TECHNISCHE UNIVERSITÄT DRESDEN

DRESDEN concept

Open Science as good practice in doctoral training and shifting incentives for Open Science in academia

Dr. Anne Gärtner (Faculty of Psychology, TU Dresden)

Open Science Day | University of Mannheim

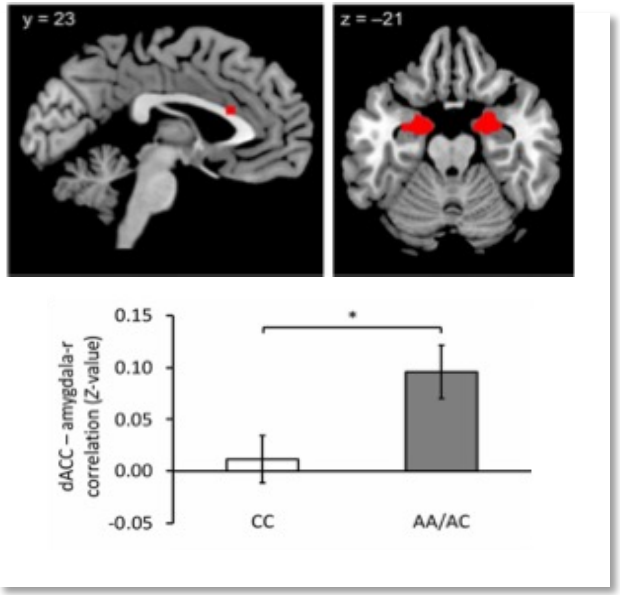
12.10.2023

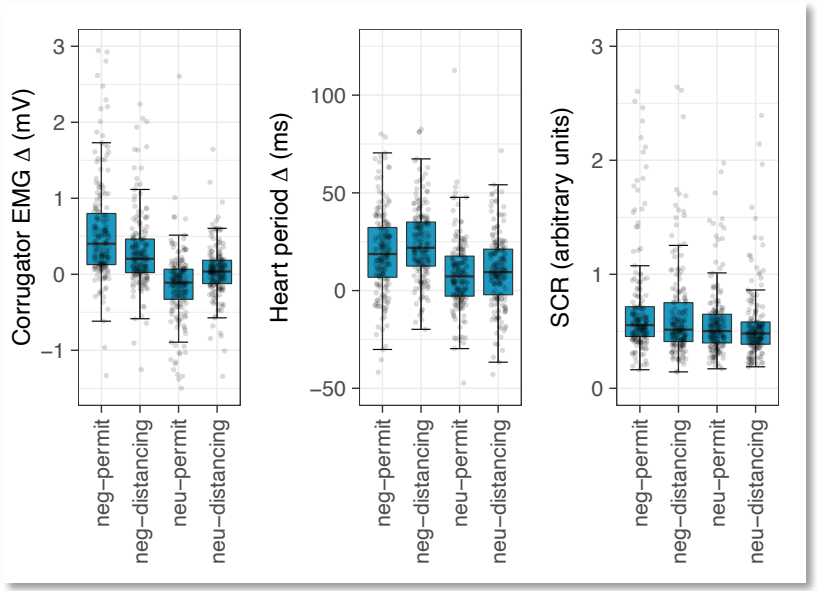
Slides: https://osf.io/gd3ze/

About me: Neurobiology of anxiety and emotion regulation

ORIGINAL PAPER

Impact of FAAH genetic variation on fronto-amygdala function during emotional processing

