

Quantification Galore

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1 Introduction

Perhaps the most influential understanding of how reference to kinds varies across languages is that of Chierchia (1998). In this framework, determiners can in principle apply to kinds and NPs can in principle denote them. English, like other Germanic languages, is taken to realize the latter possibility. One might reasonably expect, then, that it would also realize the former—that is, that it would include a determiner that combines specifically with kind-denoting NPs. This squib argues that it does. It examines the grammar of *galore*, a peripheral but nonetheless widely-attested postnominal expression that has precisely this characteristic.

Two important caveats need to be issued at the outset. First, judgments involving *galore* vary in subtle ways across speakers. I have tried to focus on clear-cut cases. Second, there are several independent complexities involved in the grammar of *galore* that I will need to set aside. One is a resistance to subject positions (*??Boulders galore rolled down the hill*). Another is a resistance to heavy NP complements reminiscent of how attributive adjectives behave (*??boulders of solid granite galore*; cf. **a proud of his children father*). I will, however, have a little to say about *galore*'s expressive meaning and its status as a positive polarity item.

I provide an overview of the relevant part of Chierchia's proposal in section 2. I then examine the semantics of *galore* in section 3 and its syntax in section 4.

This benefited from the comments and suggestions of Alan Munn, Anne-Michelle Tessier, Itamar Francez, and two anonymous LI reviewers. Thanks also to Adam Gobeski, Ai Matsui, Alex Clarke, Curt Anderson, Karl DeVries, Matt Husband, Olga Eremina, and Peter Klecha.

2 The Nominal Mapping Parameter

One of the central insights of Chierchia (1998) is a particular view of how languages can vary with respect to what their NPs denote.

In some languages, an NP always denotes a property. This is of course the standard textbook NP denotation (Heim & Kratzer 1998, Chierchia & McConnell-Ginet 1990, and many others). Romance languages are of this sort. Setting aside various complications, they systematically disallow bare NPs in argument positions, as (1) and (2) reflect:¹

- (1) *Italian:*
*Cani amano giocare / stanno giocando fuori / sono raro.
dogs love to.play / are playing outside / are rare
- (2) *French:*
*Enfants sont venus chez nous.
kids have come by us
'Kids have come to our house.'

All of these have grammatical counterparts in which the argument positions are occupied by full DPs:

- (3) *Italian:*
I cani amano giocare / stanno giocando fuori / sono raro.
the dogs love to.play / are playing outside / are rare
- (4) *French:*
Les enfants sont venus chez nous.
the kids have come by us

For straightforward type reasons, this is precisely what one would expect if bare NPs denote properties.² Argument positions are generally filled by expressions that denote individuals, and property-denoting bare NPs in these positions give rise to a type clash. An intervening determiner is required for the full DP to have an argument type (an individual or generalized quantifier). Chierchia characterizes languages such as these, in which NPs themselves denote predicates but never arguments, using two features: [+PRED] and [-ARG].

In other languages, an NP never denotes a property, but rather an individual or a kind—both, for Chierchia, of type *e*. Chinese and Japanese are of

¹All the examples in this section are from Chierchia (1998), some with slight modifications.

²There is actually an additional assumption here, which is that predicates combine with their arguments by functional application. The picture would be different given the semantic incorporation rule of van Geenhoven (1998) or the Restrict rule of Chung & Ladusaw (2004).

this sort. In these languages, bare NPs freely occur in argument positions, as the Chinese example in (5) shows:³

- (5) wò kànjiàn xióng le
 I see bear ASP
 ‘I saw (some/the) bears’

Because *xióng* ‘bear’ denotes the bear kind, it can combine directly with *see*.⁴ There is no need for an intervening determiner to reconcile the denotation of the NP with the type-theoretic requirements of the predicate. Chierchia characterizes languages such as these, in which NPs themselves denote arguments but never predicates, as [−PRED] and [+ARG].

Germanic languages generally are [+PRED] and [+ARG] because they allow their NPs to denote *either* predicates or arguments. Bare plurals such as *bears*, for example, name kinds directly (Carlson 1977 and others) and can occur in argument positions (*I saw bears*). Other NPs denote properties and require determiners in argument positions (**I saw bear*).

Quantificational determiners look different in the different classes of languages. In [+PRED] languages, determiners can be defined in the standard way:

- (6) $\llbracket \text{every} \rrbracket = \lambda f_{\langle e, t \rangle} \lambda g_{\langle e, t \rangle} . \forall x [f(x) \rightarrow g(x)]$
 $\llbracket a \rrbracket = \lambda f_{\langle e, t \rangle} \lambda g_{\langle e, t \rangle} . \exists x [f(x) \wedge g(x)]$

These both require that the NP they combine with be of type $\langle e, t \rangle$. In a [−PRED] language, though, this can never be the case. Yet these languages too have quantifiers, of course. So what to do?

