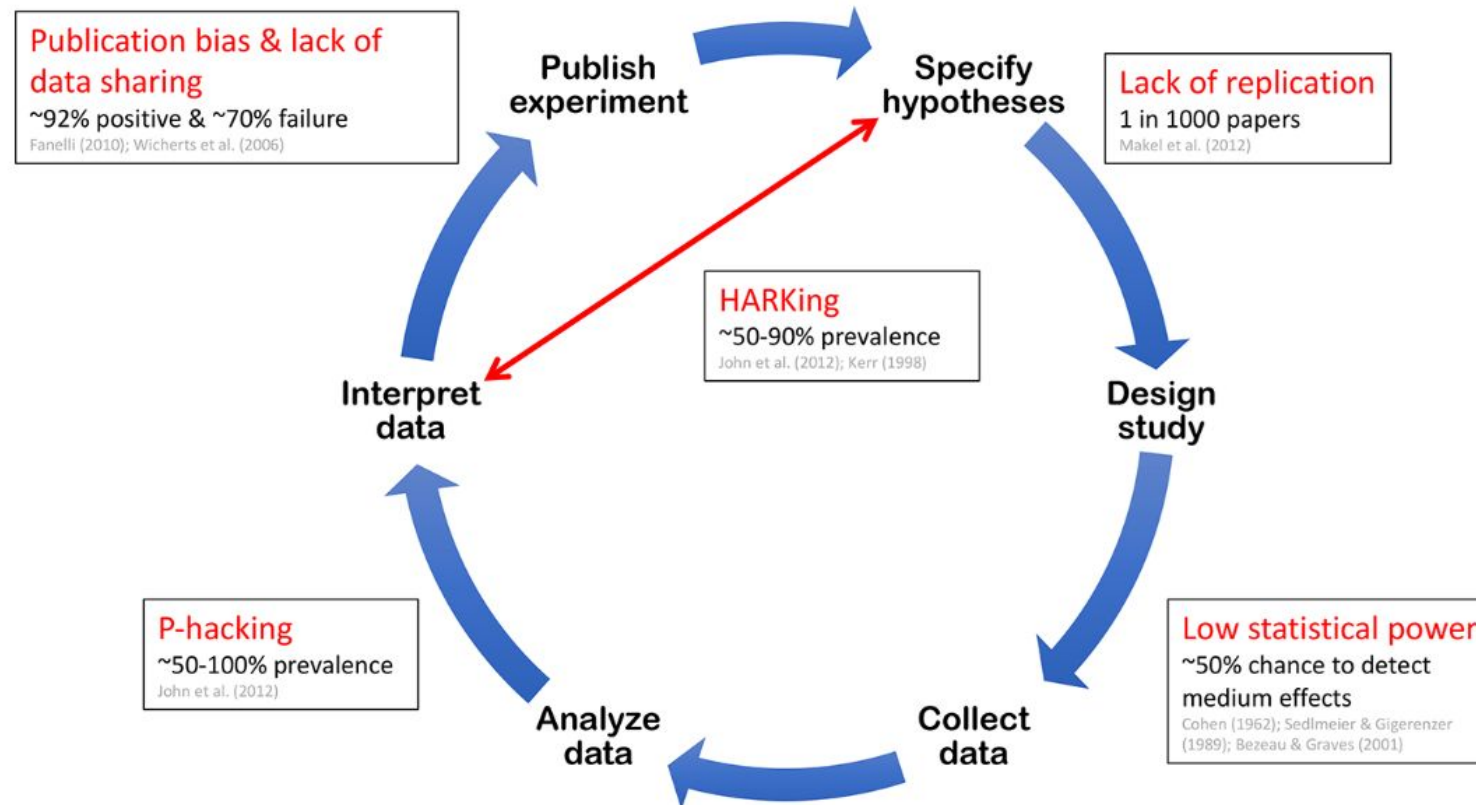# Registered Reports in Psychology: Why, for whom and how?

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RegReports - Why?

Publication bias & lack of data sharing
~92% positive & ~70% failure
Fanelli (2010); Wicherts et al. (2006)

Publish experiment

Specify hypotheses

Lack of replication
1 in 1000 papers
Makel et al. (2012)

HARKing
~50-90% prevalence
John et al. (2012); Kerr (1998)

Interpret data

Design study

P-hacking
~50-100% prevalence
John et al. (2012)

Analyze data

Collect data

Low statistical power
~50% chance to detect medium effects
Cohen (1962); Sedlmeier & Gigerenzer (1989); Bezeau & Graves (2001)

RegReports - Why?

