Habitual Sentences and Generic Quantification

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1. Introduction

Generic sentences express generalizations about objects or situations in the world. The ways in which genericity can arise in natural language have long been of interest to semanticists. In some sentences, the source of the generalization is visible – the adverb *often* in (1a), for example. However, generic meaning can also arise in the absence of an overt marker, as in (1b), which, like (1a), expresses a generalization about Mary.

- (1) a. Mary often eats roast beef sandwiches.
 - b. Mary eats roast beef sandwiches.

In the last three decades, it has been common to account for genericity by positing a covert generic operator which takes sentential scope and has the logical form of an adverb of quantification (AdvQ). This paper shows that, whatever the status of covert AdvQs in general, the particular covert operator in sentences like (1b) cannot have the logical structure of an AdvQ. Instead, I propose that the simple present tense verb in (1b) contains a phonologically null affix that does not take sentential scope. This analysis will account for the unacceptability of the indefinite object in (2b), which is unexpected on the AdvQ account.

- (2) a. Mary drinks beer.
 - b. #Mary drinks a beer.

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In support of my analysis I will draw a comparison between English and Czech/Slovak, languages which exhibit similar behavior with respect to indefinite objects but have more transparent morphology for the generic operator in question.

2. Habitual sentences

This paper is concerned with *habitual sentences*, a subclass of generic sentences. Habitual sentences contain an episodic verb and express a generalization over multiple episodes. In a present tense habitual sentence in English, the verb appears in the simple present (3).¹

- (3) a. Italians drink wine.
 - b. Bears usually eat blackberries.
 - c. Mary drinks beer.
 - d. Jane wakes up at 7:00 AM.

In the literature, the term *habitual sentence* is often used to include both sentences that contain overt AdvQs (3b) and those that do not (3a, c, d). I will be arguing that these two sentence types have crucially different properties. I therefore introduce the following terminology. A *simple habitual sentence* (SHS) contains no overt quantificational elements (I will discuss what these may be below). An *overtly quantified habitual sentence* (OQHS) contains an overt AdvQ or other quantificational element. For simplicity, I will focus on habitual sentences with individual subjects, rather than bare plurals.

Habitual sentences describe events that occur with some level of regularity.² In a SHS, the level of regularity is interpreted pragmatically, depending on the predicate and the context. In order to truthfully utter the generalization in (4a), I need far fewer instances of Mary murdering children than I do instances of Mary reading the *Times* in (4b) (this example is based on Zemach 1975, cited in Carlson 1977).

- (4) a. Mary murders children.
 - b. Mary reads the *Times*.

^{1.} Although habitual sentences in English are easily recognizable in present tense by their use of the simple present, habitual meaning is also compatible with past and future tense (i).

⁽i) a. Mary played soccer (when she was a girl).

b. Starting next week, this store will open at 10:00. [Krifka et al. 1995]

^{2.} Habitual sentences do not necessarily describe "habits" in the non-technical sense.

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Even a single predicate in a SHS is interpreted differently depending on the context (this example is based on Lawler 1973). Consider (5).

(5) Mary drinks beer.

If you have asked me what Mary might choose to drink with dinner, (5) means that Mary *usually* drinks beer. If you are serving beer and have asked me whether to give Mary a mug, (5) need only say that Mary *sometimes* drinks beer, or is *willing* to drink it, not that she usually does. And if you have asserted that Mary is a teetotaler, I can utter (5) to contradict you even if I have only seen Mary drink beer once.³

3. Previous analyses: covert adverb of quantification

The most common analysis of SHSs in recent years (Lawler 1973, Farkas and Sugioka 1983, Schubert and Pelletier 1989, Krifka et al. 1995, a.o.) is that they contain a covert quantifier, specifically an AdvQ (Lewis 1975). The logical form of an AdvQ has a tripartite structure. The AdvQ takes scope over the entire sentence, and the remainder of the sentence is partitioned into a restrictor and a nuclear scope.⁴ It is generally accepted that an AdvQ can bind a situation variable, represented by *s* in (6), and that a *when*-clause can serve as a restrictor.⁵

(6) a. Mary usually drinks beer when she's at Dempsey's Pub.
b. USUALLY_s [M at DP in s] [M drinks beer in s]
'Usually, for situations s, where Mary is at Dempsey's Pub in s, Mary drinks beer in s.'