Chierchia points out that the right result can be obtained merely by combining the standard denotations with a type shift that maps kinds to properties. Alongside the kind BEARKIND, there is the property of being a bear, for example. One is related to the other by the \cup operator:

- (7) $\cup_{\text{BEARKIND}} = \lambda x . x \text{ is a bear or bears}$

For every standard quantificational determiner denotation of the sort in (6), one can define a corresponding determiner that takes a kind rather than a property as its first argument:

- (8) $\llbracket \text{every}_k \rrbracket = \lambda k \lambda g_{\langle e, t \rangle} . \forall x [\cup k(x) \rightarrow g(x)]$
 $\llbracket a_k \rrbracket = \lambda k \lambda g_{\langle e, t \rangle} . \exists x [\cup k(x) \wedge g(x)]$

³One might of course question whether these are in fact bare NPs and not full DPs with unpronounced determiners. I will adopt Chierchia’s view.

⁴This is not quite true. The sentence in (5) reports seeing a *realization* of bearkind—that is, some number of actual bears. More on this immediately below.

There is no actual word *every_k* in English, of course. What such a quantifier would do is apply to a kind and shift it to a property. It is otherwise identical to the standard definition. The result is an elegant overall picture:

[I]n argumental languages, determiners will have to apply to kinds; but this can be obtained in a straightforward way by assuming that determiner meanings have predictable kind-taking variants . . . and that languages are free to pick and choose the variant fitting their NP type. (Chierchia 1998, p. 15)

This raises a question, though, about the nature and distribution of this freedom. A language that is [+PRED, -ARG] must use the standard quantifiers. A language that is [-PRED, +ARG] must use the kind-taking variants. So these languages are free to choose, as long as they choose the only variety that will work.

But what of a language that is [+PRED, +ARG], as English is? Here, either variety of quantifier would work. All things being equal, one might expect that some English determiners would be quantifiers of the standard variety, and others of the kind-taking variety. One normally gives English quantifiers denotations of the standard sort. But if English is genuinely free to pick some quantifiers of each variety, we might expect to find at least a few instances in which English has chosen the kind-taking variant of a quantifier.

It's not immediately obvious that it hasn't. *All* and *most*, for example, might qualify as candidates, because they both combine exclusively with plural and mass NPs. In fact, though, neither of these combines exclusively with kind-denoting ones, as I show in the next section. In this respect, neither of these quite fits the bill. But there is a quantificational expression that does: *galore*.

3 Semantics Galore

First, some data. *Galore* occurs only to the immediate right of an NP:

- (9) a. We found [_{NP} angry chickens] galore.
b. The email contained [_{NP} pictures of lolcats] galore.
- (10) a. *We found galore [_{NP} angry chickens].
b. *The email contained galore [_{NP} pictures of lolcats].

It is in fact an NP rather than a bare noun, as (9) shows. This constituent cannot be a full DP:

$$(11) \text{ *We found } [_{\text{DP}} \left\{ \begin{array}{l} \text{the} \\ \text{these} \\ \text{my} \\ \text{some} \end{array} \right\} \text{ angry chickens}] \text{ galore.}$$

I will elaborate the syntax further in section 4.

With just this much, though, one might venture a denotation. *Chickens galore* seems to mean something like ‘many chickens’, so perhaps *galore* means precisely the same thing as *many*? One reasonably standard denotation for (cardinal⁵) *many* is in (12):

$$(12) \quad \llbracket \text{galore} \rrbracket = \llbracket \text{many} \rrbracket \quad \text{(tentative)}$$

$$= \lambda f_{(e,t)} \lambda g_{(e,t)} . \exists x [f(x) \wedge g(x) \wedge |x| > \text{standard}]$$

This requires that there be a plurality that satisfies both arguments of *many* and whose cardinality exceeds a contextually-provided standard. The only part of this that is crucial here is the type—beyond that, one could substitute one’s favorite alternative (Barwise & Cooper 1981, Partee 1989/2004; see Hackl 2000 and Rett 2008 for recent surveys). This would yield (13) as the denotation of *chickens galore*:

$$(13) \quad \llbracket \text{chickens galore} \rrbracket \quad \text{(tentative)}$$

$$= \llbracket \text{galore} \rrbracket (\llbracket \text{chickens} \rrbracket)$$

$$= \lambda g_{(e,t)} . \exists x \left[\begin{array}{l} x \text{ is a plurality of chickens} \wedge g(x) \wedge \\ |x| > \text{standard} \end{array} \right]$$

This immediately runs into a problem, however. Unlike *many*, *galore* occurs with mass NPs:

- (14) a. In the cave, we found guano galore.
b. There was equivocation galore in that paper.

