The Basics of Distributive Numerals: Gil 1982, Chapters 2, 5 and 9

1.   Some Introductory Remarks

Despite Gil's own formal semantic background, this dissertation doesn't really have any formal semantics in it…   *So why are we reading it?....*

(1)   **Some 'Pros' of This Dissertation**

- Descriptively rich; a true *locus classicus* on distributive numerals
- Description of the phenomenon is both broad and deep.
    - Several languages from disparate families are discussed in depth (Georgian, Tagalog, Maricopa)
    - Numerous various phenomena and 'quirks' are noted, many of which are not subsequently pursued in other literature.

(2)   **Some 'Cons' of This Dissertation**

- No formal semantic treatment (or is this a 'pro'?...)
- Author uses an idiosyncratic (and sometimes unclear) notation for representing 'readings'
- Author's semantic description seems not to carefully distinguish 'readings' from 'verifying scenarios'.
- Author's description of the alleged readings/scenarios is sometimes unclear
- Author does not describe *how* the various readings/scenarios were actually tested
    - Facts are simply reported, without detailed discussion of the actual elicitation tasks and/or questions…

2.   Chapter 2: "Distributive Numerals, a First Exploration"

(3)   **Basic Definition of 'Distributive Numerals'**

    a.   <u>Ostensive Definition:</u> Uhm, you know, things like…

(i)	Latin:	*terni*	'three each, in threes, three at a time'
(ii)	Tagalog:	*tigtatlo*	'three each, in threes, three at a time'
(iii)	Russian:	*po tri*	'three each, in threes, three at a time'
(iv)	Georgian:	*sam-sami*	'three each, in threes, three at a time'
(v)	Hindi:	*tin-tin*	'three each, in threes, three at a time'

    b.   <u>Informal Semantic Definition:</u>

A derived numeral class which indicates that the modified NP 'is distributed over' some other entity or event. Thus, it is usually translatable into English as '*n* NPs each' or '*n* at a time' or '*n* by *n*'.

Though these expressions are remarkably frequent, they are almost *never* discussed in reference grammars…

(4)   **Two Main Syntactic Types of Distributive Numeral**

     a.   Adverbial distributive numerals   (cross linguistically universal?)
     b.   Adnominal distributive numerals   (more restricted cross linguistically)

2.1   Adnominal Distributive Numerals

(5)   **The Core Properties of Adnominal Distributive Numerals**

     a.   Adnominal syntax; (largely) shares the external syntax of unmarked numerals

     b.   Morphologically marked; derived morphologically from (plain) numerals
          • Often this marking is either (i) reduplication, or (ii) regular pluralization

     c.   *Can receive (what I call) 'pluractional readings'*, translatable as (e.g.) 'three at a time', 'in threes', 'three by three'.

(6)   **Some Examples (Gil 1982: 14)**

     a.   <u>Tagalog:</u>

Dinala	ng	dalawang	lalaki	ang	**tigtalong**	maleta
carried	DIR	two	man	TOP	**three.DIST**	suitcases

          Two men carried three suitcases each / Two men carried suitcases in threes.

     b.   <u>Georgian:</u>

Orma	k'acma	**sam-sami**	canta	c'aira.
two.ERG	men.ERG	**three.DIST**	suitcases	carried

          Two men carried three suitcases each / Two men carried suitcases in threes.

     c.   <u>Russsian:</u>

Dva	celoveka	nosili	**po tri**	cemodana.
two	men	carried	**three.DIST**	suitcases

          Two men carried three suitcases each / Two men carried suitcases in threes.

     d.   <u>Hindi:</u>

Do	admi	**tin-tin**	sut-kes	le	gaye	hai.
two	men	**three.DIST**	suitcase	take	gone	be

          Two men carried three suitcases each / Two men carried suitcases in threes.

     e.   <u>Turkish:</u>

Iki	adam	**ucer**	bavul	tasidi
two	men	**three.DIST**	suitcases	carried

          Two men carried three suitcases each / Two men carried suitcases in threes.

(7)   **No Adnominal Distributive Numerals in English (?)**

- From the description in (5) and the examples in (6), one might think that English 'binominal each' constructions like (7a) might qualify as 'distributive numerals'.

    a.   Two men carried **three** suitcases **each.**

- However, Gil (1982) disagrees. He seems to view sentences like (a) as simply being ones where a numerically modified DP co-occurs with an independent distributive maker. Thus, for him, they are no different in kind from sentences like (7b).

    b.   (i)   Two men **each** carried **three** suitcases.

              (ii)   **Each** of two men carried **three** suitcases.

- Moreover, uncontroversial cases of distributive numerals, like those in (1), allow for 'pluractional readings', ones where all that is required is that three suitcases are carried in each of a number of carrying events…

- English 'binominal each' constructions like (7a) don't seem to allow for such 'pluractional readings'…
    o   Rather, there must be exactly one group of three suitcases per man.

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(8)   **Some Critical Replies**

- Contrary to Gil's (1982) assumptions, binominal each in English *is* a special numeral construction. Note that other quantificational expressions do not allow for post-nominal *each*.

    a.   * Two men carried **many / few / a lot of** suitcases each.