If there is no overt restrictor, a context function *C* is assumed to restrict the quantification to contextually appropriate situations (7).

- (7) a. Mary often eats roast beef sandwiches.
 - b. OFTEN_s [C(s)] [M eats r.b. sandwiches in s]
 'Often, for situations s, where s is appropriate for Mary eating roast beef sandwiches, Mary eats roast beef sandwiches in s.'

^{3.} Focus stress can affect the reading of a SHS, but I believe that all the given readings of (5) are available with stress on the VP.

^{4.} A complete discussion of AdvQs is beyond the scope of this paper, but see for example Lewis (1975), Heim (1982), de Swart (1991), Diesing (1992).

^{5.} There has been much discussion about whether an AdvQ is an unselective binder or binds only a situation variable, with other apparent binding being derived. My examples assume the latter, but the difference does not affect my analysis. I also take no stand regarding any particular formulation of situation theory.

I assume that OQHSs have the form given in (6-7). The idea that SHSs share this form comes from two key observations. First, as seen in the previous section, SHSs can be paraphrased by sentences containing overt AdvQs like *usually* and *sometimes* (Lawler 1973). Farkas and Sugioka (1983) note that the meaning of a SHS is similar to that of a sentence containing overt *generally* (8).

- (8) a. Jane walks to work.
 - b. Jane generally walks to work.

Second, *when*-clauses are felicitous when no overt AdvQ is present, and the sentences with and without AdvQs again have similar meanings (9).

- (9) a. Mary generally eats green beans when she's hungry.
 - b. Mary eats green beans when she's hungry.

If a restrictor is present, the reasoning goes, it must have something to restrict, hence a covert AdvQ. Based on such evidence, Farkas and Sugioka propose a covert generic AdvQ meaning 'generally'. I will call this GEN.

It does appear that the hearer interprets (9b) as though there is a covert AdvQ.⁶ However, I put (9b) in the category of OQHSs, because the *when*-clause seems to license the quantification. This will be discussed further in the next two sections, where we will see that (9b) behaves differently from SHSs.

Note that (8b) has a covert restrictor, and (9b) a covert AdvQ. But common analyses of SHSs in the literature today (e.g. Schubert and Pelletier 1989, Krifka et al. 1995, Chierchia 1998) have both a covert AdvQ and covert restrictor (10).

(10) a. Mary drinks beer.

b. GEN_s [C(s)] [Mary drinks beer in s]
'Generally, for situations s that are appropriate for Mary drinking beer, Mary drinks beer in s.'

The next section presents evidence that (10b) cannot be the logical form of a SHS.

^{6.} When the hearer supplies an AdvQ, it is not clear whether this AdvQ is GEN or a universal. Judgments vary about the extent to which exceptions are allowed: if Mary once does not eat green beans when she's hungry, does that falsify (9b)? This is a matter for another investigation.

4. The problem: indefinites take obligatory wide scope in simple habitual sentences

If GEN is just like other AdvQs save for being covert, it should exhibit the same behavior as other AdvQs. However, it does not, specifically with respect to scope.⁷

The key fact is that SHSs do not allow indefinite objects with a generic interpretation (11). This fact has often been remarked (Carlson 1977, 1989, Krifka et al. 1995, Giorgi and Pianesi 1997, a.o.), but its significance for the logical form of SHSs has not been noted.

- (11) a. Mary drinks beer.
 - b. #Mary drinks a beer.
 - c. #Mary drinks three beers.
 - d. #Mary drinks some (=sm) beer.
 - e. #Mary drinks a pint of beer.

While (11a), with a bare plural object, is fine, (11b-e), with indefinite objects, are distinctly odd.⁸ (Though there are many environments in English, including OQHSs, where clauses like (11b-e) are acceptable; these will be discussed in the next section.)

If (11b-e) mean anything, they seem to have a wide-scope reading of the indefinite. This will be interpreted as a type if possible, and a token if not (12).

- (12) a. #Mary drinks a beer. namely Heineken (type reading)b. #Mary drinks a beer. namely that particular glass
 - (token reading very odd)
 - c. #Mary kisses a man. namely her husband (only token reading)

Consumption/creation verbs highlight the wide-scope reading of the indefinite, because the predicate can apply only once to a particular object. However, there are other predicates that exhibit the same effects, such as *kiss* (12c) and *read*. When the object can be the same each time, the wide-scope reading is natural and therefore unremarkable; cf. Krifka et al. (1995) for a similar argument about why (13) is fine.

