Section 4: Quantification in Common Speech

In this system of syllogistic logic, we recognize only certain standard quantifiers, namely 'all', 'no', 'almost all', 'few', 'most', 'many', and 'some'. In common speech, however, there seems to be an endless variety of quantifiers. The decision to count certain words as standard is really rather arbitrary. Some logicians prefer to use 'every' rather than 'all' as the standard quantifier word for Universal affirmative propositions. However, the reason for having standard words is to facilitate the creation and use of standardized rules. Hence, in any system of logic, some words or other must be recognized as standard, and the rest must be relegated to second-class status.

In order to put a sentence into correct categorical form, these various quantifiers must be replaced with a standard quantifier, and this should be done without substantially changing the meaning of the original sentence. This might seem to be an impossible task. Surely, capturing the meaning of all the quantifiers found in common speech would require many more than five quantification levels! However, this turns out not to be true. If we set aside proportions that can be expressed with mathematical exactness, the number of quantification levels that are typically expressed in common speech is quite small. It is wider than can be captured by the classical Aristotelian quantifiers; but, with a few exception at the lower end of the quantification scale, the five standard quantifiers of this system do a remarkably good job of expressing the levels of quantification typically used in common speech, for which reason they deserve to be called the "common speech quantifiers." In this section, I have tried to organize the numerous quantifier expressions of common speech into plausible categories, and indicate which standard quantifier can best be used to express each one.

I. Basic Quantifiers

Two groups of non-standard quantifiers, the common synonyms and the adverbial quantifiers, can generally be replaced with a standard quantifier without much difficulty. That gives us a good place to start.

Common Synonyms

For every standard quantifier word, there are a number of synonymous words and phrases. For each level of quantification, here are the important common synonyms that I am aware of. But, no list ever seems to be definitive. Can you think of others?

Universal:	'every', 'any', 'the only'. Also 'every one of the', 'any one of the', 'each one of the', and 'each'. Negative propositions sometimes use 'none'.
Predominant:	Universal quantifier words used with a 'hedge' word, such as 'almost', 'nearly', 'practically', 'just about,' 'pretty much', 'basically', 'essentially', and 'virtually'. Negative propositions use the negative hedge words 'scarcely' and 'hardly' with 'any', or an affirmative hedge word with 'no'.
Majority:	'the majority of', 'more than half of', 'over half of'.

Common: 'a lot of', 'a bunch of', 'a heap of', 'a mess of', 'tons of', 'loads of', 'a good amount of', etc.

Particular: 'a few', 'a couple', 'several'.[1] Also 'a fair amount of', 'a decent amount of', 'a handful of', 'a bit', 'more than none', etc.

Examples:

'Every cloud has a silver lining'.

becomes...

'All [clouds] are [things that have a silver lining]'.

All C are S.

C - clouds.
S - things that have a silver lining.

'Nearly every applicant is qualified'.

becomes...

'Almost all [applicants] are [qualified applicants]'.

Almost all A are Q.

A - applicants.
Q - qualified applicants.

'A lot of people deserve to be thanked'.

becomes...

'Many [people] are [people who deserve to be thanked]'.

Many P are D.

P - people.
D - people who deserve to be thanked.

Special Cautionary Notes:

(1) Be careful not to confuse 'few' and 'a few'. 'Few' means 'not many' and is the standard quantifier word for Predominant negative propositions. 'A few' has an affirmative meaning and is a Particular quantifier synonymous with 'some'. English is a messy language. This will not be the only pair that will cause trouble.

(2) Notice that the quantifier words 'any', 'every', 'no' and 'some' sometimes combine with a dummy word to form a compound, as in 'everything' and 'nothing'. In such a case, split the compound apart, and treat the pieces separately. Sometimes it makes sense to replace the dummy word with an equivalent dummy word. For example, 'nobody' means 'no persons' rather than 'no bodies'. 'Somewhere' means 'some places' rather than 'some wheres'.

Exercises:
A. Replace the non-standard quantifier in each sentence with a standard quantifier that has the same meaning. (These sentences are already in categorical form, except for the quantifier.)

1. Any creature from the Deneb system is a being with enhanced empathic powers.

2. Almost any creature from Altair is a creature with trilateral symmetry.

3. The only creatures with trilateral symmetry from the vicinity of the Horse-head Nebula are three-footed algosprilliums.

4. Quite a few intergalactic diplomats are creatures from the Deneb system.

5. Several intergalactic diplomats are creatures with trilateral symmetry.

B. Put the following propositions into categorical form, and replace the non-standard quantifier with a standard quantifier that has the same meaning.

