Chapter 1
The Quantifier Questionnaire

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Below we classify examples of quantificational expressions. To the extent possible provide semantically comparable expressions in the language (L) you're presenting. If L has many translations of a given expression, identify these differences (both syntactic and semantic) if you can.

We take the basic *semantic* type of quantifiers to be a relation between two properties – extensionally, two sets, and we say they have type (1,1). *No barber shaves himself* relates the set of barbers and the set of people who shave themselves. NO says their intersection is empty. *Ann always takes the bus to work* expresses the ALWAYS relation between the set of events in which Ann goes to work and the set in which she is riding a bus – the former is a subset of the latter. Our classification is *semantic* – logically equivalent expressions are typically not syntactically isomorphic: *some students* in Malagasy translates as *ny mpianatra sasantsasany* (lit: *the student some-some*). (See Baker (1995), Lee (2008), Matthewson (2001) for extensive discussion.)

We distinguish (Partee 1995) *D-quantifiers* and *A-quantifiers*. The former build expressions which are (or bind) arguments of predicates. *A-quantifiers* directly build predicates – verbal affixes, pre-verbs, auxiliary verbs, or predicate modifiers (adverbs, PPs). They are mathematically less well understood and morpho-syntactically and semantically more variable than D-quantifiers.

I Core Quantifiers: Three Basic Semantic Classes

Exhibit from your L D- and A-Quantifiers in each class below if possible (Jelinek 1995 and Vieira 1995 claim that Straits Salish and Asurini Do Trocara (Tupi-Guarani) lack D-quantifiers. No one claims that any languages lack A-quantifiers). We begin with **count** quantifiers.

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1.1 Generalized Existential (Intersective) Quantifiers

Here, for Q a quantifier and A,B sets, Q(A)(B) is determined by A∩B, the set of As that are Bs. So NO is existential as NO(A)(B) = **true** iff (if and only if) A∩B is empty regardless of which As are not Bs and which Bs are not As.

1.1.1 D-Quantifiers

D-Quantifiers in English include: *a/an*, *some*, *several*, *no*, *zero*, *one*, *two*, ..., *many*, *few*, *a few*, *a couple*, *a dozen*, *which?*, *how many?*, *finitely many*. **Cardinal** quantifiers are the most productive subclass. Here QAB just depends on |A∩B|, the number of As that are Bs.

(1)   a. I saw *a / one* picture of Churchill above the fireplace
      b. *Some / Two* sailors are singing in the street

Interrogative *How many?* is cardinal, but *Which?* is merely intersective. *Which As are Bs?* requires identifying the members of A∩B, not just their number.

(2)   a. How many students passed the exam?
      b. Which students passed the exam?

Semantically more difficult are **value judgment** Qs: *many*, *few* and *enough*. Sometimes they refer to a cardinality (not a proportion) comparing it to an expected value (Moltmann 1996).

(3)   a. *Many* students attended the lecture, *few* understood it
      b. *Enough* members attended to constitute a quorum

1.1.2 A-Quantifiers

A-Quantifiers include: *once*, *twice*, *sometimes*, *three times*, *occasionally*, *often*, *frequently*, *rarely*, *seldom*, *never*, *a lot*. (4c) from Passamaquoddy (Algonkian) illustrates a cardinality preverb. (4d) shows an A-quantifier within verbal morphology (Kalaallisut; Eskimo-Aleut).

(4)   a. John failed the exam *twice* before passing it the third time
      b. He *often / occasionally / never* visits museums on weekends
      c. Kehsi=koti+pson-uk   sikiliyem-ok   Passamaquoddy
         X.many-Fut-catch-1Conj cricket-3proximate plural
         I'm going to catch a lot of crickets   (Bruening 2008:97)
      d. ...Skakki+r+llattaar+tar+pu+gut (Skakkirlattaartarugut) Kalaallisut
            ...chess+do+sometimes+habit+IND.IV+1pl
            ...Sometimes we play chess.   (Bittner and Trondhjem 2008:42)

1.2 Generalized Universal (Co-intersective) Quantifiers

Here QAB depends on the property A – B, the set of As that are not Bs.

1.2.1 D-Quantifiers

D-Quantifiers in English include *all*, *every*, and *each*. Note: *All As are Bs* is true iff A is a subset of B, which is equivalent to A – B is empty. In addition *any* sometimes has a universal interpretation, as do the *-ever* pronominals:

(5) a. *Every* | *Each* child won a prize
    b. *Any* linguist can answer that question
       (≈ Every linguist can answer that question)
    c. *Whoever* finishes the exam gets a prize
       (≈ Each person who finishes . . .)

1.2.2 A-Quantifiers

A-Quantifiers Simplex ones are *always* and, perhaps, *whenever*. Here are a few cases from languages where A-quantification is a prominent or the only type (6c,d,e).

