Elementary Symbolic Logic

Necessity, possibility, equivalence, and consequence II

Reminder: The General Ideas

- p is necessary if and only if p must be true (i.e., could not be false).
- p is possible if and only if p could be true (i.e., is not forced to be false)
- q is a consequence of p if and only if q must be true (could not be false) whenever p is true.
- p and q are equivalent if and only if they must have the same truth value.

Varieties of Necessity, Possibility, Equivalence, and Consequence

Again: The above are fine, intuitive general formulae, but we would like to have a better sense of when a sentence must be true, or is forced to be false. What does the forcing? There are a number of different "background facts" that might play that role.

Type of N, P, E, & C	Tautological (Truth Table)	First-Order	Logical	Tarski's World
Only pay attention to the meanings of:	The truth functional (TF) connectives ($\neg$, $\wedge$, $\vee$, $\rightarrow$, $\leftrightarrow$)	○ The TF connectives ○ **The quantifiers ($\forall$, $\exists$)** ○ **Identity (=)**	○ The TF connectives ○ The quantifiers ○ Identity ○ **All other predicates**	○ The TF connectives ○ The quantifiers ○ Identity ○ All other predicates ○ **The particular quirks and features of Tarski's World**
Method for getting the right "level of attention":	Substitute sentence variables for atomics and for quantifier statements	Substitute nonsense predicates or predicate letters for English predicates	???? Axiomatization?	Test out sentences and consequence relations in TW. (Or axiomatize?)

Notice that as we move further to the right in this table, we get more and more stuff doing the "forcing"—layers upon layers of stuff that makes sentences turn out to be necessarily true. So what does that tell us about the relationship between the sets of necessary truths for each category? And what does that tell us about *possibility*, where having more stuff to force sentences to be true or false *reduces* possibility?