

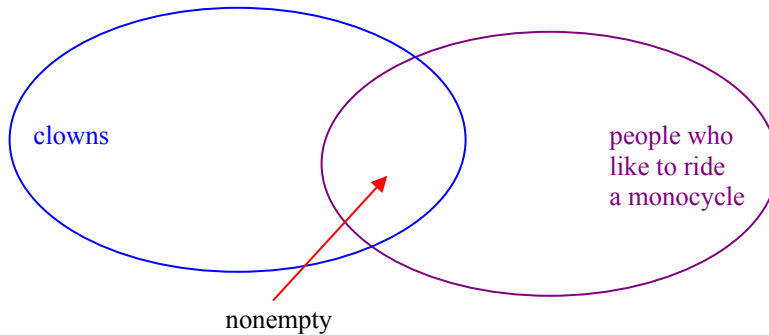
# Quantifiers and scope

## Quantifiers

Quantifiers (such as *some*, *every*, *most*, *two*) denote properties of the intersection of two sets. The relevant sets are those described by the VP, and by the complement of the quantifier itself. For example, in

- Some clown likes to ride a monocycle,

the relevant sets are the set of *clowns* and the set of *people who like to ride a monocycle*. The sentence says that there is at least one individual who is both a clown, and likes to ride a monocycle. That is, the intersection of the two sets is nonempty.



For other quantifiers, the relationship between the two sets is different. For example, in

- Three clowns ate cakes,

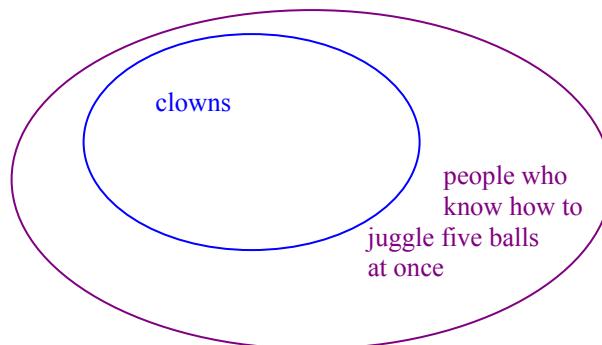
there are at least three individuals who are both clowns and ate cakes. That is, the quantifier *three* requires the intersection of the two sets (that of clowns and that of cake eaters) to contain at least three members. In

- No clown learns linguistics,

the intersection of the set of clowns and that of individuals who learn linguistics is empty (no one is both a clown and learns linguistics). Finally, in

- Every clown knows how to juggle five balls at once,

every individual who is a clown is also one who knows how to juggle five balls at once. In other words, the set of clowns is a subset of the set of individuals who know how to juggle five balls at once.



In the following part, we'll look at the interaction of various quantifiers. The relevant units will be those of a quantifier and its complement (as in *some clown*, *every cake*, and *two monocycles*).

## Scope

Recall the kinds of ambiguities we have seen so far:

- Herb likes chocolate cookies and cakes (structural)
- They can fish here (structural / lexical)
- Herb bought a file (lexical)
- Herb told me that he was extremely unhappy (referential)

There also scope ambiguity, where quantificational elements have different scope relations. Consider the following sentences:

- Some clown loves every actress
- Every student read most papers
- Exactly three languages are spoken by everyone in this room

How are these sentences ambiguous?

