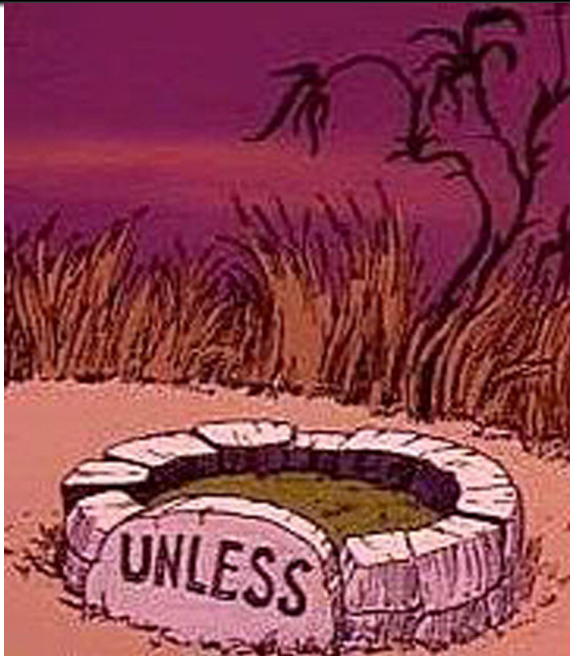# Translating "Unless"

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Conway Contingencies

Kellyanne Conway on her status with the Trump campaign:

> "I am with the campaign 'til the bitter end, unless . . .
> something [else] changes in my life."

Suppose that this is true.
And now we find out that something has changed in Conway's life.
Does it follow that she will not be with the campaign until the
bitter end?

I am with the campaign **unless** something changes in my own life.

Let "W" stand for "Conway is with the campaign."

Let "C" stand for "something changes in Conway's life."

W unless C

"Unless" as a conditional

Whenever there is an "unless," we can translate it using a conditional. We read "unless" as "if not".

Unless C, W
If not C, W

We just have to make sure that whatever comes right after the "unless" gets negated and then put in the antecedent of the conditional.

This holds no matter whether the "unless" comes at the beginning of the sentence or in the middle,

W **unless** C
W **if not** C

Thus all four of the "unless" sentences above get translated as

$$\neg C \to W$$

"Unless" as a disjunction

Unless something changes in my own life, I am with the campaign.
Unless C, W.

Another way of saying this is:

Either something changes in my own life, or I am with the campaign.
Either C or W.

$C \lor W$

(Note that both disjuncts might be true: there might be a change in Conway's life and despite that, she stays with the campaign to the bitter end. The only case that "unless" rules out is the one where there is no change in Conway's life and she isn't with the campaign to the bitter end.)

So we can translate "unless" as a disjunction. (A logic prof of mine suggested thinking of "unless" as "∨nless".)

So we have learned to translate "Unless P, Q" in two ways:

$$\neg P \rightarrow Q$$

$$P \vee Q$$

Can **both** of these be right?

Sure can! Those two FOL sentences are equivalent.

Which should I use? Whichever one feels more natural to you.