3 Types of Scientific Reproducibility

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Unpacking “Reproducibility”

“Empirical Reproducibility”

“Computational Reproducibility”

“Statistical Reproducibility”

V. Stodden, IMS Bulletin (2013)
The central motivation for the scientific method is to root out error:

- Deductive branch: the well-defined concept of the proof,
- Empirical branch: the machinery of hypothesis testing, appropriate statistical methods, structured communication of methods and protocols.

**Claim**: Computation presents only a potential third/fourth branch of the scientific method (Donoho, Stodden, et al. 2009), until the development of comparable standards.
• “Really Reproducible Research” (1992) inspired by Stanford Professor Jon Claerbout:

“The idea is: An article about computational science in a scientific publication is not the scholarship itself, it is merely advertising of the scholarship. The actual scholarship is the complete ... set of instructions [and data] which generated the figures.” David Donoho, 1998