- It's true that English (7a) does indeed require that each man carry three suitcases, and that this requirement is / may be absent from the sentences in (6).

        o   However, this may simply show that binominal each in English has *stronger* truth-conditions than the distributive numerals in (6).

        o   Thus, the semantics of English (7a) may be that of the distributive numerals in (6), *but with one additional condition* (Zimmermann 2002, Cable 2012).

        o   Under this view, there is no very deep distinction between the binominal each construction of English and the distributive numerals in (6)…

2.2   Adverbial Distributive Numerals

(9)   **The Core Properties of Adnominal Distributive Numerals**

   a.   Adverbial syntax; shares the external syntax of (manner) adverbials

   b.   Morphologically marked; derived morphologically from (plain) numerals
           • Often more morphologically complex than adnominal distributive numerals
           • Are not always derived *directly* from adnominal distributive numerals.

   c.   Illustration; Tagalog:
           Adnominal Distributive Numeral   *tigtatlong*   'three.DIST'
           Adverbial Distributive Numeral   *tatl-tatlo*   'three.DIST'

(10)   **Some Examples (Gil 1982: 14)**

   a.   English: Two men carried the suitcase **three by three / in threes.**

   b.   Tagalog:
           Dinala   ng   dalawang   lalaki **nang   tatl-tatlo**   nga maleta
           carried   DIR   two   man   **ADV   three.DIST**   TOP suitcases
           Two men carried suitcases in threes / three at a time / three by three.

   b.   Georgian:
           Orma   k'acma   cantabi   c'aira.   **sam-samat**
           two.ERG   men.ERG   suitcases   carried   **three.DIST.ADV**
           Two men carried suitcases in threes / three at a time / three by three.

   c.   Russsian:
           Dva   celoveka   nosili   cemodany   **po troje**.
           two   men   carried   suitcases   **three.DIST.ADV**
           Two men carried suitcases in threes / three at a time / three by three.

   d.   Turkish:
           Iki   adam   bavullari   **ucer ucer**   tasidi
           two   men   suitcases   **three.DIST.ADV**   carried
           Two men carried suitcases in threes / three at a time / three by three.

(11)   **Adverbial Distributive Numerals in English**

   •   Gil (1982) views English expressions like *in threes, three by three, three at a time* as
       genuine adverbial distributive numerals.

   •   According to him, they share all the core semantic and morphological properties of
       adverbial distributive numerals in other languages (Gil 1982: 140)

2.3   Morphosyntactic Typology of Distributive Numeral Constructions

(12)   a.   <u>Question:</u>   How do adnominal and adverbial distributive numerals relate to each other across languages?

        b.   <u>Answer:</u>   There seem to be five main language types.

(13)   **Gil's (1982) Typology**

        a.   <u>Languages Without Adnominal Distributive Numerals</u>

              Example   English
                           Adnominal Distributive Numeral $\varnothing$
                           Adverbial Distributive Numeral   *in threes*   'three.DIST'

        b.   <u>Languages Where Adnominal and Adverbial Distributive Numerals are Separately Derived</u>

              Example   Tagalog
                           Adnominal Distributive Numeral   *tigtatlong*   'three.DIST'
                           Adverbial Distributive Numeral   *tatl-tatlo*   'three.DIST'

        c.   <u>Languages Where Adnominal and Adverbial Distributive Numerals are Identical</u>

              Example   Latin
                           Adnominal Distributive Numeral   *terni*   'three.DIST'
                           Adverbial Distributive Numeral   *terni*   'three.DIST'

        d.   <u>Languages Where Adnominal and Adverbial Distributive Numerals are Derived from the Same 'Distributive' Base</u>

              Example   Georgian   (Base = *sam-sam*)
                           Adnominal Distributive Numeral   *sam-sami*   'three.DIST'
                           Adverbial Distributive Numeral   *sam-samat*   'three.DIST'

        e.   <u>Languages Where Adverbial Distributive Numerals are Derived from Adnominals</u>

              Example   Turkish   (Base = *uc* 'three')
                           Adnominal Distributive Numeral   *ucer*   'three.DIST'
                           Adverbial Distributive Numeral   *ucer ucer*   'three.DIST'

(14)   **Some Generalizations (Gil 1982)**

- All languages seem to have at least adverbial distributive numerals

    o   In this sense, the adverbial distributive numerals are 'unmarked'.

- Adverbial distributive numerals are always at least as morphologically complex as adnominal distributive numerals

    o   No language derives adnominal distributive numerals from adverbial ones.
    o   Many languages derive adverbial distributive numerals from adnominal ones.
    o   In this sense, adnominal distributive numerals are 'marked'.

(15)   **Gil's (1982) Typological Generalization on Adnominal Distributive Numerals**

If a language has adnominal distributive numerals, then that language *fails* to syntactically distinguish between 'common nouns' and 'determined noun phrases'.

- That is, languages with adnominal distributive numerals fail to have DPs.
- That is, all such languages freely allow bare singular NPs, with either a definite or indefinite interpretation.

Possible Counterexample: Lillooet Salish (Matthewson 2000)
...but, adnominal distributive numerals seem to be a recent innovation there…

2.4   The Semantics of Distributive Numerals

(16)   **Some Caveats Concerning Gil's (1982) Semantic Descriptions**

- Gil (1982) does not clearly distinguish between a 'reading' of a sentence and a scenario that the sentence can describe (and a scenario that the sentence is 'true' in)

- Gil (1982) does not discuss *how* the judgments in question were obtained. Thus, we're largely missing the following information:

    o   How the sentences were presented

    o   What the elicitation task to the speakers was, exactly

    o   What the speakers' responses were

(17)   **Parameters of Interpretation**

Gil (1982) classifies readings (verifying scenarios) of sentences akin to (17a) in terms of the 'parameters' in (17b).

a.   Two men carried three$_{DIST}$ suitcases.

b.   <u>Parameters of Interpretation for Distributive Numerals</u>
        (i)   number of men;
        (ii)   whether the men acted separately or collectively;
        (iii)   number of events;
        (iv)   number of suitcases;
        (v)   whether the suitcases were acted on separately or collectively.

