One of the first to criticize the use of $\varphi \rightarrow \psi$ as a way to symbolize “if . . . then . . .” statements of English was C. I. Lewis. Lewis was criticizing the use of the material conditional in Whitehead and Russell’s *Principia Mathematica*, who pronounced $\rightarrow$ as “implies.” Lewis rightly complained that if $\rightarrow$ meant “implies,” then any false proposition $p$ implies that $p$ implies $q$, since $p \rightarrow (p \rightarrow q)$ is true if $p$ is false, and that any true proposition $q$ implies that $p$ implies $q$, since $q \rightarrow (p \rightarrow q)$ is true if $q$ is true.

Logicians of course know that implication, i.e., logical entailment, is not a connective but a relation between formulas or statements. So we should just not read $\rightarrow$ as “implies” to avoid confusion. As long as we don’t, the particular worry that Lewis had simply does not arise: $p$ does not “imply” $q$ even if we think of $p$ as standing for a false English sentence. To determine if $p \models q$ we must consider all valuations, and $p \not\models q$ even when we use $p$ to symbolize a sentence which happens to be false.

But there is still something odd about “if . . . then . . .” statements such as Lewis’s

If the moon is made of green cheese, then $2 + 2 = 4$.

and about the inferences

The moon is not made of green cheese. Therefore, if the moon is made of green cheese, then $2 + 2 = 4$.

$2 + 2 = 4$. Therefore, if the moon is made of green cheese, then $2 + 2 = 4$.

Yet, if “if . . . then . . .” were just $\rightarrow$, the sentence would be unproblematically true, and the inferences unproblematically valid.

Another example of concerns the tautology $(\varphi \rightarrow \psi) \lor (\psi \rightarrow \varphi)$. This would suggest that if you take two indicative sentences $S$ and $T$ from the newspaper at random, the sentence “If $S$ then $T$, or if $T$ then $S$” should be true.

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Reading “$\rightarrow$” as “implies” is still widely practised by mathematicians and computer scientists, although philosophers try to avoid the confusions Lewis highlighted by pronouncing it as “only if.”