Discussion of:
Bruno de Finetti’s Objectivity
by: Philip Dawid

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argued, and today Philip Dawid helps illustrate and defend this position and add nuance to it, that

**Objective Probability Does Not Exist.**

Rather, that “probability” is only a tool for describing, quantifying, and manipulating our own personal ignorance or uncertainty about future events.

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The idea’s not mine— it’s from an amazing talk I heard over 30 years ago.
Persi Diaconis & Eduardo Engel (1986)

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Is the event “Hit a dark square” \textit{random}?

Does it have a well-defined objective probability?
Is hitting Blue “random” on a $2 \times 1$ grid?:
On a $2 \times 2$ grid?:

![2x2 grid diagram]
On a $4 \times 4$ grid?:

![4x4 Grid Diagram]
On a $8 \times 8$ grid?:
On a $16 \times 16$ grid?:
On a $100 \times 100$ grid?:
Evidently:

- “Randomness” isn’t a binary property— there are degrees:
  - With an $n \times n$ grid with tiny $n$, the event “a dart will hit Blue” has No Objective Probability
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- For small $n$, All bets are off—i.e., only Subjective Probabilities are applicable, since symmetry fails and the dart thrower’s skill and intentions dominate.

- For huge $n$ and any smooth dart distribution, an Objective Probability does exist and can be computed. Bounds can be computed for

\[
\left| P[ \text{dark square} ] - \frac{1}{2} \right| \leq \frac{c}{n},
\]

in terms of $n$ and a constant $c$ depending on the smoothness of the dart-throwing distribution.
Bruno and Philip are pushing us toward the practice of soliciting subjective probability distributions for addressing scientific uncertainty.

But typical 2018⁹ problems are Much Too Big for a subjective treatment—
- too many parameters for thoughtful joint prior elicitation, ⇒ may need Objective Bayes in hierarchy;
- too much data for conventional models to be OK. ⇒ may need Nonparametric Bayes.

Best current compromise appears to be using Subjective Probabilities for a Small Number of “important” parameters, and an automatic (“objective” or “reference”) approach for the hundreds of others.
Thanks! to

- Chris Hans,
- Bruno de Finetti,
- Persi Diaconis & Eduardo Engel,
- the NSF, a polite Audience (I hope), and
- Philip Dawid, for a great talk.