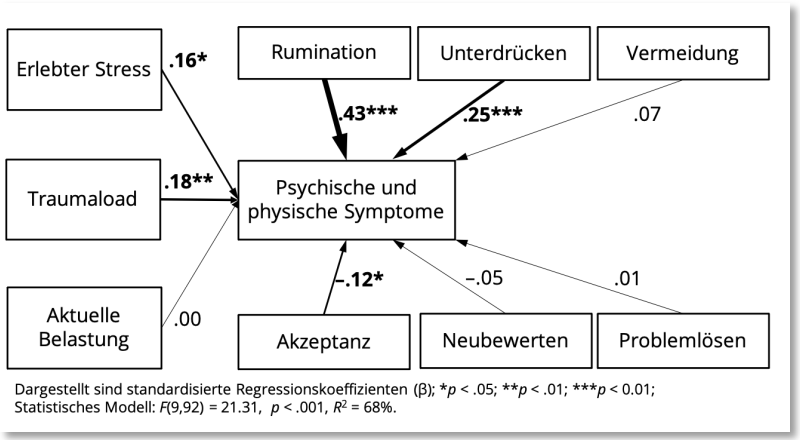




ORIGINAL RESEARCH
published: 10 January 2019
doi: 10.3389/fpsyg.2018.02744

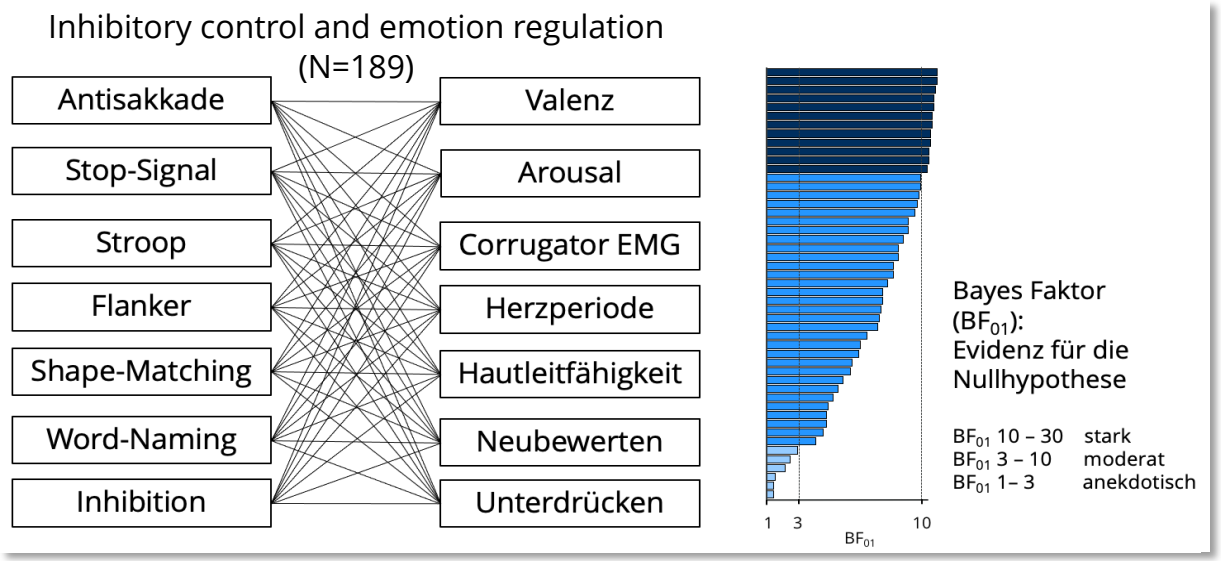
Emotion Regulation in Rescue Workers: Differential Relationship With Perceived Work-Related Stress and Stress-Related Symptoms

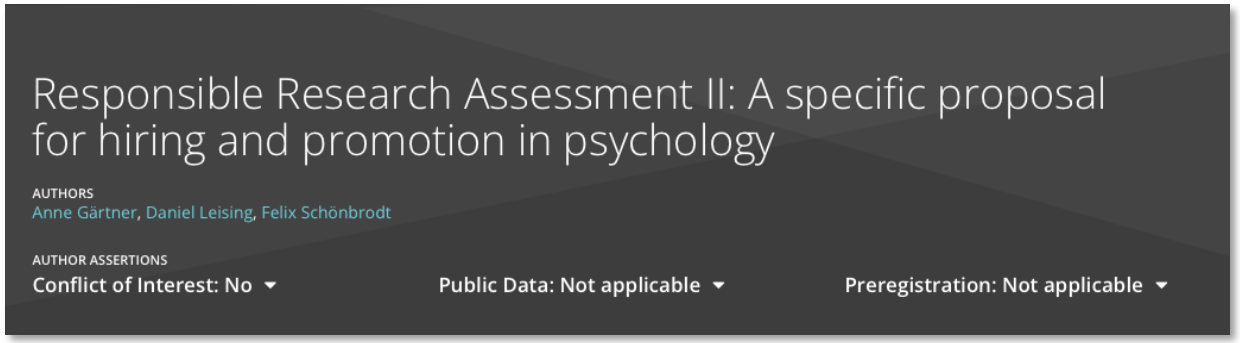
Anne Gärtner[1†], Alexander Behnke[1,2*†], Daniela Conrad[2,3], Iris-Tatjana Kolassa[2] and Roberto Rojas[4]*