(18)   **Classes of 'Readings' (Verifying Scenarios)**

*   On the basis of the parameters in (17), Gil (1982) identifies three main classes of 'readings' (verifying scenarios).

*   We'll find out in a bit why Gil (1982) sees these 'readings' as natural classes.

a.   <u>Class A Reading(s)</u>   Paraphrase: "Two men carried three suitcases each."
        (i)   two men
        (ii)   men acted separately
        (iii)   one or many events
        (iv)   two sets of three suitcases, one for each **man**
        (v)   suitcases acted upon separately or individually (one at a time / 3 together)

b.   <u>Class B Reading(s)</u>   Paraphrase: "Two men carried suitcases in threes."
        (i)   two men
        (ii)   men acted separately or collectively
        (iii)   many events
        (iv)   at least two sets of three suitcases, one for each **event**
        (v)   suitcases carried preferably collectively (three together, each event)

c.   <u>Class C Reading(s)</u>   Paraphrase: "Two men carried sets of three suitcases."
                                                  "Two men carried triplets of suitcases."
        (i)   two men
        (ii)   men acted individually or collectively
        (iii)   one or many events
        (iv)   at least two sets of three suitcases; sets preferably disjoint
        (v)   suitcases acted upon preferably collectively (three together, each event)

(19)   **Some Brief Notes on the 'Class C Reading(s)'**

- As Gil (1982) himself acknowledges, the distinction between the 'Class B' and the 'Class C' readings is not always very clear.
    - o   Note that the two types of reading only differ in parameter (iii)

- From my understanding, the 'Class C' reading covers scenarios where the two men carry a bunch of suitcases *physically grouped into bunches of three.*
    - o   This carrying could be done 'collectively', all in a single carrying
    - o   Or, it could be done 'distributively', over several trips.

- As we'll see later, the evidence for this 'Class C' reading seems to be rather indirect, and is largely based upon data from Georgian…

(20)   **Gil's (1982) Generalizations Regarding the Distribution of Readings**

   a.   True adnominal distributive numerals allow interpretations A, B, C.
   b.   Adverbial distributive numerals allow interpretations B and C only.
   c.   Numerals in conjunction with distributive markers (e.g. English binominal *each*) only allow for interpretation A.

3.   Chapter 5: "Distributive Numerals: An Analysis"

3.1   The Basics of the Analysis

(21)   **Some Formal Background: Gil's (1982) Notation for Distributivity**

- In chapters 3 and 4, Gil presents a theory of numeral semantics and distributivity.
- This semantic theory is not 'formal', in our present day sense. The theory does not characterize a mapping from a syntactic structure to a set of truth conditions.
- What the theory mainly offers is a notation for the different classes of readings.
    - o   The main notation that we'll rely on is summarized in (a) and illustrated in (b)

   a.   <u>Notation for Distribution:</u>   A ⟶ B   'A distributes over B'

   b.   <u>Illustration of Notation:</u>

          (i)   *Sentence:*   Two men each carried three suitcases.

          (ii)   *Representation of Meaning:*
                  [TWO MEN] CARRIED [THREE SUITCASES]

          (iii)   *Paraphrase of Notation:*   'three suitcases for every man'

(22)   **Notational Representation of the Readings in (18)**

     a.   <u>Class A Reading</u>   'Two men carried three suitcases each'

         [TWO MEN] CARRIED [THREE SUITCASES]

- *There are two men.*   ([TWO MEN])
- *There are three suitcases for every man.*   (arrow)
- *There are one or many events*   (no explicit plurality on V)
- (Collectivity of action not explicitly represented)

     b.   <u>Class B Reading</u>   'Two men carried suitcases in threes / three by three'

         [TWO MEN] [[SEVERAL UNITS] CARRIED] [THREE SUITCASES]

- *There are two men.*   ([TWO MEN])
- *There are many events of carrying.*   ([SEVERAL UNITS])
- *There are three suitcases for every event*   (arrow)
- (Collectivity of action not explicitly represented)

     c.   <u>Class C Reading</u>   'Two men carried sets of three / triplets of suitcases'

         [TWO MEN] CARRIED [[THREE ⟶ UNITS] SUITCASES]

- *There are two men.*   ([TWO MEN])
- *There are (several) units / groupings of suitcases.*   ([UNITS])
- *Each such unit has three (suitcases) in it.*   (arrow)
- *There are one or many events.*   (no explicit plurality on V)
- (Collectivity of action not explicitly represented)

(23)   **A Key Observation Regarding the Notation**

If we make the assumptions in (23a,b), then we predict that there will be exactly the three (classes of) readings in (18). In this sense, Gil's (1982) notation predicts/captures the three key readings in (18) of distributive numerals.

     a.   A distributive numeral must 'distribute over' some other expression in the sentence. (*i.e.*, an arrow must be drawn between the numeral and something else).

     b.   In a sentence like 'Two men carried three$_{DIST}$ suitcases', there are three expressions that 'three$_{DIST}$' could potentially distribute over:
            (i) 'two men'   (ii) the verb 'carried'   (iii) a (covert) classifier on 'suitcases'

(24)   **Additional Notes on the 'Class C' Reading**

- To get a sense of this (alleged) reading, consider the (alleged) ambiguity of (24a).

a.   These are some **heavy suitcases.**
         (i)   The suitcases together are heavy, but each one is light.
         (ii)   Each of the suitcases is heavy.