(6) a. John always takes the bus to school
    b. John sings whenever he is in the shower
    c. yas = sən   ′əw′ čey   Straits Salish
       always = 1.s.nom link work   (Jelinek 1995:515)
       I always work
    d. mək′ᵂ = ∅ ′əw′ p′əq tsə sp′eqən   Straits Salish
       all = 3abs   link white Det sprout   (Jelinek 1995:514)
       They are all/completely white, the flowers
    e. aoseoho sekwehe i-tow-i   ŋoa   Asurini do Trocara
       all   evidential 3agt-lay.down-obl men   (Tupi-Guarani)
       All men lay down   (Vieira 1995:706)
    f. Pesq skitap nokka=psehl-n   kiwhosu   Passamaquoddy
       one man (3)-all=skin-3Subj.ObvP muskrat.ObvP   (Bruening
       One man skinned all the muskrats   2008:99)
    g. barri-djarrk-dulubom   gunj   Mayali (Australian)
       3plPast-all-shoot.past.perf kangaroo   (Evans 1995:209)
       They all shot the kangaroo
    h. Gunj   barri-bebbe-yame-ng   Mayali
       kangaroo 3aP-dist-spear-Past.Perf   (Evans 1995:221)
       They each speared a kangaroo

1.3 Proportional Quantification

QAB depends on the *proportion* of As that are Bs: $|A \cap B|/|A|$.

1.3.1 D-Quantifiers

Simplex ones include *most*, *half*, and some uses of *many* / *few*. Often *most* translates as *a* / *the majority of*, which is syntactically complex.

(7)   a. *Most* students read the Times
      b. *Half the* students got an A in the course
      c. *Many* Nobel Prize winners have been Scandinavian (Westerståhl)

1.3.2 A-Quantifiers

A-Quantifiers *usually*, *mostly*, *often*, *always*, *frequently*, *rarely*. It is often not easy to decide when these adverbs pick out a number or a proportion.

(8)   a. Sue *usually* / *occasionally* takes the bus to work   (de Swart 1996)
      b. John *often* fills out his own income tax forms

1.4 Morpho-Syntactically Complex Quantifiers

Work in generative grammar often treats quantifier as a functional category, implying that its members are not productively formed. But work on English (Keenan 1996), Malagasy (Keenan 2008) and Finnish (Suihkonen 2007) suggests that this is not the case. Many of the articles in Matthewson (2008) exhibit richer quantifier inventories than in earlier work in generative grammar. Primary means of forming complex quantifiers are (1) *Modification* (*more than* ten, *almost all*) and (2) *Boolean Compounding* (*and*, *or*, *neither…nor…*, and *not*) (3) Exception Phrases (*all but ten students*) and (4) Bounding Phrases (*He exercised twice a day, six days a week for one year*). Proportional Qs and partitive constructions (*some* / *all* / *most of the students*) are typically complex.

1.4.1 Complex D-Quantifiers

1.4.1.1 Cardinal Quantifiers

Most productive here are modified **cardinal** Qs, (9). In (9c) *many* functions as a +count carrier of adverbs building complex quantifiers:

(9)   a. (*More than*) *five* | *Just five* | *About ten* women are in the class
      b. *Quite a few* | *Hardly any* | *Almost all* linguists are musicians
      c. There are *uncountably many* | *surprisingly many* blue dwarfs

      more than two, exactly/only/just ten, less/fewer than a hundred, at
      least/at most five, about/approximately ten, nearly/almost two
      hundred, between five and ten, just finitely many, infinitely many,
      hardly any, practically/almost no, fifty give or take a few

1.4.1.2 Value Judgment Cardinals

Value judgment cardinals also allow some novel modification. *many* and, less
freely, *few* function to host adverbial modifiers productively forming inten-
sional quantifiers.

(10)   a. *Too many* | *Not enough* students came to the lecture
       b. *Surprisingly many* | *few* administrators came to the party

1.4.1.3 Exception Modifiers

Exception modifiers (Moltmann 1995, 1996, von Fintel 1993) seem most nat-
ural with *no* (intersective) and *every* (co-intersective), but (11c) from Garcia-
Alvarez 2003, cited in Peters and Westerståhl 2006, finds some cases with *most*
(proportional) using the more permissive *except*.

(11)   a. *No* student *but John* | *Every* student *but John* came to the lecture
       b. *All but two* students passed the course
       c. *Almost*/*Nearly every* student signed the petition
       d. *Most* dishwashers *except very low-end models* have a water-saving
          feature

1.4.1.4 Proportional Quantifiers

Proportional quantifiers are usually syntactically complex in English:

(12)   *More than* | *Exactly* | *Nearly* | *About* | *Less than* half the students
       passed

   There are several dedicated structures in proportionality quantifiers:

(13)   a. (*More than*) *seven out of ten* sailors smoke Players
       b. *Only* | *Just* | *Not one* student *in ten* can answer that question

(14) a. *Sixty percent of* American teenagers are overweight
      b. *Less than a third of* Americans are bilingual
      c. (*Only*) *Every second* car off the production line was inspected

ten percent of, two thirds of, a (large) majority of, a (small) minority of, more than twenty percent of, less than a quarter of, between twenty and thirty percent of, all but a tenth of, (just) a small percentage of, What percentage / fraction of?, more/less than / exactly half (of), all of

1.4.1.5 Boolean Compounds

(15) a. *Not all* poets daydream
      b. *At least two but not more than ten* students got scholarships last year
      c. *Most but not all* students are liberal
      d. *Either very few or else very many* students will pass that exam
      e. *Neither every* teacher *nor every* student came to the party
      f. *Not more than one* teacher *in ten* knows the answer to that question

1.4.1.6 Partitives

Partitives in English = [(Q N) of NP$_{def}$], Q any of the quantifiers presented so far and NP$_{def}$ a definite plural NP determining a non-empty domain.