Dargestellt sind standardisierte Regressionskoeffizienten (β); *$p < .05$; **$p < .01$; ***$p < 0.01$; Statistisches Modell: $F(9,92) = 21.31$, $p < .001$, $R^2 = 68\%$.

About me: Open and reproducible research





DFG SFB 940

DGPs Deutsche Gesellschaft für Psychologie

SIPS SOCIETY FOR THE IMPROVEMENT OF PSYCHOLOGICAL SCIENCE

OPEN SCIENCE INITIATIVE
OSIP Open Science Initiative der Fakultät Psychologie der TUD

DGPs Fachgruppe Biologische Psychologie und Neuropsychologie
DGPs Deutsche Gesellschaft für Psychologie
Interest Group for Open and Reproducible Science

OPEN SCIENCE

- Good Scientific Practice Workshop (GSP)
- Research Data Management Workshop (INF)
- Research Transparency Workshop (OSIP)
- Open Science Meetings
- Open Science Lectures

3 workshops in year 1

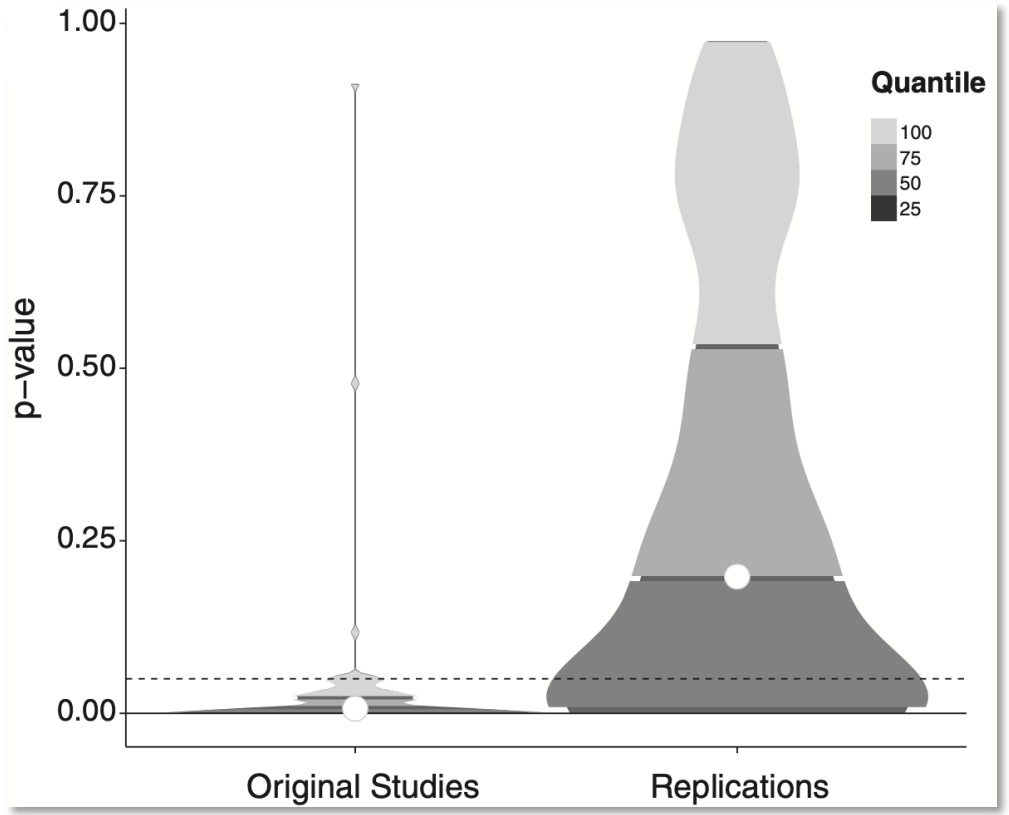
Introduction
The problem

The problem
Failed replications

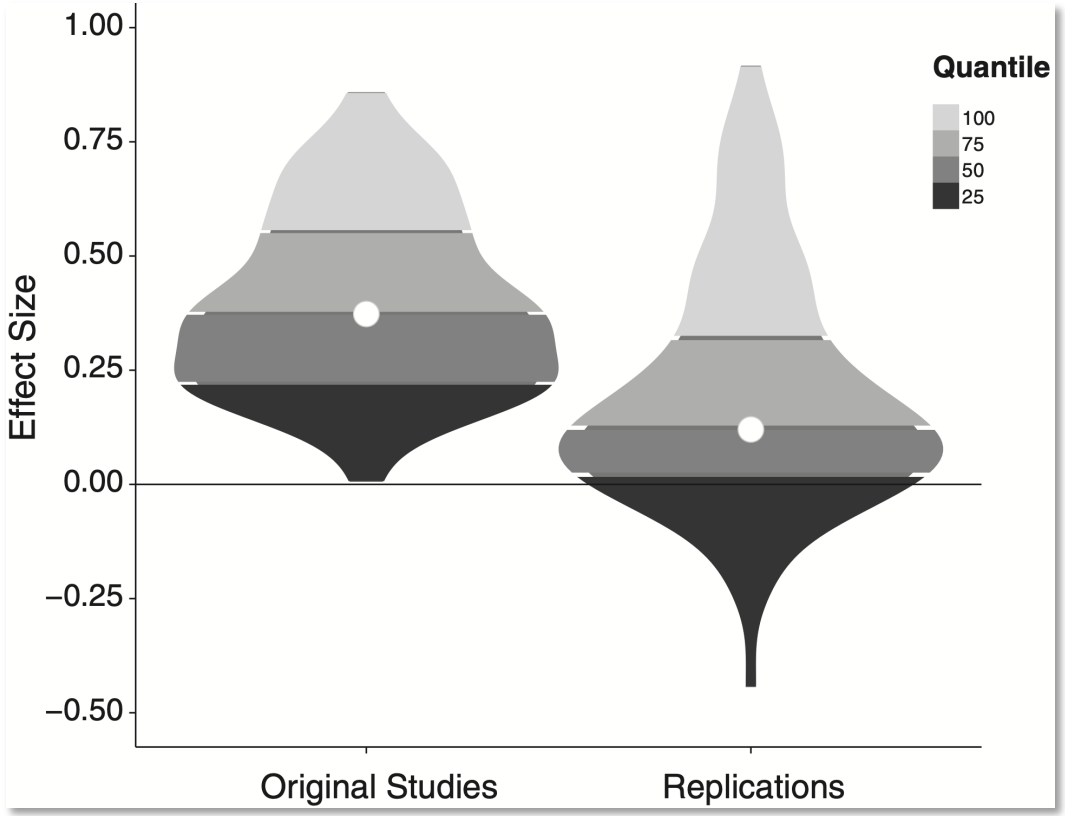
RESEARCH ARTICLE SUMMARY

PSYCHOLOGY

Estimating the reproducibility of psychological science



N = 100 studies
original studies: **97%** significant effects replication studies: **36%** significant effects