What seems to be necessary is a hybrid of *many* and *much*:

$$(15) \quad \llbracket \text{galore} \rrbracket = \lambda f_{(e,t)} \lambda g_{(e,t)} . \exists x [f(x) \wedge g(x) \wedge \text{amount}(x) > \text{standard}] \quad \text{(tentative)}$$

This differs from the earlier denotation only in that it relies on a contextually-provided measure function *amount* to measure a plural or mass individual along an appropriate dimension.

⁵It does not seem to be the case that *galore* has a proportional reading, as *many* does. *We found chickens galore* cannot mean something like ‘the number of chickens we found is large relative to the total number of chickens’.

There is, however, a deeper generalization that all this misses. Many quantificational expressions are like *galore* in that they combine with plural and mass NPs but not with singular NPs (e.g. *all, some, most*). Among these is *a lot of*, for which (15) could actually be a reasonable denotation. But unlike all of these, *galore* combines only with kind-denoting NPs.

To reveal this distinction, it will be necessary to construct examples around NPs that denote properties with no corresponding kind. This is generally the case for NPs with indexicals. There is, for example, no kind corresponding to *people in the next room* or *boys sitting here* (the examples are from Carlson 1977). These NPs are consequently incompatible with predicates that require kinds such as *are rare*:

- (16) # $\left\{ \begin{array}{l} \text{People in the next room} \\ \text{Boys sitting here} \\ \text{Parts of that machine} \end{array} \right\}$ are rare.

Such non-kind-denoting NPs are perfectly happy as complements to *many*, but they are incompatible with *galore*:

- (17) a. many $\left\{ \begin{array}{l} \text{people in the next room} \\ \text{boys sitting here} \end{array} \right\}$
 b. # $\left\{ \begin{array}{l} \text{people in the next room} \\ \text{boys sitting here} \end{array} \right\}$ galore

There is a potential confound here, however. As mentioned above, *galore* resists combining with heavy NPs. Perhaps it is actually this restriction that is to blame for the ill-formedness of (17)? To resolve this, it will be necessary to find lighter NPs with no kind counterparts. Potential candidates include *boys here*, *present difficulties*, and (less clearly) *area freeways*. These yield the same result—they are compatible with *many* but not with *galore*:

- (18) a. many $\left\{ \begin{array}{l} \text{boys here} \\ \text{present difficulties} \\ \text{area freeways} \end{array} \right\}$
 b. # $\left\{ \begin{array}{l} \text{boys here} \\ \text{present difficulties} \\ \text{area freeways} \end{array} \right\}$ galore

So this does seem to reflect an important characteristic of *galore*, which it does not share with other quantificational expressions that combine with bare plurals and mass NPs.⁶

⁶For some speakers, *galore* may even require not only kinds but kinds that are reasonably well established. These speakers have a contrast between *Coke bottles galore* and *??green*

In light of the preceding section, it is not surprising that English should have a quantifier of this sort. Its denotation, then, would be simply the kind-taking variant of the *many/much* hybrid in (15):

$$(19) \quad \llbracket galore \rrbracket = \lambda k \lambda g_{(e,t)} . \exists x [\cup k(x) \wedge g(x) \wedge amount(x) > standard]$$

(final)

This applies to a kind, and requires that there exist an (ordinary) individual that satisfies the property counterpart of the kind and that exceeds the standard in amount. Thus *chickens galore* would be as in (20):

$$(20) \quad \llbracket chickens galore \rrbracket = \lambda g_{(e,t)} . \exists x \left[\begin{array}{l} \cup CHICKENKIND(x) \wedge g(x) \wedge \\ amount(x) > standard \end{array} \right]$$

NPs that denote predicates with no corresponding kind will not be able to combine with *galore* because the \cup shift is not defined for them.

One welcome consequence of such a denotation is that the sense that *galore* is a hybrid of *many* and *much* is immediately accounted for. In Chierchia’s system, the property counterpart of a kind is always mass, because its extension includes both singular and plural individuals. Because of this, *galore* always quantifies over masses, even when combined with a count NP. It thereby neutralizes the plural-mass distinction that distinguishes *many* from *most*.

