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EXISTENTIAL GENERICS

ABSTRACT. While opinions on the semantic analysis of generics vary widely, most scholars agree that generics have a quasi-universal flavor. However, there are cases where generics receive what appears to be an existential interpretation. For example, B's response is true, even though only the platypus and the echidna lay eggs:

(1) A: Birds lay eggs.
B: Mammals lay eggs too.

In this paper I propose a uniform account of the semantics of generics, which accounts for their quasi-existential readings as well as for their more familiar quasi-universal ones. Generics are focus-sensitive operators: their domain is restricted by a set of alternatives, which may be provided by focus. I claim that, unlike other focus-sensitive operators, generics may, but do not have to, associate with focus. When alternatives are introduced, either by focus or by other means, generics get their usual quasi-universal readings. But when no alternatives are introduced, quasi-existential readings result. I argue that generics, unlike adverbs of quantification, do not introduce tripartite structures directly, but are initially interpreted as cases of direct kind predication. Only when this interpretation fails to make sense, the phonologically null generic quantifier is derived, and tripartite structures result. This two-level interpretation has the effect that while adverbs of quantification require focus to determine which elements go to the restrictor and which to the nuclear scope, and hence *must* associate with focus, generics do not, and hence may fail to associate with focus, resulting in quasi-existential readings.

1. INTRODUCTION

What is the meaning of generics and habituals? It sometimes seems there are as many theories as there are researchers who have investigated the issue (see Krifka et al. 1995; Cohen 1996; Pelletier and Asher 1997 for overviews). There are, however, two empirical phenomena on which almost everybody would agree. One is the fact that generics and habituals are not universals; they allow exceptions. Thus, (2a) is true although some mammals (e.g., the platypus) lay eggs, and (2b) may be true even if there are some occasions of Mary's smoking that are not after dinner.

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(2) a. Mammals bear live young.
b. Mary smokes [after dinner]$_F$.[1]

The second fact is that generics and habituals, although allowing for exceptions, are still stronger than existentials, and have a quasi-universal flavor, typically requiring that "many" instances satisfy some property. Thus, the existence of a few egg-laying mammals is not sufficient to make (3) true, and if only a handful of the situations in which Mary smokes are after dinner, (2b) will be false.

(3) Mammals lay eggs.

Nonetheless, it turns out there are cases that contradict the second generalization, i.e., cases where the existence of only a few instances is sufficient to make the generic or habitual true. These are cases where generics and habituals appear to have the quantificational force of an existential. In this paper I will discuss a number of such cases, and propose an account within a uniform theory of genericity.

The paper is organized as follows. In section 2 I present the data: cases where generics are interpreted quasi-existentially. In section 3 I argue that these are, indeed, generics, rather than simple existentially quantified statements. Section 4 contains a discussion of the evaluation of generics and habituals with respect to sets of alternatives. I argue that the existential interpretation arises in precisely those cases where alternatives are not induced. In section 5 I outline a theory of generics, which explains why existential readings arise when alternatives are not induced. Finally, in section 6, I discuss the differences between generics and adverbs of quantification with respect to the availability of existential interpretations, and the implications of these differences for a general theory of focus and the way it affects logical form.

[1] Here, and henceforth, $[\alpha]_F$ indicates that α is focused. Focus is often necessary to disambiguate generics and habituals. For example, while (2b) means that Mary's smoking generally occurs after dinner, (i) means that, in general, what Mary does after dinner is smoke.

(i) Mary [smokes]$_F$ after dinner.

2. QUASI-EXISTENTIAL READINGS OF GENERICS

2.1. *Emphatic Affirmation*

When a generic is uttered as an emphatic, contrastive affirmation, it appears to be interpreted existentially:

(4) a. A: Nobody in India eats beef.
B: That's not true! Indians [do]$_F$ eat beef! (Clark Glymour, p.c.)

b. A: When Mary smokes, it is never after dinner.
B: That's not true! Mary [does]$_F$ smoke after dinner.

B's statements above are made as a refutation; they are meant to contrast with the claims that nobody in India eats beef and that Mary never smokes after dinner, respectively. For B's response in (4a) to be true, it is sufficient that *some* Indians eat beef, not that Indians, in general, do so; similarly, for B's response in (4b) to be true, it suffices that there exist some cases of Mary's smoking after dinner, not that this be her typical behavior.

Note that, crucially, these sentences are refutations of universal statements (specifically, universal negative statements), not of generics. For example, what B says in (4a) refutes the universal statement that *every* Indian avoids beef, rather than the generic

(5) Indians don't eat beef.

When uttered without emphatic stress, (5) is true.[2] Therefore, if B's utterance in (4a) were its negation, it would have to be false; but, in fact, it is true. Hence both (5) and B's statement in (4a) are true. This is not a contradiction, because quasi-universal generics, unlike real universals, tolerate exceptions. Therefore, B's quasi-existential generic, saying that there are some beef-eating Indians, is not enough to falsify the quasi-universal generic (5); but it *is* enough to falsify A's universal statement in (4a).

The sentences in (4) should be contrasted with their non-emphatic counterparts, (6) and (2b), which get a regular (quasi-universal) generic interpretation.

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[2] Indeed, it can be found in naturally occurring discourse; the following is taken from the Student's Guide to the University of California Education Abroad Program in Singapore:

(i) Since Muslims don't eat pork and Indians don't eat beef, chicken is a universally accepted staple.

(6) Indians eat beef.

Note that the difference between the emphatic and non-emphatic versions is that the former contain a dummy auxiliary that is focused, whereas the latter place the focus on some other constituent. This difference will turn out to be important in accounting for their different interpretations.

2.2. *Emphatic Negation*

Generics also receive a quasi-existential interpretation when the focused auxiliary expresses negation, rather than affirmation. For example, the existence of platypuses is apparently sufficient to render (7a) false; and if Mary sometimes smokes after dinner, (7b) will be false.

(7) a. Mammals [don't]$_F$ lay eggs.
b. Mary [doesn't]$_F$ smoke after dinner.

If (7a) were the negation of the false (3), it would have to be true – but the fact is that it is false. What, then, does (7a) mean?

Suppose we claimed that (7a) is interpreted with negation having narrow scope with respect to the generic quantifier, so that it would not really be the negation of (3). In this case, the sentence would mean that, in general, if x is a mammal, x doesn't lay eggs. This would not help, however. The sentence still ought to be true (just like (2a)) since the vast majority of mammals have the property of not laying eggs.

The negation in (7a), then, has wide scope. But over what? I suggest that (7a) expresses negation of an existential statement, saying that some mammals lay eggs. Since this statement is true, its negation, (7a), is false.

Similarly, (7b) cannot be the negation of the quasi-universal interpretation of (2b). For suppose Mary smokes after dinner only every once in a while; in this case, (2b) would be false, so we would expect (7b) to be true. But, in fact, (7b) is false in the situation described.

Again, taking the negation to have narrow scope will not help. Moreover, it would lead to a rather implausible reading, meaning, in effect, that whenever Mary doesn't smoke, it is generally after dinner (cf. the discussion in Krifka et al. 1995, p. 123).

Therefore, (7b) is the negation of a proposition, but not the quasi-universal reading of (2b); instead, it negates the statement that there exist occasions when Mary's smoking occurs after dinner.

Note that in order to get the quasi-existential reading in examples such as those in (7), the auxiliary must be focused. If focus is on another constituent instead, the quasi-existential reading disappears:

(8) a. Mammals don't [lay eggs]$_F$.

b. Mary doesn't smoke [after dinner]$_F$.

