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A practical solution to the pervasive problems of p values.

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Abstract

In the field of psychology, the practice of p value null-hypothesis testing is as widespread as ever. Despite this popularity, or perhaps because of it, most psychologists are not aware of the statistical peculiarities of the p value procedure. In particular, p values are based on data that were never observed, and these hypothetical data are themselves influenced by subjective intentions. Moreover, p values do not quantify statistical evidence. This article reviews these p value problems and illustrates each problem with concrete examples. The three problems are familiar to statisticians but may be new to psychologists. A practical solution to these p value problems is to adopt a model selection perspective and use the Bayesian information criterion (BIC) for statistical inference (Raftery, 1995). The BIC provides an approximation to a Bayesian hypothesis test, does not require the specification of priors, and can be easily calculated from SPSS output.

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