Generics Oversimplified[1]

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Bare plural generics are sentences such as "tigers are striped", "ducks lay eggs", and "mosquitoes carry malaria". It is quite challenging to provide an adequate truth-conditional analysis of these sentences, as is easily illustrated by these few simple examples. Why does "ducks lay eggs" strike us as uncontroversially true, while "ducks are female" does not? There are, of course, more female ducks than egg-laying ducks, since some female ducks are infertile, immature, and so on. Why is "mosquitoes carry malaria" true when just one percent of mosquitoes have the property—while "books are paperbacks" is false, despite over eighty percent of books being paperbacks?

This paper is not concerned so much with these questions, but rather with the question of how we should understand the logical form of bare plural generics.[2] In particular, this paper evaluates a bold hypothesis that has recently been defended by David Liebesman in an article entitled "Simple Generics" (2011). Liebesman lays out a proposal concerning the logical form of generics that would, if correct, overturn more than thirty years of research on generics in linguistics and philosophy. Liebesman's account is rapidly becoming influential (see, e.g., Assarsson 2012; McConnell-Ginet 2012, among others for favorable discussion of it), and recently earned the honor of being included in the *Philosopher's Annual*. It is therefore important to evaluate its success in attempting to displace the linguistic orthodoxy.

The Standard View

The standard view concerning generics such as "tigers are striped" is that their logical forms contain an unpronounced variable binding operator, usually called "Gen". The operator *Gen* shares many of its properties with adverbs of quantification, such as "usually", "generally", "typically", "always", "sometimes", and so on. Adverbs of quantification function to relate one set of conditions containing at least one free variable to another set. Adverbs of quantification are, in David Lewis's (1975) sense, unselective, meaning that they bind any number of free variables in the sentence, be they variables ranging over objects, events, or locations. Consider, for example, the following sentence:

(1) When m and n are positive integers, the power m^n can always be computed by successive multiplication.

Following Lewis (1975), we should understand "always" as relating the material in the "when"-clause to the material in the main clause in following way:

(2) Always m, n [m and n are positive integers] [the power m^n can be computed by successive multiplication]

This kind of representation is central to Lewis's (1975) paper, and is said to be a tripartite structure, consisting of a quantifier/operator Q, a Restrictor R (picking out the domain of Q), and the Scope S, also called the matrix (picking out the properties attributed to Q elements of R). Tripartite structures take the form 'Q [R] [S]'.

The standard view assimilates generics to this model, with the unpronounced *Gen* taking the place of "always". It is usually held that *Gen* occurs whenever there are otherwise unbound variables in the Restrictor—that is, variables that are not themselves bound by a pronounced quantificational adverb or quantifying determiner. The most straightforward version of the standard view holds that indefinites such as bare plurals (and indefinite singulars, such as "a tiger") contribute predicates and unbound variables to logical forms containing them (e.g., Heim 1982; Kamp, 1981; Kamp & Ryle, 1993). Consider, then, (3):

(3) Tigers are striped

"Tigers" contributes a predicate and variable, which is mapped to the Restrictor, and the predicate "is striped" is mapped to the Scope, resulting in:

(4) [tigers(x)] [striped(x)]

This intermediate logical form has an unbound variable in its Restrictor, so the 'default' variable binder *Gen* is introduced to complete the logical form:

(5) Gen x [tigers(x)] [striped(x)]

The standard view has a straightforward motivation: "tigers are striped" and the like would seem to be generalizations of some sort, and they pattern rather like adverbially quantified tripartite structures. However, the standard view has also long recognized the existence of so-called D-generics; that is, generics such as:

(6) Dinosaurs are extinct

where the predicate is "kind selecting".

On the face of it, this would not seem to fit with the standard view—an individual cannot be extinct, only a species or kind can be; so it would be peculiar to treat (6) as having the logical form "Gen x [dinosaurs(x)] [extinct(x)]". Rather, (6) would seem to be most naturally treated as simply asserting that the kind *Dinosaur* itself

has the property of being extinct. This means that, at least sometimes, bare plurals can refer directly to kinds. If one thinks that bare plurals contribute predicates and variables to their logical forms, this means that in sentences like (6), these predicates must be 'type-shifted up' so as to pick out kinds—namely the kind whose members satisfy the predicate in question. (Semantic type-shifting is an important and widely studied phenomenon in linguistics, see, e.g., Groenendijk & Stokhof 1988; Partee 1987; ter Meulen 1995 and many others for discussion.) The logical form of (6) would then be:

(7) Extinct($\Uparrow$(dinosaurs(x))

Where "$\Uparrow$" is a type-shifting operator taking predicates to the kind that has as members all and only those individuals that satisfy the predicate.

   A different implementation of the standard view goes the other way around, as it were—it holds that bare plurals contribute kind-referring terms to their logical forms, but that these kind-terms are type-shifted so as to become predicates of individuals when they occur in sentences such as "tigers are striped"—i.e. sentences with predicates of individuals rather than of kinds (e.g., Chierchia 1998; Cohen 1996, 2007). On this view, sentences such as (6) involve no type-shifting: since "is extinct" is a kind-predicate, it can be applied directly to the bare plural's referent—namely, the kind *dinosaur*:

(8) Extinct(dinosaurs)

However, consider (3)—"is striped" denotes the sort of property that is had by individuals, not kinds, and this mismatch between predicate and subject triggers the subject term to be type-shifted down to be a predicate of individuals—namely those individuals that are members of the kind in question, as in (9):

(3) Tigers are striped

(9) [($\Downarrow$(tigers))(x)] [striped(x)]

where "$\Downarrow$" is a type shifting operator taking a kind term to a predicate that applies to all and only members of that kind. Now, as in (4), we have an unbound variable in the Restrictor, which is thus to be bound by *Gen*:

(10) Gen x [($\Downarrow$(tigers))(x)] [striped(x)]

   It is an interesting question which version of the standard view is to be preferred, but for the purposes of this discussion, they can be treated equivalently, since the logical forms of generics such as "tigers are striped" end up being parallel in that both involve an occurrence of the variable binding operator *Gen*.

The Simple View

Liebesman argues that we should replace the standard view with the simple view, according to which all generics, including ones such as "tigers are striped", have logical forms like (8):

(8) Extinct(dinosaurs)

(11) Striped(tigers)
(12) Black(ravens)

And so on, and so forth. On the simple view, "tigers are striped" is no more a *generalization* than is "*Panthera tigris* is threatened with extinction"—both simply predicate properties directly of a kind. The logical forms of bare plural generics are not tripartite, but rather bipartite: they are atomic statements that involve predicating a property directly of an individual, albeit a higher-order individual—namely a kind.

The truth conditions of generics on this view are correspondingly simple: a generic is true just in case the kind has the property. "Dinosaurs are extinct" is true just in case the kind has the property of being extinct, and "tigers are striped" is true just in case the kind has the property of being striped. One might wonder what it is for a kind to be striped, but Liebesman maintains that this is not a question to be settled by semantics, but rather by metaphysics. He argues convincingly that metaphysical scruples about applying "is striped" to a kind are not especially compelling considerations. Further, it may well be that *what it is* for the kind *Panthera tigris* to be striped *just consists in*, say, most of its members being striped. (Though what it is for the kind *Culicidae* (mosquitoes) to carry malaria may just consist in *some* of its members carrying the disease. Here Liebesman draws an analogy with parts and wholes—what it is for a table to be wooden is for most of its parts, say, to be wooden, but what it is for a table to be touching the wall is for just some of its parts to be touching the wall.) Thus, depending on the metaphysical details, we may not need to introduce anything special to account for kinds having properties. The complexities concerning just when kinds have properties reside in the metaphysics, and would not figure in any semantic analysis of generics.[3] Semantically speaking, a generic is true just in case the kind has the property, and no more need be said.