Sentence (8a) can be interpreted simply as the negation of its counterpart (3); (8a) is true because (3) is false, since it is not the case that mammals, in general, lay eggs. It may also get the narrow scope interpretation of negation, saying (truthfully) that mammals generally have the property of not laying eggs. Similarly, (8b) is just the negation of (2b); it is true iff it is not the case that when Mary smokes it is, in general, after dinner. And, less plausibly, it may perhaps also have the reading where negation take narrow scope. Crucially, all these interpretations are quasi-universal: they say that something is generally the case, not only sometimes.

2.3. *Focus-Sensitive Particles*

Von Fintel (1997) considers the interaction of *only* with generics and habituals. For example:

(9) a. Only [mammals]$_F$ bear live young.
b. We play soccer only if [the sun is shining]$_F$.

He treats *only* as an operator that applies to a sentence, its *prejacent*. The effect of applying *only* to a prejacent is to require that no relevant alternative to the prejacent is true. The prejacents of *only* in (9) are, respectively:

(10) a. [Mammals]$_F$ bear live young.
b. We play soccer if [the sun is shining]$_F$.

Thus, the truth of (9a) requires that all sentences of the following form be false:

(11) a. Birds bear live young.
b. Reptiles bear live young.
c. Fish bear live young.
d. ...

Similarly, the truth of (9b) requires the falsity of all sentences of the form

(12) a. We play soccer if it rains.
b. We play soccer if it's cloudy.
c. We play soccer if it's dark.
d. ...

However, if we treat the sentences in (10) as regular (quasi-universal) generics, this raises the following problem. Sentence (9a) is false not because there is any biological class of animals, other than mammals, that generally bear live young; in fact, there is none. While some fish and some

reptiles do bear live young, none of the generics in (11) are true.[3] However, the mere fact that there exist *some* non-mammals that bear live young, appears to be sufficient to render (9a) false.

With regard to (9b), suppose that, from time to time, we play soccer when the sun is not shining. But there is no weather condition W, where the sun does not shine, such that we generally play soccer when W holds. Hence, no sentence of the form

(13) We play soccer if W

is true, if W is an alternative to sunshine.

If we treat (10b) as a quasi-universal generic, we would predict that (9b) ought to be true. The fact of the matter is, however, that it is false in the scenario described.

Von Fintel demonstrates that if the prejacent is interpreted existentially, we get the correct reading. If (10a) is taken to make the claim that some mammals bear live young, then all of its alternatives would be in the form of existentials too. Then, the truth of (9a) would require that no existential statement about any other class but mammals hold, i.e., that there be no non-mammal that bears live young.

Similarly, suppose we interpret (10b) and its alternatives existentially. Then, for every non-sunshine weather condition W, the truth of (10b) requires the falsity of the statement that we sometimes play soccer when W holds. This is the desired interpretation.[4]

Von Fintel presents additional evidence indicating that the prejacent of *only* is interpreted existentially. Intuitively, a speaker who utters *only P* is committed to, in addition to the falsity of alternatives to P, the truth of P. It is under debate whether the truth of P is entailed, presupposed, or implicated by *only P*, but there is general agreement that it follows in some form or another. Now consider the following examples:

(14) a. Only $[\text{professors}]_F$ are confident.
b. Only $[\text{democrats}]_F$ supported Clinton.
c. Only $[\text{intelligent people}]_F$ are physicists.
d. Only $[\text{women}]_F$ have blue eyes.[5]

[3] Some of them, e.g., (11c) are not judged false either; see Cohen (1999) for an explanation of similar phenomena.

[4] Some care must be taken in defining the semantics of *only*, since the alternatives are not necessarily mutually exclusive: sunshine and rain may occur at the same time. But the precise semantics of *only* is not crucial for the points made here.

[5] Sentence (14a) is von Fintel's; he ascribes (14b) to Horn (1996), (14c) to Barker (1993), and (14d) to É. Kiss (1998b).

Speakers who utter these sentences do not appear to be committed to the respective claims that professors are generally confident, Democrats generally supported Clinton, intelligent people are generally physicists, or women generally have blue eyes. However, they do appear to be committed to (again, either by way of entailment, presupposition, or implicature) the corresponding existential claims: that some professors are confident, some intelligent people are physicists, etc.[6]

The evidence above notwithstanding, von Fintel rejects the existential interpretation of the prejacent, and goes on to account for the readings of the sentences in (9) as (quasi-universal) generics. That is to say, their respective logical forms can be put schematically as follows (where **gen** is the generic quantifier):

(15) a. Only **gen**([mammal]$_F$,bear live young)
b. Only **gen**([the sun is shining]$_F$,we play soccer)

His account of their readings is as follows. Von Fintel takes the meaning of

(16) Only **gen**($[\psi]_F, \phi$)

to be

(17) $\neg$**gen**(ψ', ϕ) $\wedge$ $\neg$**gen**(ψ'', ϕ) $\wedge \cdots$,

where ψ', ψ'' etc. are the alternatives to ψ. He proposes that generics obey the logical principles of Excluded Middle and Contraposition. Then (17) becomes equivalent to

(18) **gen**($\phi, \neg\psi'$) $\wedge$ **gen**($\phi, \neg\psi''$) $\wedge \cdots$,

which, under the assumption that the set of alternatives is exhaustive, is equivalent to

(19) **gen**(ϕ, ψ).

In effect, von Fintel proposes that the sentences in (9) have the same respective interpretations as:

(20) a. Animals that bear live young are generally mammals.
b. Generally, if we play soccer the sun is shining.

[6] If the sentence contains a modal expression, the world where the existential claim holds may of course be different from the actual world. Thus, for example, (i) means that there are worlds where superhumans exist, and one or more of them managed to do that.

(i) Only persons with superhuman strength could do that.

I am indebted to Manfred Krifka for drawing this point to my attention.

Von Fintel's proposal is problematic for a number of reasons. First, as he himself admits, the assumption that generics follow Excluded Middle and Contraposition is far from uncontroversial.

Second, the paraphrases in (20) are not quite the desired interpretations. While the existence of one non-mammal species that bears live young is sufficient to render (9a) false, (20a) would still be true. Similarly, if, on rare occasions, we play soccer when it is cloudy, (20b) would still be true, but (9b) would be false.

Third, and perhaps most problematically, we get existential readings of generics with focus-sensitive particles other than *only*. For example:

(21) a. Even [mammals]$_F$ lay eggs.
b. We play soccer even if [it rains]$_F$.

Sentence (21a) requires only that *some* mammals lay eggs; it is, therefore, true. And (21b) only requires that *sometimes* we play soccer in the rain.[7] However, von Fintel's approach is tightly related to the semantics of *only*, and it is far from clear that it could be extended to other focus-sensitive particles.

2.4. *Additives*

Of particular interest is a special type of focus-sensitive particle, additives. Just like *only* and *even*, additives give rise to quasi-existential readings. For example, if (22b) or (22c) is uttered following (22a), it only requires that some mammals lay eggs.

(22) a. Birds lay eggs.
b. Mammals also lay eggs.[8]
c. Mammals lay eggs too.

Similarly, in the context of (23a), both (23b) and (23c) require merely that we sometimes play soccer when it rains.

(23) a. We play soccer if [the sun is shining]$_F$.
b. We also play soccer if it rains.
c. We play soccer if it rains too.

[7] Perhaps (21b) also has a quasi-universal reading, according to which we generally play soccer in the rain; but the important point for our purposes here is that it certainly has a quasi-existential reading, a fact that is in need of explanation.

