

Strevens on Chance and Symmetry

Please hand in your answers anonymously on Blackboard by **Monday the 20th at 8pm**.

1. The **Principle of Indifference**, also known as the **Principle of Insufficient Reason**, can be stated as follows:

If e_1 and e_2 are incompatible events, and there is no evidence that favours one one over the other, then $\Pr(e_1) = \Pr(e_2)$

Given the reference to evidence, this is typically taken as a constraint on rational *credences* rather than a constraint *chances*. But the founders of probability did not make that distinction.

- a. As an example of how they used the principle, recall the twelve-sided die from Strevens' paper, which has one red face. Show how to use the Principle of Indifference to demonstrate that the probability *the die lands red face up* equals $1/12$.

At the start of §2, Strevens reviews the Van Fraassen/Bertrand objection to the Principle of Indifference. This objection asks you to consider a *cube factory*, which produces small cubes that have a volume of up to 8 cm^3 . The Principle of Indifference seems to justify inconsistent judgments about the probabilities in this case.

- b. Use the Principle of Indifference to argue that the probability that *the next cube will have a volume of at most 1 cm^3* is $1/8$.
 - c. Use the Principle of Indifference to argue that the probability that *the next cube will have a volume of at most 1 cm^3* is $1/2$.
 - d. Do you think either answer is more correct than the other?
 - e. Construct a different scenario where the Principle of Indifference generates inconsistent judgments about the chances.
2. Near the end of the paper, in §4.2, Strevens finds it necessary to invoke a rather different kind of principle of insufficient reason:

In the absence of any reason to think otherwise, assume that any standard variable is fairly smoothly distributed.

- a. Explain why Strevens needs this principle to make his account of chance to work.
- b. Strevens clearly thinks this principle is less problematic than the original principle of indifference. Do you agree? Give a reason.