This view has the clear virtue of simplicity. Liebesman adduces three further considerations in favor of his view. The first is the fact that sentences such as (15) are acceptable and true, and are entailed by the combination of (13) and (14), despite the fact that (13) involves a kind-predicate (like "is extinct"), while (14) involves what is usually taken to be a predicate of individuals:

(13) Mosquitoes are widespread
(14) Mosquitoes are irritating
(15) Mosquitoes are widespread and irritating

The simple view can handle such conjunctions with ease, since the subject term is the same in the logical forms of both (13) and (14); however the standard view treats (13) as having a different subject term than (14) in their respective logical forms—the subject term in (13) is kind-referring, while (14) involves the operator *Gen* binding variables over individuals. How, then, are we to understand the logical form of (15)? This is an important question—one which has perhaps not been explicitly discussed in sufficient detail in the semantics literature. Liebesman here raises a significant challenge to the standard view—though it is one that I believe can be met. For ease of exposition, however, I return to this point in the last section of the paper. Liebesman's other motivating points are that a) no known language actually articulates or pronounces *Gen*, and b) theorists have struggled to give an account of *Gen*, suggesting that *Gen* may be "intractable". The simple view again easily handles both of these points. Since there is no *Gen*, there is obviously nothing that could be pronounced—nor is there anything to be semantically analyzed. All the questions concerning the truth/falsity of generics will then collapse into questions concerning the metaphysical vagaries surrounding what it takes for a kind to have a property. Liebesman makes it clear that he believes no systematic answer will be forthcoming to the question of when a kind 'inherits' a property from its members, but as this is an extra-semantic fact, it is not one that should concern us—anymore than one should be worried about when a whole inherits properties from its parts. I take up these points in the last section of the paper. For now, suffice it to say that, if the simple view is otherwise at least as successful as the standard view, then these motivating points would perhaps suffice to lead one to prefer the simple view. However, if the simple view is simply not viable, then these motivating points are moot.[4]

Are Generics Truth-Conditionally Equivalent to Kind-Predications?

Let us begin with the central claim of the simple view: that all generics predicate properties of kinds, and are true just in case the kind has the property. I take it to be a truism that anything that is a kind is a higher-order individual, not a first-order individual. Further, it is surely a matter of logic that any kind is a kind. Given this, consider (16)–(18).

(16) Tigers are first-order individuals
(17) Tigers are not kinds
(18) Tigers are first-order individuals, not kinds

These statements are most naturally heard as true—it fact it is exceedingly difficult to hear them as false. The situation would seem to completely reverse if we use "*Panthera tigris*", the name for the kind to which the tigers belong, as the subject term instead. Compare:

(19) *Panthera tigris* is a first-order individual
(20) *Panthera tigris* is not a kind

(21) *Panthera tigris* is a first-order individual, not a kind

Unlike (16)–(18), (19)–(21) are most naturally heard as false. Liebesman's view would predict that that (16)–(18) share truth conditions with (19)–(21), however. Obviously singular/plural agreement has to be secured between the sentence sets, but Liebesman persuasively argues that this is merely due to low-level morpho-syntactic agreement (2011, p. 432—though of course, different examples are under discussion there).[5]

This seems to be a systematic phenomenon. For example, it seems indisputably true that the kind *P. tigris* has members, but

(22) Tigers have members

has a very natural reading on which it is false, and so on so forth. These examples quite strongly suggest that the truth conditions of generics are not just a matter of the kind having the predicated property, as the simple view requires.

Notice that the standard view can readily accommodate these data—e.g., (16) would be most naturally analyzed as (23):

(23) Gen x [tigers(x)] [x is a first-order individual]

This is straightforwardly true, since each tiger is itself a first-order individual.

In the course of presenting his own view, Liebesman himself provides some additional examples of the relevant sort of statement:

> As I stressed when giving a rudimentary metaphysics of kinds, kinds, unlike ordinary objects, are general: they have members (2011, p. 421).

Consider the occurrence of the bare plural "ordinary objects" here. On the simple view, this denotes a kind—namely the kind whose members comprise all and only ordinary objects. Liebesman here aims to deny that anything that is an ordinary object is general, in the sense of having members. But he expresses this thought using the bare plural construction "ordinary objects". So on Liebesman's own semantics, his statement is false; it denies the property of being general to *the kind ordinary objects*. Nor is this an isolated example in Liebesman's text;[6] the worry is not just that the statement, very surprisingly, comes out false on Liebesman's own semantics, but also that this suggests just how *unobvious* the treatment of bare plurals as always kind-denoting actually is—and just how hard it is to police this semantic interpretation, even in one's own thought.

These considerations suggest that the simple view may not be the final word in the semantics of generics. However, the simple view is primarily a view about the logical form of generics, so the main test of the view will come from its ability to account for the semantically relevant structure of generics. Let us now turn to that issue.

Pronouns and Variable-Binding

In his seminal 1977 dissertation on generics, Greg Carlson proposed an account that was somewhat in the same spirit as Liebesman's view, but with a major difference. Carlson, like Liebesman, took bare plural noun phrases to refer directly to kinds—in this respect the two views are in agreement. However, Carlson also posited a monadic predicate operator, G`, which took as input a predicate of individuals, and gave as output a predicate of kinds. ($G$` differs from the now-standard *Gen* operator in that the later is a variable binding operator that relates Restrictor to Scope, whereas the former is a single-place predicate operator. Carlson himself (1989) came to reject the G` operator in favor of *Gen*.)

Consider, for example:

(24) Tigers are striped

"Tigers", for Carlson, is a referring term, whose denotation is the kind *P. tigris*. However, the predicate "is striped" is a predicate that applies to individuals, not kinds—unlike predicates such as "is extinct"—and so the G` operator has to first be applied to the predicate. Thus (24) would be analyzed as (25):

(25) G`(λx (x is striped))(tigers)

where "tigers" refers to *P. tigris*, as it does on Liebesman's view.[7] The use of the G` operator, however, makes Carlson's proposal a very different animal from the simple view. The existence of such an operator in the logical form means that questions concerning its interpretation arise—if there is a $G$` operator, we cannot suppose that the question of *how* a kind inherits its properties from its members is a purely extra-semantic fact. For example, we can raise the question of whether G` is sensitive to factors such as whether the predicate on which it operates expresses a dangerous-making property, and so on so forth. Carlson himself does not aim to provide an analysis of $G$`, but glosses the truth conditions of generics as requiring that the property in the scope of the G` operator is had with sufficient regularity by the members of the kind. (Though, of course, this is intended as no more than a rough-and-ready gloss.) The virtues of Liebesman's simple account are lost if we posit $G$`—in this respect, G` is no different from *Gen*.