- Gil (1982: 107) proposes that these readings can be represented as follows.

b.   (i)   Reading (24ai):   [[HEAVY UNITS] SUITCASES]

         (ii)   Reading (24aii):   [[HEAVY ⟶ UNITS] SUITCASES]
                  The property of 'heavy' holds of each unit of suitcases
                  The property of 'heavy' holds of each individual suitcase

- Now, in Georgian, it is possible to unambiguously express the reading in (24aii), via reduplication of the adjective.

c.   (i)   mdzime   cantebi
                  heavy   suitcases
                  suitcases that together are heavy / suitcases that are individually heavy

         (ii)   mdzim-mdzime   cantebi
                  heavy-heavy   suitcases
                  suitcases that are individually heavy.

- Moreover, in Georgian, numerals seem morphsyntactically to be adjectives. Finally, distributive adjectives are formed via the same reduplication operation seen in (24c)

d.   (i)   sami   at'let'ebi   (ii)   sam-sami   at'let'ebi
                  three athletes   three.DIST   athletes

- Our semantic theory seems, then, to predict a reading for (24dii) that is analogous to that in (24aii)/(24bii).

e.   (i)   Reading of (24di):   [[THREE UNITS] SUITCASES]
         (ii)   Reading of (24dii):   [[THREE ⟶ UNITS] SUITCASES]
                  The property of 'three' holds of each unit of suitcases

- Gil (1982: 108) claims that some additional support for this analysis can be found in the fact that expressions like (24dii) are reported by speakers to be 'complete', and to be viable captions of a picture where a bunch of suitcases are arranged into little groups of three, little 'triplets' of suitcases (*cf.* 'three suitcases each' in English)

(25)   **Question Regarding the Contrast Between Class C and Classes B and A**

-   The class C reading (to the extent that we understand it) seems to be very weak. After all, it seems to be entailed by both the Class A and the Class B reading.

    o   If the men each carried three suitcases, this relation between the men and their suitcases could provide a 'grouping' of the suitcases themselves.

    o   If each carrying event had three suitcases in it, then again this relation between the events and the suitcases could provide a 'grouping' of the suitcases themselves…

-   We might wonder, then: *If we accept the existence of a Class C reading, what evidence do we have of separate Class A and Class B readings?*

(26)   **Gil's (1982) Empirical Argument for a Separate Class A Reading**

-   Consider sentences like (26a), where the distributive numeral is modified by 'only'.

a.   Orma k'acma   **mxolod**   **sam-sami**   canta   c'airo.
        two   men.ERG   **only**   **three.DIST** suitcases   carried
        Two men carried only three suitcases each.

-   Speakers report that in sentences like (26a), the expression *mxolod* 'only' requires the total number of suitcases to be **no more than six**; one for each man.

-   This judgment would only result if (26a) had an interpretation akin to that in (26bi). If the interpretation in (26bii) were the only one available, there'd be no constraint on the total number of suitcases (only that each group had no more than three in it).

b.   (i)   [TWO MEN] [CARRIED] [ONLY THREE SUITCASES]

                Only three suitcases for each of the two men.

        (ii)   [TWO MEN] CARRIED [ONLY THREE ⟶ UNITS] SUITCASES]
                Only three for every unit of suitcases.

-   Question:
    Doesn't Gil's account predict that (26a) should be ambiguous, and also allow the weaker (26bii) reading? How, then, do we show that (26bi) is a separate *reading?*

(27)   **Some Related Predictions of Gil's System**

   a.   Prediction 1:
           In sentences with (true) adnominal distributive numerals, if there are no other
           plural DPs in the sentence, then a Class A interpretation is not possible; only
   Class B & C.

[ONE MAN] [[SEVERAL UNITS] CARRIED] [[THREE$_{DIST}$ → UNITS] SUITCASES]
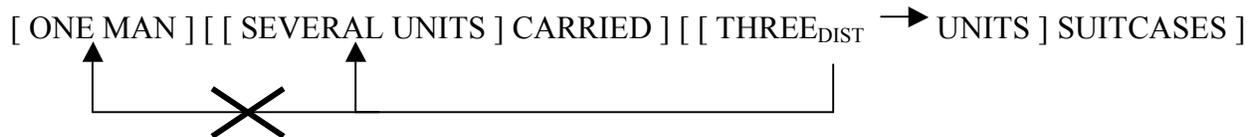
   o   The arrow from 'THREE DIST' must go to some other plural expression in
       the sentence.

   o   If there are no other plural DPs, the only options are the verb and the NP
       marked by the distributive numeral itself.

   b.   Prediction 2:
           In sentences with pseudo-distributive numerals, like English binominal each, if
           there is no other plural DP in the sentence, then the sentence is anomalous.

           * Dave carried three suitcases each.

