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We need to talk: Replicability in Online Research

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We need to Talk

Replicability in Online Research

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ReplicableOnlineResearch

Brief Definition of Two Relevant Terms

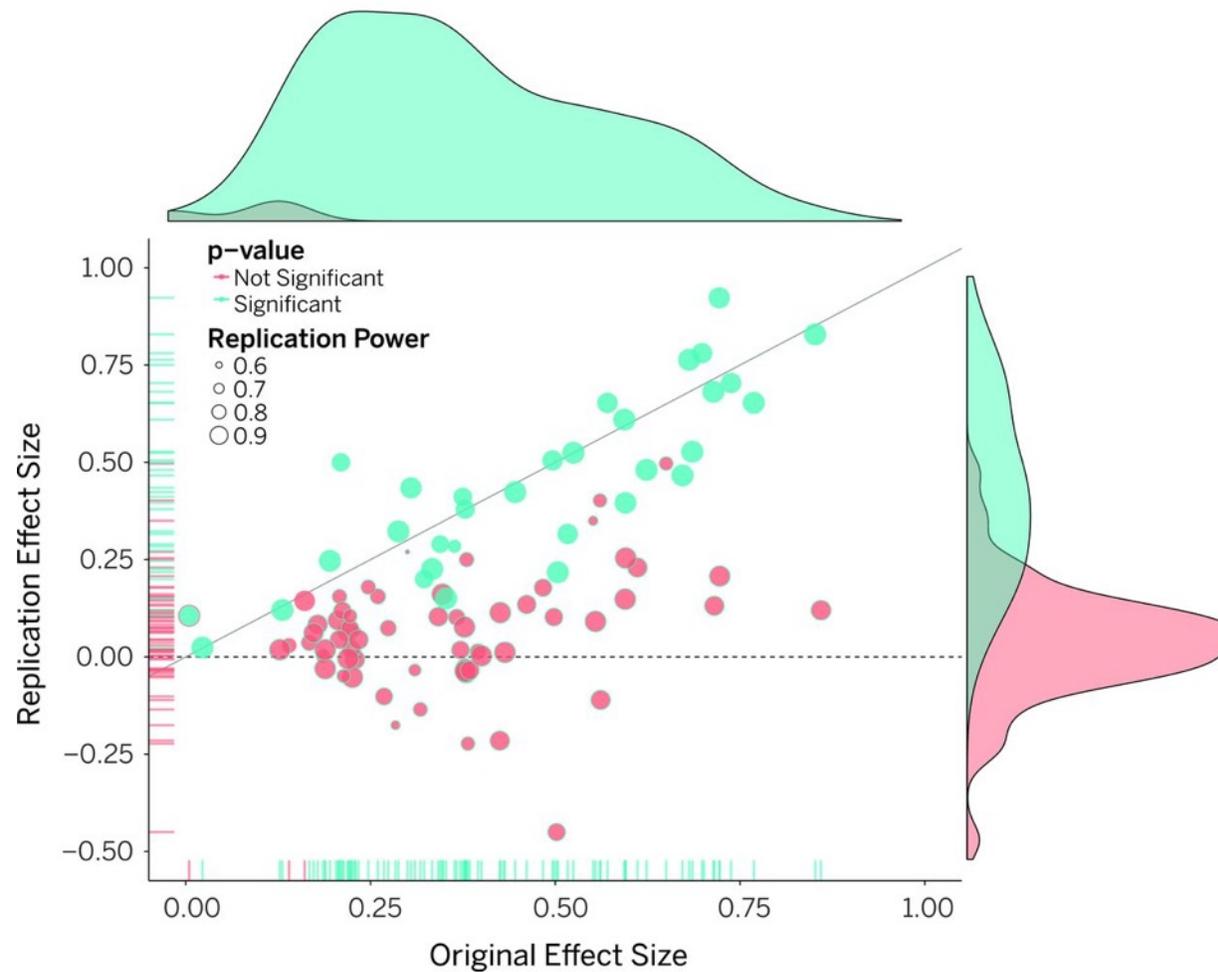
Reproducibility

- › Different researchers come to the same conclusion, based on the **same data set** from the **same study**.
- › Warranted through reproducible analysis scripts (R code, SPSS syntax, ...) and availability of data

Replicability

- › Different researchers come to the same conclusion, based on a **new data set** from a **different study**.
- › Exact, close, direct or conceptual replications

