



UNIVERSITY OF PADOVA

Beyond  $p < .05$   
Modern statistical approaches  
in psychological science

INTERNATIONAL WINTER SCHOOL 2019

## School abstract - Michèle B. Nuijten

### Gray Areas in Statistics: How Methodological and Statistical Decisions Can Influence Conclusions

We have reason to believe that many published research findings are inflated or even false. One of the causes seems to be publication bias: statistically significant studies have a higher probability of being published than studies with nonsignificant findings. However, publication bias is not the only problem we're facing. It turns out that there is a lot of flexibility in analyzing results – especially in psychology. The strategic use of this flexibility to obtain significant results can lead to false positive findings. These practices and choices are not fraud, but not perfect science either: hence, they're often dubbed “gray practices”. After this workshop, you'll be able to recognize “gray areas” in statistical and methodological choices, explain why such choices negatively affect a field's trustworthiness, and know how to avoid gray practices in your own research.

### “statcheck”: a Spellchecker for Statistics

Half of the psychology papers contain inconsistent statistical results in which the reported p-value does not match the reported test statistic and degrees of freedom. Most of these inconsistencies seem to be small and inconsequential, but in over 12.5% of the papers there are inconsistencies that might change the statistical conclusion. We developed the R package “statcheck” and the accompanying web app <http://statcheck.io> to automatically find these inconsistencies. In my talk I will discuss statcheck's potential in preventing statistical errors through self-checks and peer review. There will be an opportunity for some hands-on practice with the tool.