

The conditioning fallacy

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Version dated 9 December 1998

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Imagine this.

We are watching a famous psychologist deliver a lecture on ‘Fallacies of intuitive reasoning’. The psychologist flips a coin, but we can’t see whether it’s heads or tails; then we see the psychologist write something on the viewgraph with a blue marker, but we can’t see what was written because the projector is off. The psychologist repeats this flipping-and-marking procedure eight times: flip; mark; flip; mark; flip; mark; flip; mark; flip; mark; flip; mark; flip; mark; flip; mark. By the end we are starting to get a bit restive. Finally, the psychologist turns on the projector, and we read: ‘The outcome was one of the following: HHHHHTTT, HTTHHTHTT, or TTTTHTTT.’ Obviously, the psychologist expects to trap us with the old Conditioning Fallacy: ‘Given that the outcome is either HHHHHTTT, HTTHHTHTT, or TTTTHTTT, the probability that it is any one of these three possibilities is one third.’ But we are too wise to make a mistake like this! For one thing, we’ve been fooled by the Conditioning Fallacy too many times in the past to stumble blindly into it this time. Perhaps more important, we notice that, while the pen the psychologist is holding is blue, the writing on the viewgraph is entirely green.

DISCUSSION QUESTION: Suppose that the writing wasn’t entirely green: Suppose instead that exactly nine of the letters are blue. Which nine letters are blue?

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