1. The majority of dragons are ferocious.

2. Scarcely any dragon can be trusted.

3. A lot of dragons eat whatever they can get their claws into.

4. A few dragons are unfriendly.

5. Almost no dragons actually breathe fire.

Adverbial Quantifiers

Although adverbs are not generally used to express quantification, some adverbs, especially adverbs of time, can be used in this way. For example consider the sentence, "White cats are sometimes deaf." This sentence contains the adverb 'sometimes', but it hardly makes sense that white cats spend some of their time being deaf while spending the rest of their time with normal hearing. The sentence can best be stated in categorical form as, "Some white cats are deaf cats." Other sentences may be ambiguous. For example, "Shopkeepers are often bad tempered." Does this mean that all shopkeepers are bad tempered much of the time; or does it mean that *many* shopkeepers are bad tempered all of the time? Under the first interpretation, the sentence should be stated in categorical form as "All shopkeepers are persons who are often bad tempered." In this case, the word 'often' is not a quantifier, but a simple adverb of time. Under the second interpretation, the word 'often' *does* function as a quantifier, and the sentence should be stated in categorical form as "Many shopkeepers are bad tempered persons." You must use context and your own common sense to decide which interpretation is best.

Here are the adverbial quantifiers I am aware of. Can you think of any others?

Universal:	'always', 'never'.
Predominant:	'predominantly'. Also 'always' and 'never' used with the hedge words: 'almost', 'nearly', 'practically', 'just about', 'pretty much', 'basically', and 'essentially'. Negative propositions also use 'hardly' and 'scarcely' with 'ever'. They also use 'seldom', 'rarely', and idioms such as 'rare as hen's teeth', and 'once in a blue moon'.
Majority:	'primarily', 'usually', 'mainly', 'mostly', 'normally', 'typically', 'chiefly', 'generally', 'principally', 'for the most part', 'by and large'.
Common:	'often', 'frequently', 'commonly'.
Particular:	'sometimes', 'occasionally', 'from time to time', 'once in a while', 'every so often'.

Examples:

'Rattlesnakes are frequently found in dry climates'.

becomes...

'Many [rattlesnakes] are [snakes found in dry climates]'.

Many R are D.

R - rattlesnakes.
D - snakes found in dry climates.

'By and large, rattlesnakes avoid contact with humans'.

becomes...

'Most [rattlesnakes] are [animals that avoid contact with humans]'.

Most R are A.

R - rattlesnakes.
A - animals that avoid contact with humans.

Special Cautionary Notes:

The chief problem with adverbial quantifiers is that they are not usually stated at the beginning of the sentence. Hence, they are easy to miss. You may remember, from Section 1, that we generally interpret a missing quantifier as 'All'. But, if the quantifier is adverbial, the sentence may *appear* to have a missing quantifier, when in fact the quantifier has only been deferred to a position somewhere deeper in the sentence. If there is no quantifier at the beginning of a sentence, check for adverbial quantifiers before concluding that the quantifier is missing.

Exercises:
A. Replace the non-standard quantifier in each sentence with a standard quantifier that has the same meaning. (These sentences are already in categorical form, except for the quantifier.)

1. Diplomats from the Deneb system are usually accomplished linguists familiar with a variety of languages spoken throughout the galaxy.

2. Diplomats from the Deneb system are always experts on intergalactic protocol.

3. Creatures with bad breath are rarely successful intergalactic diplomats.

4. Frequently, experts on intergalactic protocol are accomplished linguists familiar with a variety of languages spoken throughout the galaxy.

5. Once in a while, experts on intergalactic protocol are creatures with bad breath.

B. Put the following propositions into categorical form, and replace the non-standard quantifier with a standard quantifier that has the same meaning.

1. Dragons are rarely satisfied.

2. Dragons are usually found near lakes rather than in caves.

3. Knights quite often go upon a quest at least once in their lives.

4. Dragons almost never eat princesses for breakfast as a regular part of their diet.

5. Knights who have faced the green ogre of Bonwick, quested after the fearsome beast of Kil ap Arath, and fought in mortal combat against the foes of Queen Guinevere are occasionally tenderhearted.

Mixed Exercises:
A. Put the following propositions into categorical form, and replace the non-standard quantifier with a standard quantifier that has the same meaning.

1. Every dog has his day.

2. Harsh words are just about never justified.

3. A watched pot never boils.

4. Anything worth doing is worth doing well.

5. The shoemaker always wears the worst shoes.

6. The only good mosquito is a dead mosquito.

7. Nothing lasts forever.

8. Nobody doesn't like Sara Lee.

9. The rain in Spain stays mainly on the plain.

10. In Hertford, Hereford, and Hampshire hurricanes hardly ever happen.
{Hint, use 'hurricanes' as the subject term.}

B. Put the following pairs of propositions into categorical form as necessary, and replace the non-standard quantifier with a standard quantifier having the same meaning. Create a key using only two letters. Re-write each categorical proposition as a schema using that key. If possible (and as necessary), use the Immediate Inferences to make sure the schemas have matching subjects and predicates. Then use the Square of Opposition to determine how the two schemas are related. Fill in the blank with 'true', 'false', or 'undetermined'.

1. "Every dog has his day," is true, so "The majority of dogs don't have their day," is_____.

2. "Almost no cat lovers attended this year's Westminster Dog Show," is false, so "A lot of cat lovers attended this year's Westminster Dog Show," is_____.

3. "The majority of creatures that have their day are not dogs," is false, so "Quite a lot of dogs don't have their day," is_____.

