

Figure 1: Non-vacuously true counterfactual

con:min:tf:  
fig:true

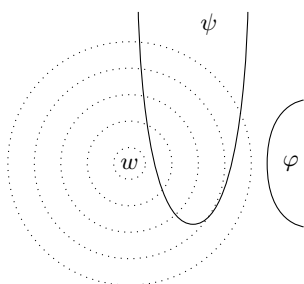


Figure 2: Vacuously true counterfactual

con:min:tf:  
fig:vacuous

## min.1 Truth and Falsity of Counterfactuals

con:min:tf:  
sec

A counterfactual  $\varphi \Box \rightarrow \psi$  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,  $\varphi \Box \rightarrow \neg\psi$  is also false (see [Figure 3](#)). If the closest  $\varphi$ -worlds do not overlap with the  $\psi$ -worlds at all, then  $\varphi \Box \rightarrow \psi$ . But, in this case all the closest  $\varphi$ -worlds are  $\neg\psi$ -worlds, and so  $\varphi \Box \rightarrow \neg\psi$  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  $\mathfrak{M}, u \Vdash \varphi \Box \rightarrow \psi$ . But there are  $\varphi$ -worlds closest to  $v$  which are not  $\psi$ -worlds, so  $\mathfrak{M}, v \not\vdash \varphi \Box \rightarrow \psi$ .

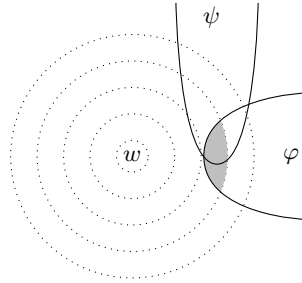


Figure 3: False counterfactual, false opposite

con:min:tf:  
fig:false

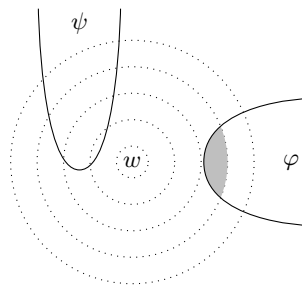


Figure 4: False counterfactual, true opposite

con:min:tf:  
fig:false-opposite

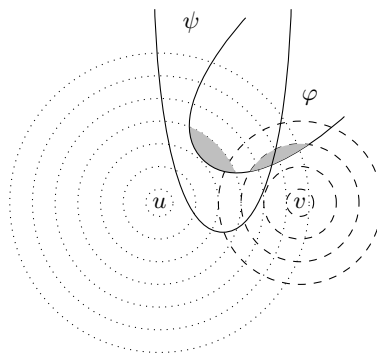


Figure 5: Contingent counterfactual

con:min:tf:  
fig:contingent

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**Bibliography**