Why, though, did Carlson posit G` in the first place? Part of the answer to this question may have been metaphysically motivated reluctance to apply "is striped" and the like directly to a kind—something that Liebesman is right to question. However, this was not the only motivation. Carlson briefly considers an account like Liebesman's, but is immediately concerned about the following sort of sentence:

(26) Cats lick themselves

On the most natural, and perhaps only, reading of (26), the sentence is true just in case cats have the property of being 'self-lickers.' That is, (26) is not naturally read

as being true if each individual cat licks another cat, but never licks itself. Carlson observes, however, that without something like a *G`* operator, the natural reading cannot be captured. That is, without such an operator, (26) is most similar to a sentence such as (27):

(27) John licks himself

whose semantic structure is:

(28) (λx (x licks x))(John)

which is in turn equivalent to:

(29) John licks John

But if we try to render (26) in the same way—that is, render it according to the simple view—we get:

(30) (λx (x licks x)) (cats)

Or equivalently,

(31) Cats lick cats

which is true on the simple view just in case *Felis catus* licks *Felis catus*. Just as "cats lick dogs" does not specify anything about which cat licks which dog, this analysis is perfectly compatible with cats licking other cats, but never licking themselves. Thus the analysis just does not capture the most natural (and perhaps only) reading of (26), which requires cats to be self-lickers. Carlson notes this, and takes this as sufficient motivation to reject the simple view and posit *G`*. (26) can then be successfully analyzed as (32):

(32) G`(λx (x licks x)) (cats)

which predicates the relevant self-licking property of the kind. That is, using the rough-and-ready 'sufficient regularity' gloss, (26) is true just in case the property of being a self-licker is had with sufficient regularity among members of the kind *Felis catus*—just in case sufficiently many individual cats are such that they lick themselves. Without the structure provided by such an operator, this cannot be captured.

Accordingly, the now-standard analysis with *Gen* instead of *G`* would be as follows:

(33) Gen x [cats(x)] [x licks x]

which also accurately captures the logical structure of the sentence, by assimilating it to the familiar logical structure associated with quantified statements such as "all cats lick themselves" or "most cats lick themselves".

The point generalizes to any generic that contains a pronoun that is bound in an 'individual' manner. Consider, for example:

(34) Politicians$_i$ think they$_i$ can outsmart their$_i$ opponents

(34) on its most natural reading does not mean that politicians think that politicians can outsmart politicians' opponents.[8] Such a reading is possible—say, if politicians decide to unite against their common enemies, i.e., journalists—and are optimistic that they will be able to collectively outsmart journalists. But this is not the only, nor the most natural, reading of (34). (34) is most readily understood as indicating that a given politician believes that she will be able to outsmart her opponents— who, in most cases, are themselves politicians. This reading is readily obtained with the *Gen* operator (it can also be arrived at with the G` operator), represented semi-informally here:

(35) Gen x [politicians(x)] [x thinks x can outsmart x's opponents]

This sort of structure is not recoverable if generics are understood to be the application of predicates to singular terms. Just as there is only one reading of

(36) John$_i$ thinks he$_i$ can outsmart his$_i$ opponents

(i.e. John thinks John can outsmart John's opponents), if "politicians" is a simple referring expression (and there is no equivalent of a G` predicate operator), there would only be one reading of (34)—i.e. politicians think politicians can outsmart politicians' opponents. Related challenges arise from sentences such as:

(37) Politicians think they are smarter than other politicians

These considerations taken together would seem to suggest that more structure is needed in the logical form of generics than the simple view provides.

Donkey Anaphora

A somewhat similar challenge is raised by what is called "donkey anaphora". Donkey anaphora occurs when the antecedent of a pronoun is 'trapped' within a restrictive relative clause, as in:

(38) Every farmer who owns a donkey$_i$ beats it$_i$

(Donkey anaphora can also occur when the pronoun's antecedent is 'trapped' within the antecedent of a conditional, but these cases will not concern us here.) Donkey anaphora also occurs in generic sentences, such as

(39) Children who grow a new tooth$_i$ show it$_i$ off
(40) Drivers who face a long commute$_i$ look forward to it$_i$
(41) Lions that see a gazelle$_i$ chase it$_i$

(The first two examples are due to Peter Lasersohn (1997).) One popular approach to donkey anaphora that is very much in keeping with the standard view—especially the version on which indefinites such as bare plurals contribute predicates and variables to the logical forms of sentences containing them—treats pronouns as variables (e.g., Heim 1982; Kamp 1981; Kamp & Ryle 1993; see King 2005, for an excellent overview). Thus "a new tooth" in (39) contributes the predicate "is a new tooth" along with an associated variable. "It" similarly contributes a variable to the logical form, and since "it" is co-indexed on the relevant interpretation with "a new tooth", the same variable is associated with both. "Children" is also an indefinite phrase, and so also contributes a predicate with a new variable to the logical form. Thus, as a first step, (39) is to be analyzed as:

(42) [child(x) & new-tooth(y) & x grows y] [x shows off y]

This structure contains two unbound variables in its Restrictor, and so the two variables are bound by the generic operator *Gen*:

(43) Gen x, y [child(x) & new-tooth(y) & x grows y] [x shows off y]

(A similar process would also be invoked to analyze "every farmer that owns a donkey beats it".) This sort of analysis of donkey anaphora with bare plurals—according to which donkey pronouns are bound variables—is clearly not available to Liebesman. Indeed, Lasersohn (1997) demonstrates that such an approach is not even compatible with Carlson's (1977) account, despite the additional flexibility afforded by the *G`* operator (see also Wilkinson 1991). The entire noun phrase "Children who grow a new tooth" must function to refer directly to the relevant kind (presumably constituted by all and only those children who grow a new tooth)— thus, the indefinite "a new tooth" is 'trapped' within this referential noun phrase, and so cannot take scope over, and thereby bind, a pronoun in the predicate. Given such an analysis, then, Carlson's old account yields (44) and Liebesman's new account yields (45):

(44) G`(λx λy (x shows off y)) (children-who-grow-a-new-tooth)
(45) λx λy (x shows off y) (children-who-grow-a-new-tooth)

However, these are both incomplete, and ill-formed as sentences, as the predicates in question are two-place, yet a value is only supplied for the first argument place.

However, as Lasersohn notes, there is another promising approach to donkey anaphora that is perfectly compatible with Carlson's account. This approach is known as an E-type analysis (so-called because Gareth Evans (1977) first proposed it), and treats donkey pronouns as definite descriptions systematically constructed on the basis of their antecedents (for details, see, e.g., Heim 1990; King 2005; Neale 1990). On this account, (38) would be informally reconstructed as:

(46) Every farmer who owns a donkey beats the donkey that he owns.

On such an account, we would informally reconstruct (39) as:

(47) Children who grow a new tooth show off the new tooth they have grown

Carlson's account is able to handle (39) if we take this approach to donkey anaphora. The kind in question is still the kind *children-who-grow-a-new-tooth*, but now the predicate to which the *G`* operator is to be applied can be formulated as:

(48) λx (x shows off the new tooth x has grown)

Adding the *G`* operator and the kind-term, we arrive at the well-formed and adequate (49):

(49) G`(λx (x shows off the new tooth x has grown)) (children-who-grow-a-new-tooth)

Using the rough gloss on the *G`* operator, this is true just in case sufficiently many individual members of the kind *children who grow a new tooth* satisfy "x shows off the new tooth x has grown". In this way, Carlson's *G`* operator approach can handle donkey anaphora (Lasersohn 1997). However, it is easy to see that (47) has a similar structure to "cats lick themselves", which we saw above requires more structure (e.g., a *G`* operator) than Liebesman's account offers. The E-type analysis leads us to treat the predicate in (47) as "x shows off the new tooth x has grown". But if this is predicated directly of the kind—without an intervening *G`* operator—this is equivalent to:

(50) λx (x shows off the new tooth x has grown) (children-who-grow-a-new-tooth)

which is in turn equivalent to:

(51) Children-who-grow-a-new-tooth show off the new tooth that children-who-grow-a-new-tooth have grown.