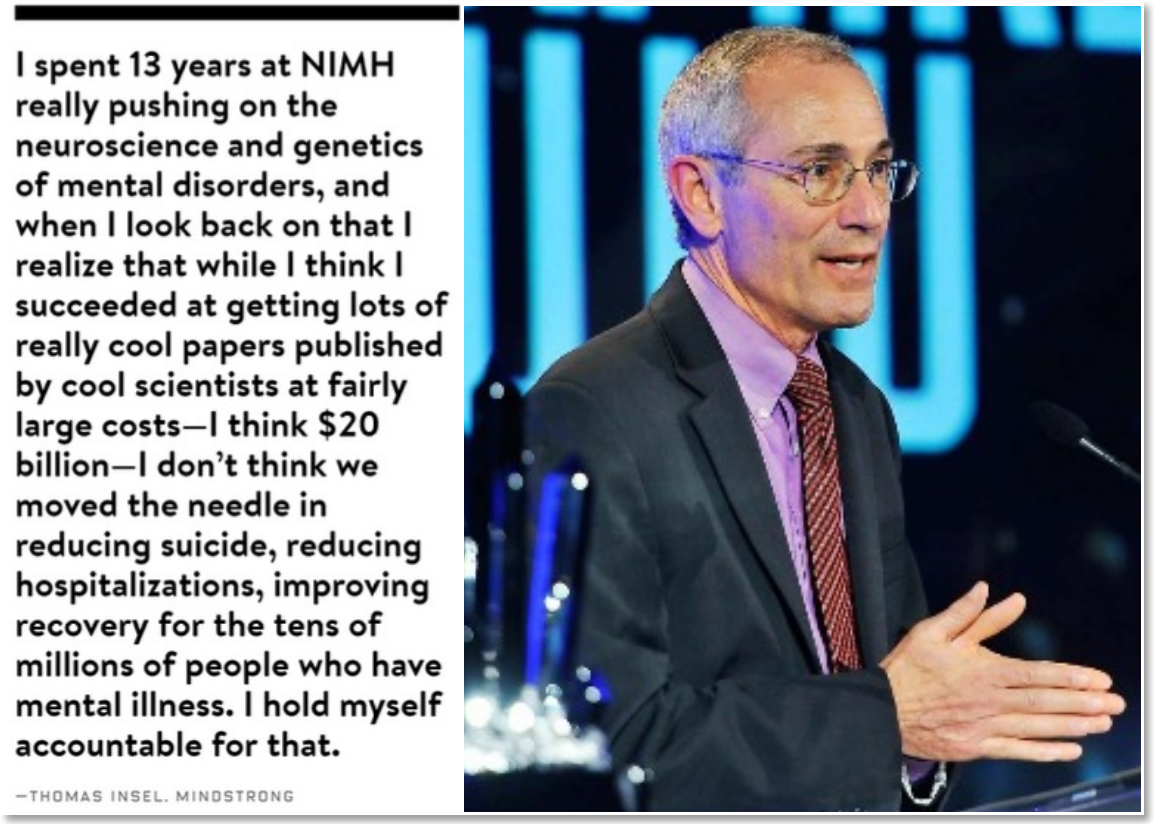


N = 97 studies
83% of all effect sizes are smaller than the original
M_O: *r* = .40; M_R: ***r* = .20**

Open Science Collaboration (2015). *Science, 349*(6251), aac4716.