(13) Mary drives a Toyota.

^{7.} See Delfitto (2002) for other arguments against the AdvQ analysis of SHSs.

^{8.} Throughout, I distinguish bare plurals from indefinites. Although it has been proposed that bare plurals are ambiguous between kinds and indefinites, there is significant evidence against this view – see e.g. Chierchia 1998, Rooth 1995.

The oddness of (11b-e) is not by itself an argument against the presence of covert GEN. As R. Kayne (p.c.) has noted, (11b-e) are still somewhat odd with the addition of the overt AdvQ *generally* (14).

(14) ?#Mary generally drinks a / three / some (=sm) / a pint of beer(s).

This can be attributed to the fact that *generally*, like *usually*, has only a proportional reading, and (14) supplies no context for evaluating the proportion (see de Swart 1991 for a discussion of proportional vs. pure frequency readings, which arise with AdvQs like *often*.) But GEN should have the same properties as *generally*, so it could still be present in (11b-e).

The key environment for comparing SHSs to OQHSs is one that supplies a discourse topic, which can serve as a restrictor for an AdvQ (von Fintel 1994). When a discourse topic is available, an OQHS, even a proportional one, allows an indefinite object, while a SHS does not (15).⁹

- (15) Mary and Bob arrive at a party. Mary immediately goes to greet her friends, while Bob stays and chats with the host. The host offers Bob a drink and asks what Mary would like.
 - a. Bob: Well, I'm not really sure, but she usually drinks a beer.
 - b. Bob: #Well, I'm not really sure, but she drinks a beer.

(15b) has only the odd wide-scope reading for the indefinite. It is crucial that the restrictor in (15) (roughly, *when she is at a party*) is extralinguistic, for if it were encoded linguistically this would make (15b) an OQHS.

These scope facts are incompatible with the AdvQ analysis of SHSs. I assume in what follows that indefinites are generalized quantifiers with existential force, and that they undergo QR to a scope-bearing position in their clause.¹⁰ In sentences with a tripartite structure at LF and an indefinite object, the relevant clause is the nuclear scope of the AdvQ.

- (16) a. Mary usually drinks a beer when she's at Dempsey's Pub.
 - b. USUALLY_s [M at DP in s] $\exists x [beer(x) \land M drinks x in s]$ 'Usually, for situations s such that Mary is at D.P. in s, there is an x such that x is a beer and Mary drinks x in s.'

^{9.} Many English speakers will prefer *has a beer* to *drinks a beer* in (15). I have used *drink* for consistency, but feel free to substitute *have*. I thank R. Kayne (p.c.) for this observation.

^{10.} The argument can be translated to other theories about indefinites, e.g. if indefinites are variables bound by existential closure (Heim 1982).

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If SHSs had a tripartite structure, we would expect (17b) to be available, but it is not.

- (17) a. #Mary drinks a beer.
 - b. GEN_s [C(s)] $\exists x$ [beer(x) \land M drinks x in s] 'Generally, for situations s that are appropriate for Mary drinking a beer, there is an x such that x is a beer and Mary drinks x in s.'

It therefore seems clear that SHSs do not have a tripartite structure.

Note also that this is not just a case of extra-wide-scope indefinites. It is well known that indefinites have the power to escape scope islands. However, in the cases of extra-wide scope discussed in the literature, the narrow scope reading is always possible as well, so that indefinites are assumed to have two options for scope-taking (Reinhart 1997, Winter 1997, Kratzer 1998). In the present case, there is no narrow-scope reading, so the wide scope of the indefinite requires a different explanation.

5. Overtly quantified environments license indefinite objects with simple present tense

As mentioned above, clauses like (11b-e) are acceptable when embedded in a variety of environments. Some of these are: with a *when*clause (18), with a quantificational adverbial (19), inside a *when*-clause (20), in the narrative present (21), and as the answer to a question about a set of situations (22).