Even on the most charitable interpretation of what (51) comes to, there is nothing in the structure of it that guarantees that a given child shows off *his or her own* new tooth (as opposed to, say, showing off the new tooth of the nearest other child who has just grown a new tooth). However, it is characteristic of donkey sentences that they require this interpretation. Just as "every farmer who owns a donkey beats it" requires *each* farmer to beat *his/her own* donkey—not just *some or other* donkey— "children who grow a new tooth show it off" requires a similar interpretation. (Were it not for this requirement, donkey anaphora would not be such an interesting and challenging semantic phenomenon.) The simple view does not have the resources to capture this requirement, however. Just as it is unable to capture the fact that "cats lick themselves" requires self-licking among individual cats—and so is not made true by each cat, say, licking its neighbor—it cannot reflect that "children who grow a new tooth show it off" requires each relevant individual child to show off *his or her own tooth*, rather than, say, his or her *neighbor's* tooth.[9]

A summary of the arguments in this section is that bare plural noun phrases operate syntactically and semantically in ways more akin to quantified phrases than to singular terms. One's account of bare plurals should not be so simple as to ignore this basic difference in structure.

Weak Crossover Effects

As a further consideration, we might note that there is a test that is often employed by linguists to reveal whether there is a variable-binding operator in the logical form of a statement (e.g., May 1985; Postal 1993).[10] (Liebesman, in his footnote 31, acknowledges this consideration, but claims that he and his informants have difficulty generating the relevant intuitions. There are two ways to understand this remark—that they have difficulty generating the intuitions in the case of generics, or that they have difficulty generating weak crossover intuitions altogether. I address the former interpretation at the end of the section, though I must note that the relevant intuitions do seem very clear to me and my informants. I will not address the latter interpretation since weak crossover effects have been discussed, investigated, and relied on by linguists over the last forty or so years, and so should not be so quickly dismissed.)

To illustrate the phenomenon, consider the following pair of sentences:

(52) John$_i$ is loved by his$_i$ mother
(53) His$_i$ mother loves John$_i$

(53) is interpretable here as a paraphrase of (52). (It is perhaps somewhat of a borderline case of acceptability, but it is clearly not outright uninterpretable on the relevant reading.) This sort of paraphrase is only possible when the noun phrase that binds the possessive pronouns (in this case, "John" binds "his") does not

involve a variable binding operator. Consider, for example, what happens when we replace "John" with the quantificational noun phrase "every boy":

(54) Every boy$_i$ is loved by his$_i$ mother
(55) *His$_i$ mother loves every boy$_i$

It is obvious that (55) is completely unacceptable on the relevant reading—we cannot use it to paraphrase (54). (That is, even if (53) is only borderline acceptable, (55) is outright unacceptable.) (55) is well formed only if "his mother" is taken deictically—e.g., if Bob is contextually salient, and we wish to say how generally loving Bob's mother is.[11]

If we consider bare plural noun phrases that occur with adverbs of quantification, we observe that—as one would expect on anyone's view—they pattern like quantifiers with respect to this test.

(56) Mostly, boys$_i$ are loved by their$_i$ mothers
(57) *Mostly, their$_i$ mothers love boys$_i$

(57), like (55), does not have the relevant reading (i.e., it cannot be understood as a paraphrase of (56)).[12] This is as one would expect, since the plural "boys" here is quantified by the adverb "mostly". But what if we remove the adverb "mostly"? Then "boys" will be generically interpreted—which on the simple view means that it is a kind-referring expression with no associated variable binding operators. Thus, on the simple view, removing "mostly" from the pair should make a notable difference to the acceptability of (57)—that is, "boys", with no adverb of quantification around, should pattern more like "John" with respect to this test. If, however, bare plurals contain variables to be bound by a *Gen*-operator, then removing "mostly" should not affect the acceptability of (57). As against the simple view, this latter prediction is the one that seems to be borne out:

(58) Boys$_i$ are loved by their$_i$ mothers
(59) *Their$_i$ mothers love boys$_i$

(59) is not an acceptable paraphrase of (58), any more than (57) is an acceptable paraphrase of (56). Thus, the weak crossover test would also seem to favor the idea that there is more structure present in bare plural generics than the simple view allows. Again, the important point is that the simple view actually predicts that (57) should be completely unacceptable while (59) should be at least borderline acceptable—they should exhibit the same contrast as (55) and (53). That is, the simple view predicts a difference in acceptability between (57) and (59) (as paraphrases of (56) and (58)), which seems not to be the case.

Significantly, this issue is not addressed by saying that it is difficult to "generate the relevant intuitions". The simple view *makes a prediction* concerning a *difference* in intuitions concerning this sentence pair—namely that removing "mostly" should

make a difference to the acceptability of (57). Saying that one finds the intuitions hard to generate here is not responsive to the argument. The point is that the simple view implies that there will be a clear difference between (59) and (57). To vindicate the simple view, one has to have the intuition that there *is* such a difference.

Indefinite Singular Generics

Bare plural generics are the most common type of generic sentence in English, yet they are not the only type—the second most common type of generic (in English) is the indefinite singular generic (e.g., "a tiger is striped", "a duck lays eggs"; see Gelman (2003) for discussion of the relative frequency of these forms). Indefinite singular generics exhibit a somewhat different pattern from bare plurals, mostly in that they can be somewhat infelicitous, even though the bare plural counterpart is not. For example:

(60) ?A mosquito carries West Nile virus
(61) Mosquitoes carry West Nile virus
(62) ?A barn is red
(63) Barns are red

However, in many other cases, they seem to express something very similar to, if not semantically equivalent to, bare plural generics. For example:

(64) A tiger is striped
(65) Tigers are striped
(66) A raven is black
(67) Ravens are black
(68) A duck lays eggs
(69) Ducks lay eggs
(70) A duck is female (false)
(71) Ducks are female (false)

And so on, so forth. As these examples illustrate, indefinite singular generics exhibit at least some of the same 'troublesome' features as bare plurals—for example, "a duck lays eggs", "a lion has a mane", and "a pig suckles its young" are acceptable and true (see Leslie, Khemlani, Prasada, & Glucksberg 2009), yet "a duck is female", "a lion is male", and "a pig is female" are not—even though there are more female ducks than egg-laying ducks, and so on so forth. (These indefinite singular generics should also not be treated as merely involving domain restriction to, e.g., one sex, for the same reasons that the corresponding bare plurals should not– see Leslie 2008, 2012, for discussion.)

