

Solution to Challenge 10, Fall '04

Camp 1 is correct in claiming that before you look in the first box, you are equally likely to have chosen the box with the smaller sum. However, their proof goes wrong when they claim that this must still be true once you've seen what's in the first box. A simple counterexample is the case where you open the first box and find a single penny in it.

Let E_x be the event where the game show places dollar amounts x and $2x$ in the boxes. The show has finite resources, so it cannot be that all such events are equally likely for all x all the way out to infinity. For some x , E_x is more likely than E_{2x} .

If the probabilities of E_{100} and E_{200} are the same, then Camp 1's calculation is correct. If the probability of E_{100} is twice that of E_{200} , then Camp 2's calculation is correct. Nothing in the statement of the problem justifies either of these arbitrary assumptions.

Both camps are guilty of manufacturing data out of thin air and smuggling it into their calculations. The correct answer is that not enough information is given to solve the problem.

We received a large number of lengthy, elaborate, clever, but incorrect defenses of Camp 1's or Camp 2's positions. In a couple of cases the solvers said that they had spent an entire day on the problem. Some incorrect solutions came from CSU faculty members. They can take consolation in the fact that the author of these pages (Ross McConnell) once made a case for Camp 2's position in front of a class.

Correct solutions were given by Saravanan Sellappa, Tarun Banka, and Erich Hefner (CSU grad students), Florian Hulpke (University of Hannover grad student), Edwin Chong (CSU faculty), and Bogdan Chlebus (University of Colorado, Denver faculty). The two ice creams from Challenges 9 and 10 go to Saravanan and Tarun.