4. "A cat has hardly ever won the Westminster Dog Show," is true, so "As a general rule, cats don't win the Westminster Dog Show," is_____.

5. "Any dog that attends this year's Westminster Dog Show is sure to have his day," is true, so "The only dogs that aren't sure to have their day are those that didn't attend this year's Westminster Dog Show," is_____.

II. Special Cases

You may be thinking that this list of non-standard quantifiers is already quite long and confusing. I regret to tell you that there is more. The synonyms and adverbial quantifiers make up the bulk of the quantifiers regularly encountered in common speech, but there are numerous other special cases that need to be considered.

Negative Exceptive Quantifiers

By far the most important problem in quantification involves a small group that may be called the **negative exceptives**. This includes 'none except', 'none unless', 'none but', 'only', 'just', and 'alone'.[5] These words are always treated as Universal, *but with a twist*. 'Only S are P' does *not* means 'All S are P'. It means, 'All non-S are non-P.' For example, at an exclusive club where only men are eligible to join, it is not necessarily true that *all* men are eligible to join.

Some men may also be excluded, on grounds of race or religion. What the club policy states is – not that all men are eligible to join – but that all *women* (non-men) are *ineligible*!

There are actually three acceptable ways to render a negative exceptive quantifier:

(1) All non-S are non-P.
(2) All P are S.
(3) No non-S are P.

Using the Immediate Inferences, you can easily see that these three formulations are equivalent to each other. Use whichever formulation seems most intuitive to you, or most natural given the example you are working with.

The reason the negative exceptives are so important is that they are frequently used in English, and frequently misunderstood (or misrepresented). The word "only" is especially prone to abuse. Students have a remarkably difficult time understanding that "only" (by itself, without the word "the" in front of it) is *not a synonym for 'all'*. This is an old problem, and every logic textbook struggles to explain it. In every class I have ever taught, roughly half the class seem to be incapable of grasping the concept: '*ONLY' DOES NOT MEAN ALL*!! I get tired of repeating myself, so please go back and re-read the previous three paragraphs again. Read them as many times as you need to, and study the examples carefully. There will be a test later, and only people who understand how to use negative exceptives will pass it!

Examples:

'Only unimportant people are honored for their mediocrity'.

becomes...

'All [important people] are [people not honored for their mediocrity]'.

All I are non-H.

I - important people (i.e. non-unimportant people).
H - people honored for their mediocrity.

In this example, notice that the subject already contains a negative element. Rather than introducing the clumsy term 'non-unimportant people' it is better to remove the negative that is already present.

'None but the best are admitted to this school'.

becomes...

'All [the non-best persons] are [persons not admitted to this school]'.

All non-B are non-A.

B - the best persons.
A - persons admitted to this school.

Exercises

A. Replace the non-standard quantifier in each sentence with a standard quantifier that has the same meaning. (These sentences are already in categorical form, except for the quantifier.)

1. None except employees are people entrusted with a key to the restroom.

2. Only non-Jews are members in good standing at the Brook Hollow Country Club.

3. No people are permitted to join the Brook Hollow Country Club, unless they are members of the Republican Party.

4. Just white people are people permitted to ride at the front of the bus.

5. Muslim souls alone are souls not permitted to enter Heaven.

B. Put the following propositions into categorical form, and replace the non-standard quantifier with a standard quantifier that has the same meaning.

1. Only people who eat chocolate chip cookies for breakfast get fat.

2. None but hand-picked coffee beans are used in Maxwell House Coffee.

3. Just those who have received a vaccination are safe from the pandemic.

4. Fox News alone reports the real facts concerning what is going on in the world.

5. Only people who don't watch Fox News don't know what is going on in the world.

Cardinal Numbers

Some propositions have quantifiers that employ ordinary cardinal numbers. Examples include, 'Five cows are lying under a tree', 'A hundred people were killed in the crash', and 'Twenty students passed the exam'. Such quantifiers may be called cardinal quantifiers. It is possible to develop a complete theory of cardinal quantifiers,[2] but the quantifiers in *this* system represent proportions rather than exact numbers. We are not concerned with how many, but with how many *relative to the total.*

Occasionally, the number may be used to emphasize a proportional quantifier, usually 'many', as in "Many hundreds of lives could have been saved." In other cases, a proposition will use a number, but also use words such as 'the', 'these', and 'those' to inform us that this number is, not just *some portion* of a total, but *is* the total. In effect, the entire group is treated as an "individual," as explained below. The word 'both' also tells us that the subject has two members, but also that it has *only* two. In that case we may treat the number as 'all'.

However, sometimes a proposition will have no information at all about the size of the number relative to the entire group. In that case, *regardless of the size of the number*, we have no choice but to regard it as meaning "some."

Examples:

'The twelve apostles are men.'

becomes...

'All [the twelve apostles] are [men].'

All A are M. A - the apostles
M – men

'A billion dollars were spent on the MX missile'.

becomes...

'Some [dollars] are [dollars that were spent on the MX missile]'.