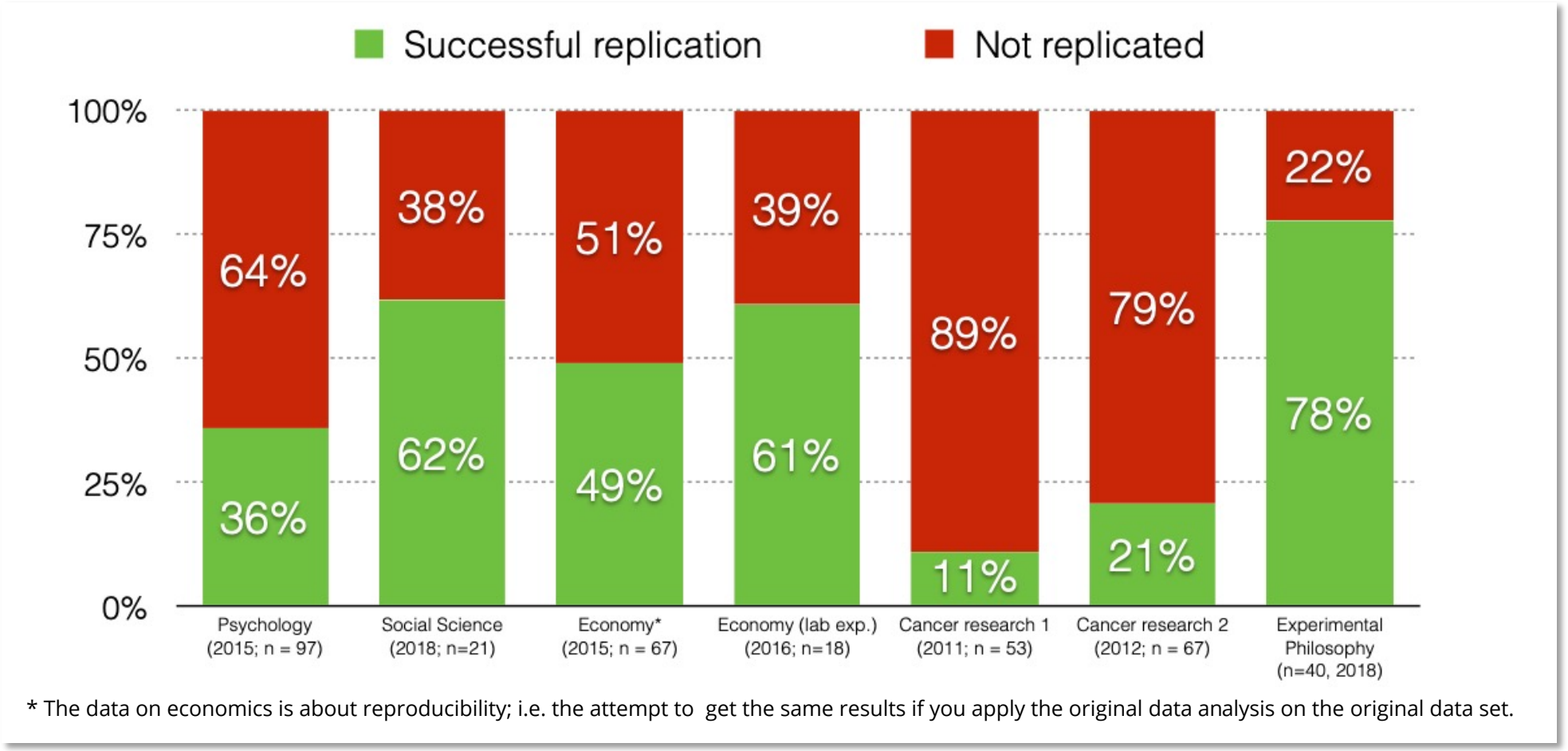
The problem
Is it just Psychology?

No!



Macleod et al. (2014). *The Lancet, 383*(9912),101-104; adapted from Ulrich Dirnagl | WIRED

The problem
Is it just Psychology?



* The data on economics is about reproducibility; i.e. the attempt to get the same results if you apply the original data analysis on the original data set.

Open Science Collaboration (2015); Camerer et al. (2018); Chang & Li (2015); Begley & Ellis (2012); Prinz et al. (2011); Cova et al. (2018); adapted from Felix Schönbrodt

The problem
Quantity, not quality

Actual (not desired) relevance in professorship hiring committees	**Rank**
Number of peer-reviewed publications	1
Fit of research profile to the hiring department	2
Quality of research talk	3
Number of publications	4
Volume of acquired third-party funding	5
Number of first authorships	6
…	…

N = 1453 psychology researchers, 66% were actually members of a professorship hiring committee

Abele-Brehm & Bühner (2016). *Psychologische Rundschau, 67*(4), 250-261.

The problem

Introduction
Change of the incentive structure

DORA

San Francisco Declaration on Research Assessment

PLOS BIOLOGY

OPEN ACCESS

ESSAY

The Hong Kong Principles for assessing researchers: Fostering research integrity

David Moher, Lex Bouter, Sabine Kleinert, Paul Glasziou, Mai Har Sham, Virginia Barbour, Anne-Marie Coriat, Nicole Foeger, Ulrich Dirnagl

LERU

RECOGNITION & REWARDS
ROOM FOR EVERYONE'S TALENT

DFG Deutsche Forschungsgemeinschaft

Research Funding | Funded Projects | DFG in Profile | What's New

Home › Funding › Information for Researchers › 2022 › Package of Measures to Support a Shift in the Culture of Res