[8] Here, and in the other example sentences involving additives, I am omitting an indication of focus, since the location of focus in such sentences is, in fact, controversial. The matter will be picked up in section 4.2 below.

The additive *too* has been discussed by Cavedon and Glasbey (1994). They consider the following mini-discourse:

(24) Mary smokes [before breakfast]$_F$. She smokes after dinner too.

Cavedon and Glasbey treat both sentences in (24) equally – they are both regular, quasi-universal generics. The first means that, in general, if Mary is smoking, it is before breakfast; the second – that it is after dinner. Cavedon and Glasbey attempt to account for the apparent contradiction by claiming that the two sentences are evaluated with respect to different contexts (or *channels*).

This proposal, however, is problematic. For one thing, it is not clear that there is a perceived change of context in the transition from the first sentence to the second. More importantly for the purposes of this paper, the second sentence does not appear to have the same interpretation as the first one. Suppose 90% of the times in which Mary smokes are before breakfast, and only the remaining 10% are after dinner. So she generally smokes before breakfast, but it is not the case that she generally smokes after dinner. Yet I think (24) would be, nonetheless, true. In contrast, if Mary smokes 90% of the time after dinner, and only 10% before breakfast, (24) would be false. So it appears that, whereas the first sentence in (24) receives the ordinary generic reading, the second sentence is interpreted quasi-existentially, just like generics with other focus-sensitive particles.

2.5. *Unrestricted Habituals*

Restricted habituals such as (2b) and (10b) above are normally interpreted quasi-universally. However, if we remove the respective modifiers *after dinner* and *if the sun is shining*, the interpretations of the sentences change.

(25) a. Mary smokes.
b. We play soccer.

What do sentences such as (25a) and (25b) mean? If we interpret them quasi-universally, they would seem to require that, in general, a situation containing Mary is one in which she smokes, and a situation containing us (the speakers) is one in which we play soccer. In other words, Mary smokes almost all of the time, and we play soccer almost all of the time. This is clearly far too strong a requirement.

Several suggestions have been made concerning this problem. Schubert and Pelletier (1989) propose that the relevant restriction is somehow provided by the context. This is undoubtedly true in many cases, e.g., when (25a) is said to an airline clerk who is assigning Mary a seat on a plane, or when (25b) is uttered in response to the question

(26) What do you do on Sundays?

Nevertheless, the context does not always provide a useful set of alternatives. The sentences in (25) make perfect sense, and cause the hearer to have certain beliefs regarding Mary and the speakers, respectively, even when uttered out of the blue.

Krifka (1988) proposes that unrestricted habituals express quantification over normal situations. For example, *John smokes* means that in all normal situations, John smokes. He does not provide any detailed theory of how a situation can be characterized as normal, but suggests that

> [w]e simply derive from our theories about smoking and John which situations we would consider as abnormal for him to smoke in, and the range of these situations can be quite wide. For example, we could assume that s is abnormal in this respect if John is sleeping in s, or if John is eating in s, or if John is a guest in s and his hosts object to smoking, or that s follows a situation s' in which John has already smoked a cigarette. . . There might be many more reasons to assume s to be abnormal for John's smoking (p. 303).

One problem with this suggestion is that the notion of normality is vague, and the predictions of a theory based on it are not very clear (see Cohen 1996 for further arguments against theories of generics based on normality). Furthermore, situations that are clearly abnormal may affect the truth of sentences like (25a). Suppose Mary is constantly harassed by a militant smoker who forces her to smoke at gun-point, and, consequently, she smokes several cigarettes every day. It seems that, in this case, (25a) would be true. Now suppose that Mary is very fond of cigarettes, but she stays as a guest at a house where no smoking is allowed, and never leaves it; in this case, (25a) would be false.[9]

Strzalkowski (1988) proposes a different solution to the problem:

> Statements like *John smokes, John walks to work, This department handles mail arriving from Antarctica*, or *Mary writes to her mother*, describe activities which involve an element of repetition over time. Of course, this "repetition" has a different character for each of these statements. In the case of *John smokes*, for example, we would normally require that the activity occurs at least once a day (p. 5).

Strzalkowski's account, however, is problematic. An explicit knowledge of the frequency with which smoking ought to occur does not seem necessary in order to judge the truth or falsity of (25a). Moreover, how is one to know what this frequency is? Strzalkowski claims that this is

[9] Contrast (25a) with (i), which does appear to be, respectively, false and true in the scenarios described:

(i) Mary is a smoker.

Sentences like (i), however, are not habituals, and I have nothing to say about their semantics in this paper.

dependent on *arbitrary* standards, and is thus unable to predict which habituals are true and which are false.

Elsewhere (Cohen 1996) I have claimed that the standard is not arbitrary, but is determined by an appropriate comparison class. For example, the standard for smoking, with respect to which (25a) is evaluated, is dependent on common practices in the community which Mary belongs to. Sentence (25a) would be true, then, just in case, on a given situation, Mary is more likely to smoke than an arbitrary member of her community is. However, I no longer believe that this is a correct statement of the truth conditions of (25a); so long as Mary smokes, even if she smokes less than the average in the class she is compared to, (25a) is true.

How, then, can we analyze unrestricted habituals? Of particular interest here is an earlier suggestion of Krifka's (Krifka 1987), according to which (25a) makes the claim that there exist some conditions under which Mary would smoke. That is to say, the sentence makes an existential statement. Importantly, Krifka does not take the existential quantifier to quantify over situations in which Mary smokes, but over conditions that bring about Mary's smoking. In other words, Mary's smoking is possible; if the right conditions obtain, she would smoke.

Sentences similar to (25b) have been discussed by Schubert and Pelletier (1989), who consider the following examples:

(27) a. This car goes 200 kph.
b. Kim reads German.
c. Robin rides horses.

Schubert and Pelletier claim that such sentences are ambiguous. They have a (quasi-universal) generic reading, which can be paraphrased as:

(28) a. Generally, when this car is being driven, it goes 200 kph.
b. Generally, when Kim reads something, she reads in German.
c. Generally, when Robin rides an animal, he rides a horse.

However, according to Schubert and Pelletier, these sentences also have a "capacity" reading. Under this reading, the sentences can be paraphrased as:

(29) a. This car is capable of going 200 kph.
b. Kim is able to read German.
c. Robin knows how to ride a horse.

Under the capacity reading, (25b) can probably be paraphrased as

(30) We know how to play soccer.

What is common to both Krifka's (1987) interpretation and Schubert and Pelletier's capacity reading is that both appear to make a claim about the possible existence of situations: there may be situations in which Mary smokes, the car goes 200 kph, Kim reads German, Robin rides a horse, or we play soccer.

A similar observation is made by Dahl (1975). He considers the following sentence, from Lawler (1972):

(31) Nephi's dog chases cars.

According to Lawler, the habitual (31) is interpreted existentially: it does not require that Nephi's dog chase cars all or most of the time, but only some of the time. Dahl agrees with Lawler's judgment, but reinterprets (31) as making a statement about the possibility of Nephi's dog chasing cars: "if he sees a car in a few minutes, it is not excluded that he will chase it" (p. 105).

Krifka (1987) accounts for his reading of (25a) by positing that the restricting predicate is a predicate variable, existentially quantified. He does not, however, explain the source of this existential quantifier. Schubert and Pelletier (1989) treat their capacity reading as distinct from the generic reading, and assume that it does not involve the generic quantifier at all. In this paper I will propose that both readings, as well as the other cases of existentially interpreted generics discussed above, can be accounted for uniformly, and that this account can be incorporated into a general theory of generics.