DIE WELT

Einmal ist KEINMAL

Zahlreiche klassische Experimente der Psychologie
lassen sich nicht wiederholen. Sind sie deshalb falsch?

DER UMGANG MIT DATEN IST MANCHMAL SEHR KREATIV

Im Grunde wissen die Psychologen
noch nicht, warum Bestätigungsversu-
che des Öfteren scheitern. Es könnte
auch an einer gewissen Kreativität in
der Auswertung der Daten in den Origi-
nalstudien liegen.

The New York Times

SCIENCE TIMES AT 40

**Essay: The Experiments
Are Fascinating. But
Nobody Can Repeat Them.**

Science is mired in a "replication" crisis. Fixing it will not be easy.

ScienceNews
MAGAZINE OF THE SOCIETY FOR SCIENCE & THE PUBLIC

SCIENCE & THE PUBLIC   PSYCHOLOGY, SCIENCE & SOCIETY

**'Replication crisis' spurs
reforms in how science
studies are done**

RegReports - Why?

Foster trust in empirical science!

by enabling researchers to demonstrate that their studies have been conducted, analyzed, and reported as initially planned

RegReports - For whom?

- Authors
  - can base their research on scientific and quality criteria - irrespective of the possible outcome
- Editors
  - can increase validity and replicability of their journal contents
  - establish a quality commitment and brand
- Readers
  - higher confidence in published results, because of reduced publication bias
- Funding agencies
  - efficient budget allocation by ensuring the proper publication of null results

RegReports - How?

- Authors of empirical studies publish details regarding sampling, sample size and the plan for analysis *prior* to conducting the study

- preregistered study protocols can be handled and peer-reviewed like an article
  - acceptance of preregistered study protocols based on method and quality of design, not on outcome

➔ Increase in robustness and replicability of psychological science

RegReports - How?

Over 160 journal already offer a preregistered format today!

Source: https://cos.io/rr/

RegReports - A silver bullet?

"The single cheap solution that will solve all of the problems in the entire world" (Goldacre, 2009)

Several challenges remain

- incentive for authors to adopt preregistration formats
- integration for authors in writing a study protocol
- integration and decision aids for reviewers
- integration into journal systems for editors and readers

RegReports - How?

ZPID is a Public Open Science Institute for Psychology and related disciplines
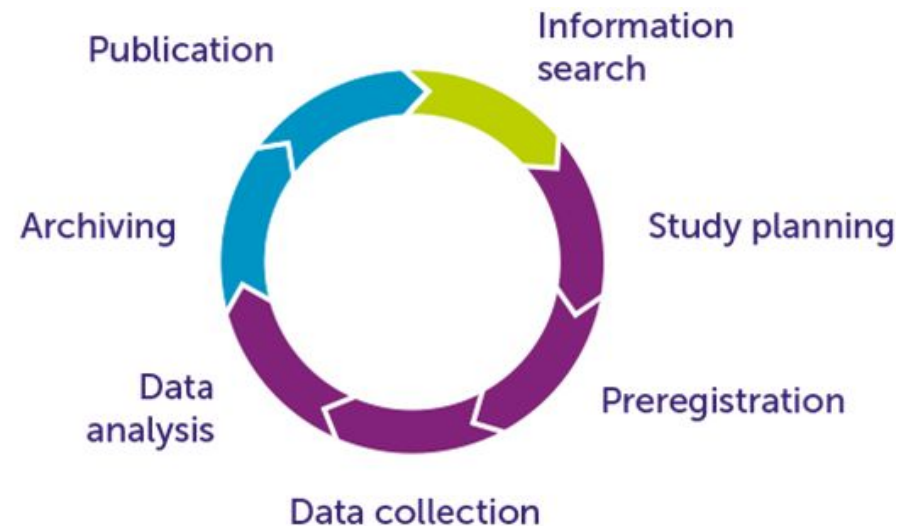
RegReports - How?