Some D are S. D - dollars.
S - dollars that were spent on the MX missile.

Absent Quantifiers

When a proposition has *no* quantifier at the beginning of the sentence, the first thing to do is look for an adverbial quantifier. Propositions rarely have no quantifier at all. However, there are some cases in which there genuinely is no quantifier in the sentence.

The most important case is when the subject term is an **individual** of some type or other. We have already considered (in Section 1) the most obvious of these cases, namely those in which the subject term is a named person. But individuals need not necessarily have names. Individuals can also be identified by the use of definite articles: 'the table', 'this pen', 'that house'. Articles such as 'a', 'an', 'the', 'that', 'these', and 'those', are not quantifiers. Rather they indicate an individual *or group of individuals* that we are talking about. In such sentences, are normally talking about *all* of the individuals indicated. Hence, we would use the quantifier "all," even though it is not explicitly stated. An "individual" could also be a collection of objects, such as a committee, or a club. Individuals may even be abstractions, such as 'truth', 'beauty', 'justice', 'peace', etc. Mass nouns, such as 'sugar' and 'water' can also be treated as individuals. All such "individuals" must be treated as having Universal quantification.[4]

Example:

'Truth is the first casualty of war'.

becomes...

'All [things that are truth] are [things that are the first casualty of war]'.

All T are C. T - truth.
C - the first casualty of war.

However, in some rare cases, a statement with a missing quantifier must be interpreted as Particular rather than as Universal. Unfortunately, I am not aware of any rule to follow in spotting such cases, other than simply understanding the context. Use Universal quantification where it makes sense to do so; but, if Universal quantification does not make sense, then Particular quantification will have to do.

Examples:

'Cows are animals'.	*becomes...*	'All [cows] are [animals]'.
All C are A.	C – cows A – animals	
'Cows are in the pasture'.	*becomes...*	'Some [cows] are [animals in the pasture]'.
Some C are A.	C – cows A – animals in the pasture	
Could it be that every single cow in the entire world is now in that particular pasture?		

'A cow is an animal'.	*becomes...*	'All [cows] are [animals]'.
All C are A.	C – cows A – animals	
'A cow ate mother's rose bush'.	*becomes...*	'Some [cows] are [animals that ate my mother's rose bush]'.
Some C are A.	C – cows A – animals that ate my mother's rose bush.	
Could it be that every cow who ever existed ate mother's rose bush?		

Exercises:
A. Replace the non-standard quantifier in each sentence with a standard quantifier that has the same meaning. (These sentences are already in categorical form, except for the quantifier.)

1. Xymmt is an intergalactic diplomat from the Deneb system.

2. Three-footed algosprilliums are creatures with trilateral symmetry.

3. A three-footed algosprillium is a member of the current diplomatic mission from the Deneb system.

4. Those three creatures posing as intergalactic diplomats from Alpha Centauri are actually intergalactic assassins.

5. A creature with enhanced empathic powers, who also happens to be an accomplished linguist familiar with a variety of languages spoken throughout the galaxy, is a natural diplomat.

B. Put the following propositions into categorical form, and replace the non-standard quantifier with a standard quantifier that has the same meaning.

1. Seven brave knights went on a quest to slay the fearful three-headed dragon of Quotha.

2. The test of a true knight is whether he can look at his own face in the Mirror of Truth.

3. Courage in the face of adversity is a necessary attribute for a true knight.

4. True knights are faithful to the vows of knighthood.

5. A true knight would do almost anything to please Queen Guinevere.

Mixed Exercises:
A. Put the following propositions into categorical form as necessary, and replace the non-standard quantifier with a standard quantifier that has the same meaning.

1. Sixty billion creatures are residents of Alpha Centauri.

2. Planetary systems that maintain friendly diplomatic relations with the Earth have a shared interest in peaceful interspace commerce.

3. None but accomplished linguists are qualified to be entrusted with sensitive intergalactic negotiations.

4. Both of the diplomats from the Deneb system are accomplished linguists.

5. Only planetary systems that have a shared interest in peaceful interspace commerce maintain friendly diplomatic relations with the Earth.

6. Money is the root of all evil.

7. A fool and his money are soon parted.

8. The three rules of real estate are location, location, location.

9. Those who live by the sword die by the sword.

10. The best things in life are free.

B. Put the following pairs of propositions into categorical form as necessary, and replace the non-standard quantifier with a standard quantifier having the same meaning. Create a key using only two letters. Re-write each categorical proposition as a schema using that key. If possible (and as necessary), use the Immediate Inferences to make sure the schemas have matching subjects and predicates. Then use the Square of Opposition to determine how the two schemas are related. Fill in the blank with 'true', false', or 'undetermined'.

1. "Both of the paying guests don't have an alibi for the time of the murder," is true, so "Those who have an alibi for the murder aren't paying guests", is_____.

2. "Even guilty people sometimes have a plausible alibi," is false, so "Only people who don't have a plausible alibi are guilty," is_____.

3. "People who have an alibi for the time of the murder are innocent," is true, so "People who have an alibi for the time of the murder are generally guilty," is_____.

