Response by the American Statistical Society on p-values: What’s next?

In February 2016 our sister society, the American Statistical Association (ASA), issued a statement on p-values (reprinted in [1]). It enunciated six principles. Four of these are negative, focusing on what the p-value is not and enjoining people from using p-values for “scientific conclusions and business or policy decisions.” Obviously the p-value isn’t good for much.

We think the ASA did not go far enough. It is time to admit that the era of p-values is over. Statisticians have successfully used them to baffle undergraduates, trick scientists, and fool editors everywhere, but the world is starting to see through this ruse. We need to abandon this early 20th century attempt by statisticians to control decision making. We need to return to what actually works.

In place of p-values, the ASS advocates the STOP (SeaT-Of-Pants procedure). This time-honored and -tested method was used by the ancient Greeks, renaissance men, and all scientists until Ronald Fisher came along and ruined things. The STOP is simple, direct, data-driven, and authoritative. To carry it out, an authority figure (an older male, by preference) reviews the data and decides whether they agree with his opinion. When he decides they do, the result is “significant.” Otherwise it is not and everybody is required to forget about the whole thing.

Principles

1. The STOP can indicate how incompatible the data are with a specified statistical model.

We like this phrase because it’s such a fancy way of saying the STOP will answer any question yes or no. Unlike p-values or other statistical procedures, it leaves no doubt. It’s the perfect response to those
who say “we don’t need no stinkin’ null hypothesis! What the *?!@ is that, anyway? Nobody ever
could figure out what it was supposed to be.”

2. The STOP doesn’t measure the probability that a hypothesis is true: it actually decides whether
it’s true or not.

Everybody is confused by probabilities. By taking probability out of the picture, the STOP eliminates the
need for years of undergraduate and graduate study. Now anybody (who is sufficiently old and male)
can perform statistical analysis without the pain and torture of listening to even a single statistical
lecture or running arcane software that spews unintelligible output.

3. Scientific conclusions and business or policy decisions can be based on common sense and real
authority figures.

Important decisions always have been made by authorities, anyway, so let’s just admit it and cut out the
middlemen. Using the STOP will free statisticians to do what they are best suited for: using numbers to
obfuscate the truth and sanctifying the preferences of those in power.

4. Proper inference requires full reporting and transparency

The STOP is the most transparent and self-evident statistical procedure ever invented: you look at the
data and you decide. It eliminates all those confusing z-tests, t-tests, chi-squared tests, and alphabet
soup procedures (ANOVA! GLM! MLE!) used by people to hide the fact they have no clue what the data
mean.

5. The STOP measures the importance of the result.

This is self-evident: if a person in authority employs the STOP, then the result must be important.
6. *By itself, the STOP provides a good measure of evidence regarding a model or hypothesis.*

We wouldn’t want to challenge an authority, would we? Researchers and decision makers will recognize that the STOP provides all the information they need to know. For these reasons, data analysis can end with the STOP; there is no need for alternative approaches, like p-values, machine learning, or astrology.

**Other approaches**

Some statisticians prefer so-called “Bayesian” methods, in which an obscure theorem posthumously published by an 18th century cleric is applied mindlessly to solve every problem. Its most noted advocates freely admit these methods are “subjective.” If we’re going to use subjective methods, then obviously the more authoritative and knowledgeable the decision maker is, the better the result will be. The STOP thereby emerges as the logical limit of all Bayes methods. Why go to the effort of working those awful calculations, and tying up so much computer time, when you can just show the data to the guy in charge and ask him what his opinion is? End of story.

Another community has recently arisen to challenge the priesthood of statisticians. They call themselves “machine learners” and “data scientists,” but they’re really just hackers looking for higher status. It’s the official position of the ASS that these guys should go form their own professional organization if they want people to take them seriously.

Acknowledgment: We thank the usual meddlers and bigshots for talking about this over a few beers and lending their cachet to our enterprise. You know who they are.

**Reference**