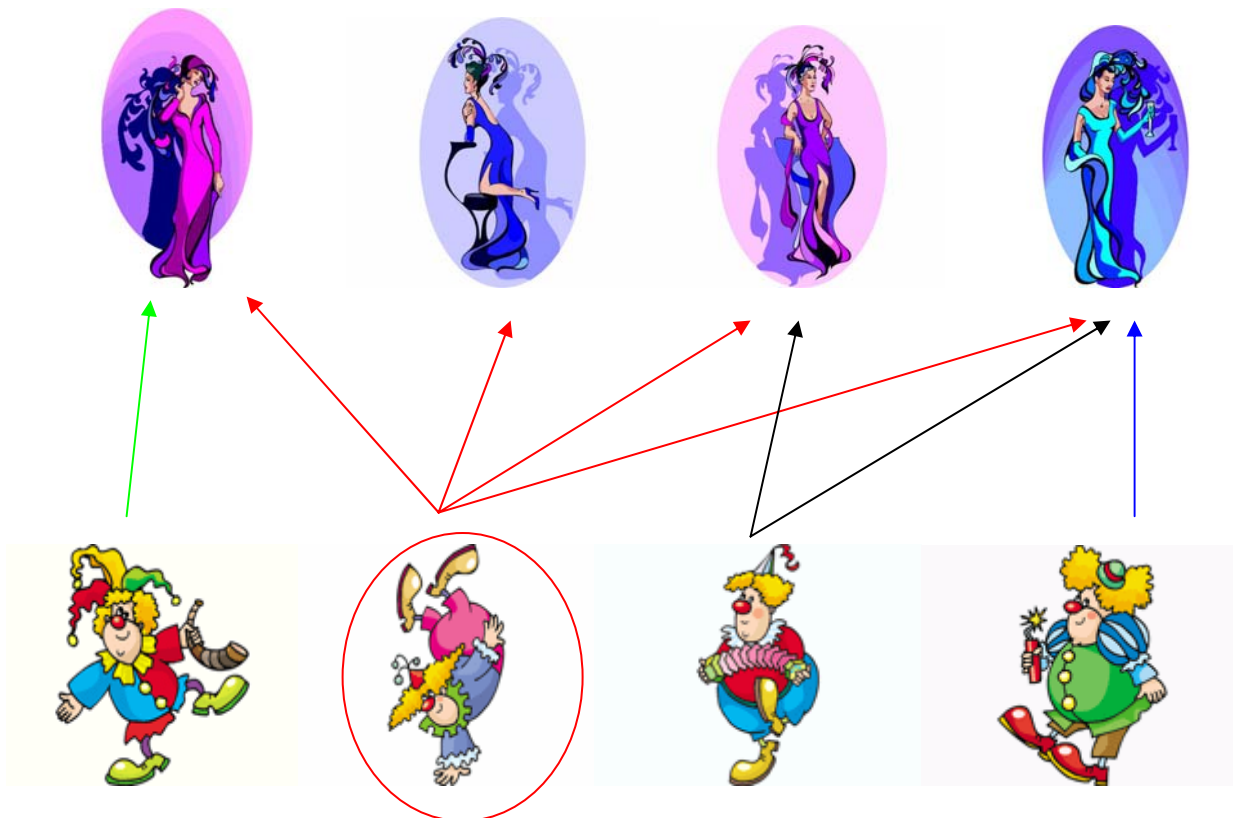
### Some clown loves every actress

Consider the two scenarios (situations) illustrated below. There are four clowns and four actresses in each scenario. The arrows indicate who loves who, with the arrows pointing at the loved one.

#### Some clown loves every actress, 1st reading

In the first scenario, there is a single clown who loves all the actresses. The other three clowns love only one or two actresses each. That is, there is some clown (namely, the one doing a handstand) who loves every actress.

