

William Matzko

Problem 6.2.5

With Bayesian methods, however, we will make claims of the form given. I like the argument that you used, but there is a subtle flaw - it OK to say I am 95% certain that something is true when in fact it is false. I've left open that chance that I am wrong and assigned a probability of 5% to it. Probably we'd need to discuss this more for me to make my point.

The problem with the claim is that it is not true. If  $a$  was computed to a confidence interval of  $[0.9, 1.1]$ , it is incorrect to claim that  $a$  has a 95% chance of being in that interval. Suppose that  $a$  was known to us, but not the people conducting the experiment. Let's say  $a$  has a value of 1.2. If the researchers computed a confidence interval of  $a$  to be  $[0.9, 1.1]$  and tried to claim  $a$  was in that interval with 95% certainty, they would be wrong— $a$  is simply not in the interval; there is nothing left to chance there.

A better interpretation would be “if we did this experiment a bunch of times and computed the 95% confidence interval each time, about 95% of those intervals would contain  $a$ .” Indeed, it is not correct to make statements about a single particular interval; rather, it is describing a large number of intervals.

Good