- ZPID wants to enable preregistration
  - no normative statements
    - mission of associations like DGPs, APA, etc.
  - Supporting pre-registration by:
    - integrating preregistration into a research cycle
    - participating in developing and implementing joint standards (currently with: DGPs, Hogrefe, SIPS, APA, BPS, etc.)
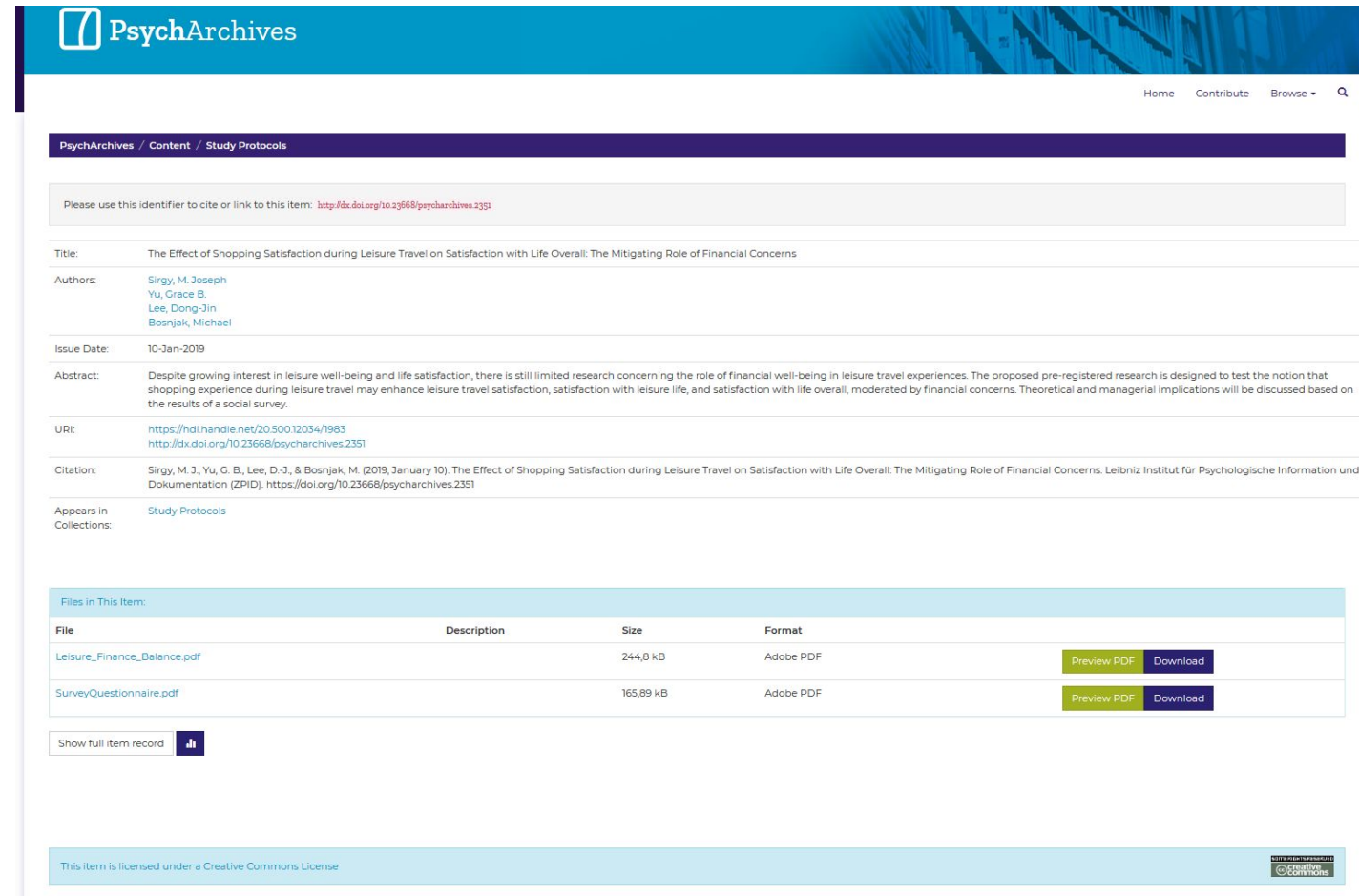
Publication