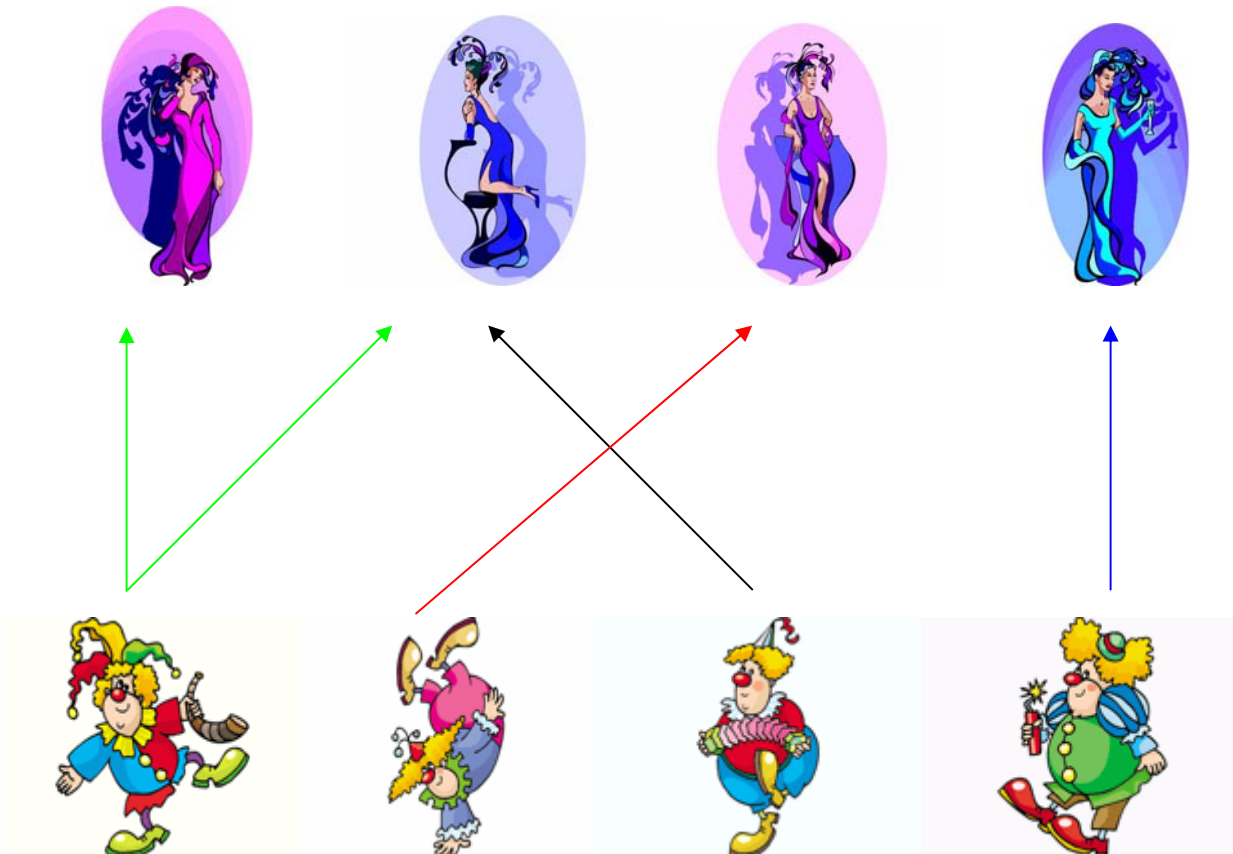
In this case, *some clown* is said to have wide scope over *every actress* (because there is a unique clown who loves all the actresses).



**Some clown loves every actress, 2nd reading**

In the second scenario, none of the clowns loves more than two actresses. Thus there is no single clown who would love every actress. The sentence *some clown loves every actress* is still true, however. For every actress, there is some clown who loves her. The clowns who have feelings toward the actresses can be different for each actress. In the scenario below, there is only one clown who loves two actresses. However, for each actress there is some clown (at least one clown) who loves her.

In this case, *every actress has wide scope over some clown* (because clowns can vary along with actresses).



Of the two readings, does any of the readings entail the other? Why, or why not?