4. "None are suspected of committing the murder, except paying guests," is false, so "Only those who aren't paying guests are suspected of committing the murder," is_____.

5. "Twenty-five paying guests are suspected of committing the murder," is true, so "A lot of people suspected of committing the murder are paying guests," is_____.

III. Modifiers

Sometimes the addition of a word or phrase can completely change the meaning of a quantifier. These modifying words appear to fall into three groups: **intensifiers**, which strengthen the meaning of a quantifier (or attempt to do so), **de-intensifiers**, which seem to weaken the meaning of a quantifier, but actually have the effect of changing the interpretation of the quantifier from "minimal" to "maximal," and **negatives**, which have the effect of denying or contradicting the quantifier altogether.

Intensifiers

Intensifiers are words that seem to raise the level of quantification. These include 'quite', 'more than', and – in the case of cardinal numbers – 'at least'. When used with the Particular quantifiers (including cardinal numbers), an intensifier can change the quantifier into a Common quantifier. Phrases such as 'quite a few', 'quite a bit', etc. are understood as meaning 'many' rather than 'some'. 'More than' can have the same effect: 'more than a few', 'more than a couple'. 'More than' can also add a rhetorical intensity to cardinal numbers which changes how we interpret them. 'A million' by itself is neither large nor small. It is just 'some'. But '*more than* a million' stresses the largeness of the number, and seems to suggest that it is large enough to be considered 'many'. 'At least a million' also seems to be mean 'many'.

Intensifiers can also be added to some Common quantifiers, but, while this certainly has the effect of *stressing* the quantity, it does not have the effect of *raising the level* of quantity. For example, 'quite a lot', 'quite a bunch', 'a whole lot', and 'a whole bunch', each stress that we mean '*many*', but they all still fall short of meaning 'most', They continue to mean just 'many'.

Example:

More than a couple soldiers volunteered for the assignment'.

becomes...

'Many [soldiers] are [persons who volunteered for the assignment]'.

Many S are V. S - soldiers.
V - persons who volunteered for the assignment.

De-intensifiers

De-intensifiers are words that seem to *lower* the level of quantification. These include 'only,' 'just', 'at most', 'barely', 'fewer than', 'less than', etc. They are added to Particular quantifiers, but Particular quantifiers are already at the bottom of the Square of Opposition, so de-intensifiers actually have the effect of changing the interpretation from minimal to maximal (see Section 1, Interpretation of Quantifiers). The result is that Particular quantifiers are turned into Predominant quantifiers: 'only some', 'just a few', 'less than a couple', and the adverbials, 'only sometimes', 'just occasionally', 'at most once in a while', etc. When applied to an affirmative statement, the quantifier becomes "few"; when applied to a negative statement, the quantifier becomes "almost all." Again, remember that raw numbers generally have to be treated as Particular quantifiers. Predictably, adding a de-intensifier will change the number into a Predominant quantifier, as in. "Just five people survived the crash." Five, by itself is neither small nor large. Adding a de-intensifier emphasizes the smallness of the number, and seems to justify treating it as "few."

Example:

'Only some people with no college diploma get decent jobs'.

becomes...

'Few [people with no college diploma] are [people who get decent jobs]'.

Few non-D are J. D - people with a college diploma.
J - people who get decent jobs.

Exercises:
A. Replace the non-standard quantifier in each sentence with a standard quantifier that has the same meaning. (These sentences are already in categorical form, except for the quantifier.)

1. Only a few creatures from Alpha Centauri are beings with enhanced empathic powers.

2. At least seventy creatures from Alpha Centauri are visitors to the United Nations this year.

3. Quite a few alien beings are terrible and sadistic killers.

4. A whole bunch of alien beings are guests at the President's private residence.

5. Less than a dozen terrible and sadistic killers are creatures with enhanced empathic powers.

B. Put the following propositions into categorical form, and replace the non-standard quantifier with a standard quantifier that has the same meaning.

1. Only a couple dragons have been spotted in England in the past two or three centuries.

2. More than seven knights have set forth to slay the terrible three-headed giant of Carolingia, never to return.

3. More than a smattering of evil monsters haunt the dreaded Wilderness of Despair.

4. Just a few knights have returned from the perilous quest for the ring of enchantment.

5. Quite a lot of students become discouraged when they first study logic.

Negatives

Adding the word 'not' to the front of a quantifier also has an understandably profound effect on meaning. There is a definite pattern to quantifier negations. Because of the relations on the Diagram of Opposition, affirmative Universals become Particular negatives (with the exception of 'any'). That is, "Not all snakes are dangerous animals," becomes "Some snakes are *not* dangerous animals." Likewise, denying a Common affirmative quantifier makes it into a Predominant negative. Denying a Predominant negative quantifier makes it into a Common affirmative.

Universal negative:	'not any'.
Predominant negative:	'not many', 'not a lot', 'not more than a few', 'not more than a couple', 'not often', 'not more than [n]'.
Common affirmative:	'not only a few', 'not only a couple', 'not just a few', 'not just a couple', 'no (or not) less than', 'not less than [n]'. Also the adverbials: 'not just occasionally', 'not just sometimes', etc.
Particular negative:	'not all', 'not every'.