Information for Researchers No. 61 | 1 September 2022

Package of Measures to Support a Shift in the Culture of Research Assessment

CoARA

Coalition for reforming research assessment

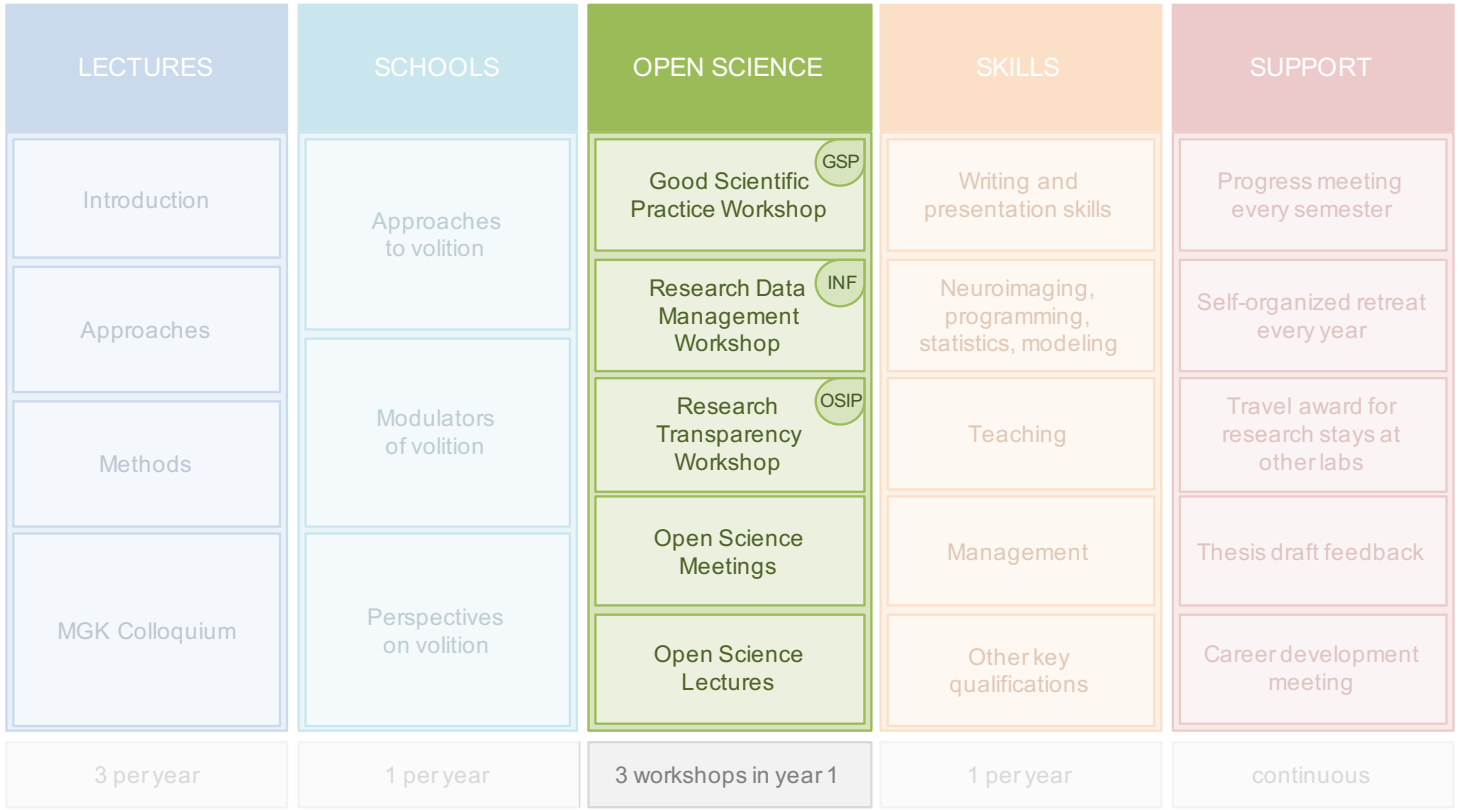
- recognise diverse outputs, practices and activities that maximise quality and impact of research
- basing assessment primarily on qualitative judgement
- responsible use of quantitative indicators