In light of these similarities, it is reasonable to suppose that one's account of bare plural generics should be able to be at least extended to cover indefinite singular generics. (E.g., I think that indefinite singulars can be simply treated as expressing a subset of the generalizations that bare plurals can express,[13] but alternatively, one

might reasonably posit two *Gen* operators, Gen_1 and Gen_2, with similar but non-identical semantic analyses; see Greenberg (2003), as an example of an account in this spirit.) That is, one's account of bare plural generics should not be tied to that construction in such a way that it *cannot* be naturally extended to indefinite singular generics. A converse way of putting the point is that, if one's account of bare plurals does not extend to indefinite singulars, then we are still left with an unexplained part of language that exhibits much of the same puzzling behavior we wished to explain (away) in the first place. This is why providing an account of the relation between bare plurals and indefinite singulars has in the linguistics literature (e.g., Greenberg 2003) generally been taken to be a desideratum of any theory of bare plurals.

It is common ground that bare plural noun phrases *can* refer to kinds, whether or not they invariably do. Recall the predicate "is extinct". It is infelicitous to apply this predicate to an individual, e.g. "*Tigger is extinct"—"is extinct" requires its subject to be kind-referring. Other such predicates include "is widespread", "is scattered throughout the temperate regions of Australia" (at least on the intended reading of the latter predicate):

(72) Dinosaurs are extinct
(73) Cats are widespread
(74) Koalas are scattered throughout the temperate regions of Australia

These predicates thus offer a way of testing whether a noun phrase at least *can* refer to kinds. However, it has long been noted that indefinite singulars cannot be felicitously combined with such predicates:[14]

(75) *A dinosaur is extinct
(76) *A cat is widespread
(77) *A koala is scattered throughout the temperate regions of Australia

Indefinite singulars, then, cannot refer to kinds. If they could serve as kind-referring terms, then (75)–(77) should be acceptable, but they are not. Importantly, this means that a theorist should not paraphrase or 'restructure' the logical form of indefinite singulars like "a tiger is striped" so that it refers to *P. tigris,* for this would prompt the question of why that restructuring does not occur in (75)–(77), rendering them acceptable. That is, if one holds that indefinite singulars *can* refer to kinds, then one faces the question of why (75)–(77) are unacceptable. It would be awkward to hold that indefinite singulars refer to kinds when they occur with *non*-kind selecting predicates such as "is striped", but do not refer to kinds when they occur with *kind-selecting* predicates such as "is extinct". This would suggest that the simple view cannot extend its treatment of bare plural generics to indefinite singular generics. But if "a lion" cannot refer to the kind *Panthera leo*, then we cannot sidestep the question of why "a lion has a mane" is true while "a lion is male" is false by saying it is because *P. leo* has a mane but isn't male. Thus on the simple view, we are still owed an account of the indefinite singular generic, which has not proven any less

"intractable" than the bare plural. The simple view's proposal about bare plural generics cannot be carried across to the indefinite singular.

But perhaps the infelicity of (75)–(77) can be assimilated to the infelicity of indefinite singular generics such as:

(78) ?A barn is red
(79) ?A mosquito carries West Nile virus

Some support for this might be gleaned from noting that (80), a close cousin of (77), is also somewhat infelicitous, despite containing a predicate of individuals, not kinds:

(80) ?A koala dwells in the temperate regions of Australia

However, as Yael Greenberg (2003) notes, the infelicity of indefinite singular generics such as (78) can be overcome, or at least ameliorated, with a little contextual information. For example, consider:

(81) There are important cultural traditions governing the colors of various buildings. These traditions have evolved over a long period of time, and play a vital role in allowing for the rapid identification of buildings. For example, one can always differentiate a shed from a barn, even at a glance, for a shed is green while a barn is red.

In the same way, the infelicity of (80) can be ameliorated with the following (inaccurate!) information:

(82) Australian animals occupy very specific ecological niches, and thus each Australian species has a characteristic habitat, outside of which they are rarely found. For example, a kangaroo never leaves the Red Desert, while a koala dwells in the temperate regions.

However, similar stage-setting does nothing to help (77)—it remains uninterpretable on the relevant non-gruesome reading:

(83) Australian animals occupy very specific ecological niches, and thus each Australian species has a characteristic habitat, outside of which they are rarely found. For example, a kangaroo never leaves the Red Desert, while a koala is scattered throughout the temperate regions.

The unacceptability of (75)–(77) would seem to be clearly due to the inability of indefinite singulars to refer to kinds—it is not to be assimilated to the more fluid and contextually dependent infelicity of (78) and (79).

Thus, if we say that bare plural generics are to be explained by the supposition that they predicate properties directly of the kind—and thus systematically bracket questions such as why "ducks lay eggs" can be true without "ducks are female" also being true—we cannot offer the same explanation of why indefinite singulars behave as they do. We will need to provide another, separate explanation of why "a duck lays eggs" is true, but "a duck is female" is false.[15] But the simple view was advanced in part because it was supposed to avoid the need for such explanations. That advantage now seems merely apparent.

The Motivation for the Simple View

The simple view would thus seem to be overly simple—it does not have enough structure in it to account for a variety of linguistic phenomena. What, though, of the original motivation for the simple view? Can one address Liebesman's concerns, while still positing a *Gen* operator? I will discuss Liebesman's three explicit motivations for the simple view shortly, but first I briefly discuss a point that he brings up several times as a means of bolstering his view.

"This Kind of Animal"

At several points, Liebesman appeals to the intersubstitutability of bare plurals such as "dogs" with expressions such as "this kind of animal" (said while demonstrating a dog). For example, (84) and (85) seem to be interchangeable:

(84) Dogs bark
(85) This kind of animal barks [while demonstrating a dog]

Although this is not listed as an explicit motivating consideration, it is at times implicitly used as such. That is, if "this kind of animal" is indisputably a kind-referring expression and is intersubstitutable with bare plurals, then this bolsters the case that bare plurals are themselves kind-referring expressions.[16]

There are, however, a number of reasons to think that the semantics of expressions like "this kind of animal" are more complex than one might think. In particular, the construction "this kind of X" (or "sort", or "type", or so on) does not pattern like a normal demonstrative + noun phrase construction (Wilkinson 1991, 1995). For example, if a normal noun phrase is used, then we cannot combine it with a demonstrative and use it in a "there are" construction:

(86) *There are those books in the library

However, note the acceptability of (87):

(87) There are those kinds of books in the library

When a demonstrative is combined with "kind of X", it becomes acceptable in a "there are" construction, suggesting that there is something special about the construction "this kind of X", and that it should not be understood on a par with normal cases of demonstratives + noun phrases (see Wilkinson, 1991, 1995, and subsequent discussion for more details). Interestingly, the construction "there are" is generally only felicitous when combined with an indefinite noun phrase, such as a bare plural or an indefinite singular:

  (88) There are books in the library
  (89) There is a book is in the library

Further, "this kind of X" would seem to be modifiable with adverbs of quantification (again, as indefinite phrases are). (90) and (91) would seem to be synonymous (Wilkinson, 1991, 1995):

  (90) That kind of equation usually has two solutions
  (91) Equations of that kind usually have two solutions

These sorts of considerations, and others, have led linguists to treat constructions of the form "this kind of X" as having the semantics of indefinite plurals, rather than of complex demonstratives referring directly to kinds. "This kind of animal" is best informally glossed as "animals of this kind", rather than in any other way. If "this kind of animal" is itself an indefinite, it is unsurprising that it tends to be intersubstitutable with bare plurals, but this does not in itself provide independent reason to suppose that bare plural generics involve kind-reference.[17]

Bare Plurals with Conjunctive Predicates

The most promising motivation for the simple view is the acceptability of bare plurals with conjunctive predicates, where one conjunct involves a predicate of individuals, and the other a predicate of kinds. For example, we not only have (92) and (93), but also (94):

  (92) Mosquitoes are widespread
  (93) Mosquitoes are annoying
  (94) Mosquitoes are widespread and annoying

Liebesman asks how such sentences could be compatible with the standard *Gen*-based account, since the first conjunct requires a kind-interpretation of "mosquitoes", while the second requires (on the standard view) that *Gen* appear in the logical form to bind a predicate of individuals. The simple view deals easily with such constructions, since both conjuncts are taken to be direct predications of properties to the kind. But, as we have seen, the simple view cannot be the right account of the logical form of generics—so how, then, are sentences such as (94) to be analyzed?