(16) a. (*All | None | Both | Neither | Just two | Each*) *of* those thieves fled
      b. *Some/Most but not all of* John's dogs were inoculated
      c. *Not more than a third of* the prisoners escaped
      d. John didn't see *any of* those films

1.4.2 Complex A-Quantifiers

1.4.2.1 A-Quantifiers

A-quantifiers are modifiable as above, often with **bounding phrases**, as in (17f,g):

(17) a. Sean has been to Dublin {*exactly* twice / *more than* five times}
      b. He jogs to work on most *if not all* weekends / *almost* every Friday
      c. Ann {*almost* never / *only* occasionally} takes the bus to school
      d. Ann jogs to school *twice as often as* you do   (Comparative +count)
      e. Ann smokes *twice as much as* you do   (Comparative –count)
      f. Ed worked 50 weeks a year for 30 years   (Bounding)
      g. John does twenty push-ups *twice a day*, *five days a week*.
                                                        (Pratt and Francez 2001)

1.4.2.2 Boolean Compounds

(18) a. In local elections Ann has *usually but not always* voted Democrat
b. Ed has taken the exam *at least twice but not more than five times*
c. Ann sleeps late *on weekends and on holidays except for Easter*

II Selected Topics

Consider the expression of the phenomena in **1.5–1.17** in your L

1.5 Comparative Quantifiers

In (19a,b,c) the italicized expressions denote quantifiers mapping two properties to a quantified NP (QNP) denotation. See Keenan and Moss (1984), Keenan (1987) and Beghelli (1994).

(19) a. *More* students *than* teachers are vegans
b. The reporter interviewed *twice as many* students *as* teachers
c. We talked to *the same number of* students *as* teachers
d. *How many more* students *than* teachers signed the petition?
e. *Just as many* students *as* teachers' bicycles were stolen
f. *Proportionately more* students *than* teachers signed the petition

That *more students than teachers* is an argument expression is supported by the diversity of ordinary NP positions in which it occurs in (19a–e). The quantifiers in (20a–e) are cardinal, but now depend on two numbers – in (19a) the number of students who are vegans and the number of teachers who are. *Proportionately more...than...* in (19f) is Proportional.

1.6 Type (2) Quantifiers

Type (2) Quantifiers (Keenan 1992, 1996, Szabolcsi 1997, Peters and Westerståhl 2006) express a property of binary relations. We seek ones provably not reducible to the iterated application of two ordinary QNPs. Useful here are adjectives implying 'different', e.g. *rival*, *mutually antagonistic*, *opposing*, etc., but also 'same', e.g. *similar*, *same color*, etc.

(20) a. *Different people* like *different things*
b. *Each student* answered *a different* / *the same question* on the exam
c. *Which pupils* answered *which questions* (on the exam)?
(= Identify the pairs (x,y), x a pupil, y a question and x answered y).

d. *Sy and Jim* live in *neighboring towns / support rival political parties*

e. *John* danced with *Mary* but *no one else* danced with *anyone else*

(Moltmann 1996)

f. Ann *often/never* sees *the same movie more than once*

g. *The paintings* should be hung in *separate rooms or on opposite walls of the same room*

h. *Different jurors* drew *different conclusions* from *the same arguments*

(Tyhurst 1989)

(21)   Men are *usually* taller than women (Proportional).
(Compares man-woman pairs $\langle x,y \rangle$ with x taller than y) to man-woman pairs in general)

1.7 Distributive Numerals and Binominal Each

Binominal *each* in (22a), like *apiece*, forces a distributive reading of the subject NP *the assistants*. See Safir and Stowell (1988) and Zimmermann (2002). By contrast *between them* in (22b) forces a collective reading on the subject.

(22)   a. The assistants graded sixty exams *each / apiece*
b. The assistants graded sixty exams *between them*

Binominal *each* shares readings with distributive numerals found in Latin, Tagalog, Japanese, Georgian, Rumanian and Basque among others. See Gil (1982, 1988, 2005).