3. Existential Generics or Simple Existentials?

Given the quasi-existential interpretation of the sentences discussed above, we may suspect that they are not generic after all. Maybe, if a sentence looks like an existential, it simply *is* an existential.

It is well known that bare plurals may, in addition to their generic interpretation, receive an existential one:

(32) a. Birds are flying overhead right now.
b. Mechanics are available.

Sentence (32a) does not express a general property of birds, but the existence of some birds that are flying overhead; (32b) is normally not taken to be about mechanics in general, but expresses the existence of some available mechanics.

Perhaps the sentences discussed above are no more generic than the sentences in (32). Perhaps they are simple existential statements, and thus pose no problem for a theory of genericity.[10]

However, this solution will not do, for a number of reasons. First, we have seen that, in some cases, habituals too admit of existential readings. Unlike bare plurals, habituals are not normally considered to be ambiguous between generic and existential readings – they are only generic. Therefore, we would have to devise some theory explaining how, and under what conditions, sentences that appear to be habituals are actually interpreted existentially. To my knowledge, no such theory has been proposed.

Second, note that even in the non-habitual sentences, using a bare plural is not necessary to receive the existential interpretation. We can replace it with a definite singular, without a significant change in meaning:

(33) a. A: Nobody in India eats beef.
B: That's not true! The Indian does eat beef.
b. The Martian mammal doesn't lay eggs.
c. Only the Martian mammal bears live young.

The only restriction is that it must be possible to interpret the definite description generically; for example, *the mammal* cannot be read as a generic, but *the Martian mammal* can (see e.g., Vendler 1971; Carlson 1977; Bolinger 1980; Dayal 1992 for accounts on the constraints guiding the distribution of definite singular generics). Unlike a bare plural, a definite singular cannot be interpreted as a simple existentially quantified variable – the following sentences are not equivalent to those in (32):

(34) a. The bird is flying overhead right now.
b. The mechanic is available.

Third, like generics, and unlike simple existentials, the sentences under discussion are *lawlike*. They express a generalization that is not temporary, and is expected to occur in the future with some regularity. Let us look at all our examples in turn, to clarify the point.

Suppose that during this year's mating season, a group of puritan zoologists took the trouble to prevent any male platypus from getting near any female platypus, and any male echidna from getting near any female echidna, so that this year no mammals laid eggs. Sentence (7a), however, would remain false, and the sentences in (22) would remain true, provided

[10] Which is not to say that the derivation of the existential readings of sentences such as those in (32) is a simple matter. For theories of the existential readings of bare plurals see, among others: Carlson (1977); Diesing (1992); Kratzer (1995); Van Geenhoven (1996); Chierchia (1998); Cohen and Erteschik-Shir (2002).

that this is just a temporary situation, and we have every reason to believe that, in the future, platypuses and echidnas will continue to mate normally.

Now suppose these same zoologists chose, instead, to prevent all non-mammals that bear live young (some fish, some reptiles) from mating. This would mean that, temporarily, no animals other than mammals bore live young. Still, since this would be a temporary state that would be expected to change the following year, (9a) would remain false.

Similarly, if on a single extraordinary occasion, perhaps when she was extremely nervous, Mary smoked after dinner, this would not make (7b) false, nor would it make (4b), (24), or (25a) true. Rather, what is required is that, over a long period of time, we can regularly find after-dinner situations in which Mary smokes.

Now consider (4a). B's response would not be judged true simply if there existed one Indian who happened to eat beef. Its truth requires that, throughout a long period of time, one may be able to find instances of Indians who eat beef.

If one cloudy day we happened to have played soccer because of extraordinary circumstances that are not expected to recur, this would not be sufficient to render (9b) false, nor would it make (21b), (23b), or (25b) true. And the truth of the sentences in (27) all imply that the car's ability to go 200 kph, Kim's ability to read German, and Robin's ability to ride horses are enduring, even if they are rarely, or even never, exercised.

I conclude, then, that what we are dealing with here is a case of generics, rather than existentially quantified statements. The goal of this paper is to pursue a uniform theory of genericity that is able to account for these existential generics, as well as for the usual quasi-universal readings of generics. Of crucial importance to such a theory is the dependence of the interpretation of generics on sets of *alternatives*. We will turn to this issue next.

4. Sets of Alternatives

4.1. *Quasi-Universal Generics and Alternatives*

As Schubert and Pelletier (1987) have already observed, the domains of generics and habituals are restricted to relevant cases. For example, let us reconsider the sentences in (2), repeated below as (35).

(35) a. Mammals bear live young.
b. Mary smokes [after dinner]$_F$.

Intuitively, the domain of (35a) is not all mammals. Male mammals are irrelevant, as are females that are too young or too old. The fact that these mammals do not, in fact, bear live young, does not affect the truth or falsity of (35a); they simply do not matter. In contrast, female platypuses, which lay eggs, do matter, although they are not sufficient to render (35a) false. Similarly, (35b) is not about all situations involving Mary, but only about situations in which she smokes. What she does when she does not smoke is completely irrelevant to the truth or falsity of (35b).

In Cohen (1996) I account for such facts by suggesting that a generic is evaluated with respect to a set of *alternatives*. Thus, (35a) is evaluated with respect to alternative ways to procreate, say the properties of bearing live young, laying eggs, and undergoing mitosis. Then, only mammals that satisfy one of those alternatives are taken into account; all others are ignored. Since, in general, such mammals bear live young, (35a) is true. Similarly, the alternatives with respect to which (35b) is evaluated are alternative times of smoking: after dinner, before breakfast, in the afternoon, etc. The sentence is true just in case whenever Mary is smoking (at some time or other), she is, in general, smoking after dinner.

A different choice of alternatives may change the truth conditions of the sentence. Consider the following example:

(36) People buy cheap goods from thieves.

This sentence is ambiguous. It may be interpreted with respect to alternative prices of goods people buy from thieves, say {*cheap*, *medium priced*, *expensive*,...}. Under this reading, the sentence states that, in general, if a person buys something from a thief, the price will be cheap. The sentence would therefore be judged true, since presumably goods bought from thieves are relatively cheap.

Alternatively, we can interpret (36) with respect to alternative sources of cheap goods, say {*from thieves*, *at garage sales*, *at auctions*, ...}. The sentence would then say that if a person buys something cheap from some source, it will generally be bought from a thief. Under this reading, (36) is hopefully false, since people usually buy cheap goods from other sources (e.g., garage sales).

The appropriate set of alternatives can be made explicit, using clefts or pseudo clefts,[11] as in the following examples:

(37) a. The kind of goods people buy from thieves are cheap ones.
b. Where people buy cheap goods from is thieves.

[11] I follow the terminology of Higgins (1973), who states that "the notion of pseudo-cleft sentences must be generalized to include copular sentences with subjects consisting of a full lexical noun modified by a relative clause" (p. 56).

Sentence (37a) can only be interpreted to be about different prices of goods (hence true), whereas (37b) can only be interpreted to be about different sources of cheap goods (hence false).

Another way alternatives can be induced is by focus, when it *associates* (in the sense of Rooth 1985) with the generic quantifier. For example:

(38) a. People buy [cheap]$_F$ goods from thieves.
b. People buy cheap goods [from thieves]$_F$.

Sentence (38a) is evaluated with respect to alternative prices of goods, whereas (38b) is about alternative sources of cheap goods.