Recall that there is some controversy within *Gen*-based accounts over the contribution of a bare plural. In particular, there are two dominant views, with one view being that bare plurals contribute kind-referring expressions which are then type-shifted down to become predicates of individuals in examples such as (93). This predicate of individuals then restricts the scope of *Gen*. This type shifting is triggered by the predicate in question ("is annoying") being a predicate of individuals, not kinds. In examples such as (92), no such type-shifting need occur. The other view is effectively the converse of the first—bare plurals contribute predicates of individuals with unbound variables. In examples such as (92), these predicates are type-shifted 'up' to become predicates of kinds, which is triggered by the predicate in question ("is widespread") being a predicate of kinds.

Ariel Cohen (2007), in passing, observes that sentences such as (94) are most easily handled if one takes the first view. To sketch how this might go, we can note that, if "mosquitoes" is itself a kind-referring expression, then it can be initially treated as a singular term and so distributed over the conjunction (here, x is a variable that ranges over kinds, and x a variable that ranges over individuals):

(95) $(\lambda x^{`}(x^{`} \text{ is widespread}))(\text{mosquitoes}) \& (\lambda x (x \text{ is annoying}))(\text{mosquitoes})$

The first conjunct has no mismatch in it—the predicate in question is a predicate of kinds, and is applied to a kind-term. The second conjunct, however, involves a type mismatch, so *mosquitoes* is type-shifted down to become a predicate of individuals, just as it would in an independent sentence. Thus we get the desired result:[18]

(96) $(\lambda x^{`} (x^{`} \text{ is widespread}))(\text{mosquitoes}) \& \text{ Gen } x [(\Downarrow(\text{mosquitoes}))(x)]$ $[\text{annoying}(x)]$

Thus the existence of bare plurals with conjunctive predicates that are mismatched in type does not pose an especially daunting problem for those who would posit a *Gen* operator.

Generics and Markedness

Liebesman's second motivating point concerns the fact that there is no known language that actually articulates *Gen*. The point is easy to see in English: we say "*most* tigers are striped", "*usually*, tigers are striped", and so on—but to utter the generic, one 'omits' the quantifier: "tigers are striped". We do not actually *say* "gen tigers are striped", whatever the logical form may be. While the syntactic manifestations of genericity differ considerably between languages, it seems that generics always correspond to a less 'marked' surface form relative to quantified statements. No language, it would seem, explicitly articulates *Gen* in the way that, say, a universal quantifier is articulated.

Liebesman is correct that any account of generics should explain this fact. (It is perhaps not surprising that I agree with him on this point, since the point plays a central role in Leslie (2007, 2008, 2012).) For example, if one holds that *Gen* is

to be analyzed as, say, universal quantification over some combination of possible worlds and individuals, one owes an explanation of why *this* universal quantification invariably corresponds to an *unarticulated* operator, while other forms of universal quantification invariably correspond to articulated operators.

In Leslie (2007, 2008, 2012), I argue at length that generics are language's way of letting us give voice to cognitively fundamental generalizations. That is, I argue that we have a basic way of forming general judgments—of going beyond the here-and-now to form expectations concerning the properties of novel instances of a category—that is in place from the first year of life. When we later come to acquire language, we use the generic form to articulate these generalizations that we have been making all along. Even when we are able to form other kinds of generalizations—e.g., universal ones—generic generalizations remain our most basic, default kind of generalization. This hypothesis issues in a range of empirical predictions, which have thus far met with high degree of confirmation (Hollander, Gelman, & Star 2002; Leslie & Gelman 2012; Leslie, Khemlani & Glucksberg 2011; Mannheim, Gelman, Escalante, Huayhua, & Puma 2011; Meyer, Gelman, & Stilwell 2011; Tardif, Gelman, Fu, & Zhu 2011, and others; for a review, see Leslie 2012).

Pace Liebesman, this 'generics-as-defaults' hypothesis offers an explanation for the fact that *Gen* is unpronounced, on the assumption that languages tend to be fairly 'efficiently designed'. In particular, if one wishes to interact efficiently with a system, and the system has a basic, default way of proceeding or performing a task, then one need only issue an explicit instruction to the system if one wishes it to *deviate* from this default way of proceeding. (Or to put it in more intuitive terms, if one is dealing with a child who, say, by default does not pick up her toys, one only needs to say something if one wishes the child to *deviate* from her default and actually pick up her toys. If one does not wish the child to pick up her toys on a given occasion, it would be a waste of breath to say "don't pick up your toys", since this is what will happen even if one remains silent.) Thus, quantifiers may be articulated in language because one needs to *tell* the cognitive system, as it were, to deviate from its default, generic mode of generalizing, and instead generalize in the universal manner, and so on. Generics, by virtue of tapping into cognitive defaults, require no such explicit phonological marking (for more detailed discussion, see Leslie 2012).

Liebesman writes of this, "The explanatory power of [Leslie's] theory is limited: it can explain why natural languages need not have a pronounced generic operator but it can't explain why they do not" (2011, p. 415). This objection would be correct if it were somehow outré to suppose that languages are fairly efficiently designed—but this is rapidly becoming an important guiding principle across linguistics. For example, the entire Minimalist program in syntax is based on this idea (e.g., Chomsky 1995, 2000). Minimalism is only one illustration—for example, theorists who largely work outside of the Chomskyan framework have also embraced this principle (e.g., Jaeger & Tily 2011). All one must hold is that languages are reasonably efficient in their design; then the generics-as-defaults hypothesis predicts that any given language is very unlikely to have an articulated generic operator. (And this claim is, in fact, all the empirical data actually supports—the fact that all

the languages that have been studied to date in this regard lack generic operators does not entail, again *pace* Liebesman, that no human language could *possibly* have an articulated *Gen*. But even this strong prediction would follow if one held—as some do—that languages are by their natures maximally efficient.) The generics-as-default hypothesis, plus some plausible hypothesis to the effect that languages tend to be reasonably efficient, thus provides an explanation that is perfectly appropriate to the empirical data.

The Intractability of Gen

The final strand of motivation for adopting the simple view is that, as Liebesman sees it, theorists have failed in the task of analyzing *Gen*. Or more specifically:

> Surveying the literature on generics reveals a large supply of complicated and interesting examples, and, to go with the examples, a large supply of complicated and interesting semantic accounts of Gen. With the exception of Leslie's (2007 and 2008) recent proposal, there are extant counterexamples to every analysis. One has the feeling that Leslie's theory has only been spared because of its recency (2011, p. 411).