(23)   a. Bina   hastilia ferunt   Latin. Betts (1986)
Two-each spears   carry+3pl
They carry two spears each

b. Legiones singulas posuit   Brundisi, Tarenti, Siponti
Legions   one-each station+at Brundisium, Tarentum, Sipontum
He stationed one legion each at Brundisium, Tarentum, and
Sipontum

c. Doi oameni au   cărat   cîte trei   valise Romanian
two men   have carry.pastpart dist. three suitcases
Two men carried three suitcases each   (Gil 1993)
*Three suitcases are such that each of two men carried them

d. Ikasle-ek   irakasle-a-ri azapi-na   lan   aurkeztu zizkioten
student-pl.erg teacher-sg-dat seven-each work present aux.pl
The students presented seven works each to the teacher

(Basque, Etxeberria 2008)

Sometimes distributive numerals are more naturally translated as 'in threes':

(24)   a. Romanma   da   Zurabma   sam-sami   čanta   caiɣo
           Roman.erg   and   Zurab.erg   3-each.abs suitcase.abs   carry.pst.3sg
           Roman and Zurab carried three suitcases each,   or   (Georgian)
           Roman and Zurab carried the suitcases three by three   (Gil 2005)

       b. Nilahatra tsiroaroa ny mpianatra   Malagasy
          lined+up   tsi-2-2   the student
          The students lined up two by two / in twos

1.8 Mass Quantifiers and Noun Classifiers

Count Nouns denote properties of individuated objects. They combine directly with quantifiers: *two books*, *most cats*, etc. *Mass* nouns like *sand* and *hydrogen* do not: **most hydrogens*, **two sands*. To quantify over mass N denotations we pair them with **numeral classifiers** (Gil 2005:226–230), themselves often count Ns, usually illustrated with cardinal quantifiers, (25a), but other Qs occasionally license them, (25b).

(25)   a. Five <u>ears</u> of corn, two <u>sticks</u> of gum, several <u>sheets</u> of paper, a <u>loaf</u>
          of bread, ten <u>pieces</u> of candy, no <u>bars</u> of soap, a hundred <u>head</u> of
          cattle, a <u>head</u> of lettuce
       b. every <u>piece</u> of gum, most <u>grains</u> of sand

   In English such classifiers are of limited utility as typically object denoting nouns are quantifiable without them. But in some Ls *two books* would gloss as *two volume book*, *two cats* as *two tail cat*, etc. Indicate the prominence of classifiers in your L. Mass Ns may also be quantified using **container** nouns, (26a) and **measure phrases**, (26b), (Higginbotham 1994).

(26)   a. two *bottles* of wine, a *carton* of milk, many *boxes* of candy,
          every *keg* of beer
       b. a *kilogram* of salt, two *pounds* of cheese, a *ton* of fertilizer

   Some D-quantifiers, including some comparatives, combine just with +count nouns:

   ten houses / **ten* hydrogens, *How many* houses? / **How many*
   hydrogens?   *few* students / **few* butter, *ten per cent* of U.S. teenagers /
   *ten per cent of gold, *Fewer* students *than* teachers / **fewer* rice *than* corn

Occasionally such quantifiers combine with a mass N yielding a 'kind' interpretation: *two fine wines*, *an excellent cheese*.

Some D-quantifiers combine with both mass and count nouns: *All* (*the*) houses / *all* (*the*) beer, *a lot of* cats / *a lot of* wine, (*some*/*no*) car(s) / (*some*/*no*) rubber, *not enough* students / *not enough* water, *hardly any* students / *hardly any* wine, *more* boys *than* girls / *more* rice *than* corn

Some D-quantifiers (fewer, we think) combine just with mass nouns:

much oatmeal / *much hamburgers, *How much* soup? / *How much soups?, very little wine / *very little houses, as much rice as corn / *as much boys as girls, *less* flour *than* buttermilk / *less cats *than* dogs, *the whole*/*entire* day / *the whole/entire days

Lastly the Qs in (27a,b) form partitives in English with a grammatically singular head noun.

(27)   a. *all*/*some*/*most*/*a lot*/*hardly any* of the house was damaged in the flood
       b. *much*/(*very*) *little*/*How much* of the house was damaged in the flood
       c. *no/*both/*many/*every/*each/*one of the house was damaged in the flood

1.9 Existential Constructions

Existential Constructions (ECs) assert, deny, or query the existence of objects or stuff with a certain property. A language may lack a distinctive EC (Passamaquoddy; Bruening 2008:85). If a language has one they accept as pivots cardinal NPs, including comparatives (28d), and value judgement NPs, both count, (28a), and mass (28e).

(28)   a. There are *too many students* in the class now
       b. Are there *any women* / *more than two women* in the class?
       c. There aren't *any students* on the committee
       d. There aren't *more* cats *than* dogs / *as many* cats *as* dogs in the pen
       e. There is *too much* / *not enough salt* in the soup

Query 1 Definiteness effect

Which quantifiers are acceptable as pivots in your L?

(29)   a. *Aren't there most men in the army?
          (Intended: Aren't most men in the army?)
       b. *Aren't there all men in the army?
          (Intended: Aren't all men in the army?)

Query 2

Is negation in Existentials, (28c), the same or different than negation in non-existential Ss? They are the same in English and Malagasy but different in Hebrew and Tagalog.

Query 3

Is the EC construction used for inalienable possession, as in (30) from Malagasy?

