* to be characterizing the generic predicate. I find this sentence unacceptable since the use of an adverb to modify a generic argument which conflicts with an also-present adverb modifying the predicate is simply ungrammatical for me; instead, I would say *Every man who owns a donkey beats it now and then* for Lewis' intended interpretation.

Sentence (b) has essentially the same structure, but with a simple generic description (NP) rather than a restrictive if/when clause. The adverb *usually* modifies the <quadratic equation, two different solutions> relation, which is an open class due to the open-class nature of the argument *a quadratic equation*. However, the single relation denoted by *have* in this case is a complex sub-relation itself, the information being provided by the predicate that the range of the sub-relation has cardinality two. This sub-relation is being treated as a unit relation from the point of view of the open-class generic indefinite quantifier, however.

(b) Singular

Singular entities can be pluralized and also can be made generic by means of morphosyntax available to the language, normally more fully developed for arguments than for predicates. The possible combinations of arguments and predicates are defined by the aforementioned constraint: a generic/plural argument implies a generic/plural predicate, where generic is in some sense the negation of specific and plural is the negation of singular. Certain arguments are inherently generic, that is, mass terms. Certain predicates are inherently generic, that is, the non-stage predicates.[15] Certain predicates also require kind arguments, that is, the kind predicates. Kinds are represented by the "generic" *the N* construction and also idiosyncratically by the generic bare plural construction (more on that below).

This analysis will cover the evidence we have discussed, except for the restrictive if/when clauses. Restrictive if/when clauses must be reanalyzed as representing generic causal connectives, that is, an open class of causal relations. All of the behavior of 20-28 can be explained by this analysis. Sentence 20 is acceptable because there is an open class of <Blue-eyed(Wolf), Intelligent(Wolf)> relations due to the open class number of wolves. Sentence 21 is acceptable because there is an open class of <Nice-to(you, John), Nice(John)> relations due to the open class of being-nice-causing-niceness events (a similar explanation accounts for the interpretations of the example in footnote 8). Sentence 22 is acceptable due to the open class of lizards and of sun-shining-causing-pleasure events. Sentence 23 is acceptable if interpreted as applying over an open class of <Widespread(Small-fish), Rare(Big-fish)> relations, not because the predicates are kind predicates; it would be unacceptable if such an interpretation were not possible, as in:

(55) *Mongooses are rare if/when dodos are extinct.

Sentence 55 is unacceptable because there can only be one <Rare(Mongoose), Extinct(Dodo)> relation since a species can only become extinct once. Likewise, sentence 24 is unacceptable, because there is only one <Blue-eyed(John), Intelligent(John)> relation, and so it is not a open-class set.

The reason that there must normally be a matching of the level of the predicate in the main clause and the if/when clause—or rather, the level of the root predicates, since they all must be made generic—is that normally one cannot imagine

[15] I am not sure what would count as inherently plural arguments and predicates.I am quite certain that predicates requiring collective or group readings of arguments do not count, since they are units, albeit units of a unusual kind. Group arguments such as *committee* and *orchestra* are inherently plural when they are used noncollectively, as in *The orchestra stood up and bowed.* The plural of group arguments generally denote an aggregate of groups just as the plural of mass terms, when acceptable, denote an aggregate of kinds: *committees, feldspars.* The closest to an inherently plural predicate is the unbounded iterative reading of cyclic verbs such as *flash, spark* and *turn* (rotation). These predicates always include the singular action as well, however; perhaps a better example are the Russian non-punctual counterparts of the punctual cyclic verbs that are derived from them by the *-nu-* infix.

examples where there can be an open-class set of causal relations between, say, a kind-level main clause predicate and a stage-level if/when clause predicate. But such examples can indeed be constructed:

(56) Owls are rare if/when the vole population crashes.

Likewise, the examples in 25-28 are acceptable or unacceptable due to the open-class or closed-class nature of the causal relation, which is licensed by the open-class or closed-class nature of the subject. In fact one can construct acceptable restrictive if/when constructions with closed-class arguments if the predicates allow for an open-class causal relation such as being-nice-causing-niceness:

(57) All the boys in our class are nice if/when you are nice to them.

(58) Every boy in our class is nice if/when you are nice to him.