[DAVE] [[SEVERAL UNITS] CARRIED] [[THREE$_{DIST}$ UNITS] SUITCASES]
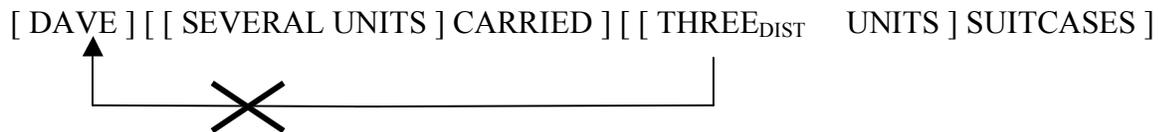
   o   In these pseudo-distributive numeral constructions (like English binominal
       each), only the Class A interpretation is possible.
       ▪   That is, the 'distributive arrow' must connect the numeral to some
           other plural DP.

   o   Thus, if there is no other plural DP in the sentence, the required distributivity
       cannot be achieved, and the sentence is ill-formed.

3.2   Distributive Numerals in Subject Position

In all the examples that we've seen thus far, an adnominal distributive numeral is contained
within a *direct object…*

   •   Of course, it's also possible for adnominal distributive numerals to be contained
       within subjects (28)…

   •   There are, however, some interesting and unexpected effects of such placement.

(28)   **Distributive Numerals in Subject Position (Gil 1982: 119)**

    a.   <u>Tagalog:</u>

Dinala	ng	**tigdalawang**	lalaki	ang	tatlong	maleta
carried	DIR	**two.DIST**	man	TOP	three	suitcases

        Some men in twos / in pairs carried three suitcases.

    b.   <u>Georgian:</u>

Or-rma	k'acma	sami	canta	c'aira.
two.DIST.ERG	men.ERG	three	suitcases	carried

        Some men in twos / in pairs carried three suitcases.

    c.   <u>Turkish:</u>

Ikiser	adam	uc	bavul	tasidi
two.DIST	men	three	suitcases	carried

        Some men in twos / in pairs carried three suitcases.

(29)   **Initial Predictions Regarding the Sentences in (28)**

If we follow the notation Gil has laid out, we predict that sentences like those in (28) should allow for three types of reading.

    a.   <u>Class A Reading</u>   *Three suitcases were each carried by two men.*
        [TWO MEN] [CARRIED] [THREE SUITCASES]

    b.   <u>Class B Reading</u>   *Three suitcases were carried, and each carrying had two men.*
        [TWO MEN] [[SEVERAL UNITS] CARRIED] [THREE SUITCASES]
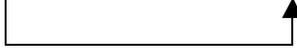
    c.   <u>Class C Reading:</u>   *Some men in little pairs carried three suitcases.*
        [[TWO ⟶ UNITS] MEN] [CARRIED] [THREE SUITCASES]

(30)   **The Reported Facts**

- Speakers tend to find sentences like those in (28) to be extremely awkward. Many find them just straight-up ungrammatical. (*cf. *Three men each carried two suitcases*)

- To the extent that (28) is OK, Class A and Class B interpretations are dispreferred

    o   The sentences in (28) are generally understood to describe a single carrying.
        ▪ NOT CLASS B

    o   The sentences in (28) are generally understood to describe events containing *any* even number of men (not six, *i.e.,* not two for each suitcases)
        ▪ NOT CLASS A

(31)   **An Explanation of the Reported Facts**

- Note that, because the distributive numeral is on the subject, the Class A and Class B readings in (29) require the 'distributivity arrow' to go *downward* into a c-commanded position.

- According to Gil (1982: 123) these kinds of distributivity relations violate 'grammatical hierarchy relations governing quantifier scope'.

- Basically, the notion seems to be that A can distribute over B *only if* B is hierarchically higher than A.
  - o   Thus, the Class A and Class B readings in (29a,b) are akin to cases of inverted scope readings of quantificational DPs, and so will naturally be dispreferred.

(32)   **Question:**   How do speakers express the readings/propositions represented in (29a,b)?

(33)   **Answer:**   Speakers generally choose one of two strategies.

   a.   Passivization, So that the Object is 'Promoted' and the Subject is 'Demoted'
   Sami   canta   **or-ori**   k'acit   c'arebulia.
   three   suitcases   **two.DIST**   men   carry.PASS
   Three suitcases were carried by two men each / by men in twos.
   (All the readings in (29) are possible.)

   b.   Use of *Two* Distributive Numerals: One on the Subject, and One on the Object
   Or-orma   k'acma   **ert-erti**   canta   c'airo.
   two.DIST   men   **one.DIST**   suitcase   carry
   Men in twos carried suitcases one-by-one.

(34)   **Follow-Up Questions:**

   a.   Why Does Strategy (33a) Work?
   In the passive, the distributive numeral in the passivized subject *is* c-commanded by both the verb and the passivized object (theme).

   b.   Why Does Strategy (33b) Work?
   With two distributive numerals, two simultaneous class C readings are possible.

[[TWO⟶ UNITS] MEN] CARRIED [[THREE⟶ UNITS] SUITCASE]

- Following (18c), this is an especially weak reading; all it states is that the men can be grouped into pairs, and the suitcases in triplets.

- Thus, (34b) can cover all the scenarios the readings in (29) cover.

3.3   Distributive Numerals and Conjoined NPs

In languages with adnominal distributive numerals, it is often possible to for such numerals to modify conjoined NPs.

(35)   **Distributive Numerals Modifying Conjoined NPs**

   a.   <u>Tagalog:</u>
         Kumain   ang   isang lalaki ng   **tigtatlong**   apol   at   saging
         ate   TOP   one   man   DIR   **three.DIST**   apple   and   orange
         A man ate three_{DIST} apples and oranges.

   b.   <u>Turkish:</u>
         Bir   adam   **ucer**   elma   ve   portakal   yedi.
         one   man   **three.DIST**   apple and   orange   ate
         A man ate three_{DIST} apples and oranges.

   c.   <u>Georgian:</u>
         Ertma k'acma   **sam-sami**   vaslebi da   portoxalebi   c'ama
         one   man   **three.DIST**   apples and   orange   ate
         A man ate three_{DIST} apples and oranges.