There are two other components of the meaning of *galore* that warrant mentioning, though they are not related to the larger picture of kinds and Chierchia’s crosslinguistic typology. The first of these is an expressive component (in the sense of Potts 2007). It is hard to pin this down—indeed, it is a characteristic of expressive meaning that it is difficult to express in non-expressive terms—but it suggests that the speaker has been stricken with a sense of cup-runneeth-over abundance. This may help explain why *galore* is a positive polarity item:

(21) *There weren’t chickens galore.

Expressive meaning generally resists embedding. The negation in *There weren’t any fucking chickens*, for example, denies the presence of chickens, but it does not deny the expressive content of *fucking*—we still conclude that the speaker is agitated. If the expressive component of *galore* involves striking abundance, (21) would simultaneously deny that chickens are plentiful and convey the speaker’s wonderment at how plentiful they are.

bottles galore. (The use of this pair of NPs to explore how well-established kinds behave is originally due to Barbara Partee, found in various forms starting with Carlson 1977 (Partee 2004).)

The other component of the meaning of *galore* that bears mentioning here is that it is most natural in contexts in which it is not presupposed that there are individuals in the extension of the NP.⁷ It is a little odd, for example, to use *chickens galore* when it has already been established that there are chickens. (This may be an ‘antipresupposition’ in the sense of Percus 2006.) The other side of this coin is that *galore* is especially well-suited for introducing new discourse referents, as in existential constructions and sentences that report creating or encountering something:

- (22) a. We $\left\{ \begin{array}{l} \text{built} \\ \text{made} \\ \text{constructed} \end{array} \right\}$ robots galore.
 b. We $\left\{ \begin{array}{l} \text{found} \\ \text{discovered} \\ \text{detected} \\ \text{saw} \end{array} \right\}$ chickens galore.

It is awkward to varying extents in many other contexts:

- (23) a. We $\left\{ \begin{array}{l} \text{?fed} \\ \text{?massaged} \\ \text{?entertained} \\ \text{??fear} \\ \text{??loathe} \end{array} \right\}$ chickens galore.
 b. ?We $\left\{ \begin{array}{l} \text{destroyed} \\ \text{disassembled} \end{array} \right\}$ robots galore.

I can only offer speculation about what is going on here. Perhaps this effect, like the polarity facts, is related to the expressive meaning of *galore*. The problem with (23) may be that these sentences attempt to do too many things at once: they express the speaker’s wonderment at the abundance of something, and simultaneously convey descriptive information that is not directly relevant to this sense of wonderment. If I am impressed at how many chickens there are, it seems odd to convey this while simultaneously reporting that I (say) fed them, since the feeding event doesn’t figure in my wonderment. A much more natural way to structure the discourse would be to convey first that I am impressed by the number of chickens, and only subsequently that I fed them. This difficulty does not arise in sentences such as those in (22). There is a natural connection between having built many robots and being impressed at how many there now are. Finding chickens is

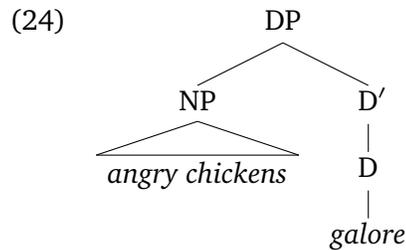
⁷I owe this observation to an LI reviewer.

similar. In both of these cases, the question of cardinality arises naturally.⁸

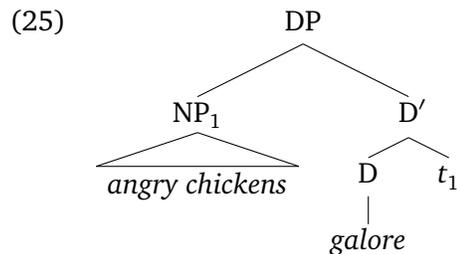
It would go beyond the scope of this squib to address these issues in more detail, but it is worth observing that there seems to be a lot of complexity lurking just beneath the surface here. My focus is on what *galore* might tell us about kinds and quantification, but it might also be telling us something about the nature of expressive meaning and its relation to discourse structure.

4 Syntax Galore

The semantics just presented treats *galore* as a quantificational determiner. This suggests a syntax in which *galore* has its NP argument provided not by its complement as is normally the case, but rather by its specifier:



Such a structure is perhaps a bit less surprising if construed as the result of a movement operation that displaces the NP from its customary complement position:



In moving its argument in this way, *galore* would parallel the behavior of certain members of other categories, including the degree word *enough* and perhaps the adposition *ago*.⁹

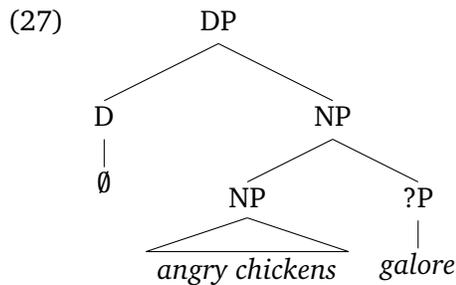
⁸A reviewer points out that there may be a connection between such restrictions and the oddness of *galore* in subject position. Subject positions are associated with discourse topics, and in this respect are not very good places to introduce novel discourse referents.