(30) a. Misy zazakely ao   an-trano   b. Misy rihana roa io   trano io
         Exist children there in-house   Exist storey two that house that
         There are children in the house   That house has two storeys

1.10 'Floating' Quantifiers

'Floating' quantifiers are ones that occur both within the predicate and as D-quantifiers yielding rough paraphrases. In English only *all* and *both* float, anteceded by the subject:

(31) a. All (of) the girls came to the party   The girls *all* came to the party
         b. Both Jack and Jill fell down the hill   Jack and Jill *both* fell down . . .
         c. The two students laughed out loud   *The students *two* laughed . . .

But in Hebrew and Japanese (Gil 1993) numerals may float. And in Pima (Munro 1984) Qs that float include *vees* 'all', *ha'i* 'some', *mu'i* 'many', *'al ha'as* 'a little', and *'al ha'akia* 'a few'. They may be anteceded by Subjects, Direct Objects, Indirect Objects/PPs, and Possessors:

(32) a. Vees hegam ceceoj 'o   ñeid heg Alice
            all   those men   3.aux see art Alice
            All those men saw Alice

       b. Hegam ceceoj 'o   vees ñeid heg Alice
            those   men   3.aux all see art Alice
            Those men all saw Alice

       c. Gook ceceoj 'o   voopo   d. Ceceoj 'o   gook voopo
            two   men   3.aux run:pl   men   3.aux two   run:pl
            Two boys are running   Two boys are running

       e. Vaik ceceoj 'añ   ha-ñeid   f. M'añ vaik ha-ñeid heg ceceoj
            three men   1 s.aux them-see   1s.aux three them-see art men
            I see three boys   I see three boys

  g. Nei 'ant   heg vees heñ-navpuj ha-maakaika
     see 1s.aux art all my-friends their-doctor
     I saw the doctor of all my friends

  h. Vees nei 'ant   heg heñ-navpuj ha-maakaika
     all   see 1s.aux art my-friends their-doctor
     I saw the doctor of all my friends

Curiously non-subjects trump subjects for antecedence when both are possible:

(33) Heñ-navpuj 'at   ha'i ha-maa   hegam ceceoj heg 'e-o"ohan
      my-friends 3.aux some them-give those men   art 3refl-books
      My friends gave some of their books to the men
      *Some of my friends gave their books to the men
      *My friends gave their books to some of the men

Moreover two quantifiers may float simultaneously, in which case antecedence is determined by linear order (even if it leads to crossing dependencies, as below):

(34) a. Rina 'at   gook ha'i ha-maa   heg 'e-o"ohgan hegam mamakai
       Rina 3.aux two some them-give art 3refl-books those doctors
       Rina gave two of her books to some of the doctors

    b. Rina 'at   gook ha'i ha-maa   hegam mamakai heg 'e-o"ohgan
       Rina 3.aux two some them-give those doctors art 3refl-books
       Rina gave some of her books to two of the doctors

1.11 Distribution of Quantifiers

1.11.1 Bare Qs as Predicates

In English a limited usage, (35), but well attested elsewhere, (36):

(35) The students in the course were ?few / *twelve / *all

(36) a. Maro / Vitsy / Folo ny mpianatra afa-panadinana   Malagasy
      Many Few Ten the student   free-exam
      The students who passed the exam were many / few / ten

    b. *Rehetra / *Sasany ny mpianatra nanatrika ny lanonana
       All   / Some the student   attended the celebration
       The students who attended the celebration were all / some

    c. Sami   pilce   ktanaqsu-pon-ik motewolonu-wok
       because long.ago be.many-Pret-3   motewolon-3
       Because there used to be many motewolonu   Passamaquoddy
                                                      (Bruening 2008:72)

    d. ŋən′ = ∅   cə   sčeenəx
       Big/many = 3abs Det fish   Straits Salish
       They are many, the fish   (Jelinek 1995:519)

    e. *mək′w = ∅   cə   sčeenəc   "
       All = 3abs   Det fish
       They are all, the fish

Are Predicate Quantifiers limited to cardinal numerals and value judgment cardinals?

1.11.2 Can Bare Qs Function as Arguments?

If so, which ones?

(37)   a. The ties were cheap so I bought *three*, *several*, *a few*, *many*, **most*, **all*, **each*
      b. Here are the cars I have available. *Most* / *All* / *Only a few* are in good condition.

1.12 Relations Between Lexical Universal, Existential and Interrogative Pronouns

Can your L form quantifiers from interrogative or indefinite pronouns?

  1.   English: *whoever*, *whatever*, *whenever*, *wherever*, *however*, **whyever*
      Malagasy: *iza* = who?, *na iza na iza* 'or who or who' = whoever, *na inona na inona* 'whatever', *na aiza na aiza* 'wherever, etc.

  2.   Are (negative) existential and interrogative pronouns morphologically related?
      Russian *kto?* 'Who?', *nikto* 'no one', *kogda?* 'when', *nikogda* 'never'.
      Passamaquaddy (Bruening 2008:75) *keq* 'What[inan]'?, *wen* '[what[animate]]?' and *tama* 'where?' are also used as indefinites: *something*, *someone*, and *somewhere* respectively.