(36)   **The Reported Readings of These Sentences**

   a.   One man ate three apples and three oranges.

   b.   One man ate triplets of fruit, each triplet contained apples and oranges.

   c.   One man ate triplets of apple and triplets of oranges.

Gil (1982: 130) claims that his notation is able to capture the possibility of all these readings.

(37)   **Representation of the Readings in (36)**

   Note, in Gil's (1982) notation, '>' means 'scopes over.' However 'scopes over' is never clearly defined.

   a.   <u>Reading (36a):</u>   [[THREE UNITS] ⟶ [APPLES AND ORANGES]]

   b.   <u>Reading (36b):</u>   [[THREE⟶ UNITS] > [APPLES AND ORANGES]]

   c.   <u>Reading (36c):</u>   [[THREE⟶ UNITS] < [APPLES AND ORANGES]]

(38)   **An Interesting Quirk**

In each of the sentences in (35), the subject is singular. If we make the subject plural (38a), the range of interpretations broadens (38b).

a.   Tagalog:
Orma   k'acma   **sam-sami**   vaslebi da   portoxalebi   c'ama
two   man   **three.DIST**   apples and   orange   ate
Two men ate three_{DIST} apples and oranges.

b.   The Reported Readings of Sentences like (38a):

(i)   Two men collectively ate three apples and three oranges.

(ii)   Two men collectively ate triplets of fruit, each with apples and oranges.

(iii)   Two men collectively ate triplets of apples and triplets of oranges.

(iv)   Two men each ate three apples and three oranges.

c.   Gil's (1982: 135) Analysis

 • Readings (38bi)-(38biii) are represented as in (37).

 • Reading (38biv) involves *double distributivity*. The numeral 'three' is distributed over both the conjunction 'apples and oranges', and over the subject 'two men'.

[TWO MEN] [CARRIED] [[THREE UNITS] ⟶ [APPLES AND ORANGES]]]

d.   A Criticism:

 • Introducing the possibility of 'double distributivity' as in (38c) seems like it might vastly increase the expressive power of Gil's system.

 • However, he never considers the effect this has on his predictions for simple distributive numeral sentences like (6).

 • He also doesn't make much subsequent use of this analytic option…

3.4   Adverbial Distributive Numerals

(39)   **Gil's Key Generalization Regarding Adverbial Distributive Numerals**

Adverbial distributive numerals only permit Class B and Class C interpretations. They do not permit Class A interpretations.
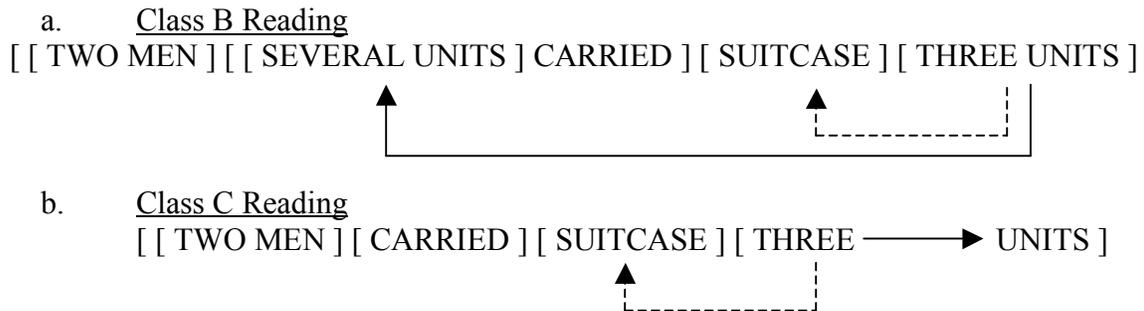
    a.   <u>Illustration:</u>   Two men carried the suitcases in threes.

    b.   <u>Interpretations:</u>
        (i)   *Class B:*   Two men carried suitcases, three (suitcase) at a time.
        (ii)   *Class C:*   Two men carried triplets of suitcases.
        (iii)   *NOT Class A*: Two men each carried three suitcases.

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(40)   **Criticism**
* It's not at all clear to me in what sense (39a) 'lacks the reading' in (39biii).
* After all, sentence (39a) is true if each of two men carry three suitcases…

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(41)   **Gil's Semantic Representations for Adverbial Distributive Numerals**

* As before, the solid arrow represent the 'distributivity relation'
* The dashed line represents the 'qualification relation'; it marks the entity understood to be occurring in groups of three.

    a.   <u>Class B Reading</u>
  [[TWO MEN] [[SEVERAL UNITS] CARRIED] [SUITCASE] [THREE UNITS]

    b.   <u>Class C Reading</u>
       [[TWO MEN] [CARRIED] [SUITCASE] [THREE   ⟶   UNITS]

(42)   **An Interesting Contrast Between Adverbial Distributive Numerals (Gil 1982: 141)**

It seems that different distributive numerals can prefer different kinds of readings.

    a.   Two men carried suitcases in threes. (Class A and Class B both OK)
    b.   Two men carried suitcases three by three.   (Class C 'preferred')
    c.   Two men carried suitcases three at a time.   (Class B obligatory)

    <u>Question:</u>   The restricted interpretations of binominal each lead Gil to claim that it's *not* really a distributive numeral. So, *why* are similar conclusions *not* drawn from the facts in (42)?...

