

Corrections to *Theory and Reality*, 2nd edition

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This note describes two corrections to the book *Theory and Reality*, 2nd edition. Both errors are in Chapter 12, "Bayesianism and New Views of Evidence." Electronic versions of the book (Kindle and library versions) should include the corrections soon, as should eventual reprints of the paperback.

First, the discussion of the "convergence" of different people's degrees of belief as evidence comes in, on pp. 278-79, omits some qualifications, so the claim is stated too strongly. The first edition of the book had the same problem. The passage reads:

Consider two people with very different prior probabilities for hypothesis h but the same likelihoods for all possible pieces of evidence (e_1, e_2, e_3, \dots), conditional on all the different hypotheses that are relevant. Now suppose also that these two people see all the same actual evidence. Then as long as neither person has a prior probability for h of exactly 0 or 1 at the start, their degrees of belief in h will get closer and closer as evidence comes in. It can be proved that for *any* amount of initial disagreement about h , there will be *some* amount of evidence that will get the two people to any specified degree of closeness in their final probabilities for h . That is, if having final probabilities within (say) 0.001 of each other counts as being in close agreement, then no matter how far apart people start out, there is some amount of evidence that will get them within 0.001 of each other by the end. (Again, this assumes that no one's prior probabilities are exactly 0 or 1.) Initial disagreement is eventually washed out by the weight of evidence.

The main problem is that the convergence only occurs if the evidence continues to favor the same hypotheses – if h continues to be supported as more and more evidence comes in. If incoming evidence favors h for a while, and then starts to disconfirm it, the agreement between the two people can "unravel." I should also have said that if the two people have zero or one probabilities for any other hypotheses at the start, they agree on what these are. The new version of the passage includes these conditions.

Consider two people with very different prior probabilities for hypothesis h but the same likelihoods for all possible pieces of evidence (e_1, e_2, e_3, \dots), conditional on all the different hypotheses that are relevant. Now suppose also that these two people see all the same actual evidence, and this evidence, as it comes in, always pushes in the same direction – it favors the same hypotheses. Then, as long as neither person has a prior

probability for h of exactly 0 or 1 at the start (and if they have zero probabilities for any other hypotheses competing with h , they agree on what these are), their degrees of belief in h will get closer and closer as the evidence comes in. It can be proved that for *any* amount of initial disagreement in their prior probabilities for h , there will be *some* amount of evidence that will get the two people, in these circumstances, to any specified degree of closeness in their final probabilities for that hypothesis. Even very large initial disagreements can be eventually overcome ("washed out") by the weight of evidence.

The second one is a typo. On page 282, the last subscript on the page should be "1" not "2."

The passage should read: "in a situation where h_1 is true."