1.13 Decreasing D-Quantifiers

Q is decreasing (on its second argument) iff QAB implies QAB′ whenever B′ is a subset of B (Dually Q is increasing if QAB implies QAB′ if B ⊆ B′). *No* is decreasing since *No boys are laughing* implies *No boys are laughing loudly*.

1.13.1 Does Your L Have Quantifiers Which Build Decreasing NPs?

(38)   *No* students came to the lecture   (Intersective)
       Fewer than five students attended   "
       Not all children cry a lot   (Co-intersective)
       Less than a quarter of the students passed the exam   (Proportional)
       Not more than seven out of ten sailors smoke Players   "

1.13.2 If Your L Has Decreasing NPs Do They License Negative Polarity Items?

(39)   Neither John nor Bill have *ever* been to Moscow
       Not more than two students saw *any* birds on the walk
       Less than half the students here have *ever* been to Pinsk

1.14 Distribution

1.14.1 Grammatical Roles

Do QNPs occur in all major grammatical roles – subject, object, object of adposition, possessor? Does your L have possessive quantifiers, (40d)?

(40)   a. John answered *just two* / *all but two questions* on the exam
       b. Ruth answered *most* / *three quarters of* the questions
       c. The library sent a notice to *several* students / *all the* students / *about half the* students
       d. *Two students*' doctors were arrested

1.14.2 Special Positions

Do QNPs occupy special positions not allowed or unusual for definite NPs? For example in English overtly negated NPs occur better in subject than object position:

(41)   a. Not every student answered every question
       b. *Every student answered not every question

In San Lucas Quiavini Zapotec, normally VSO, quantified subjects appear preverbally, while quantified objects occur in situ (Lee 2008):

(42)   a. B-da'uh   Carlos   chòonn   gueht
          perf-eat   Carlos   three   tortilla
          Carlos ate three tortillas

       b. Yra'ta'   gylla'   nàa   neyets
          Every/all flower   neut.be white
          All the flowers are white

Chamorro (mostly VSO; Chung 2008) forbids quantified *external* arguments to the right of the predicate. But such QNPs can be topicalized to the left of the predicate, and quantified NPs can occur as subjects of passive and unaccusative predicates, (43f):

(43)   a. Ha-na'säagi'   i   semnak i   atadok-ku
          Agr-make.painful.prog   the sun   the eye-agr
          The sun hurts my eyes

       b. *Man-aitai   käda patgun lepblu. c. *Man-aitai   lepblu käda patgun.
           agr.AP-read each child   book   agr.AP-read book   each child
           Each child read a book   Each child read a book

       d. Käda patgun man-aitai   lepblu.
          each child agr.AP-read book
          Each child read a book

       e. käda saina guäha   diretcho-nña... pära u-fam-a'tinas areklu
          each parent agr.exist   right-agr...   Fut agr-AP-make   rule
          Every parent has the right to make rules   (Chung 1998:263)

       f. Ma-na'sinmagagu   käda patgun
          agr.Pass-make.be.without.clothes each child
          Each child was made to undress

Finally, we do find Ss with more than one QNP binding arguments of the same predicate:

(44)   Todu i   taotao gi   ha:lum kuattu mang-ue.kuentus dos na   lingguahi.
       All   the person Loc inside room   agr-speak.Prog   two Lnk language
       Every person in the room speaks two languages. ('every' wide scope)

1.15 Scope Ambiguities

Can two or more arguments of a given predicate be bound simultaneously by QNPs? If so do you get scope ambiguities?

(45)   a. Some editor read every manuscript   (Scope ambiguous in English)

Subject Wide Scope (SWS): There is one editor x who read all the ms
Object Wide Scope (OWS): Each manuscript is such that at least one
    editor read it (possibly different editors read different manuscripts)

b. Three teachers graded 100 exams

?? SWS: There are 3 teachers each of whom graded 100 exams
?? OWS: There are 100 exams such that each teacher graded them
    Group: There is a group of 3 teachers and a group of 100 exams
    and the group of teachers graded the group of exams   (Natural)

In (22) we saw that *apiece* and binominal *each* force a distributive (SWS) reading, whereas the adverbial *between them* forces group (collective) readings,
In English, modified numerals in object position tend to force narrow scope, but an appropriate existential S will force object wide-scope:

c. Each student read one Shakespeare play over the vacation (Scope
                                                              ambiguous)
d. Each student read at least one Shakespeare play   (Just SWS)
e. There was one Shakespeare play that each student read (Just OWS).
f. In English, NPs which are not increasing tend to be interpreted in situ

No politician kissed every baby at the fair   (Just SWS)
Every politician kissed no baby at the fair   (Just SWS)
Just one pupil answered every question on the exam   (Just SWS)
All but one pupil answered at least one question   (Just SWS)

In English different lexical choices of quantifier may trigger different judgments of scope (non-)ambiguity even when the Qs are near synonyms.

g. Some editor read all the manuscripts   (Just SWS)
Some editor read every/each manuscript   (Scope Ambiguous)
A picture of all the students   [Maybe one picture, many students]
A picture of each student   [As many pictures as students]

some friend of every senator   (Scope ambiguous)
    some x such that x is a friend of every senator (*Some* wide scope)
    for every senator y, some friend of y (*Every senator* wide scope)

     h. Scope ambiguity asymmetries in wh-questions.