One note of clarification is in order: I am taking focus here to be what has sometimes been called "narrow," "identificational," or "restrictive" focus, i.e., the element (or elements) of a sentence that may be associated with focus-sensitive particles and induces alternatives. Narrow focus is often contrasted with "wide" or "information" focus, which is the part of the sentence containing new information. É. Kiss (1998a) makes a strong case for the distinction between the two. She points out that since almost all utterances contain some new information (otherwise why utter them?), "[a]n information focus is present in every sentence, but not every sentence contains an identificational focus" (p. 246).

4.2. *Quasi-Existential Generics and Alternatives*

Having discussed the notion of alternatives, let us see if we can identify a common characteristic of all types of existential generic discussed in section 2 above. I propose that in all these sentences, no alternatives are introduced. This means that alternatives are not introduced overtly, and, moreover, either there is no (narrow) focus, or the focused part is not associated with the generic quantifier.

Let us consider all the examples in turn, to substantiate this claim. We will start with (4) and (7), repeated below:

(39) a. A: Nobody in India eats beef.
B: That's not true! Indians [do]$_F$ eat beef!
b. A: When Mary smokes, it is never after dinner.
B: That's not true! Mary [does]$_F$ smoke after dinner.
c. Mammals [don't]$_F$ lay eggs.
d. Mary [doesn't]$_F$ smoke after dinner.

In these generics, focus is on the auxiliary, and it has a contrastive meaning. I suggest that in this case, the focus is not associated with the generic quantifier; moreover, alternatives are not introduced in any other way.

The first claim, namely that when focus is contrastive, it does not associate with a focus sensitive operator, is well established. For example:

(40) A: John always takes [Mary]$_F$ to the movies.
B: No! [Peter]$_F$ always takes Mary to the movies.

In A's statement, focus is on *Mary*, and it associates with the focus-sensitive operator *always*: A says that, whenever John takes someone to the movies, it is always Mary. In B's response, however, focus is not associated with *always*. Although *Peter* is focused, B is not saying that whenever someone takes Mary to the movies, it is always Peter, but rather that whenever Peter takes someone to the movies, it is always Mary (and that A is wrong in saying that John, rather than Peter, behaves in this way). Perhaps the contrastive role of focus here comes from its association with some phonologically null **contrast** operator (cf. Partee 1991) or **assert** operator (Jacobs 1988); the important point for us here is that, at any rate, focus is not associated with the focus-sensitive operator, *always*.

We can see the same phenomenon with generics and habituals:

(41) a. A: People buy [cheap]$_F$ goods from retailers.
B: No! People buy cheap goods [from thieves]$_F$.
b. A: Mary smokes [after dinner]$_F$.
B: No! [Kate]$_F$ smokes after dinner.

B's answer in (41a), just like (38a), is about alternative prices of goods, hence it is true. Despite the focus on *from thieves*, the sentence is not evaluated with respect to various sources of cheap goods. In this case, the focus of B's answer serves a contrastive role; thus, we get the interpretation that B is correcting A's claim by stating that it is thieves, rather than retailers, that people buy cheap goods from.

In B's refutation in (41b), focus is on *Kate*, and is not associated with the generic quantifier. Thus, the sentence does not mean that when someone smokes after dinner, it is generally Kate. Instead, B's utterance means that whenever Kate smokes, it is, in general, after dinner.

In contrastive contexts, then, focus does not associate with the focus-sensitive operator. However, I am making a stronger claim: that in the sentences in (39), alternatives are not introduced in any other way. This is certainly not the case in B's utterances in (40), (41a), and (41b), where alternatives *are* introduced, and they do restrict the domain of the quantifier. In fact, these sentences behave as if there were focus on, respectively, *Mary*, *cheap*, and *after dinner*, and this focus were associated with the focus-sensitive operator (in these examples, *always* or the generic quantifier). Partee (1991) suggests that in such cases B's utterance inherits the

focus structure of A's statement. For example, in B's utterance in (40), in addition to the focus on *Peter* (which is associated with the **contrast** operator) there is also focus on *Mary* (just like in A's utterance). It is this focus, usually called *second-occurrence focus*, that is associated with the quantifier.

Perhaps, one could claim, the same thing happens with the sentences in (39); in addition to the focus on the auxiliary, it might be thought, there is also second-occurrence focus, and it is this focus that induces alternatives and associates with **gen**.

This, however, will not do. Focus on the auxiliary allows no focus on the rest of the sentence, not even second-occurrence focus.[12] Consider an exchange similar to (40), but with focus on the auxiliary:

(42) A: John never takes [Mary]$_F$ to the movies.
B: No! John always [does]$_F$ take Mary to the movies.

B's statement does not get the interpretation that whenever John takes someone to the movies, it is always Mary. In other words, there is no second-occurrence focus on *Mary*. Rather, what B seems to be saying is that whenever the question of John's taking Mary to the movies comes up, he always takes her. The adverb associates with the auxiliary, i.e., with the truth polarity of the sentence in its scope (cf. Höhle 1992): whenever the truth of *John is taking Mary to the movies* is in question, it is true.

We can conclude, then, that focus on the auxiliary has the effect of disallowing focus on any other part of the clause, and that, consequently, no alternatives are introduced for the evaluation of the generics in (39).

Since I claim that in sentences such as those in (39) no alternatives are introduced, one might expect that if alternatives were forced explicitly, the sentences would lose their quasi-existential interpretation. This prediction is, indeed, borne out:

(43) a. What Indians eat [is]$_F$ beef!
b. The occasions on which Mary smokes [are]$_F$ after dinner!
c. The way by which mammals reproduce is [not]$_F$ by laying eggs.
d. The occasions on which Mary smokes are [not]$_F$ after dinner.

Sentence (43a) means that Indians generally eat beef; and (43b) says that, in general, Mary smokes after dinner. Sentence (43c), unlike (39c), is true; and (43d) says that it it false that Mary generally smokes after dinner, not that she never smokes after dinner.

[12] Compare Creswell (1999), who claims that focus on the auxiliary indicates that the rest of the proposition is old.

Let us now consider the examples involving focus-sensitive particles, repeated below:

(44) a. Only [mammals]$_F$ bear live young.
b. Even [mammals]$_F$ lay eggs.

(45) a. We play soccer only if [the sun is shining]$_F$.
b. We play soccer even if [it rains]$_F$.

These sentences exhibit the same characteristics: focus is associated not with the generic quantifier, but with the focus-sensitive particle, hence no alternatives are induced.

Note, once more, that when alternatives are explicitly introduced, the quasi-existential reading disappears:[13]

(46) a. Only [mammals]$_F$ are such that the way by which they reproduce is bearing live young.
b. Even [mammals]$_F$ are such that the way by which they reproduce is laying eggs.

(47) a. The game we play is soccer only if [the sun is shining]$_F$.
b. The game we play is soccer even if [it rains]$_F$.

Sentence (46a), unlike (44a), is a regular, quasi-universal generic: it implies that mammals, in general, bear live young, and that no other class has this generic property (i.e., there might be some non-mammal species that bears live young, but no class that has this property in general). Similarly, (46b), in contrast with (44b), implies that mammals, in general, bear live young, not that only some of them do.

Sentence (47a), unlike (45a), allows that we sometimes play soccer in conditions under which the sun is not shining, so long as we don't do so in general. And (47b) requires that we, in general, play soccer when it rains, not merely that we sometimes play soccer in the rain, as follows from (45b).

Additives, as they occur in the examples repeated below, are an interesting case.