⁹This adopts a structure for the extended AP in which it is embedded inside a DegP (Abney 1987, Grimshaw 1991, Corver 1990, Kennedy 1997; cf. Bresnan 1973, Heim 2000, Bhatt & Pancheva 2004).

- (26) a. [_{DP} [_{AP} tall]₁ [_{DP} enough t₁]]
 b. [_{PP} [_{DP} six years]₁ [_{P'} ago t₁]]

Indeed, *enough* even in its adnominal form can occur postposed (e.g. *food enough to feed an army*). The resemblance between *enough* and *galore* is not accidental. *Galore* once had a prenominal use like the one *enough* still has, and it is in fact a borrowing from Irish of an expression that means roughly ‘enough’ (*Oxford English Dictionary* 1989).

The movement approach seems preferable to one in which *galore* is an adjunct, as in (27):



This adjunction structure would be surprising in light of the determiner-like semantics. There is no semantic obstacle in principle to such a structure, of course, but it would constitute an unmotivated departure from the typical connection between syntactic adjunction and semantic modification.

This structure has a number of purely syntactic drawbacks as well. First, it would leave unexplained why *galore* is apparently in complementary distribution with determiners. It might lead us to expect that the D position in (27) could be occupied, giving rise to e.g. **the angry chickens galore* or **the Emperor Penguin galore*.¹⁰

Second, an adjunction structure would lead us to expect *galore* itself to be phrasal, and therefore to support its own further structure. Yet there is no evidence for this. The nature of this further structure would of course depend on the precise category *galore* is assigned to, but logical possibilities include **very galore* (by analogy to *very many*) and **almost galore* (by analogy to *almost every*). To be sure, the semantics as it stands would rule out the former, and possibly the latter. The important point, however, is that this was not inevitable. The semantics could be modified to accommodate these if there were syntactic evidence that it is necessary. As it turns out, there is none.

¹⁰The former example is actually independently ruled out by the proposed semantics because *the angry chickens* is not kind-denoting, but the latter is not. *The Emperor Penguin* can denote a kind, so **the Emperor Penguin galore* might have been a perfectly grammatical way of expressing ‘Emperor Penguins galore’.

Third, an adjunction structure would suggest that the *galore* adjunct could be extraposed, but this too is impossible:

- (28) a. There was action galore in his movies.¹¹
b. *There was action in his movies galore.
- (29) a. The film industry has found talent galore creeping beneath the floorboards of historic Old Main.¹²
b. *The film industry has found talent creeping beneath the floorboards of historic Old Main galore.

There are, however, expressions that seem to be grammatical cousins to *galore* that may support some limited extraposition, among them *aplenty* and *by the shitload*:

- (30) There was action in his movies $\left\{ \begin{array}{l} \%aplenty \\ \text{by the shitload} \end{array} \right\}$.

Perhaps these are in fact syntactic adjuncts.

If *galore* has the syntax suggested here, it would diverge in an interesting way from expressions such as *more* and *enough*. Starting with Bresnan (1973), it has been standard to assume that in their adnominal use, these expressions occur with an unpronounced adjective *MANY*. Positing such a null adjective makes it possible to provide a unified semantics for these expressions in both their adnominal (*more students*) and adjectival (*more ugly*) uses. Despite its historical connection to *enough*, *galore* does not occur in the adjectival domain, and there seems to be no other evidence that it occurs with an unpronounced adjective. Its syntax may thus provide a snapshot of an intermediate stage on the path of diachronic development from degree modifier to ordinary determiner.

5 Final Remark

I have argued that *galore* is a quantificational determiner that is specialized for kind-denoting NPs, and that in this respect it realizes a determiner type Chierchia (1998) leads us to expect to find in English. Semantically, *galore* resembles the determiners of languages such as Chinese and Japanese. This way of looking at it relates it to the more general idea that some of the

¹¹‘Eric Rohmer’s movies convey more than what words could’. *The Star* (Toronto). Jan. 16, 2010.

¹²Wasacz, Walter. ‘Wayne State trains Detroit’s next generation for stage and screen’. *Model D*, Jan. 19, 2010.

typological variation observed across languages may sometimes be observed on a smaller scale in the peripheral constructions of a single language—that what is peripheral in one language may faintly echo what is central in another.

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