Information search

Archiving

Study planning

Data analysis

Preregistration
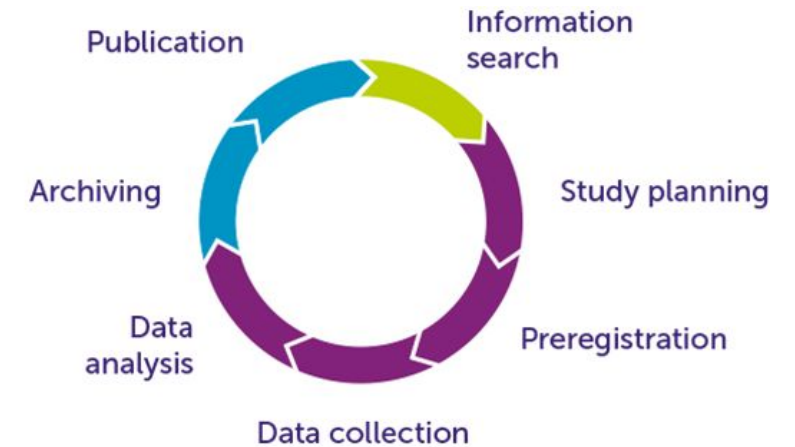
Data collection

RegReports - How?

- ZPID wants to enable Registered Reports!
  - offering free and independent data collection services for successfully reviewed protocols
  - offering notarization and long-term preservation services
  - developing a service for authors and editors to create and review protocols ("RegReports")
  - developing SMART-preregistration in PsychOpen GOLD (OA journals) ("SMART-Protocols")
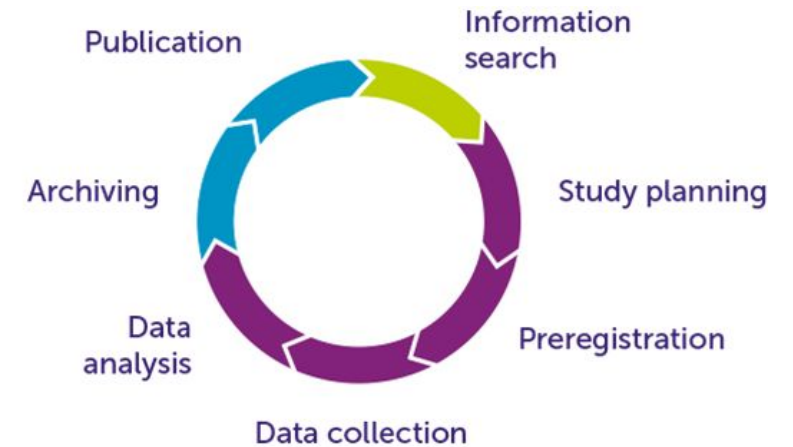
RegReports - notarization and preservation

- PsychArchives
  - keep a copy of protocols with an independent third party ("notarization")
  - connect and preserve protocol, data, analysis code, publication and all other digital research objects for a study in one place

RegReports - service to create and review

- Platform populated with templates developed for psychological science
  - technology based e.g. on protocols.io

Copy of Information Recommended for Inclusion in Manuscripts Reporting Meta-Analyses

Description   Guidelines & Warnings   Materials   **Steps**   +SHARE   VIEW   All changes saved

🔒 Title
1 State the research question and type of research synthesis (e.g., narrative synthesis, meta-analysis).

🔒 Author note
2 List all sources of monetary and in-kind funding support; state the role of funders in conducting the synthesis and deciding to publish the results, if any.
   Describe possible conflicts of interest, including financial and other nonfinancial interests.
   Give the place where the synthesis is registered and its registry number, if registered.
   Provide name, affiliation, and e-mail address of corresponding author.

🔒 Abstract
3 **Objectives:**
   State the research problems, questions, or hypotheses under investigation.

🔒 Abstract
4 **Eligibility criteria:**
   Describe the characteristics for inclusion of studies, including independent variables (treatments, interventions), dependent variables (outcomes, criteria), and eligible study designs.