       1. Which student answered the most / all the questions? (Just SWS)
       2. a. Which question did each student answer? (Scope Ambiguous)
          SWS: For each student x, identify the question x answered
          OWS: Identify a unique question y such that each student
            answered y.
       b. Which question did all the students answer?   (Just OWS)

(46)   Ambiguity between nominal and verbal quantifiers (Gil 1993)

     Two boys sang three times
       SWS: There are two boys who sang three times each
       OWS: On three occasions there were two boys who sang

(47)   Quantifier-Negation scope. In preference in English quantified subjects scope semantically over negation, as in (48a,b). (48a′,b′) forces negation to scope over the subject:

(48)   a. Every student in my class doesn't smoke   (Every > not)
     a′. Not every student in my class smokes   (Not > every)

     b. More than four teachers didn't sign the petition   (Four > not)
     b′. Not more than four teachers signed the petition   (Not > four)

   (Short universal subjects are ambiguous. *Everyone doesn't know that* might be used to mean that no one knows that or simply that not everyone knows that.) In contrast, objects in English naturally scope under negation: *Ed hasn't read more than 30 Shakespeare plays* may be true and is not used to mean that there are 30 such plays he hasn't read, which may be false.

1.16 One to One Dependency

(49)   a. For every drop of rain a flower grows   (Boolos 1981)
     b. Every acorn we planted grew into a big oak tree
            (Lee et al. 1999, see Jackendoff 1983, Gruber 1965)

1.17 Rate Phrases

(50)   a. John washes his face *three times a day*
     b. I run *twenty kilometers a day*

1.18 Some Concluding Spot Checks

(51) Does your L

    a. have at least one monomorphemic *all*?
    b. have at least one monomorphimic *one*?
    c. have at least one monomorphemic value judgment *many*?
    d. have a monomorphemic Det translating *no?*
    e. make a lexical or phrasal distinction between a distributive and a collective universal quantifier? E.g. English distinguishes *all* (*the*) from *each* / *every*. Mohawk (Baker 1995 distinguishes *akwéku* 'all' and *skátshu* 'each'; Malagasy (Keenan 2008) has 7 or 8 universal type quantifiers.

(52) In your L are A-quantifiers morphosyntactically more complex than D-ones (Gil 1993)?
frequently, *occasionally* are built from *frequent*, *occasional*. *Three times*, *many times* even have the internal structure of an NP. But *often* and *seldom* are not more complex than *many* and *few*. And we appear to have some semantic back-formation, with the adjective interpreted as a function of the adverb:

(53) a. He is a frequent visitor at the zoo =   He visits the zoo frequently
     b. An occasional sailor walked by = Occasionally a sailor walked by
                                              (Stump 1981)

    Note that in (53b) the right hand S is scope ambiguous, the left one only has *occasionally* with wide scope – so the sailors may vary with the occasions.

(54) Does your L have a simple translation of *only*? If so does it apply in the same form in the following three contexts?

    a. Only John came to the party
    b. Only five students came to the lecture
    c. John only sang, he didn't also dance

References

Bach, Emmon, Eloise Jelinek, Angelika Kratzer, and Barbara H. Partee (eds.). 1995. *Quantification in natural languages*, Vols. 1 and 2. Dordrecht: Kluwer Academic Publishers.

Baker, Mark. 1995. On the absence of certain quantifiers in Mohawk. In Bach et al. (1995), Vol I. 13–21.

Beghelli, Filippo. 1994. Structured quantifiers. In *Dynamics, polarity, and quantification*, eds. M. Kanazawa and C. Piñón, 119–147. Stanford, CA: CSLI.

Betts, Gavin. 1986. *Latin (Teach yourself books)*. London: Hodder Headline Plc.

Bittner, Maria, and Naja Trondhjem. 2008. Quantification as reference: Evidence from Q-verbs. In Matthewson (2008), 7–67.

Boolos, George. 1981. For every A there is a B. *Linguistic Inquiry* 12:465–466.

Bruening, Benjamin. 2008. Quantification in Passamaquoddy. In Matthewson (2008), 67–105.

Chung, Sandra. 1998. *The design of agreement*. Chicago, IL: University of Chicago Press.

Chung, Sandra. 2008. Possessors and definiteness effects in two Austronesian languages. In Matthewson (2008), 179–225.

Etxeberria, Urtzi. 2008. On Basque quantification and on how some languages restrict their quantificational domain overtly. In Matthewson (2008), 225–277.

Evans, Nick. 1995. Q-quantifiers and scope in Mayali. In Bach et al. (1995), Vol I. 207–271.