(48) a. Mammals also lay eggs.
b. Mammals lay eggs too.

(49) a. We also play soccer if it rains.
b. We play soccer if it rains too.

(50) Mary smokes [before breakfast]$_F$. She smokes after dinner too.

[13] This results in rather cumbersome sentences, but the judgments, I believe, are quite clear.

There are two ways to consider additives: the traditional approach is to treat them as operators that associate with focus, just like *only* and *even*. If we choose this path, the same generalization would apply: the additive associates with focus, hence the generic has no focus to associate with, and no alternatives are induced.

An alternative way to consider additives is as particles that are, themselves, focused, and the associated element is a contrastive topic, rather than a focus (Krifka 1999). In this case, too, the part of the sentence that is inside the scope of the generic quantifier is focusless, and no alternatives are therefore introduced.

So, according to either account of additives, the generic in their scope is evaluated with respect to no alternatives.[14] Indeed, when alternatives are overtly introduced, the quasi-existential reading disappears:

(51) a. Mammals also are such that the way by which they reproduce is laying eggs.
b. The game we play is soccer if it rains too.
c. Mary smokes [before breakfast]$_F$. *The occasions on which she smokes are after dinner too.

Sentence (51a), unlike (22b), says (falsely) that laying eggs is a characteristic property of mammals; sentence (51b), unlike (49b), says that we generally play soccer when it rains; and the second sentence of (51c), unlike that of (50), is bad because it contradicts the first.

What about the case of unrestricted habituals? Here, I suggest, there is simply no (narrow) focus at all. Recall that while (almost) all sentences have wide focus, i.e., indicate something new, there is no reason to expect that all sentences have narrow focus. Since there is no narrow focus to be associated with the generic quantifier, no alternatives are induced. As in the other cases, when we introduce alternatives overtly, the interpretation of the sentences changes:

(52) a. The vice which Mary engages in is smoking.
b. The game we play is soccer.
c. The speed at which this car goes is 200 kph.
d. The language in which Kim reads is German.
e. The animals which Robin rides are horses.
f. What Nephi's dog chases is cars.

[14] It is because of this controversy regarding the focus structure of additives that I refrain from marking focus on the example sentences, since the theory proposed here is compatible with both views of additives.

Sentence (52a) cannot mean that Mary smokes on occasion, but rather that, in general, whenever she engages in some vice, she smokes; (52b) means that whenever we play a game, it is generally soccer; (52c) means that whenever this car moves under some contextually specified conditions (perhaps when it moves as fast as it is able), it generally goes 200 kph; (52d) means that whenever Kim reads something, it is generally written in German; and (52f) means that, in general, when Nephi's dog chases something, it is a car.[15]

What happens when we focus part of the habitual?

(53) a. Mary [smokes]$_F$.
b. We play [soccer]$_F$.
c. This car goes [200 kph]$_F$.
d. Kim reads [German]$_F$.
e. Robin rides [horses]$_F$.
f. Nephi's dog chases [cars]$_F$.

In this case, we can read the sentences as quasi-universal generics, rather than quasi-existentially: (53a) means that whenever Mary engages in one of a contextually determined class of actions (e.g., vices), she generally smokes; (53b) has a reading where, whenever we play some game, it is usually soccer; (53c) has the (implausible) interpretation that whenever this car is driven, it generally goes 200 kph, etc.

Note that focus may have a different interpretation too – it may have a contrastive role. That is to say, the sentences in (53) can be used to refute somebody's claim that Mary doesn't smoke, that we don't play soccer, etc. In this case, the quasi-existential interpretations of the sentences remain, because focus, even when present, does not associate with the generic quantifier (but, perhaps, with the **contrast** or **assert** operator).[16]

[15] Compare Declerk (1986), who considers (31) and observes: "The corresponding 'universal' reading (which ... can be brought by clefting [(31)]: 'It is cars that Nephi's dog chases') ... is the idea 'on all occasions when Nephi's dog chases something, it is a car that he chases' " (pp. 155–156).

[16] There is another type of generics that also do not receive a quasi-universal reading. I am referring to well known examples such as

(i) a. The Frenchman eats horsemeat.
b. Dutchmen are good sailors.

These sentences are usually judged true, even though few Frenchmen eat horsemeat, and few Dutchmen are good sailors. I believe these generics are different from the ones discussed here: in particular, the set of alternatives, far from being a singleton, contains alternatives to the subject as well as the predicate, and is instrumental in their interpretation. See Cohen (2001b) for my proposed treatment of such generics.

5. From Universal to Existential

5.1. *Alternatives and Logical Form*

To summarize the discussion so far: we have seen a reading of generics that can be characterized as quasi-existential, in contrast with the more familiar quasi-universal interpretation. We have noted one characteristic common to all these generics: no alternatives are introduced, either overtly or by way of (narrow) focus. The challenge is to show how the quasi-existential interpretation of generics follows from their usual, quasi-universal reading in cases where no alternatives are induced. In this section I will present just such a theory.

Let me start with a few preliminary remarks. I take genericity to involve a phonologically null generic quantifier, so that, for instance, the logical form of (2a) is roughly:[17]

(54) $\mathbf{gen}_x[\mathbf{mammal}(x), \mathbf{bear\text{-}live\text{-}young}(x)]$

What are the truth conditions of (54)? More generally, what are the truth conditions of $\mathbf{gen}_x[\psi(x), \phi(x)]$? Intuitively, it is true iff, "in general", if $\psi(x)$ then $\phi(x)$. Putting it this way does not, of course, say much; one needs to say exactly what "in general" actually means.[18] Yet, for the purposes of this paper, this vague characterization will suffice, so long as it conforms to two very basic, almost trivial rules:

(55) a. If all ψs, throughout a relevant, sufficiently long period of time, are ϕs, then $\mathbf{gen}_x[\psi(x), \phi(x)]$ is true;
b. If no ψs, throughout a relevant, sufficiently long period of time, are ϕs, then $\mathbf{gen}_x[\psi(x), \phi(x)]$ is false.

The reference to a sufficiently long period of time is intended to make sure the truth of the generic is not dependent on just a temporary generalization. Thus, if all Supreme Court judges happened to have a prime Social Security number, this would not be sufficient to render (56) true.

(56) Supreme Court judges have a prime Social Security number.

While the precise truth conditions of **gen** do not affect the thesis that will be proposed here, what *is* important is the fact that, as discussed in section 4.1 above, generics are evaluated with respect to a set of altern-

[17] But only roughly: the fact that *mammals* refers to a kind is not captured. I will return to this issue in section 6 below.

[18] Elsewhere (Cohen 1996, 1999) I propose that generics express probability judgments, and many other theories have been proposed (see Krifka et al. 1995; Cohen 1996; Pelletier and Asher 1997 for overviews).

atives. The disjunction of these alternatives restricts the domain of the generic quantifier. For example, suppose (54) is evaluated with respect to the following set of alternatives:

(57) $A = \{$**bear-live-young**, **lay-eggs**, **undergo-mitosis**$\}$

Then (54) would mean that, if x is a mammal and x satisfies $\bigvee A(x)$, the disjunction of the alternatives, then, in general, x bears live young. The disjunction of the alternatives is satisfied by any individual that procreates in some fashion; hence, (54) is satisfied iff in general, if x is a procreating mammal, x bears live young. This is the desired interpretation of (2a).

Other generics will be evaluated similarly: if $\mathbf{gen}_x[\psi(x), \phi(x)]$ is a generic evaluated with respect to a set of alternatives A, it will be true just in case, in general, if $\psi(x) \wedge \bigvee A(x)$ then $\phi(x)$.

