4.7 Constructing Categorical Propositions

We have spent the last couple of weeks studying categorical propositions. Unfortunately, in the real world, the statements that people make seldom have that form. Here, we will learn how to take various statements and convert them into one of the four categorical proposition forms.

1. They need nouns: Categorical propositions—such as "All S are P"—must have NOUNS for both the subject class and the predicate class. But often the predicate has something else instead (like an adjective). In those cases, we need to insert the noun. For instance,

"All kittens are adorable"

technically does not have the correct form. It SHOULD say something like "All kittens are adorable *things*" or perhaps "All kittens are adorable *animals*." Similarly,

"Some logic lessons are exciting"

SHOULD be re-written as "Some logic lessons are exciting *lessons*."

2. They need "are" or "are not" as the copula: The form that we want to achieve is one where ALL categorical propositions use either the copula "are" or "are not." But, propositions in the real world often lack a copula. In those cases, we need to convert the proposition so that it has the correct verb form. For instance,

"Some dogs bite"

does not have "are" or "are not" as its verb form. It SHOULD say something like:

"Some dogs *are biters*"
or: "Some dogs *are things that bite*"
or: "Some dogs *are animals that bite*"

All of the above are acceptable. Similarly,

"All squirrels gather nuts"

should be re-written as:

"All squirrels *are nut-gatherers*"
"All squirrels *are things that gather nuts*"
"All squirrels *are animals that gather nuts*" …and so on.

3. They must be about CLASSES of things—not individual things themselves: Many propositions are about a SINGLE person, or thing, or time, or place. But, the subject class and the predicate class of categorical propositions are CLASSES of things. So, any proposition that has a single individual as its subject or predicate must be converted. For instance,

"Meghan is a computer programmer"

should say "All *people identical to Meghan* are computer programmers." NOW we have a statement of the form "All S are P" where both S and P are CLASSES of things. "People identical to Meghan" represents a category that things can be a member of. As it turns out, the only thing that belongs in the category of "people identical to Meghan" is Meghan herself (one SINGLE person)—so there is only ONE thing in this class. Let's try another example:

"Atlanta is in Georgia"

This should say, "All *states identical to Georgia* are *states where Atlanta is*." One more:

"I like pizza"

This should say, "All *people identical to me* are *people who like pizza*."

Note: This might all seem a little confusing right now, but realize it's all about getting each proposition into the correct FORM, so that, later, we can construct valid arguments out of them.

4. Adverbs and pronouns are translated: Words about places and times, such as "always," "never," "everywhere," and "nowhere" need to be converted. Similarly, words about people or things, such as "who," "whoever," "what," "whatever," "anyone," "anything," etc., need to be converted as well. For example:

"Heights always make me nauseous"

should say, "All things that are heights are things that make me nauseous." Or:

"The mosquitos are everywhere"

should be translated to "All places are places where there are mosquitos." Try one more:

"He gets whatever he asks for"

should be translated to "All things he asks for are things that he gets."

5. They need quantifiers: Recall that categorical propositions either begin with "All", "No", or "Some." Most real-world assertions do not begin with one of these three words. When that is the case, we'll need to insert one of those words. (You may have noticed that we have already done this a number of times in the examples above). Here are some more examples of statements that do not have quantifiers:

"Roses are red"

should say, "*ALL* roses are red things." Similarly,

"Newborn babies aren't potty-trained"

should be re-written as, "*NO* newborn babies are babies that are potty-trained." And:

"Birds are in the backyard"

should be re-written as, "*SOME* birds are creatures that are in the backyard."

6. They need "All" or "No" or "Some" as quantifiers: Often, a given statement WILL have a quantifier—but it won't be one of the three quantifiers we need ("all", "no", or "some"). For instance, lots of statements begin with "many", "a few", "several", "every", or "anyone." In those cases, we must convert the quantifier. For instance,

"Not every student will pass"

should be re-written as, "*Some* students are students who will not pass." Similarly,

"Several toys are still on the floor"

should be re-written as, "*Some* toys are toys that are still on the floor." Another one:

"A few days are cloudy"

should be re-written as, "*Some* days are days that are cloudy." One more:

"Not many of the book's pages are dry"

This one implies TWO different things: It implies that SOME of the book's pages are dry, while SOME (most?) of the book's pages are wet. So, we must re-write this as TWO propositions: (1) "*Some* of the pages of the book **are pages that are dry**" and (2) "*Some* of the pages of the book **are not pages that are dry**."

7. Conditional statements are translated: Often, given statements are in the form of a conditional—this is an "if … then" statement. If so, they will need to be translated into a categorical statement. Typically, "**If S, then P**" can be translated into an **A-proposition** ("All S are P"), while "**If S, then *not* P**" can be translated into an **E-proposition** ("No S are P"). For instance,

"If it's expensive, then I can't afford it"

gets translated as, "All expensive things are things that I cannot afford." Meanwhile,

"If it has wings, then it is not human"

gets translated as, "No things with wings are humans."

For quick reference, remember:

- *"If S, then P" → **TRANSLATES AS** → "All S are P"*
- *"If S, then not P" → **TRANSLATES AS** → "No S are P"*

Multiple steps: Sometimes, statements are more easily translated into conditional ("if … then") statements FIRST, and THEN translated into categorical propositions. For instance,

"I always wear shorts unless it is snowing"

This sentence tells us that the speaker DOES wear shorts all the time—but NOT when it is snowing. So, we can translate this as, "If it is not snowing, then I wear shorts." Now we have a conditional of the form "If S, then P" which we can translate into "All S are P." So the translation is: "All days when it is not snowing are days when I wear shorts."

8. Exclusive propositions are translated: Many given statements will express the idea that nothing is a member of some category EXCEPT a single person, or a single thing, etc. These are called "**exclusive**" propositions. These must be translated into standard form—usually into "A" propositions ("All S are P"). For instance,

"No one EXCEPT my friends are allowed to borrow my car"

gets translated as, "All people allowed to borrow my car are my friends." Or try this one:

"ONLY coffee gets me going in the morning"

gets translated as, "All things that get me going in the morning are coffee."

9. "The Only" is different than "Only": The last example began with "Only." But, statements that begin with "THE only" get translated differently. For example,

"*The only* topping I don't like is anchovies"

gets translated as, "All toppings that I do not like are anchovies."

10. Exceptive properties are translated: Above, we examined "exclusive" propositions, where ONLY ONE individual IS a member of a class. But, sometimes, a proposition states that ALL BUT one individual is a member of a class (in other words, ONLY ONE individual IS NOT a member of a class). These propositions commonly contain phrases such as "all but" or "all except," and are called "**exceptive**" propositions. They must be translated into standard form.

But note: Exceptive propositions imply TWO categorical propositions—typically, one "E" proposition ("No S are P") and one "A" proposition ("All S are P").

For instance,

"I will eat *all* toppings *except* anchovies on my pizza"

This tells us TWO things: (1) Something about what I will NOT eat, and (2) Something about what I WILL eat. So, this gets translated as, (1) "No pizza toppings I will eat are anchovies" AND (2) "All non-anchovies are pizza toppings I will eat." Try one more:

"*All but* Charlie were at the party"

Again, this tells us TWO things: (1) Charlie was NOT at the party, and (2) Everyone else WAS at the party. So, this gets translated as, (1) "No people who were at the party are people identical to Charlie" AND (2) "All people who are not identical to Charlie are people who were at the party."

Note: Do homework for section 4.7 at this time.