Examples:

'Not many kitchen utensils sold on television after midnight come with a money-back guarantee'.

becomes...

'Few [kitchen utensils sold on television after midnight] are [things that come with a money-back guarantee]'.

Few K are C. K - kitchen utensils sold on television after midnight.
C - things that come with a money-back guarantee.

'Not only a few record albums sold on TV are by has-beens'.

becomes...

'Many [record albums sold on TV] are [record albums by has-beens]'.

Some R are not H. R - record albums sold on TV.
H - record albums by has-beens.

An interesting situation arises when 'not' appears with the negative exceptive words 'only' and 'just'. as in 'Not just parakeets are songbirds'. Put such sentences into categorical form in two steps: (1) Ignore the word 'not'. Eliminate the negative exceptive by treating it as explained in the section on negative exceptives. The resulting sentence will then have 'not all' as its quantifier. (2) Replace 'not all' with 'some... (are not)...', as just explained above.

Example:

'Not only blacks are subjected to racial prejudice'.

becomes...

'Not all [non-blacks] are [persons not subjected to racial prejudice]'.

which becomes...

'Some [non-blacks] are not [persons not subjected to racial prejudice]'.

Some non-B are not non-S. B-blacks.
S-persons subjected to racial prejudice.

Exercises:
A. Replace the non-standard quantifier in each sentence with a standard quantifier that has the same meaning. (These sentences are already in categorical form, except for the quantifier.)

1. Not many creatures with enhanced empathic powers are terrible and sadistic killers.

2. Not all alien beings are creatures with trilateral symmetry.

3. Intergalactic assassins are not only sometimes sadistic killers.

4. Not any creatures with trilateral symmetry are intergalactic assassins.

5. Intergalactic assassins are not usually welcome dinner guests.

B. Put the following propositions into categorical form, and replace the non-standard quantifier with a standard quantifier that has the same meaning.

1. Not a lot of people feel that ogres are welcome dinner guests.

2. Not any people feel that dragons are welcome dinner guests.

3. Not just a few ogres feel that people are welcome dinner guests.

4. No less than twelve people were eaten by ogres last year.

5. People are not only occasionally terrified when they encounter a dragon.

Mixed Exercises:
A. Put the following propositions into categorical form, and replace the non-standard quantifier with a standard quantifier that has the same meaning.

1. Undercover agents are not often persons of impeccable moral character.

2. More than half of agencies that engage in intelligence gathering activities are agencies that employ undercover agents.

3. Just a few agencies of the Federal Government are agencies that engage in no intelligence gathering activities.

4. International assassins are just occasionally, people who work for intelligence gathering agencies.

5. Agencies of the Federal Government that engage in intelligence gathering activities only occasionally are agencies that hire international assassins.

6. Barely half a dozen existentialist philosophers write novels.

7. Not many people who write novels are existentialist philosophers.

8. Quite a lot of the existentialist philosophers who write novels write depressing novels.

9. Just about all people who write depressing novels are existentialist philosophers.

10. Not every existentialist philosopher who writes novels is depressing.

B. Put the following pairs of propositions into categorical form as necessary, and replace the non-standard quantifier with a standard quantifier having the same meaning. Create a key using only two letters. Re-write each categorical proposition as a schema using that key. If possible (and as necessary), use the Immediate Inferences to make sure the schemas have matching subjects and predicates. Then use the Square of Opposition to determine how the two schemas are related. Fill in the blank with 'true', 'false', or 'undetermined'.

1. "Each one of the non-paying guests doesn't have an alibi for the time of the murder," is false, so "Not any of those who have an alibi for the time of the murder are non-paying guests," is_____.

2. "Only a few innocent people have a plausible alibi," is true, so "Nearly the only people who have a plausible alibi are guilty," is_____.

3. "Once in a while even guilty people have a plausible alibi," is false, so "Not all people who have a plausible alibi are innocent," is_____.

4. "Not many paying guests are suspected of committing the murder," is true, so "Quite a few people who are not suspected of committing the murder are paying guests," is_____.

5. "Not every paying guest is suspected of committing the murder," is false, so "Just a few paying guests are suspected of committing the murder" is_____.

The Word 'Only'

Beware of the word 'only'. As we have seen, it is used in three different ways, with a different meaning in each case. Also remember that, in each of these three cases, it can be used with the negative 'not'.

(1) 'The only' is a synonym for 'all'. So "The only Ss are Ps," means "All S are P." "Ss are *not* the only Ps," means "Some P are not S."

(2) 'Only' can also be used as a de-intensifier. In combination with a Particular quantifier, it becomes a Predominant quantifier. "Only some Ss are Ps," means "Few S are P." "*Not* only some Ss are Ps," means "Many S are P."

(3) 'Only' *by itself* is a negative exceptive quantifier that behaves like 'none except'. "Only Ss are Ps"' means "All non-S are non-P." "*Not* only Ss are Ps" means "Some non-S are not non-P."