An interesting question arises: what happens if there are no individuals that, when assigned to x, satisfy $\psi(x) \wedge \bigvee A(x)$? It is well known that quantifiers presuppose the nonemptiness of their domain. If the generic quantifier behaves in the same way, we would expect in such cases the sentence to be odd, neither clearly true nor clearly false.

Consider the following example:

(58) Male hedgehogs bear live young.

If we evaluate (58) with respect to the set of alternatives (57), it would mean that, in general, if x is a male hedgehog that procreates in some way, x bears live young. But no male hedgehog procreates in any way, hence the domain is empty, and we would expect (58) to be neither true nor false.

However, (58), when uttered with normal intonation, seems to be simply false for most speakers. In Cohen (1996, pp. 119–120) I suggest that, in this case, a different set of alternatives is accommodated. Since the most plausible set of alternatives leads to a presupposition failure, a different one is accommodated – consisting simply of the property of bearing live young and its negation:

(59) $A = \{$**bear-live-young**, $\neg$**bear-live-young**$\}$.

The disjunction of these alternatives is a tautology, hence every male hedgehog satisfies it. Thus, after this accommodation, (58) expresses quantification over all male hedgehogs, not only over the (nonexistent) procreating ones. So long as there are any male hedgehogs, then, the domain of the generic is nonempty, and (58) avoids presupposition failure. It says that, in general, if x is a male hedgehog, it bears live young. By (55b), sentence (58) is, therefore, false, rather than lacking a truth value, as desired. I therefore conclude that when none of the members of the

domain of a generic satisfy the disjunction of the alternatives, the generic sentence is false.

5.2. *Singleton Sets of Alternatives*

If the theory described above is on the right track, it can account for the regular, quasi-universal interpretation of generics. Can it also account for their quasi-existential readings? I suggest that it can.

We have seen that when no alternatives are introduced, generics get a quasi-existential reading. What does it mean to say that no alternatives to the generic $\mathbf{gen}_x[\psi(x), \phi(x)]$ are introduced? It means that A, the set of alternatives to ϕ, is simply the singleton set $\{\phi\}$. Then, the sentence is true iff:

(60) In general, if $\psi(x) \wedge \bigvee A(x)$, then $\phi(x)$.

But since

(61) $\bigvee A = \phi$,

this comes down to:

(62) In general, if $\psi(x) \wedge \phi(x)$, then $\phi(x)$.

If there exist some individuals that, when assigned to x, satisfy $\psi(x) \wedge \phi(x)$, (62) will be trivially true, assuming (55a). So, if there are some ψs that are ϕs, the generic is true.

What if there are none? In this case, the domain of the generic is empty, which is a case of presupposition failure, and, as we have seen above, an exhaustive set of alternatives is accommodated:

(63) $A = \{\phi, \neg\phi\}$

Since the disjunction of (63) is a tautology, satisfied by any individual, the generic would be true iff:

(64) In general, if $\psi(x)$ then $\phi(x)$.

But since this accommodation is triggered only when no ψs are ϕs, (64) is false, by (55b).

To conclude: when a singleton set of alternatives is introduced, the generic $\mathbf{gen}_x[\psi(x), \phi(x)]$ is true iff there are some individuals that, when assigned to x, satisfy $\psi(x)$ and also $\phi(x)$.

Thus, (4a) says that there are Indians who eat beef, and (4b) and (24) say that there are occasions when Mary smokes after dinner. Sentence (7a), by being the negation of a generic that is evaluated with respect to a singleton set of alternatives, states that it is false that some mammal lays

eggs. Similarly, (7b) is true iff there are no occasions of Mary's smoking after dinner. Sentence (9a) is true just in case mammals are the only class that has some members that bear live young, and the truth of (9b) requires that sunny days be the only kind of days where there exist occasions of our playing soccer. Unrestricted habituals are also interpreted in the same way: there are some occasions on which Mary is smoking, we are playing soccer, this car is going 200 kph, Kim is reading a German book, Robin is riding a horse, or Nephi's dog is chasing a car.

It is this restriction of the domain by a singleton set of alternatives that gives these generics their existential flavor, without making them truly existential. The interpretation still involves the generic quantifier, not a simple existential quantifier. Hence, existential generics still maintain their lawlikeness. For example, (25a) does not require that Mary smoke all or most of the time, but rather some of the time. However, one or two accidental, extraordinary occurrences of Mary's smoking would not suffice to validate the generic.

6. Generics and Focus Sensitivity

We have seen that it is not necessary for a generic sentence to introduce alternatives. This means that generics do not have to associate with focus; they may be evaluated (and receive a quasi-existential interpretation) even when there is no narrow focus. In this, they constitute a special kind of focus-sensitive operator; they may associate with focus, in the sense that focus may provide alternatives restricting the domain of the quantifier, but they do not have to. Generics are therefore different from other focus-sensitive operators, whose association with focus appears to be mandatory.

In particular, let us consider adverbs of quantification. The generic quantifier is often taken to be just another adverb of quantification, whose meaning is similar to *usually* or *generally*. Indeed, the sentences in (2) appear to mean, respectively, more or less the same as

(65) a. Mammals generally [bear live young]$_F$.
b. Mary generally smokes [after dinner]$_F$.

It would, therefore, be interesting to see whether sentences involving an overt *generally* have quasi-existential readings too. It turns out that, in fact, they do not:

(66) a. Indians [do]$_F$ generally eat beef.
b. Mary [does]$_F$ generally smoke after dinner.

c. Mammals [don't]$_F$ generally lay eggs.
d. Mary [doesn't]$_F$ generally smoke after dinner.
e. Only [mammals]$_F$ generally bear live young.
f. We generally play soccer only if [the sun is shining]$_F$.
g. Mammals also generally lay eggs.
h. Mary generally smokes [before breakfast]$_F$. *She generally smokes [after dinner]$_F$ too.
i. Mary generally smokes.

Sentences (66a) and (66b) do not make existential claims; it does not suffice for their truth that only some Indians eat beef or that Mary only sometimes smoke after dinner.

Sentence (66c), unlike (7a), does not mean that no mammals lay eggs; rather, it is simply a negation of the claim that mammals generally lay eggs. Hence, unlike (7a), (66c) is true. Similarly, (66d) does not mean that Mary never smokes after dinner, only that it is false that she generally does so.

Sentence (66e) does not, unlike (9a), say that mammals are the only type of animals that bear live young, only that they are the only ones that do so as a rule. In the same way, (66f), unlike (9b), allows that we play soccer on days that are not sunny, so long as we do not do so as a rule.

Similarly, (66g) requires that mammals on the whole, not just a few of them, lay eggs. The discourse in (66h) is bad because the first sentence says that whenever Mary smokes it is usually before breakfast, while the second sentence contradicts the first by saying it is, in fact, usually after dinner. The infelicity of (66h), in contrast with the felicity of (24), indicates that the *generally* sentence does not receive a quasi-existential interpretation.

Sentence (66i), just like other unrestricted *generally* sentences, does not receive an existential interpretation either. It says that any situation, out of a contextually defined set of situations, is, in general, such that Mary smokes in it. In fact, without such a contextually defined set of situations, this sentence would be odd, because it would imply that Mary smokes practically all the time.

It appears, then, that sentences containing adverbs of quantification, unlike generics, *must* induce a set of alternatives with respect to which they are evaluated. It follows that adverbs of quantification must associate with focus; the focused element cannot be left to be associated with something else. This restriction, however, does not apply to generics, which do not have to, though they may, associate with focus. The question, then, is why? Why are generics so special?

