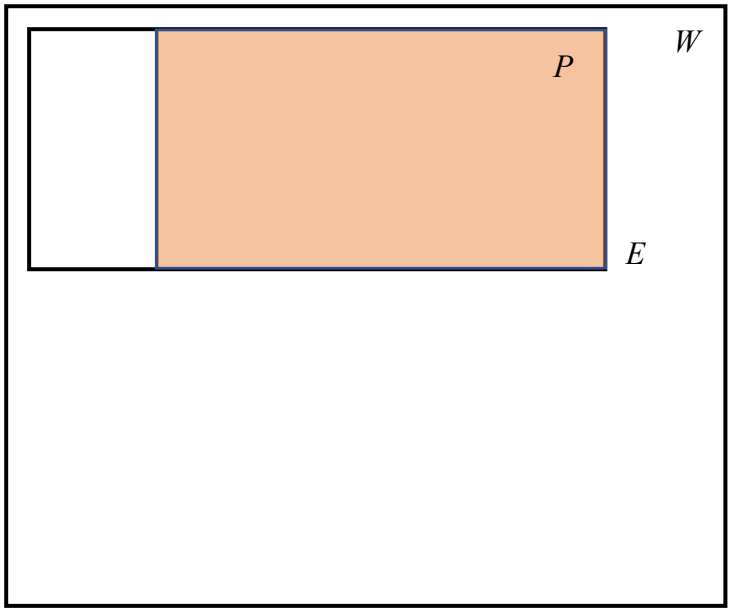
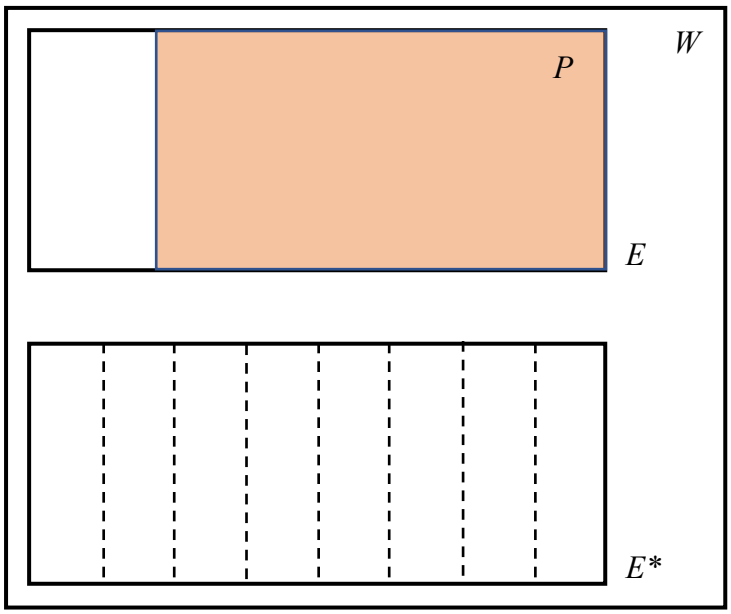
The Lottery Argument, Visually

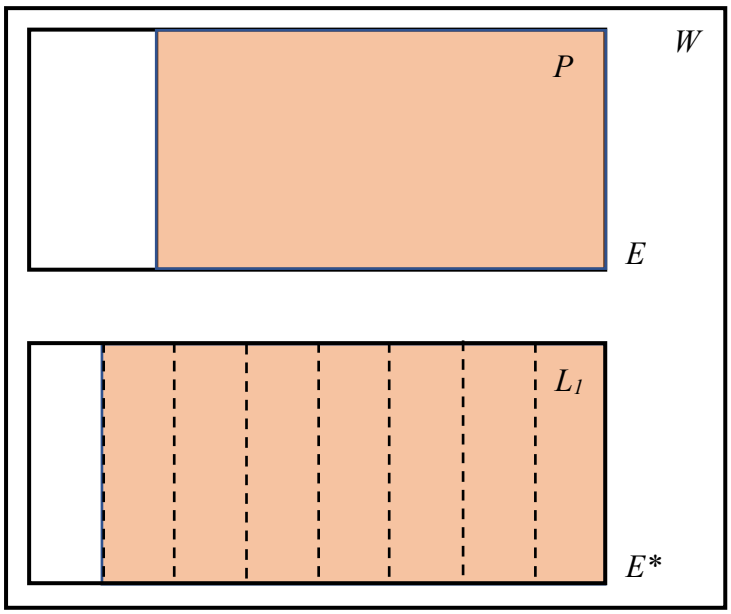


Assume J-INFALLIBILITY is false in some particular way.