It is difficult to know how to respond to the charge that one's interlocutor has a premonition that counterexamples to one's theory will soon be forthcoming. However, the important point is that Liebesman takes his own theory to be better placed than other accounts precisely because it does not supply any systematic account of how a kind 'inherits' its properties from its members. On this point he draws an analogy with the ways in which wholes can be said to 'inherit' properties from their parts:

> Attempting to give a systematic account of the way in which material objects inherit properties from their parts is something of a fool's errand. The quantity and salience of the parts that is required for inheritance varies greatly . . . The relationship between kinds and their members is similarly unsystematic (2011, p. 420).

One might well take issue with Liebesman here, say by pointing to recent psychological work that supports the idea in Leslie (2007, 2008, in press b) that judgments of generics are *systematically* sensitive to whether the property makes its bearers dangerous or not (e.g., Cimpian, Brandone, & Gelman 2011; see also Prasada, Khemlani, Leslie, & Glucksberg 2013). Even if the systematicity is not of the sort that is familiar from formal semantics, this does not mean that another sort of systematic analysis cannot be forthcoming—one that is systematic in the way that hypotheses and theories from the psychological sciences tend to be. Indeed, if generics give voice to our most cognitively fundamental generalizations—as much recent evidence suggests (Gelman 2010; Leslie 2007, 2008, 2012; Leslie & Gelman 2012; Leslie et al. 2011; Mannheim et al. 2011; Meyer et al. 2011; Tardif et al. 2011, and others)—then this would explain why the import of *Gen* is best studied using the tools of empirical psychology. And unlike Liebesman's "don't ask don't tell' approach to the question of when kinds have properties, and hence to the question of when generics are to be accepted or rejected, this line of psychological research issues in empirical predictions, which are in the process of being tested.

If generics do indeed articulate cognitively fundamental generalizations, then this makes vivid just why it is so important to pursue the question of when we accept or reject generic generalizations: understanding the nature of these generalizations sheds lights on an exceedingly central and important feature of our psychology. Generics are a window onto *how we generalize information*—which is in itself one of the most central questions in cognitive science. The empirical study of generics has the potential to illuminate issues that range from conceptual development to conceptual analysis (e.g., Brandone, Cimpian, Leslie, & Gelman 2012; Cimpian et al. 2010; Cimpian & Markman 2009; Gelman 2003, 2010; Gelman & Bloom 2007; Johnston & Leslie 2012; Prasada & Dillingham 2006, 2009; Prasada et al. 2013) and from social cognition to societal prejudice (e.g., Cimpian 2010; Cimpian, Bian, & Sutherland submitted; Cimpian & Markman 2011; Cimpian, Mu, & Erickson 2012; Haslanger 2011; Leslie in press a, b, c; Rhodes, Leslie, & Tworek 2012).

Pursuing these questions is hardly a "fool's errand".

Conclusion

The simple view is a bold challenge to the orthodoxy surrounding generics; it forces us to revisit a number of issues, and thereby subject the standard view to scrutiny. A view should not become so well-entrenched that it cannot be questioned, lest the area stagnate, and important issues go unaddressed. In proposing the simple view of generics, Liebesman has provided us with an occasion to remind ourselves of the rich range of issues that surround generics and their logical forms.

In particular, any successful account must handle:

- The non-equivalence of sentences such as "tigers are kinds" and "*Panthera tigris* is a kind"
- The underlying complexity in logical form that is revealed by sentences such as "cats lick themselves" and "politicians think that they can outsmart their opponents"
- Donkey anaphora in generics, as in "children who grow a new tooth like to show it off"
- Weak crossover effects in the generic context
- The phenomenon of indefinite singular generics whose indefinite singular subjects cannot refer to kinds

And while accommodating the above phenomena, any successful account must also explain:

- The acceptability of conjunctive predications, where one predicate is kind-selecting while the other is not, as in "mosquitoes are widespread and irritating"
- Why *Gen* is rarely, if ever, phonologically articulated
- And why generics, unlike quantifiers, have proved so difficult to analyze in a formal semantic framework.

My own conclusion is that the standard view of the logical form of generics, coupled with the understanding that *Gen* invokes our most cognitively basic way of generalizing the material in the Scope to the material in the Restrictor, can meet these challenges.

Notes

[1] Preparation of this article was supported by NSF grant BCS-1226942.

[2] For extensive discussion of these questions see Asher and Morreau (1995), Cohen (1996, 2004), Lawler (1973), Leslie (2007, 2008), Krifka et al. (1995), Pelletier and Asher (1997), among others.

[3] Compare, e.g., dispositional analyses of what it is to be red—e.g., *what it is to be red is to be perceived as red by standard observers in standard conditions*. It would be quite implausible to suppose that this analysis figures in the *semantic* analysis of "x is red"—one can readily hold that this is the metaphysics of *being red* without thinking that this figures in, say, the lexical entry for "is red". See Leslie (2007) for more discussion of this point.

[4] Is the fact that type-shifting is not needed also some motivation for adopting the simple view? Liebesman does not explicitly discuss this. However, one should be cautious here, given that bare plural noun phrases can uncontroversially serve as the restrictors of adverbs of quantification, as in "mostly, tigers are striped". Liebesman does not seem to dispute this. But then considerations of compositionality would seem to require that "tigers" be univocal in its contribution, and so if its contribution is a kind referring term, then type-shifting will be needed to deal with sentences like "mostly, tigers are striped", so as to allow "tigers" to restrict "mostly".

[5] A further question, though, concerns what we are to make of bare plurals in predicate position. How, for example, are we to understand "tigers are mammals"? Here "mammals" occurs as a bare plural, and so a strict implementation of the simple view would have it be itself a directly referential term that denotes the class Mammalia. Would then "tigers are mammals" assert an identity between the species *P. tigris* and the class Mammalia? Here perhaps a proponent of the simple view could appeal to type-shifting, and argue that when a bare plural occurs as part of a predicate, it is to be type-shifted down to be a predicate that applies to members of the kind. This would further underscore that the simple view does not escape the need for type-shifting.

[6] Liebesman also writes "They [generics] contain reference to objects that, *unlike ordinary objects*, are general: they have or can have members" p. 421 (emphasis added).

[7] This formalism makes use of lambda abstraction. Lambda abstraction is a convenient way to represent predicates, and is not conceptually different from just leaving the variables free in the formula, and representing a predicate that way. Thus formalizing the predicate 'is F' as 'Fx' vs. 'λxFx' is not substantially different, but is more convenient for longer formulae with many free variables. When a lambda abstracted predicate is followed by a singular term, e.g. '$(\lambda xFx)(a)$', the result is the truth evaluable formula 'a is F', or formally, 'a is in the extension of F.' The formula can be simplified to 'Fa' without change of meaning.

[8] The subscripts represent that the pronouns have "politicians" as their antecedent. This is to indicate that a deictic reading of the pronouns is not relevant here—e.g. a reading on which a group of, e.g., doctors is salient, and the sentence is used to say that politicians think *those doctors* can outsmart their opponents.