## Every student read most papers

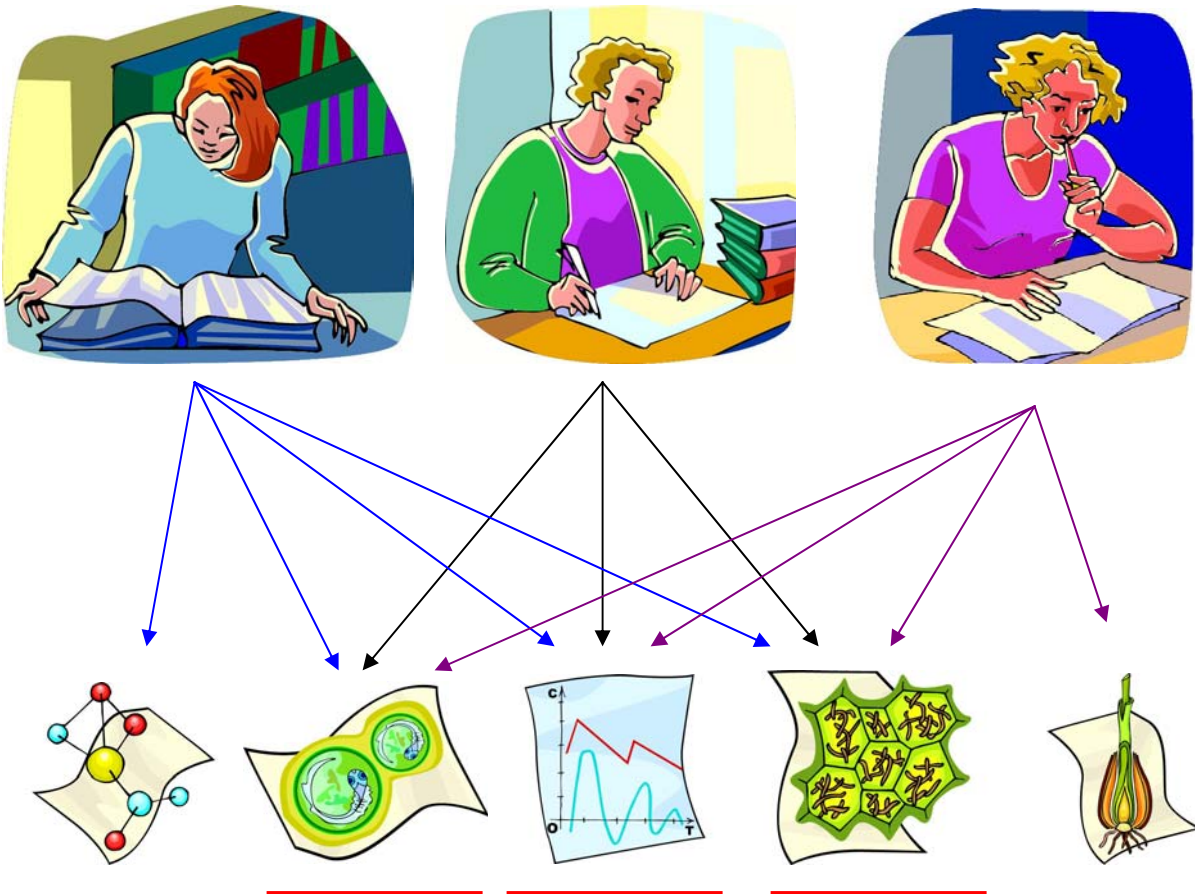
Before discussing the two readings, consider what *most papers* means. If there are ten papers altogether, then (at least) how many papers are *most papers*? And if there are five papers? Let us assume that *most* means *more than half* – that is, if there are ten papers, then *most papers* are at least six papers; and with five papers, at least three papers count as *most*.

Again, there are two scenarios. In both scenarios, there are three students and five papers. The arrows pointing from a student to a paper indicate that the student has read that paper.

### Every student read most papers; 1st reading

In the first scenario, there are three papers that all three students have read. The remaining two papers were read by one student each. Since there are five papers altogether, three papers count as *most papers*. Thus for most papers (namely, the second, third, and fourth one) it is true that every student read it.

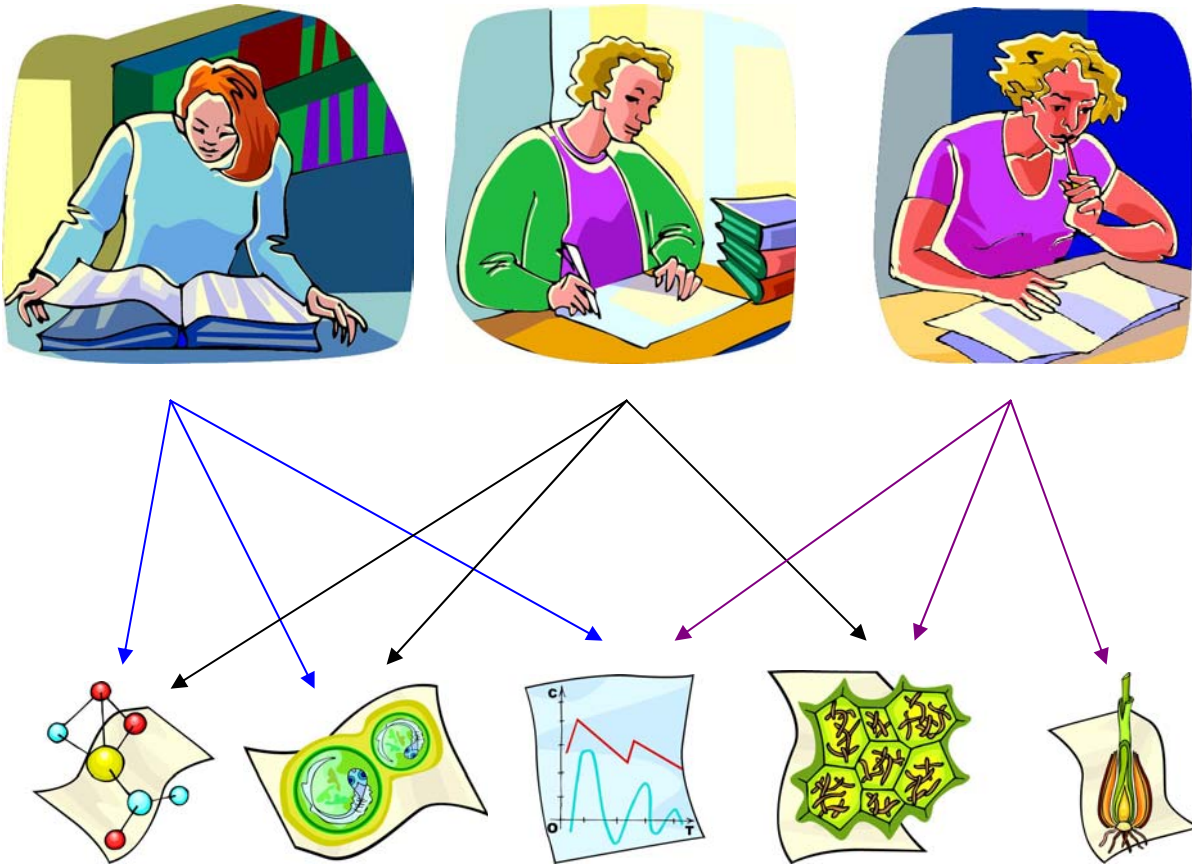
In this case, ***most papers has wide scope over every student*** (because for most papers (in this case, three) it is true that they were each read by every student)