🔒 Abstract
5 **Methods of synthesis:**
   Describe the methods for synthesizing study results, including
   ▪ Statistical and other methods used to summarize and to compare studies
   ▪ Specific methods used to integrate studies if a meta-analysis was conducted (e.g., effect-size metric, averaging method, the model used in homogeneity analysis)
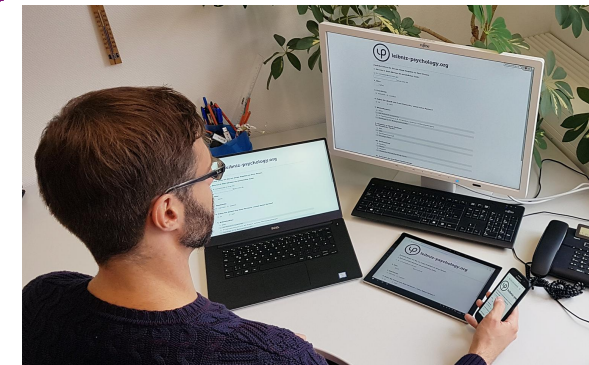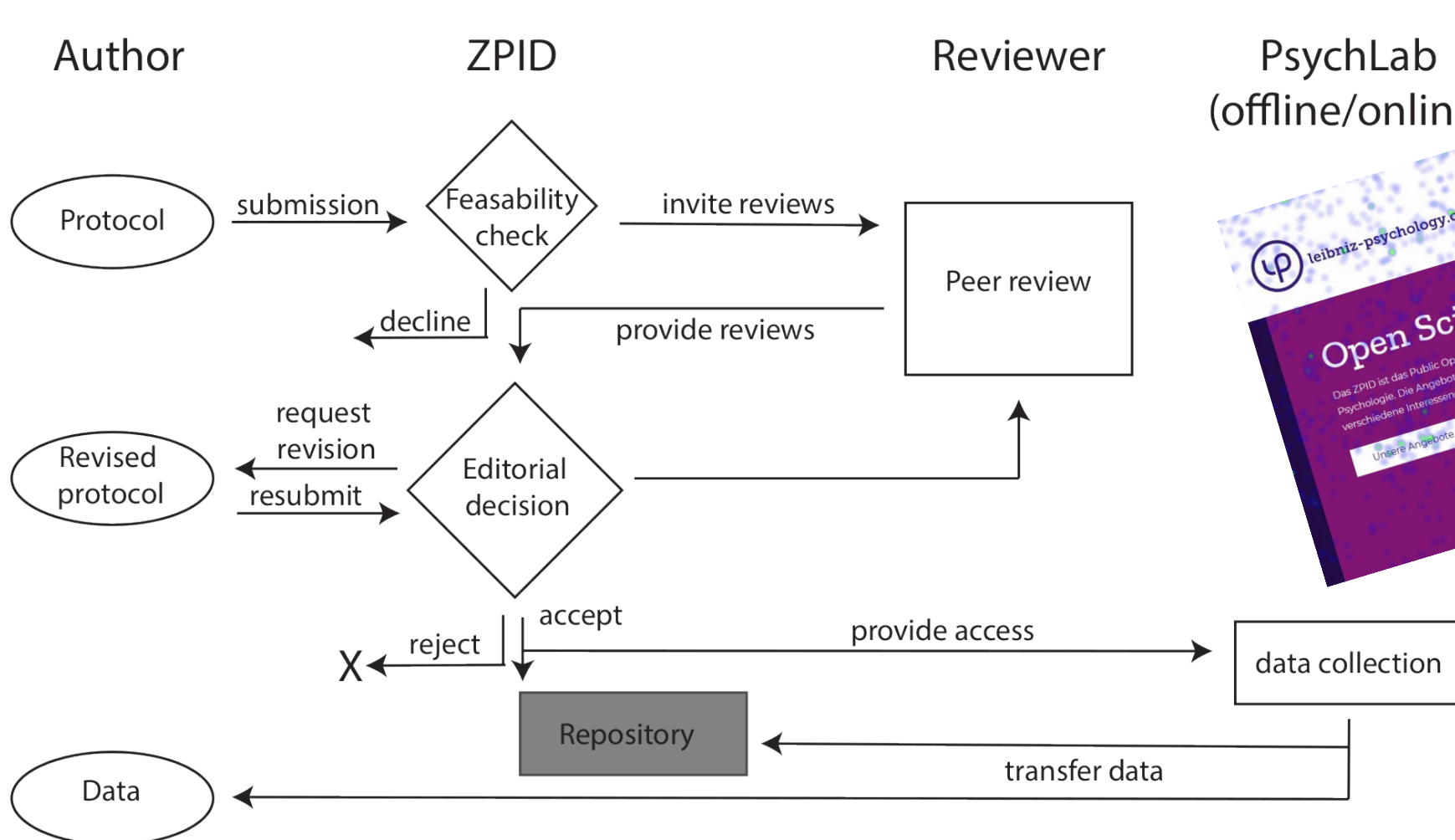
🔒 Abstract
6 **Results:**
   State the results of the synthesis, including
   ▪ Number of included studies and participants, and their important characteristics
   ▪ Results for the primary outcome(s) and moderator analyses
   ▪ Effect size(s) and confidence interval(s) associated with each analysis if aa meta-analysis was conducted
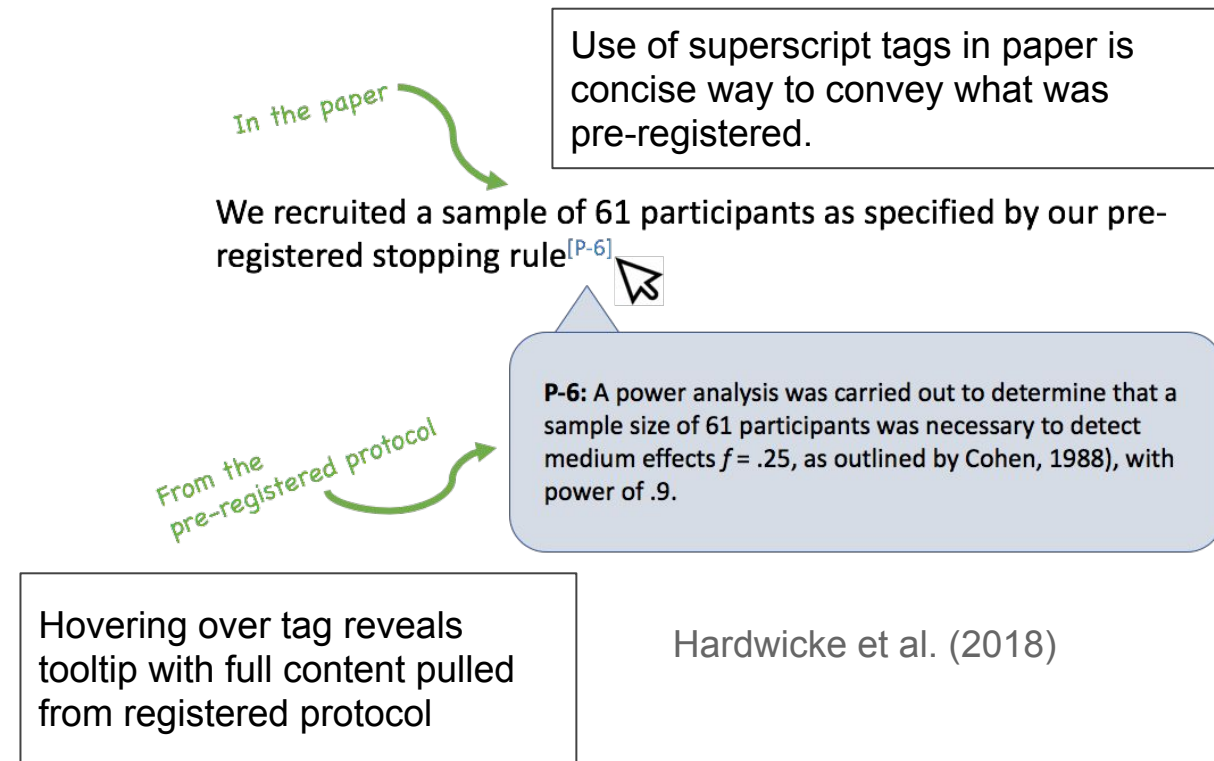
RegReports - free data collection incentive

RegReports - SMART-Preregistrations

- Deposit additional machine-readable version of protocols in PsychArchives
  - markup of individual sections within the protocol
- Implement display on journal side in PsychOpen GOLD OA journals

In the paper

Use of superscript tags in paper is concise way to convey what was pre-registered.

We recruited a sample of 61 participants as specified by our pre-registered stopping rule[P-6]

From the pre-registered protocol

P-6: A power analysis was carried out to determine that a sample size of 61 participants was necessary to detect medium effects $f = .25$, as outlined by Cohen, 1988), with power of .9.

Hovering over tag reveals tooltip with full content pulled from registered protocol

Hardwicke et al. (2018)

RegReports - Perspectives

- 2019: prototype software for comfortably creating and reviewing protocols and notarizing them in PsychArchives
- 2020: PsychLab Offline incentive fully operational

We expect most of the proposed ideas to be transferable to other empirical sciences, as the approaches are not strictly specific for psychology and hope these domains can profit from our endeavours.

Thank you very much. Any questions?