

Chapter Three Translation Problems Set 6 #2, #4: Discussion

Problem: Translate each of the following English sentences into the formal language.

Discussion: Sentence 2 contains the form phrases “*even though*,” “*in-*,” and “*both... and*”.

2. Even though Jack is incapable of flight, both birds and squirrels fear him.
(**P**: Jack is capable of flight. **Q**: Birds fear Jack. **R**: Squirrels fear Jack)

But while there is a comma here to help resolve the competition among the form phrases, no phrase sits by the comma capable of gluing the parts of the sentence together. (“Both” is next to the comma; but if “both... and” were the main form phrase, the comma would be next to “and,” not next to the optional phrase “both.”)

Also, “even though” is a phrase gluing together left and right parts, but shows up here with no part to its left.

We recognize these as the two classic clues of inversion: “even though” (and everything after it, up to the comma) was moved to the front of the sentence.

2. **Even though** Jack is incapable of flight, both birds and squirrels fear him.
(**P**: Jack is capable of flight. **Q**: Birds fear Jack. **R**: Squirrels fear Jack)

Even though in-P, both **Q** and **R**

“Even though” is the main form phrase of the sentence, translated by the wedge (with parentheses).

(in-P \wedge both Q and R)

“Both... and” is also translated by the wedge (with parentheses).

$$(\text{in-}P \wedge \text{both } Q \text{ and } R)$$
$$(\text{in-}P \wedge (Q \wedge R))$$

The negation morpheme “in-” is translated by the tilde.

$$(\sim P \wedge (Q \wedge R))$$

Sentence 4 has the form phrases “unless” and “either... or”.

4. Unless Rex helps us move the furniture, we’ll either have to hire movers or finish the job tomorrow.

(**P**: Rex helps us move the furniture. **Q**: We’ll have to hire movers. **R**: We’ll have to finish the job tomorrow)

Here again we see the clues of inversion: (i) a left-right form phrase (“unless”) with no part to its left; and (ii) nothing at the comma break fit to glue the whole sentence together. We see that “unless” (and everything after it, up to the comma) was moved to the left by inversion.

4. Unless Rex helps us move the furniture, we’ll either have to hire movers or finish the job tomorrow.

(**P**: Rex helps us move the furniture. **Q**: We’ll have to hire movers. **R**: We’ll have to finish the job tomorrow)

Unless P, either Q or R

That makes “unless” the main form phrase here. “Unless” is translated by the vel (with parentheses).

$(P \vee \text{either } Q \text{ or } R)$

“Either... or” is also translated by a vel (with parentheses).

$(P \vee \text{either } Q \text{ or } R)$

$(P \vee (Q \vee R))$