Exercises: (Remember that test I warned you about?)
A. Replace the non-standard quantifier in each sentence with a standard quantifier that has the same meaning. (These sentences are already in categorical form, except for the quantifier.)

1. Only a couple of planetary systems are signatories to the Declaration of the Universal Rights of Sentient Beings.

2. Accomplished linguists are not the only creatures qualified to be entrusted with sensitive intergalactic negotiations.

3. Only non-earth creatures are beings with enhanced empathic powers.

4. The only planetary systems that are not signatories to the Declaration of the Universal Rights of Sentient Beings are systems that regularly employ the services of intergalactic assassins.

5. Not only beings without enhanced empathic powers are creatures unqualified to be entrusted with sensitive intergalactic negotiations.

B. Put the following propositions into categorical form, and replace the non-standard quantifier with a standard quantifier that has the same meaning.

1. Only true knights are able to slay dragons.

2. Not only cowards quail before the wrath of Queen Guinevere.

3. Not only a few knights are worthy to be Knights of the Round Table.

4. None but Sir Lancelot can slay the terrible three-headed giant of Carolingia.

5. The only knights in the realm went on a quest for the ring of enchantment.

Ways of Expressing Quantification

The following is a list of non-standard ways of expressing quantification in English, organized to show how these words and phrases can be restated in canonical categorical form. Remember that this list is not complete, and probably cannot be made complete. Language constantly changes, so, as new idioms make their way into common speech, this list will necessarily grow. If you can think of other ways of expressing quantification, feel free to add them to the list.

UNIVERSAL AFFIRMATIVE QUANTIFICATION (All S are P)

a. Synonymous words and phrases:

Every
Any
Each
} S is P.

The only Ss are Ps.

b. Adverbial quantifiers:

S is always P

c. Cases in which the quantifier is omitted:

(1) The quantifier is "understood."

(2) The subject is a singular entity or group:

a. a proper name

b. with a definite or indefinite article:
A(n) S is a P.
The/this/that S is a P.
These/those S's are P's.

c. an abstract noun or a mass noun

c. Numbers:

All [n] of the S's are P's.
Each of the [n] S's is a P's.
Both of the S's are P's.

b. Negative exceptive quantifiers (special):

Only S are P.
Just Ss are Ps.
None but S are P.
None except S are P.
Ss alone are Ps.
} { All non-S are non-P.
All P are S.
No non-S are P.

UNIVERSAL NEGATIVE QUANTIFICATION (No S are P)

a. Synonymous words and phrases:

None of the Ss are Ps.

b. Adverbial quantifiers:

S is never P.

c. Negations:

Not any S are P.

PREDOMINANT AFFIRMATIVE QUANTIFICATION (Almost all S are P)

a. Synonymous words and phrases:

Almost Nearly Practically Just about Pretty much Basically Essentially Virtually	all every any	S is P.
	the only	Ss are Ps.

b. Adverbial quantifiers:

S is { almost / nearly / practically / just about } always P.

PREDOMINANT NEGATIVE QUANTIFICATION (Few S are P)

a. Synonymous words and phrases:

Hardly Scarcely Barely	any S are P.
Almost Nearly Practically Just about	no S are P.

b. Adverbial quantifiers:

S is { almost / practically / just about } never P.

S is { hardly / scarcely / barely } ever P.

S is { seldom / Rarely } P.

c. De-intensifiers:

{ Only / Just / At most } { some / a few / a couple / [n] } S are P.

{ Less than / Fewer than / Barely } { a couple / [n] } S are P.

S are { only / just } { occasionally / sometimes } P.

d. Negations:

No(t) { a lot of / more than a few / more than a couple / many / more than [n] / over [n] } S are P.

S is not often P.

MAJORITY QUANTIFICATION (Most S are P)

a. Synonymous phrases:

{ The majority of / More than half of / Over half of } S are P.

b. Adverbial quantifiers:

S is { primarily / mainly / mostly / usually / principally / normally / typically / chiefly / generally } P.

For the most part, S is P.
By and large, S is P.

COMMON QUANTIFICATION (Many S are P)

a. Synonymous phrases:

{ A lot of / A bunch of } S are P.

Also 'a heap of', 'a mess of', 'tons of', 'loads of', etc.

Numerous Ss are Ps.

b. Adverbial quantifiers:

S is { often / frequently / commonly } P.

c. Intensifiers:

{ More than [n] / Over [n] / At least [n] } S are P.

More than a few S are P.
More than a couple of S are P.

d. Negatives:

Not { only / just } { some / a few / [n] } S are P.

No(t) fewer than [n] S are P.
No(t) less than [n] S are P.

PARTICULAR AFFIRMATIVE QUANTIFICATION (Some S are P)

a. Synonymous words and phrases:

A few
A couple
Several
} S are P.

Also: a fair amount, a decent amount of, a handful of, a bit of, a pinch of, a smidgen of, a fraction of, a portion of, a smattering of, etc.

b. Adverbial quantifiers:

S is { sometimes / occasionally } P.