Gil, David. 1982. *Distributive numerals*. PhD dissertation, UCLA, Los Angeles, CA.

Gil, David. 1988. Georgian reduplication and the domain of distributivity. *Linguistics* 26:1039–1065.

Gil, David. 1993. *Nominal and verbal quantification. Sprachtypologie und Universalienforschung*, 46.4, 275–317. Berlin: Walter de Gruyter.

Gil, David. 2005. Distributive numerals. In Haspelmath et al. (2005), 222–226.

Gruber, Jeffrey. 1965. *Studies in Lexical Relations*. PhD dissertation, MIT. Reprinted in *Lexical Structures in Syntax and Semantics*. North-Holland, Amsterdam.

Haspelmath, Martin, Matthew S. Dryer, David Gil, and Bernard Comrie (eds.). 2005. *The World Atlas of Language Structures* (WALS). Oxford; New York, NY: Oxford University Press.

Higginbotham, James. 1994. Mass and count quantifiers. *Linguistics and Philosophy* 17:447–480. Reprinted in Bach et al. Vol. II.

Jackendoff, Ray. 1983. *Semantics and cognition*. Cambridge, MA: MIT Press.

Keenan, Edward L. 1987. Multiply-headed NPs. *Linguistic Inquiry* 18.3:481–490.

Keenan, Edward L. 1992. Beyond the Frege boundary. *Linguistics and Philosophy* 15:199–221.

Keenan, Edward L. 1996. Further beyond the Frege boundary. In *Quantifiers, logic, and language*, eds. J. Van der Does and J. Van Eijck, 179–201. Stanford, CA: CSLI.

Keenan, Edward L. 2008. Quantification in Malagasy. In Matthewson (2008), 319–353.

Keenan, Edward L., and Larry S. Moss. 1984. Generalized quantifiers and the expressive power of natural language. In *Generalized quantifiers in natural language*, eds. J. van Benthem and A. ter Meulen, 73–127. Dordrecht, Holland: Foris Publications.

Lee, Felicia. 2008. On the absence of quantificational determiners in San Lucas Quiavini Zapotec. In Matthewson (2008), 353–383.

Lee, Thomas Hun-Tak, Virginia Yip, and Wang Chuming. 1999. Inverse scope in Chinese-English interlanguage. *Lingua Posnaniensis* XLI:49–66.

Matthewson, Lisa. 2001. Quantification and the nature of crosslinguistic variation. *Natural Language Semantics* 9:145–189.

Matthewson, Lisa. 2008. *Quantification: A cross-linguistic perspective*. Emerald North-Holland Linguistic Series, Vol. 64. Bingley, UK.

Moltmann, Friederike. 1995. Exception sentences and polyadic quantification. *Linguistics and Philosophy* 18:223–280.

Moltmann, Friederike. 1996. Resumptive quantifiers in exception phrases. In *Quantifiers, deduction and context*, eds. H. De Swart, M. Kanazawa, and C. Piñón, Stanford, CA: CSLI.

Munro, Pamela. 1984. Floating quantifiers in Pima. In Eung-Do Cook and Donna Gerdts (eds.). *The Syntax of Native American Languages*, 269–287. New York, NY: Academic Press.

Partee, Barbara H. 1995. Quantificational structures and compositionality. In Bach et al. (1995), 541–601.

Peters, Stanley, and Dag Westerståhl. 2006. *Quantifiers in language and logic*. Oxford: Oxford University Press.

Pratt, Ian, and Nissim Francez. 2001. Temporal prepositions and temporal generalized quantifiers. *Linguistics and Philosophy* 24(2):187–222.

Safir, K., and T. Stowell. 1988. Binominal 'each'. In *Proceedings of NELS 18*, 426–450, Amherst, MA.

Stump, Gregory. 1981. The interpretation of frequency adjectives. *Linguistics and Philosophy* 4:221–257.

Suihkonen, Pirkko. 2007. *On Quantification in Finnish*. Muenchen: Lincom GmbH.

de Swart, Henriëtte. 1996. Quantification over time. In van der Does and van Eijck (1996), 311–337.

Szabolcsi, Anna. 1997. Quantifiers in pair-list readings. In *Ways of scope taking*, ed. A. Szabolcsi, 311–347. Dordrecht: Kluwer.

Tyhurst, James. 1989. A semantic characterization of referentially dependent Noun Phrases. Ms. Department of Linguistics, UCLA. Presented at the Winter Meetings of the Linguistic Society of America.

van der Does, Jaap, and Jan van Eijck. 1996. *Quantifiers, logic, and language*. Stanford, CA: CSLI.

Vieira, Marcia Damaso. 1995. The expression of quantificational notions in Asurini do Trocara: Evidence against the universality of Determiner quantification. In Bach et al. (1995), Vol II. 701–721.

von Fintel, Kai. 1993. Exceptive constructions. *Natural Language Semantics* 1:123–148.

WALS (see Haspelmath et al. (2005) above).

Zimmermann, Malte. 2002. *Boys buying two sausages each*. PhD dissertation, University of Amsterdam, Amsterdam.