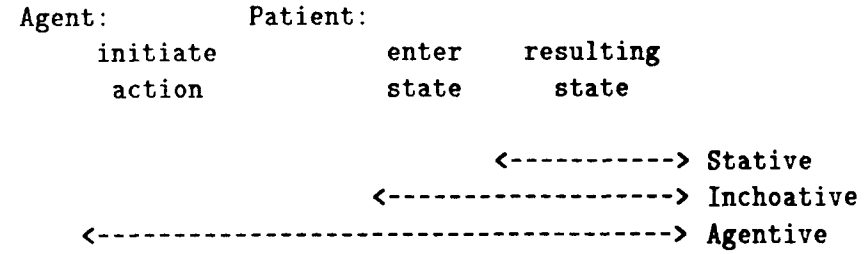
The one unusual feature of the analysis is that two semantic objects appear to be doing roughly the same work for a single concept, namely the existence of kinds, ideally represented by the "generic" *the N* expression, and the open-class "generics". Both types of objects are used to express what we informally call "generic" expressions. Yet there is support in the semantic interpretation of the grammar for these two distinct types of "generics", as we have seen. In fact, there is also a third type, the arbitrary-selection of an individual from an (open-class) set which is represented by *any* and the generic indefinite *a*. The behavior of these forms appears to be derivable from the nature of the set over which the arbitrary function ranges. With the exception of the acceptablity of the bare plural as an argument for a predicate requiring a kind argument (and as the subject in the "so-called" construction (Carlson 1977b:442-443)), the behavior of the three grammatical/semantic types is distinct, although related.

The three ways in which English (and other languages) has been found to represent generics correspond very closely to the three ways in which philosophers and others have attempted to define generics: in terms of an individual type (kinds), as the set of all tokens that satisfy the type (open-class sets), and—less popular and less well formalized—as a prototype or typical individual, resorting neither to abstract kinds or sets (the arbitrary-function determiners). Different languages place different emphases on the different strategies in their grammars: for example, the English generic *the N* construction is quite rare and may die out—the use of the bare plural as an argument of a kind predicate and as a name in the "so-called" construction may be the first step to the elimination of the generic definite—while the generic definite article is much more extensively used in the grammar of, for example, French.

The linguistic evidence does not appear to decide among the three hypotheses concerning the nature of generics. In fact, the linguistic evidence suggests that the three analyses are equivalent in some sense. For comparison, consider two

analyses of time and temporal relations (cf. Hobbs et al. 1986). One analysis, the "absolute" analysis, takes the time line as a basic primitive and derives relations among events by comparing the events to the time line. The other analysis, the "relativist" analysis, takes relations among events as a primitive and constructs the time line as a series of clock-ticking events related to each other and to other events in systematic ways. The two analyses, as axiomatized in Hobbs et al. 1986, are equivalent. The linguistic evidence suggests that both analyses are relevant for the semantics of natural languages. On the one hand, there are proper names, adposition phrases and deictic expressions for points and intervals on an absolute time line, such as *(on) Monday, (in) 1986, yesterday, (at) 5 o'clock.* On the other hand, there are temporal connectives such as *before, after, while,* and *during* and gerundive constructions such as *Having eaten dinner, John went to bed* which refer to relative temporal relations among events.

Another example of equivalent representations can be found in the realm of lexical semantics (Talmy 1985). Consider the type of complex action represented by the systems of posture verbs such as the English verb-particle construction *lay [someone] down.* The action consists of three causally-ordered parts: an agent's initiating the action, a patient entering into a state (posture), and the patient being in the resulting state:



(The names for the different event types are Talmy's.) All three event types are related but cross-linguistic evidence indicates that any of the three types can be taken as basic while lexical-semantic operations derive the other two. The operations normally found are causative, inchoative, reflexive and stative/passive; the presence of these operations in natural languages allows equivalent representations of the three related event types, for example (Talmy 1985:85-88):

German:	
Stative = Root	*(leigen)*
Agentive = causative(Root)	*(legen)*
Inchoative = causative(reflexive(Root))	*(sich legen)*
Japanese:	
Inchoative = Root	*(tatu)*
Stative = stative/passive(Root)	*(tat-te iru)*
Agentive = causative(Root)	*(tateru, tatseru)*
Spanish:	
Agentive = Root	*(acostar)*
Inchoative = reflexive(Root)	*(acostarse)*
Stative = stative/passive(Root)	*(estar acostado)*

Again, the evidence suggests no cognitive preference for one event type as basic, but instead suggests several equivalent representations are appropriate.

Thus, the linguistic situation for temporal relationships among events and the lexical semantics of related agentive-inchoative-stative verb types is exactly analogous to that for generics. In all of these cases, we may suggest a general cognitive hypothesis. The human conceptualization of certain phenomena, such as generics, temporal relations, and the relationship between cetain event types may not have a single unique or preferred solution. Instead, there are a number of (presumably) equivalent solutions, one or more of which may be directly reflected in the grammar of an individual natural language. In those cases where there is more than one solution, the set of solutions defines the linguistic typology of the phenomenon in question.

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