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Link to published version (if available):
10.1038/s41562-017-0189-z

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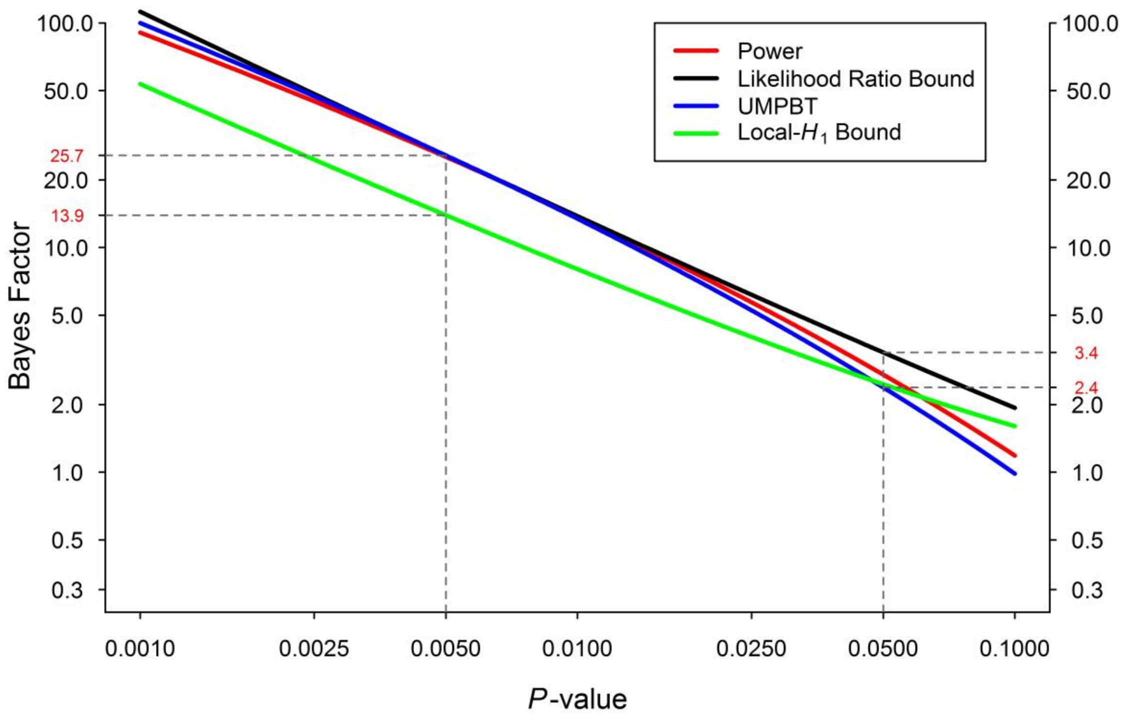

Fig. 1. **Relationship between the *P*-value and the Bayes Factor.** The Bayes factor (BF) is defined as $\frac{f(x_{\text{obs}}|H_1)}{f(x_{\text{obs}}|H_0)}$. The figure assumes that observations are drawn i.i.d. according to $x \sim N(\mu, \sigma^2)$, where the mean μ is unknown and the variance σ^2 is known. The *P*-value is from a two-sided *z* test (or equivalently a one-sided χ_1^2 test) of the null hypothesis $H_0: \mu = 0$. "Power": BF obtained by defining H_1 as putting ½ probability on $\mu = \pm m$ for the value of m that gives 75% power for the test of size $\alpha = 0.05$. This H_1 represents an effect size typical of that which is implicitly assumed by researchers during experimental design. "Likelihood Ratio Bound": BF obtained by defining H_1 as putting ½ probability on $\mu = \pm\hat{x}$, where $\hat{x}$ is approximately equal to the mean of the observations. These BFs are upper bounds among the class of all H_1's that are symmetric around the null, but they are improper because the data are used to define H_1. "UMPBT": BF obtained by defining H_1 according to the uniformly most powerful Bayesian test (*5*) that places ½ probability on $\mu = \pm w$, where w is the alternative hypothesis that corresponds to a one-sided test of size 0.0025. This curve is indistinguishable from the "Power" curve that would be obtained if the power used in its definition was 80% rather than 75%. "Local-H_1 Bound": BF $= \frac{1}{-ep\ln p}$, where p is the *P*-value, is a large-sample upper bound on the BF from among all unimodal alternative hypotheses that have a mode at the null and satisfy certain regularity conditions (*15*). For more details, see the Supplementary Online Materials (SOM).