From time to time
Once in a while
} S is P.

c. Cases in which the quantifier is omitted.

(1) The quantifier is "understood."
(2) Indefinite articles: A(n) S is a P.

d. Numbers:

[n] S are P.

PARTICULAR NEGATIVE QUANTIFICATION (special)

a. Negatives with (most) universal:

Not all S are P.
Not every S is a P.
} Some S are not P.

b. Negatives with negative exceptives:

Not only Ss are Ps.
Not just Ss are Ps.
} Some non-S are not non-P

Exercises:
Put the following pairs of propositions into categorical form as necessary, and replace the non-standard quantifier with a standard quantifier having the same meaning. Create a key using only two letters. Re-write each categorical proposition as a schema using that key. If possible (and as necessary), use the Immediate Inferences to make sure the schemas have matching subjects and predicates. Then use the Square of Opposition to determine how the two schemas are related. Fill in the blank with 'true', false', or 'undetermined'.

1. "Quite a lot of creatures who ride bicycles are ducks" is false, so "Almost the only creatures who ride bicycles are ducks" is_____.

2. "Ducks never compose Shakespearean sonnets" is true, so "A few ducks compose Shakespearean sonnets" is_____.

3. "The majority of ducks are arrogant" is false, so "Quite a few ducks are arrogant" is_____.

4. "Ducks that ride bicycles usually also compose Shakespearean sonnets" is true, so "More than a couple ducks that ride bicycles compose Shakespearean sonnets" is_____.

5. "Not all creatures who compose Petrarchan sonnets are ducks" is false, so "Almost no creatures who compose Petrarchan sonnets is a duck" is_____.

6. "Ducks rarely ride bicycles" is true, so "Ducks generally ride bicycles" is_____.

7. "A lot of ducks are arrogant" is false, so "Not any ducks are arrogant" is_____.

8. "By and large, ducks that compose Shakespearean sonnets do not ride bicycles" is true, so "Scarcely any ducks that compose Shakespearean sonnets do not ride bicycles" is_____.

9. "Just about the only creatures who ride bicycles are ducks" is false, so "From time to time, creatures who ride bicycles are not ducks" is_____.

10. "Not every creature that composes Shakespearean sonnets is a duck" is true, so "Almost every creature that composes Shakespearean sonnets is a duck" is_____.

11. "Nearly every duck likes bread crumbs" is true, so "Ducks quite often don't like bread crumbs" is_____.

12. "Ducks are occasionally non-arrogant" is false, so "Not only some ducks are arrogant" is_____.

13. "Several ducks that ride bicycles also compose Petrarchan sonnets" is true, so "Ducks that compose Petrarchan sonnets quite frequently also ride bicycles" is_____.

14. "Only non-ducks ride bicycles" is false, so "Creatures that ride bicycles are often ducks" is_____.

15. "The only creatures that ride bicycles are non-ducks" is true, so "Only a few ducks ride bicycles" is_____.

Notes

[1]Most speakers of English recognize subtly different meanings among these words. There is some disagreement among speakers over whether 'some' means 'at least one' or 'at least two or three'. Trained logicians choose the former; naive opinion tends toward the latter. There is general agreement that 'a couple' means 'at least two', 'a few' means 'at least three', and 'several', means 'at least three or four'. A truly sophisticated syllogistic logic would probably be able to take account of these differences. However this syllogistic is not sufficiently sophisticated, and is constrained to treat these words as synonymous expressions, all of which mean, essentially 'an unspecified quantity greater than none'.

[2]In modern symbolic logic, cardinal quantifiers are explained in terms of Particular (or rather "Existential") quantification, plus identity.

[3]In order to avoid potential abuse it must be remembered that, while a numeric quantity can be turned into an ordinary language proportional quantity, a proportional quantifier cannot be turned into a numeric quantity; and that in any case treating numeric quantities as proportional quantities is a make-shift procedure in the first place, but the best we can do without getting into serious complexities. As an example of potential abuse, notice that the inference, 'More than 100 S are P, therefore 200 S are P' is invalid. But this would be expressed in proportional quantifiers as 'Many S are P, therefore some S are P', which is valid. However, no harm is done: while we can make '200 S are P' into 'Some S are P', we can't make 'Some S are P' into '200 S are P'.

[4]Some logicians prefer to treat individuals as a special case of quantification, called 'wild' quantification. This approach has certain advantages if one is working under the Boolean assumptions concerning existence, which we are not. (See Section 3.) The relevant literature on 'wild' quantification is: T. Czezowski, "On certain peculiarities of singular propositions," *Mind*, Vol. 64 (1955), pp. 392-395; George Englebretsen, "Czezowski on wild quantity," and "Singular/general," both in *The Notre Dame Journal of Formal Logic*, Vol. 27, No. 1 (Jan, 1986), pp. 62-65 and pp. 104-107.

[5]The affirmative exceptive quantifiers, which include 'all but' and 'all except', pose a still different set of problems, which are not dealt with in this book.