[9] Could one defend the simple view by claiming that this is merely pragmatic? That is, that the logical form of "children who grow a new tooth show it off" really is as the simple view has it (i.e., as (51), on the supposition that (51) is interpretable), and the relevant 'each-to-his/her-own' interpretations are merely pragmatically generated? This sits uncomfortably with the large body of research dedicated to donkey anaphora in quantified and conditional sentences. If one seeks to accurately analyze donkey anaphora in these cases, it would be peculiar to say the least to suppose that an entirely different—i.e., pragmatic—analysis was appropriate in the case of bare plurals. That is, this response would require that we try to accurately represent the logical forms of "every child who grows a new tooth shows it off" and "if a child grows a new tooth, she shows it off" in such a way that the pronoun is appropriately

bound by its antecedent—which is the heart of the extensive literature on this sort of anaphora—but in the case of "children who grow a new tooth show it off", we shrug it off as merely pragmatic. Similar remarks apply to "cats lick themselves"—should there be a semantic explanation of the 'self-licking' interpretation of "most cats licks themselves" but a pragmatic explanation in the case of "cats lick themselves"? Since there is an enormous body of work on the vagaries of pronoun binding in linguistics, it would seem peculiar to suppose that it is not to be extended to the otherwise parallel-seeming case of bare plurals. (Unless perhaps linguists have been misguided in producing this body of work, and should instead have shrugged their shoulders at the outset and declared it to be merely pragmatic!) Further, if the explanation were really pragmatic, then surely the 'cats lick cats' reading of "cats lick themselves" should be somewhat recoverable, at least upon reflection—we should have a sense that "cats lick themselves" *unlike "most cats lick themselves"* has a core semantic interpretation on which self-licking is not required. This simply does not seem to be the case.

[10] The test is often misleadingly described as identifying whether there is a quantifier in the logical form; however the test only speaks to whether there is an operator that binds variables in the logical form—it does not settle the semantic properties of that operator. The case of generics is important here, because it may well be that even though we have good reason to posit a variable binding operator *Gen*, it is far from clear that *Gen* should be semantically classed as a quantifier. See Leslie (2007) for discussion.

[11] Why is this so? Briefly, the basic idea on most accounts is the following: variable binding operators and their associated domain restrictions take wide-scope over much of the sentence at the level of logical form. For this to happen, they have to move by a process standardly called Quantifier Raising. (Positing such a process allows for the explanation of phenomena such as scope ambiguities and the like.) The process is similar to the one by which wh-words in English come to occupy the 'left-most' position in questions containing them. (However, Quantifier Raising occurs only at the unarticulated level of logical form, whereas wh-words move in the explicit surface form.) The basic principle is this: if a constituent of a sentence moves at some level of representation, it cannot 'cross over' a pronoun for which it is the antecedent. That is, the antecedent of a pronoun must either be to the 'left' or the 'right' of the pronoun at every level—it cannot be to the 'right' at some levels and to the 'left' at others. Notice that if we replace "John" in (53) by "who", the resulting question is as uninterpretable as (55):

*Who_i does his_i mother love?

Singular terms such as "John" remain in situ at logical form—they do not undergo Quantifier Raising since they are not associated with any variable binding operators, hence the acceptability of (53). However, if instead we have a wh-word or a noun phrase associated with a variable binding operator, then 'right-to-left' movement occurs, and thus so do crossover effects, resulting in the sentence being unacceptable on the relevant reading.

[12] The use of a bare plural forces plurality on us, but note that we can rewrite (52)–(53) above using plurals: "their $mothers_{i,j}$ love $John_i$ and $Bill_j$". This remains reasonably acceptable, while "$their_i$ mothers love all $boys_i$" still does not have the relevant reading.

[13] My view—which I will not argue for here, nor spell out in much detail—is that some generics predicate what we might call *characteristic* properties of the kind, and these generics are acceptable as both bare plurals and indefinite singulars. Other generics predicate properties of the kind because those properties make their bearers striking/dangerous (e.g., (61)), or because most members of the kind have the property (e.g., (63)). These generics are somewhat infelicitous as indefinite singulars. If this is correct, then indefinite singular generics invoke a restriction on the range of generic generalizations that we can express via bare plural generics; however, when a given generic is felicitously expressed as an indefinite singular, we do not need a new analysis of that generic, but can rather invoke the analysis used for its bare plural counterpart.

Some would argue that indefinite singulars involve a different kind of force than bare plurals—that they express that the property is somehow more important or 'essential' or 'modally central' to the kind. I think that this can be explained by the observation that indefinite singulars *enforce* the characteristic reading (when available), whereas bare plurals do not. This observation, combined with independently motivated observations concerning polysemy in a number of noun phrases, accounts for the sense that indefinite singulars and bare plurals differ in force (see Leslie in press a, for more discussion; see also Carlson 2010; Leslie et al. 2009; Prasada & Dillingham 2006, 2009).

[14] There is a way to hear these as felicitous, i.e., by taking the predicate to range over subkinds of, e.g., dinosaurs and then hear the sentence as saying that *a kind of dinosaur* is extinct. Note that this is possible even if the noun phrase is quantified (e.g. "Most dinosaurs are extinct"). This is not, of course, the relevant reading, as it tells us nothing about whether indefinite singulars *per se* can be kind-referring in the way that bare plurals can be.

[15] A potentially tempting move here might be to invoke the definite singular generic, e.g. "the tiger is striped". Many people take it to be obvious that "the tiger" here refers directly to *P. tigris*, though it is not always so clear why this is taken to be obvious. But one might reason: if "the tiger" *obviously* refers to *P. tigris*, then it's six-of-one, half-a-dozen-of-the-other—if bare plurals are *like* indefinite singulars, then they are *unlike* definite singulars. However, the points raised in the section on pronouns all apply to definite singular generics (e.g., "the (successful) politician thinks he can outsmart his opponents"; "the child who grows a new tooth loves to show it off"), reflecting that, even if we suppose they refer directly to the kind, some sort of further structure is still needed in the sentence. One easy and uniform way to implement this would be to allow that definite singulars refer to kinds, but then suppose that if the predicate is a predicate of individuals, then the kind-term is type-shifted down to be a predicate of individuals (i.e. a predicate that applies to individuals iff they are members of the kind). As noted in the introduction, several theorists (e.g. Chierchia 1998; Cohen 1996, 2007) have proposed such a mechanism in the case of bare plurals.

[16] Note, however, that once type-shifting enters the background semantics—as it does in most linguistic theories—then this line of argument, even if correct, wouldn't ensure that both expressions weren't type-shifted down to become predicates of individuals at logical form.

[17] Note also that we can say "this kind of animal licks itself" (gesturing at a cat) and clearly convey the claim that the individual members lick *themselves*. The logical form must therefore provide the structure needed to vindicate this.

[18] Interestingly, this approach has the power to explain the otherwise puzzling fact that "peacocks lay eggs" and "peacocks have big tails" seem to entail (at least one reading of) "peacocks lay eggs and have big tails", even though not a single peacock has both properties. This is explicable if the conjunction is understood as equivalent to "peacocks lay eggs and peacocks have big tails," as would be predicted by this approach. If there is another reading of "peacocks lay eggs and have big tails" on which it is false, then we could allow that conjunctive predicates that match each other in variable type may be treated as genuinely conjunctive—e.g., to be analyzed as (λx (x lays eggs and x has a big tail)). Similarly, if there are cases in which there are anaphoric relations in conjunctive predicates of bare plurals that cannot be assimilated to general cases of discourse anaphora, then such cases would require also treating the predicate as genuinely conjunctive. So long as we are dealing with type matched predicates, allowing this possibility would seem to be unproblematic.

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