Assume, for example, that *S* is justified in believing some proposition *P* on the basis of evidence *E*, but Pr(*P* | *E*) is only 0.77 (77%)

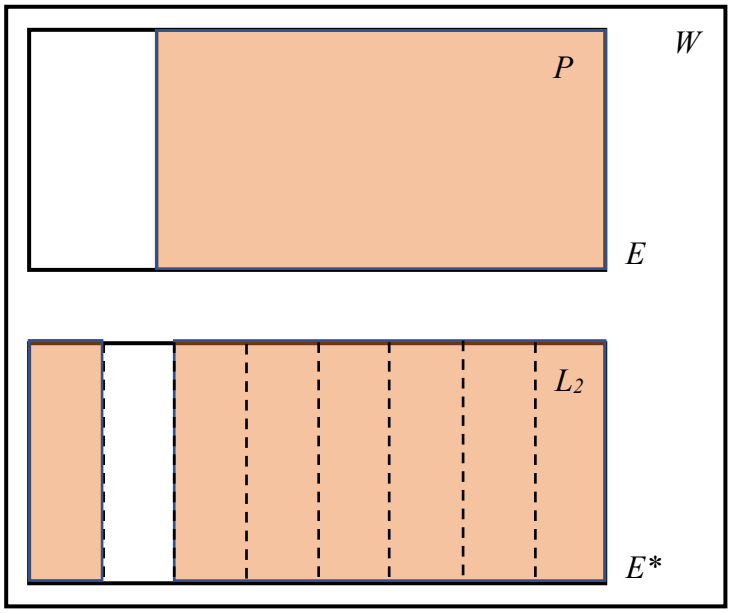


Consider another proposition: *E** = There is a fair 8-ticket lottery being held



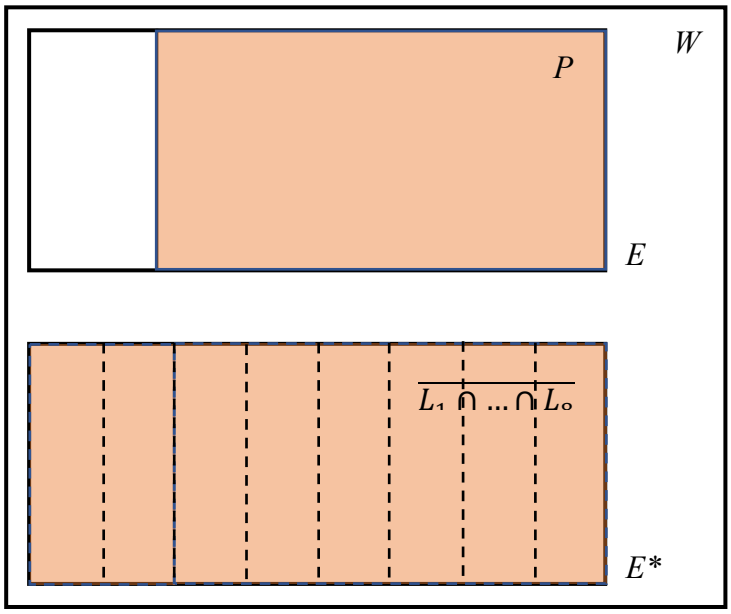
MONOTONICITY basically says that if 77% chance was good enough in the case of *P* and *E*, it's *always* good enough (that case sets a *precedent*).

Given *E**, the chance of Ticket 1 losing (L_1) is 7/8, i,e, 87.5%, which is greater than 77%. So *S* is justified in believing L_1.



The same argument applies to the claim that Ticket 2 will lose…

And so on, for *every* ticket!



But equally, note that the probability that not all tickets will lose $(\overline{L_1 \cap \ldots \cap L_8})$, given E*, is 100%, since there is a guaranteed winner. This is also above 77%, so *S* is justified in believing this too.

So by the above and CONJUNCTION, *S* is justified in believing that all tickets will lose *and* not all tickets will lose.

But that belief can't possibly be true! So by CONSISTENCY, *S* is *not* justified in believing that.

Contradiction! Something went wrong here: presumably *S* wasn't justified in believing *P* on the basis of E after all.

The argument doesn't just work for 77% but for any value that would make J-INFALLIBILITY false (any value under 100%). So we conclude that J-INFALLIBILITY must be true after all.