- (18) Mary drinks a beer when she's upset.
- (19) Mary runs a mile every morning.
- (20) When Mary drinks a beer, her friends (always) get upset.
- (21) Mary gets home. She eats dinner. <u>She drinks a beer</u>. She brushes her teeth. She goes to bed.
- (22) A: What does Mary do when she gets home? B: She drinks a pint of beer.

Note that in the narrative present (21), the indefinite is not interpreted generically; only one beer-drinking episode occurs.

The environments in (18-22) all contain some overt element that either quantifies, or licenses quantification, over situations. I sketch the general idea of each one here. (18) contains a restrictor, and the hearer supplies an AdvQ. In (19), the adverbial is the quantifier: 'for every situation *s* such that *s* is a morning, Mary runs a mile in *s*'. In (20), the indefinite undergoes QR in the restrictor and is interpreted relative to the situation variable

bound by the AdvQ. (21) can be explained if we assume that the narrative present works by invoking a situation and then describing extensions to it. In (22), the question makes the set of getting-home situations salient as a discourse topic, which can serve as the restrictor for a covert AdvQ.

It appears that whenever there is quantification over situations, an indefinite object is licensed. I conclude that SHSs, where the indefinite is not licensed, do not involve sentential quantification over situations.

The comparison of OQHSs with SHSs also suggests a generalization about tripartite structures in English. Given an AdvQ, the hearer can supply a restrictor. Given a restrictor, the hearer can supply an AdvQ. But given only a nuclear scope, the hearer will not supply both an AdvQ and a restrictor; the sentence will not be interpreted as having a tripartite structure. (Cf. Partee 1995 for a discussion of this issue.)

6. Proposal, part 1: two meanings for simple present tense

If there is no sentential GEN operator in a SHS, its generic meaning must arise in another way. I propose that SHSs in English contain a silent habitual operator HAB, which does not take sentential scope. This operator can be identified with an aspectual head in the IP domain. When combined with the verb (and in the absence of past or future tense), it yields the simple present form which is characteristic of SHSs in English.¹¹

A consequence of this proposal is that what we call the simple present tense in English is actually two forms, one containing the phonologically null HAB affix and the other bare. There is good evidence that the bare form, not the habitual form, occurs under quantification. Consider (23).

(23) a. When Mary wears a dress, Bob takes her to dinner.

b. When Mary drinks a beer, her friends always get upset.

The simple present tense verbs in (23) do not carry habitual meaning; rather, it arises from quantification over situations. (23a) does not mean that when Mary wears a dress with regularity, Bob takes her to dinner with regularity. Similarly, (23b) does not mean that when Mary drinks a beer with regularity, her friends get upset – even though this is plausible. Rather, (23b) says that they get upset each time she drinks one.

V.HAB, which occurs in SHSs, is imperfective. The bare form, however, is perfective, since it refers to an event as a closed unit. I will refer to this verb form as V.PF, without, however, suggesting that there is

^{11.} See Partee (1995) for a cross-linguistic typology of quantificational affixes. HAB would be one that does not take sentential scope.

actually a perfective affix. Note that V.PF is dependent on quantification over situations for its interpretation.

These notions about V.PF are not new. Giorgi and Pianesi (1997) claim that all verbs in English are inherently perfective. Enç (1996) claims that simple present tense in English is dependent and relies on another element, like a modal, to say when it occurs.¹² The new elements are the notion that the simple present may contain a habitual operator, and the partitioning of simple present into two forms.

7. Genericity with habitual and perfective verbs in Czech/Slovak

Cross-linguistic evidence for a HAB operator comes from languages with an overt habitual morpheme. Czech and Slovak have a verbal suffix *-va-* which creates generic meaning (Filip 1994, Filip and Carlson 1997, Dahl 1995).¹³ There are several uses of *-va-*, one of which is in habitual sentences. *-Va-* combines with an imperfective verb (which may have been derived with an imperfectivizing prefix). While imperfective verbs are consistent with either progressive or habitual meaning, *-va-* verbs can only be habitual (Comrie 1976, Dahl 1985, Filip and Carlson 1997), as shown by the fact that the *-va-* verb in (24b) is incompatible with a punctual adverbial.