**Every student read most papers; 2nd reading**

In this scenario, it is not the case that most papers are such that they were read by every student. In fact, there is no paper that was read by every student; each paper was read by one or two students only. However, every student read three (possibly different) papers each. Again, since three papers count as *most papers* in this scenario, every student read most papers.

In this case, *every student has wide scope over most papers* (because papers can vary along with students)



**Three languages are spoken by everyone in this room**

How is this sentence ambiguous? Give two scenarios and describe the readings.

## Word order and scope

In English, the ambiguity arises with the sentences above. In some languages, however, the word order can disambiguate the readings. The quantifier on the left has wide scope over the quantifier on the right.

### German

- (1) Jeder hat einen Fehler gemacht  
everybody has one mistake made  
'Everybody made one mistake' [maybe everyone made a different one]
- (2) Einen Fehler hat jeder gemacht  
one mistake has everyone made  
'Everybody made one mistake' [everyone made the same mistake]

In (1), the mistake committed can be a different mistake for each person. In (2), however, there is a single mistake that everyone made. That is, *jeder* (everyone) has wide scope in (1), and *einen Fehler* (one mistake) has wide scope over *jeder* in (2). Notice how word order correlates with the available readings.

### Russian

- (3) odin mal'chik videl kazhduju devuchku  
one boy-nom saw every girl-acc  
'A boy saw every girl' [the same boy saw all girls]
- (4) kazhduju devuchku videl odin mal'chik  
every girl-acc saw a boy-nom  
'A boy saw every girl' [a different boy saw every girl]

### Hungarian

Hungarian shows that word order may, but does not always have to, determine scope. For each example, indicate which quantifier(s) have wide scope. Does any one of the readings entail the other? How can you define the environment where scope is unambiguously determined, and the environment where ambiguity arises?

- (5) tegnap a legtöbb ember két süteményből evett  
yesterday the most person two cakes-from ate  
'Yesterday most people ate from two cakes'  
[yesterday most people ate from two (possibly different) cakes]
- (6) tegnap két süteményből a legtöbb ember evett  
yesterday two cakes-from the most person ate  
'Yesterday most people ate from two cakes'  
[yesterday there were two cakes such that most people ate from them]
- (7) tegnap evett a legtöbb ember két süteményből  
yesterday ate the most person two cakes-from  
'Yesterday most people ate from two cakes'  
[yesterday there were two cakes such that most people ate from them]  
[yesterday most people ate from two (possibly different) cakes]
- (8) tegnap evett két süteményből a legtöbb ember  
yesterday ate two cakes-from the most person  
'Yesterday most people ate from two cakes'  
[yesterday there were two cakes such that most people ate from them]  
[yesterday most people ate from two (possibly different) cakes]