In order to answer this question, let us consider the interpretation of a sentence involving an adverb of quantification. Rooth (1985) notes that the following sentences have different truth conditions:

(67) a. In Saint Petersburg, ballerinas always escorted [officers]$_F$.
b. In Saint Petersburg, [ballerinas]$_F$ always escorted officers.

Sentence (67a) is true just in case, whenever a ballerina accompanied someone, it was invariably an officer (but officers may have had other companions as well); sentence (67b), on the other hand, conveys the statement that, whenever someone escorted an officer, it was always a ballerina (but ballerinas may have accompanied other people as well).

As we have seen above, the disjunction of the set of alternatives induced by focus restricts the quantification domain of the adverb. Thus, the adverb in (67a) quantifies over the set of ballerinas who escorted someone, and the sentence says that such ballerinas always escorted officers. Sentence (67b), in contrast, expresses quantification over officers who were escorted by someone, stating that such companions were always ballerinas. Crucially, without focus the sentence would be ambiguous: syntax is not sufficient to tell us what the domain of the quantifier is.

But what does it mean to say that focus affects the domain of an adverbial quantifier? Applying Rooth's theory to the tripartite quantificational structures developed by Kamp (1981) and Heim (1982), Partee (1991) suggests that focus affects logical form: the focused material is mapped onto the nuclear scope, whereas the rest of the sentences, together with the disjunction of the alternatives, is mapped onto the restrictor.

Thus, a sentence involving an adverb of quantification is evaluated in the following way. The adverb induces a tripartite form. This, in itself, is not sufficient to evaluate the sentence – we need to know which elements are mapped onto the restrictor, and which are mapped onto the nuclear scope. This is determined by focus and the alternatives it induces. Hence, adverbs of quantification *must* associate with focus; without focus, it is impossible to know what the logical form of the sentence is, and, hence, it is impossible to evaluate it.

One point needs to be clarified: the fact that adverbs of quantification require focus for their semantic interpretation does not necessarily entail that this focus is phonologically marked (though it might be). The question whether semantic focus is identical with phonological focus is a difficult one, as we have already seen with the discussion of second-occurrence focus above.[19] Discussing a solution to it lies beyond the scope of this paper. I can only echo Rooth (1995), who writes: "In this discussion, I would like to leave aside the question whether this expected focus marking is really phonologically defensible" (p. 270).

[19] See Bartels (1997) and Krifka (1997) for discussions of the phonological properties of second-occurrence focus.

Adverbs of quantification, then, require narrow focus. What about generics? The situation here is somewhat different. Unlike overt adverbs of quantification, the generic quantifier is not phonologically present in the sentence. This obvious fact has an important consequence that is not always appreciated: if the generic quantifier is not there, it needs to be inferred by the hearer.

An analogy may be instructive here. Consider the phenomenon of ellipsis, exemplified by (68b).

(68) a. Who will take care of dinner?
b. John will.

Sentence (68b), on its own, cannot be interpreted. It is missing some material, which needs to be inferred by the hearer. In the appropriate context, for example, when (68b) is an answer to (68a), this inference can be made easily; in other contexts, it may be hard or impossible. But the important point is that this inference is triggered by the unacceptability of (68b) as it stands; if (68b) were fine, no ellipsis resolution would be necessary.

A similar observation can be made regarding the generic quantifier. Some generics are quite acceptable without it, and inferring its existence is unnecessary. For example:

(69) Pandas are an endangered species.

This sentence does not involve quantification; it predicates a property, being an endangered species, directly of the kind ↑**panda**.[20] Predication does not involve a tripartite structure, and its logical form is not dependent on the alternatives induced by focus.[21] Thus, the logical form of (69) is something like (70).

(70) **endangered**(↑**panda**)

There are cases, however, when direct kind predication does not make sense. For example, (71) does not mean that the kind itself eats bamboo shoots, but that individual pandas do.

(71) Pandas eat bamboo shoots.

The kind ↑**panda** is simply not the sort of thing that can eat; only individual pandas can. Thus, the logical form (72) is unacceptable.

(72) **eat-bamboo-shoots**(↑**panda**)

[20] I am using Link's (1995) notation, according to which $\uparrow p$ is the kind denoted by the common noun whose meaning is p.

[21] According to some theories it is dependent on topic; but this still does not make it dependent on focus, since topic is not the complement of narrow focus.

The fact that there are cases where direct kind predication is ruled out is supported by more than just intuition. Consider, for example, (73a), from Carlson (1977) (his (35), p. 165).

(73) a. Cats like themselves.
b. **like**(↑**cat**, ↑**cat**)

Carlson points out that if (73a) were interpreted as predicating the property *like themselves* directly of the kind ↑**cat**, it would have (73b) as its logical form. But this logical form says that cats like cats, and we would lose the more plausible reading where, in general, a cat likes itself, but not necessarily other cats.

Consequently, in cases where direct kind predication will not do, Carlson proposes that a phonologically null generic operator is necessary. I accept this view, though for me, unlike Carlson, the generic operator is a quantifier (see Cohen 1996 for arguments for this move). Specifically, in cases such as (72), the generic quantifier, **gen**, is inferred, and the argument of predication becomes its restrictor. This, however, results in a type mismatch: the restrictor ought to be an open formula, rather than a kind. Therefore, ↑**panda** is type-shifted to $C(x, \uparrow\textbf{panda})$, which indicates that x is an instance of the kind ↑**panda**.[22] Consequently, we get the following quantificational statement (Cohen 2001a):

(74) $\textbf{gen}_x[C(x, \uparrow\textbf{panda}), \textbf{eat-bamboo-shoots}(x)]$

The important point for our purposes here is that the restrictor is simply the argument of the predicate in (72), after suitable type-shifting. Crucially, it is not determined by focus. Hence, at the stage where the restrictor of **gen** is determined, focus does not play a role. Focus, if present, can, of course, affect the meaning of the sentence, by inducing alternatives, as described in section 4.1 above. But it is not necessary to determine the logical form. It is for this reason that alternatives do not have to be introduced, and when they are not, quasi-existential readings result.

Note that when the possibility of direct kind predication is blocked, focus *is* necessary, and quasi-existential interpretations are unavailable. It is known that, except when they are used taxonomically, indefinite singulars cannot denote kinds:

(75) *A panda is an endangered species.

[22] Compare ter Meulen (1995), who proposes a similar type-shifting rule. C is similar to Carlson's (1977) representation relation R, but differs from it in that it allows collections, in addition to individuals, to be representatives of a kind; see Cohen (1996) for the details.

Hence, direct kind predication is impossible with indefinite singular generics, and, consequently, they cannot give rise to quasi-existential interpretations:

(76) a. An Indian [does]$_F$ eat beef.
b. A mammal lays eggs too.

Sentence (76a) can only mean that, in general, an Indian eats beef, not that some do; and (76b) means that, in general, a mammal lays eggs, not that some mammals do.[23]

Hence, generics, unlike other focus-sensitive particles, *may* associate with focus, but do not *have* to. When there is no focus, and alternatives are not introduced in some other way, generics receive a quasi-existential interpretation; otherwise, they receive their regular, quasi-universal reading.

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[23] I am indebted to Manfred Krifka for this observation. Whether indefinite singular generics involve the generic quantifier is under debate; elsewhere (Cohen 2001a) I claim they do not. This does not, however, affect the point made here.

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