(24)	a.	Karel	hrál	(v tom okamžiku)	hokej
		Charles	play.PAST	(at that moment)	hockey
		'Charles	s was playing		

b. Karel hrá-va-l (*v tom okamžiku) hokej Charles play.HAB.PAST at that moment hockey 'Charles (regularly) played hockey (right then).' [Czech: Filip and Carlson 1997]

Filip (1994) analyzes *-va-* as an AdvQ. However, *-va-* verbs exhibit the same infelicity with indefinite objects as SHSs in English (25).¹⁴

(25)	a.	Mária	písavala	listy
		Mary	write.HAB.PAST	letters
		'Maria (re	ia (regularly) wrote letters.'	

^{12.} Schubert and Pelletier (1989) also refer to a simple present tense form that occurs only in conditionals.

^{13.} Other Slavic languages have -va-, but it is more productive in modern Czech/Slovak.

^{14.} Because Czech and Slovak don't have singular indefinites, these examples use a numeric determiner for the indefinite.

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b.	#Mária	písavala	dva	listy			
	Mary	write.HAB.PAST	two	letters			
	'Maria (re	'Maria (regularly) wrote two letters.'					
	[Slovak: S	. Beňuš p.c.]					

I therefore suggest that *-va-* is an overt HAB operator. Note that the indefinite object is not problematic in itself, since it is felicitous with a perfective verb form, derived using the perfectivizing prefix *na-* (26).

 Mária napísala dva listy (každý deň) Mary PF.write.PAST two letters every day 'Mary wrote two letters (every day).'
 [Slovak: S. Beňuš p.c.]

In addition to *-va-* verbs, another way of expressing habitual meaning in Czech is with a perfective verb under quantification (27).

(27) Kdykoli tam přijdu^P, nabídnou^P mi slivovici whenever there come.1SG offer.3PL me plum.brandy 'Whenever I visit there, they offer me plum brandy.' [Czech: Filip and Carlson 1997. Superscript P = perfective aspect.]

Habitual meaning in (27) cannot originate with the perfective verb. Rather, as in the English examples, the perfective verb is interpreted with respect to the quantifier *whenever*. Thus, the two sources of habitual meaning that I proposed for English are transparent in Czech/Slovak: a habitual morpheme, or quantification with a perfective verb.

Note, however, that the parallel between Czech/Slovak and English is not absolute. First, unlike English, present tense perfective verbs in Czech can be used without a quantifier, though they have a 'future' meaning. Second, though I have proposed that the verb under quantification in English is always V.PF, not V.HAB, *-va-* verbs in Czech and Slovak are compatible with quantification (28).¹⁵

(28)	a.	Karel	hrá-va-l	obyčejně	hokej
		Charles	play.HAB.PAST	usually	hockey
	'Charles usually played hockey.'				
		[Czech: Filip and Carlson 1997]			

^{15.} It may be the case that *V*.*HAB* is available under overt quantification in English as well, under certain conditions. For example, (i) seems to contain *play*.*HAB*.

⁽i) When Mary is at the seashore, she plays chess.

 b. Mária písavala dva listy každý den Mary write.HAB.PAST two letters every day 'Mary (regularly) wrote two letters every day.'
 [Slovak: S. Beňuš p.c.]

A corpus study by Danaher (2003) shows that *-va-* verbs are used without overt quantification approximately 75% of the time in Czech. The different distributions of V.HAB in English and Czech/Slovak need to be further investigated.

8. Proposal, part 2: HAB and Carlson's generalization operator

The HAB operator must have a form in which it obligatorily scopes under the QR'ed object. Though I make no claim that it is the only option, a good candidate for such an operator is Carlson's (1977) inductive generalization operator G, which he identifies as an aspectual operator.¹⁶

In Carlson's (1977) ontology, elements of type e have a sortal type, either kind (normally a bare plural), object (an individual), or stage. Stages are spatio-temporal slices of either objects or kinds, and stage-level predicates apply only to stages. A realization operator R relates a stage to the object or kind it is a slice of. Thus (29a) is ill-formed, while (29b) is well-formed. The superscript indicates the sortal type of a variable.

(29) Mary ran. (ignoring tense) a. run(m) = ill-formed, sort level mismatch b. $\exists x^{s} [R(x^{s}, m) \land run'(x^{s})] = well$ -formed 'There exists a stage x^{s} such that x^{s} realizes Mary and x^{s} ran.'

