min.1 Truth and Falsity of Counterfactuals

A counterfactual $\varphi \square \rightarrow \psi$ is (non-vacuously) true if the closest $\varphi$-worlds are all $\psi$-worlds, as depicted in Figure 1. A counterfactual is also true at $w$ if the system of spheres around $w$ has no $\varphi$-admitting spheres at all. In that case it is vacuously true (see Figure 2).

It can be false in two ways. One way is if the closest $\varphi$-worlds are not all $\psi$-worlds, but some of them are. In this case, $\varphi \square \rightarrow \neg\psi$ is also false (see Figure 3). If the closest $\varphi$-worlds do not overlap with the $\psi$-worlds at all, then $\varphi \square \rightarrow \psi$. But, in this case all the closest $\varphi$-worlds are $\neg\psi$-worlds, and so $\varphi \square \rightarrow \neg\psi$ is true (see Figure 4).

In contrast to the strict conditional, counterfactuals may be contingent. Consider the sphere model in Figure 5. The $\varphi$-worlds closest to $u$ are all $\psi$-worlds, so $M, u \models \varphi \square \rightarrow \psi$. But there are $\varphi$-worlds closest to $v$ which are not $\psi$-worlds, so $M, v \not\models \varphi \square \rightarrow \psi.$
Figure 3: False counterfactual, false opposite

Figure 4: False counterfactual, true opposite

Figure 5: Contingent counterfactual