Reproducibility Project: Psychology – Results



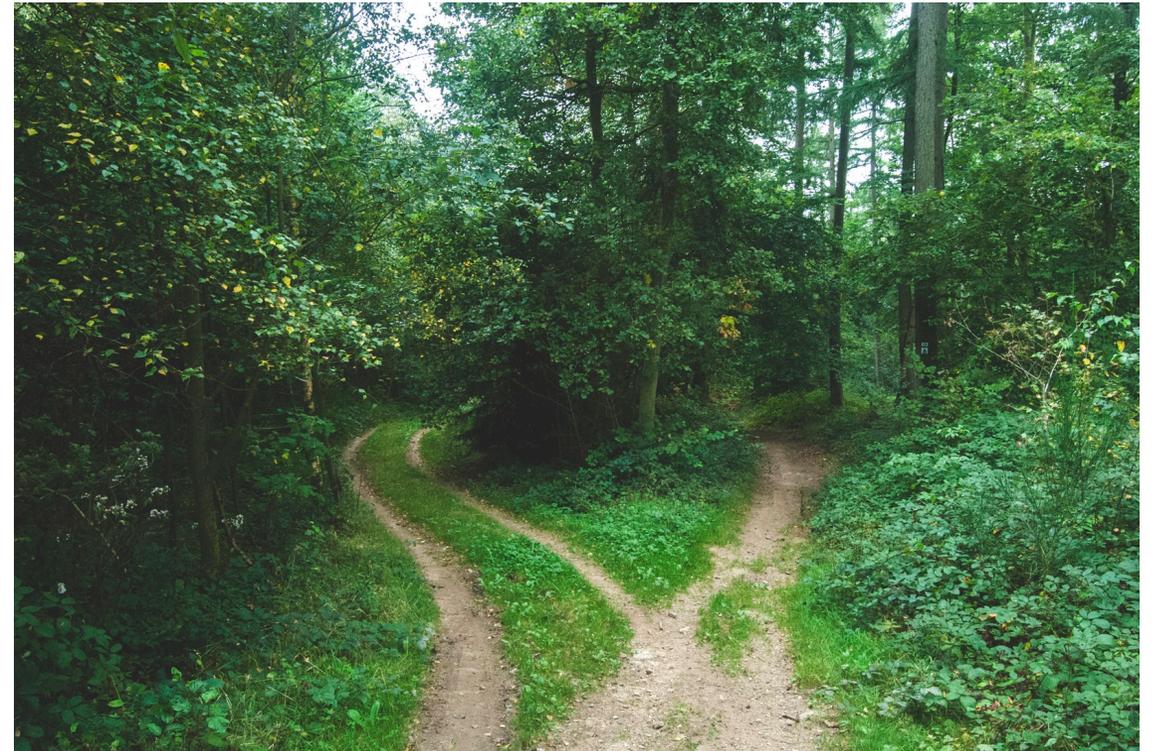
Source: Open Science Collaboration. (2015). Estimating the reproducibility of psychological science. *Science*, 349(6251), aac4716.

Replicability Crisis: A Crisis of Confidence?

The rate of successful replications is alarmingly low!

Causes for low replicability in Psychology? Among others...

- › Publication Bias
- › Garden of Forking Paths (Questionable Research Practices / p -Hacking)
- › Mindless Statistics
- › Sexy effects & Weak theories
- › Small, WEIRD samples
- › Incentive structure in academia („publish or perish“)
- › Data Fabrication / Data Manipulation





What can we do? Among others...

„Quick“ fixes

- › Pre-registration & Registered Reports
- › Open Science principles: Open Material, Open Data
- › Direct & Conceptual Replications
- › Better Statistical Analysis
 - Discern confirmatory from exploratory analysis
 - Use adequate statistical tool (not everything warrants p -values)
 - Account for measurement error

Long-term Fixes

- › Meta-Analysis and systematic reviews
- › Improve Theories
- › Improve Measurements
- › Change common practices and institutional incentives

What About Online Research?

Online Research shares **theoretical and methodological foundation** with psychological science

Academic Research



Market Research

What is Replicability in Market Research?



Would two different market research institutes come to the same conclusion?

Recommendations to Improve our Research

Academic Online Research / Research on Research

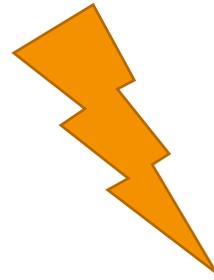
- › Pre-registration of hypotheses and study protocols / **Registered Reports**
- › Conduct **replications & Meta-analyses**
- › **Open Science:** Share study material and research data openly (where possible)
- › Improve **statistical analysis**
 - Discern confirmatory from exploratory analysis
 - Use adequate statistical tool (not everything warrants p -values)
 - Account for measurement error

Commercial Market Research

- › Pre-registration of hypotheses and study protocols
- › Statistical analysis fit for investigating noisy, possibly hierarchical, exploratory data (e.g. Bayesian data analysis)
- › Reproducible Analyses
- › Design analysis (sample size planning)
- › Internal Replications (Cross-Validation, Split-Half analyses, Sensitivity analysis, ...)

Conflict of Goals – We might need to trade off...

High quality, replicable research



Agile, low-cost research

Outlook: What can we do?

- › Investigate findings in Online Research: **Validate, Replicate and Integrate**
- › **Start a discussion** in both academic and commercial research



Thanks for your attention!



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References & Further Reading

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