The purpose of G is to generalize from stages to objects. When we say *Mary runs*, for example, we make an inductive generalization about Mary based on instances of Mary running. The use of G is shown in (30).

(30) G(run)(m) = well-formed

An implementation (mine, not Carlson's) of G is given in (31), and an example in (32). $\exists_{sufficient}$ means that there exist sufficiently many stages to make a generalization.

(31) $[|G|] = \lambda P_{<e}^{s} \lambda x^{o} [\exists_{sufficient} y^{s} . R(y^{s}, x^{o}) \wedge P(y^{s})]$

^{16.} In later work, Carlson (1989) advocates a tripartite structure for SHSs to account for focus effects. I believe that focus effects can be accounted for under an aspectual operator analysis just as they are for other monoclausal sentences.

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(32) $G(run)(m) = \exists_{sufficient} y^s \cdot R(y^s, m) \wedge run'(y^s)$ 'There are sufficiently many Mary-stages that run for us to generalize to Mary herself.'

The notion of *sufficiently many* is properly left to pragmatics.

G' is the inductive generalization operator for transitive verbs. Assuming that bare plurals are names of kinds and do not have quantificational force, a SHS with a bare plural object has the LF in (33b).

(33) a. Mary drinks beer. b. $G'(drink(beer))(m) = \exists_{sufficient} y^s \cdot R(y^s,m) \land \exists z^s \cdot R(z^s,b) \land drink'(z^s, y^s)$ 'There are sufficient Mary-stages that drink beer-stages for us to generalize to Mary herself.'

Note that no generalization is made about beer - it is simply the object of the extensional transitive stage-level verb (see Carlson 1977 for a full implementation).

An indefinite object, however, undergoes QR. I assume that HAB (i.e. G/G') is in AspP, which is quite low (cf. Travis 1991) and that there is no scope-bearing position for the object which is below AspP. Since G' does not yield a tripartite structure at LF, the indefinite is the highest quantificational element in the sentence (34).

(34) a. #Mary drinks a beer. b. G'(drink(a beer))(m) $= \exists x^o [beer'(x^o) \land \exists_{sufficient} y^s . R(y^s, m) \land \exists z^s . R(z^s, x^o) \land drink'(z^s, y^s)]$ (There is a been such that there are sufficient Mary starse that

'There is a beer such that there are sufficient Mary-stages that drink stages of that beer for us to generalize to Mary herself.'

Thus (34a) says that Mary drinks stages of a particular beer with regularity.

OQHSs will not contain G/G'. However, within a situation of relatively short temporal duration, only stages, not objects, may occur. Therefore quantification over situations licenses stage realizations of objects (35).

(35) Mary always drinks a beer when she's at Dempsey's Pub. ALWAYS_s $[\exists x^s . R(x^s, m) \text{ in } s \land x^s \text{ at DP in } s]$ $[\exists_{y^o} . \text{beer'}(y^o) \land \exists z^s . R(z^s, m) \text{ in } s$ $\land \exists w^s [R(w^s, y^o) \land \text{drink'}(w^s, z^s) \text{ in } s]]$ 'For every situation *s* that contains a Mary-stage which is at Dempsey's Pub in *s*, there is a beer, and *s* contains a Marystage which drinks a stage of that beer in *s*.' Rimell - to appear in WCCFL 23 Proceedings (pre-publication version) 13

As before, the indefinite undergoes QR within the nuclear scope and is interpreted relative to the situations quantified over.

9. Conclusion and extensions

I have suggested that SHSs contain V.HAB, where HAB is an aspectual operator that can be equated with something like Carlson's G operator and does not take sentential scope. OQHSs, on the other hand, contain V.PF, a bare form that occurs only under quantification. Thus habitual meaning may arise either from a habitual morpheme, or from a perfective verb form under quantification. I have also suggested that the two structures are parallel in English and Czech/Slovak.

This analysis further predicts that wide-scope readings should be observed for any quantified objects in SHSs, not just indefinites. In fact, this is borne out with universally quantified objects: (36a) is felicitous while (36b) is not.

- (36) In the kitchen at the police station: Policeman A: The new guy is a big pig.
 - a. Policeman B: Yeah, he always eats every donut.
 - b. Policeman B: #Yeah, he eats every donut.

Future work will extend the analysis to habitual sentences with bare plural subjects.

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