(43)   **An Interesting Prediction of the Generalizations in (42)**

- If the matrix verb is *stative* – and thus lacks the 'several units' (event) argument – 'in threes' and 'three by three' will be acceptable, receiving only the spatial reading.
- However, 'three at a time' will be anomalous.

a.   The chairs are arranged in threes.   (Class C / Spatial Reading Only)
b.   The chairs are arranged three by three.   (Class C / Spatial Reading Only)
c.   * The chairs are arranged three at a time.

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4.   Chapter 9: "Linguistic Universals Governing Distributive Numerals"

Gil (1982) puts forth 22 universals concerning distributive numerals.

- He acknowledges that they more like 'conjectures', since they are mostly based only upon five to ten different languages.

- We won't cover *all* of Gil's generalizations.
  o   Some are rather trivial.
  o   Others rest upon dated assumptions (*e.g.* that English numerals are determiners)

- Gil notes that most of the generalizations seem to defy language external (functional or diachronic) explanation. Thus, they seem to point to core idiosyncracies of UG…

4.1   Generalizations on the Cross-Linguistic Distribution of Distributive Numerals

(44)   **Universal 1**:   All languages have adverbial distributive numerals.

Evidence: As of 1982, Gil hadn't found a counterexample.

(45)   **Some Discussion**

a.   Gil seems to include amongst the 'adverbial distributive numerals' such complex expressions as 'three (suitcases) at a time'.

- If so, it's perhaps not too surprising that every language has *some* means for expresssing such concepts.

b.   As we'll see, *adnominal* distributive numerals are far more 'marked'. *Why?*

- Perhaps the issue is that such numerals involve (or allow) quantificational over *events*; perhaps its least marked for such event quantifiers to be adverbial, rather than adnominal…

(46) **Universal 3:**
If a language has an *ordinal* distributive numeral ('one n^{th} NP each'), then it has adnominal distributive numerals.

    a.   <u>Evidence (Gil 1982: 314)</u>

Language	Adnominal Dist-Num *three each / in threes*	Ordinal Dist-Num *a third NP each*
Tagalog	tigtatlo	ikaikatlo
Fox	nanesw	nanesonameg
Georgian	sam-sami	--------
Latin	terni	--------
English	----------	---------

    b.   <u>Some Discussion:</u>

        (i)   It seems 'distributive ordinals' are more marked than plain adnominal distributive numerals.

        (ii)   Since ordinals are necessarily adnominal, this makes sense. In addition, the semantics of 'distributive ordinals' looks somewhat different from that of the plain adnominal distributive numerals. They deserve a closer look…

(47) **Universal 4:**
If a language has a distributive *non*-numeral quantifier, then it has plain adnominal distributive numerals.

    a.   <u>Evidence (Gil 1982: 315)</u>

Language	Adnominal Dist-Num *three each / in threes*	Dist Quantifier *each… many*
Georgian	sam-sami	bevr-bevri
Maricopa	xmokxperk	palyxperk
Russian	po tri	po mnogu
Tagalog	tigtatlo	----------
Turkish	ucer	----------
English	----------	----------

    b.   <u>Some Discussion:</u>
Note that the impossibility of '*many suitcases each*' in English is in line with this generalization, and again suggests that binominal each is closer to distributive numerals than what Gil (1982) suggests…

(48)   **Universal 6:**
         If a language has distributive *non-quantifying* expressions (*e.g* adjectives), then it has plain adnominal distributive numerals.

       a.   Evidence (Gil 1982: 317)

Language	Adnominal Dist-Num	Dist Adjective
	three each / in threes	*each good*
Georgian	sam-sami	k'arg-k'argi
Maricopa	xmokxperk	xotyxperk
Tagalog	tigtatlo	----------
Turkish	ucer	----------

       b.   Some Discussion:
             (i)   Note that the meaning of these 'distributive adjectives' isn't obviously related to that of the distributive numerals.
             (ii)   The morphological relations between them, however, are quite intriguing.

4.2   Generalizations Regarding the Morphological Form of Distributive Numerals

(49)   **Universal 7:** Distributive numerals are derived from unmarked numerals (duh).

       The Usual Means of Morphological Derivation:
       o Reduplication (Georgian):   *sam* 'three'   →   *sam-sami* 'three.DIST'
       o Pluralization (English):   three   →   in three**s**

(50)   **Universal 10:**
         Distributive numerals of a 'series' α (*e.g.* adnominal or adverbial) are formed through:
       o A (non-empty) marker of 'distributivity'
       o A (potentially null) marker of the series α

(51)   **Key Prediction of Universal 10:**

Adnominal distributive numerals will never be more 'morphologically marked' than adverbial distributive numerals.

