Collaborative replication and education projects

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Collaborative replication and education project (CREP): Accelerating transition to full open science practices
Why needed?

The Nine Circles of Scientific Hell

I  Limbo
II  Overselling
III  Post-Hoc Storytelling
IV  P-Value Fishing
V   Creative Outliers
VI  Plagiarism
VII  Non-Publication
VIII Partial Publication
IX  Inventing Data

The Hypothetico-deductive model of the scientific method

1. Collect data
2. Analyze data
3. Design study
4. Specify hypotheses
5. Publish experiment
6. Interpret data
The Hypothetico-deductive model of the scientific method

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

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

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

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

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

*Pre-registration (n) =* publication of data-collection and analysis plan *before collecting the data*

“Gold” pre-registration
- Submit study plan to a journal
- Acceptance before start of data-collection

“Silver” pre-registration
- Publish study plan on the internet (e.g., OSF)
- Collect data and refer to pre-registration document
Pre-registration of replications

- Simultaneously solves
  - File-drawer (all results published)
  - HARKing (impossible)
  - P-hacking (impossible)
  - Low power (high power required a priori)

→ Ensures validity of the hypothetico-deductive model
Replication projects in teaching

Replication of Kool, W., McGuire, J. T., Rosen, Z. B., & Botvinick, M. M. (2010) at UiT - The Arctic University of Norway

**Pro:**
- Good research practices
- Real-life project
- Direct interaction with original authors

**Challenges:**
- Power
- Probably only feasible for replications
# CREP Workflow

<table>
<thead>
<tr>
<th>Tasks</th>
<th>Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Claiming a study</td>
<td>contact us &amp; provide contact details, receive a CREP# and Executive Reviewer and Administrative Advisor</td>
</tr>
<tr>
<td>Preparing a Study</td>
<td>Fork the CREP study page to be replicated. edit and populate it with relevant</td>
</tr>
<tr>
<td>First Pre-Data Review</td>
<td>contact Executive Reviewer 2 weeks before data collection begins. Include all info on OSF page except for IRB approval. Please include CREP# and link to OSF page</td>
</tr>
<tr>
<td>Response to Review</td>
<td>reply to exec reviewer about what changes were made.</td>
</tr>
<tr>
<td>Data Collection</td>
<td>REGISTER the OSF page using “OSF-Standard Pre-Data Collection Registration”. Send link to registered page to Executive reviewer before data collection</td>
</tr>
<tr>
<td>Second -Post Analyses Review</td>
<td>add data component, add results component, notify Jon Grahe and administrative assistant that project is complete</td>
</tr>
<tr>
<td>Post Review</td>
<td>update OSF page with any publications / presentations</td>
</tr>
</tbody>
</table>
# CREP Workflow

<table>
<thead>
<tr>
<th>Tasks</th>
<th>Supervisors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Finding a study</td>
<td>encourage students to review CREP</td>
</tr>
<tr>
<td>Preparing a Study</td>
<td>check that students are completing basic information</td>
</tr>
<tr>
<td>First Review</td>
<td>check page first to give any preliminary feedback</td>
</tr>
<tr>
<td>Response to Review</td>
<td>assist students in addressing pressing issues</td>
</tr>
<tr>
<td>Second Review</td>
<td>monitor student progress; advise on best practices</td>
</tr>
<tr>
<td>Post Review</td>
<td>work with students on conference presentations and manuscripts as desired</td>
</tr>
</tbody>
</table>
# CREP Workflow

<table>
<thead>
<tr>
<th>Tasks</th>
<th>Administrators</th>
</tr>
</thead>
<tbody>
<tr>
<td>Claiming a study</td>
<td>add information to CREP Progress page, make sure contributor has best practice guidelines. Share CREP progress page with new contributor (view only)</td>
</tr>
<tr>
<td>Preparing a Study</td>
<td>put link to student OSF page on our “in progress projects” on OSF page</td>
</tr>
<tr>
<td>First Review</td>
<td>Update CREP progress</td>
</tr>
<tr>
<td>Response to Review</td>
<td>Update CREP progress</td>
</tr>
<tr>
<td>Second Review</td>
<td>update CREP progress, update OSF page moving approved study in Researchers and Findings page</td>
</tr>
<tr>
<td>Post Review</td>
<td>email contributors and ask them to add component “What I learned from the CREP project?”</td>
</tr>
<tr>
<td>Tasks</td>
<td>Reviewers</td>
</tr>
<tr>
<td>----------------</td>
<td>--------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>First Review</td>
<td>review OSF page and original manuscript, identify any issue that would impact data collection; identify any suggestions for improving communication on OSF page; make sure page was forked from study page</td>
</tr>
<tr>
<td>Second Review</td>
<td>check data files are readable; data honesty statement (completion pledge); results reported correctly; study was preregistered; wiki descriptions of each component are informative; check to make sure the N &gt; than minimum required</td>
</tr>
</tbody>
</table>
Brilliant text about @CREP_psych by @Gerit_Pfuhl: "Replications are not only necessary; they are the best way to learn how to conduct research." How come this isn't standard practice yet? psykologisktidskrift.no/accelerating-...
Accelerating Open Science: The Collaborative Replications and Education Project (CREP)

9. NOVEMBER 2018

Written by: Gerit Pfuhl, Associate professor in psychology at UiT and NTNU.

This article is from our newest edition of Psykologisk Tidsskrift, Fagkritikk (read more).

Recent years have seen a revolution in publishing and large support for open access publishing.... Les mer!


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Abstract

According to the justified True Belief (JTB) account of knowledge, a person’s ability to know something is defined by having a belief that is both justified and true (i.e., knowledge is justified true belief). However, this account fails to consider the role of luck. In 1983, Gettier argued that JTB is insufficient because it does not account for ...

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