- Adverbial numerals always bear some overt marking of their adverbial status.
- Adnominal numerals are generally unmarked.
- Thus, *adnominal* distributive numerals will sometimes bear no marking other than that which indicates distributivity.
- However, *adverbial* distributive numerals will always bear some additional morphological marking, indicating their adverbial status.
- **In this way, we resolve the tension between the fact that adverbial distributive numerals are typologically *unmarked*, but always morphologically *marked*.**

(52) **Universal 12:**
In the derivation of an adverbial distributive numeral, the addition of the distributive marking always *feeds* the addition of the adverbial marking.

    a.   Illustration / Evidence (Gil 1982: 332)

(i)	Georgian:	Base:	*sam*	'three'
		Dist-Marking:	*sam-sam*	'three$_{DIST}$'
		Adv-Marking:	*sam-samat*	'three$_{DIST.ADV}$'
			(*cf. *samat-samat*)	

(ii)	Turkish:	Base:	*uc*	'three'
		Dist-Marking:	*ucer*	'three$_{DIST}$'
		Adv-Marking:	*ucer ucer*	'three$_{DIST.ADV}$'
			(*cf. *uc-ucer*)	

    b.   Some Discussion:
In analyzing adverbial distributive numerals, it seems we should prefer analyses where the 'adverbializer' takes scope over the 'distributivizer'

4.3   Generalizations Regarding the Semantics of Distributive Numerals

(53) **Universal 14:**
If the semantics of a derived numeral differs from those of the base numeral in regards to the availability of collective or distributive readings, then the derived numeral induces a relation of distributivity.

    a.   Some Discussion:
This universal amounts to the claim that there are no 'collective numerals', ones which would cause the sentence in (i) to necessarily have the interpretation in (ii).
    (i)   Two men carried three$_{COLLECTIVE}$ suitcases.
    (ii)   Two men together carried three suitcases all at the same time.

    Question: Why don't these 'collective numerals' exist?
        Gil (1982) frames no hypotheses.

(54) **Universal 15:**
If the meaning of a derived numeral requires an expression X to distribute over an expression Y, then that numeral must occur within the expression X.

    a.   Some Discussion:
This universal amounts to the claim that there are no 'distributive key numerals', ones that would cause the sentence in (i) to have the interpretation in (ii).
    (i)   Two$_{DIST}$ men carried three suitcases.
    (ii)   Each of two men carried three suitcases.

(55)   **Some Possible Counterexamples to Universal 15**

      a.   *Latin:*   uterque   'each of two'
      b.   Dyirbal: daran   'each of two'
      c.   English: both   (note: forces distributive reading)

      <u>Gil's Observation:</u>   All potential counterexamples involve groups of two.
                                There is never something like 'both' that applies to groups of three

(56)   **Some More Discussion**

- Universal 15, if true, strikes me as a rather interesting puzzle.

- Not only would the meaning of something like two_{DIST} in (54a) be easy to represent, it's *also* something that could plausibly arise historically.

      o   We have expressions like 'each of the two men' / 'the two men each V'.
      •   Why couldn't these undergo grammaticalization to something like *each-two*, with the (non-existent) meaning in (54)?

(57)   **Universal 19:**
No language has different distributive numeral series syntactically identical but differing semantically only in the possible domains over which distributivity obtains.

      a.   <u>Some Discussion</u>
           (i)   This universal amounts to the claim that the 'domain of distributivity' (where the arrow points) is never morphologically marked on the distributive numeral.

           (ii)   *However,* this seems to be directly counterexemplified in Gil's own discussion of the English adverbial distributive numerals *in threes, three by three, three at a time*.

           (iii)   Perhaps Universal 19 is meant to apply only to adnominal numerals?

(58)   **Universal 21:**
A language 'is likely to' have adnominal distributive numerals if and only if it does not have indefinite or definite articles, or if such articles are merely optional.

(59)   **Universal 22:**
A language 'is likely to' have adnominal distributive numerals if and only it does not have nominal plural marking, or if such marking is merely optional.

(60) **Evidence for the Universals in (58) and (59)**
In the chart below – excerpted from Gil (1982: 351-352) – '+' means *exists and is obligatory*, '–' means *does not exist*, and '+/-' means *exists and is optional*.

Language	Indefinite Article	Definite Article	Plural Marking
Languages with DistNums			
Tagalog	-	-	+/-
Hindi	+/-	-	+/-
Georgian	-	-	+/-
Turkish	-	-	+/-
Maricopa	-	-	+/-
Romanian	+/-	+	+
Languages without Dist Nums			
English	+/-	+	+
French	+	+	+
Hebrew	+/-	+	+/-

a. Some Potential Counterexamples
    • Romanian has distributive numerals, but has the same profile as English.
    • Lillooet Salish has adnominal distributive numerals (Matthewson 2000), but has an obligatory article.

(61) **Gil's (1982) Explanation for Universals (58) and (59)**

a. Key Background Assumption 1:
    There are languages, like Mandarin, where all NPs receive a 'mass interpretation'. It is *these* languages where articles and plural marking is absent or optional.

b. Key Background Assumption 2:
    Adnominal distributive numerals *must* admit of the Class C reading, whereby the adnominal numeral distributes over the modified noun.

c. The Reasoning:
    • Determiners, for whatever reason, cannot distribute over the N they modify (Illustration: *few men* ≠ 'men grouped in little bunches of a few')

    • In non-mass languages, numerals are determiners. In mass languages, numerals are *not* determiners (because there are no DPs).

    • Thus, in non-mass languages, numerals won't be able to distribute over Ns. Thus, numerals cannot in principle be distributive numerals.

    • In mass-languages, there are no DPs, and so numerals are some other category (adjective, usually). Thus, nothing prevents them from being able to distribute over the N they modify, and so they can in principle be distributive numerals.

(62)   **Some Key Criticisms of this Analysis**

• Numerals in English are no longer thought to be determiners. Rather, they have long been held to be adjectives (of some sort).

• Languages like Mandarin and Hindi are no longer thought to lack a mass/count distinction. Even in these languages, there are signs that there exists a class of count nouns, and that determiners do exist.