Part 1

Open Science as good practice in doctoral training

Open Science as good practice in doctoral training
Implementation in a CRC

CRC 940 Volition and Cognitive Control (3rd funding period), Module „Graduiertenkolleg“



Open Science as good practice in doctoral training
Implementation in a CRC

- **E-learning material (OPAL)** complemented by 3 workshops (1–2 days)
- **W1 Good Scientific Practice**: basic scientific values, scientific misconduct, clearing processes in case of conflict
- **W2 Research Data Management**: facilitate scientific workflows, routines to assess, analyze, store and share data
- **W3 Research Transparency**: Open Science principles and practices, including preregistration, open access, data, materials, code, and reproducible research
- Optional visits of **OSIP meetings** and open science lectures
- Module is currently under evaluation, will be revised and finalized for the **implementation** at the **whole Faculty** of Psychology (2024)

mandatory for all CRC PhD students!

OSIP Open Science Initiative der Fakultät Psychologie der TUD

Open Science as good practice in doctoral training
Implementation in a CRC

DFG SFB 940

W3 Research Transparency (Open Science Practices)

– two-day workshop at CRC 940 for all PhD students, incl. online OPAL module

Topics Day 1
- Power Analysis
- Data Collection
- *P*-hacking
- Publication Bias
- Preregistration

Topics Day 2
- Open Access
- Open Data and Materials
- Reproducible Analyses
- Practices

TU Dresden | semesterübergreifend

MGK Open Science Module

Verantwortliche/r: Anne Gärtner | Alexander Strobel | Patricia Schimm | Josephine Zerna | Stefan Scherbaum

Doing research responsibly, efficiently and transparently

With this e-learning module, we would like to support you in conducting your research efficiently and transparently according to the rules of good scientific practice. To this end, this module combines three workshops:

- Workshop 1: Good Scientific Practice
- Workshop 2: Research Data Management
- Workshop 3: Research Transparency

For each workshop, online content is provided, but there will also be virtual or presence meetings of one to two days to follow up on essential issues of each workshop. You are free to go through the online content of each workshop as your times allows, but you are required to attend the respective meetings to follow up on the online content of each workshop during the initial period of your doctoral studies. Be assured that you will find the topics dealt with most helpful for your scientific work.

OPAL Module

Teaching Open Science @ TUD

DFG SFB 940

Bachelor

Module Methods of Psychology

- Training in general open science aspects
- Replicability crisis
- Credibility
- Statistical methods

Module Empirical Studies

- Preregistration of research projects
- OSF and AsPredicted templates
- Open data and documentation

Bachelor Thesis (in progress)

- Open Science part of the guidelines for (1) conducting and (2) supervising Bachelor theses
- Engagement in Open Science practices part of the thesis evaluation protocol

Master

Dedicated course elements in various modules on

- Open Science
- Good Scientific Practice
- Replicability crisis
- Preregistration

Module Applied Statistics in Clinical Research

- Good Scientific Practice
- Questionable research practices (p-hacking, harking)
- Replicability crisis
- Preregistration

Module Neurobiology of Individual Differences

- Introduction to open data, open code, open material
- Preregistration of own research project with AsPredicted template

Module Research and Intervention

- Lectures/tutorials on how to preregister project ideas

Postgraduate Training

Collaborative Research Centre 940: MGK Open Science Module

- **E-learning** material complemented by three **workshops** (1–2 days)
- **1) Good Scientific Practice**: basic scientific values, scientific misconduct, clearing processes in case of conflict
- **2) Research Data Management**: facilitate scientific workflows, routines to assess, analyze, store and share data
- **3) Open Science Practices**: principles and practices including preregistration, open access, data, materials, code and reproducible research
- Optional visits of **OSIP meetings** and open science **lectures**
- Module is currently in pilot phase, will be evaluated, revised and finalized during 2021

Teaching Open Science @ TUD

DFG SFB 940

Bachelor

Module Methods of Psychology
- Training in general open science aspects
- Replicability crisis
- Credibility
- Statistical methods

Module Empirical Studies
- Preregistration of research projects
- OSF and AsPredicted templates
- Open data and documentation

Bachelor Thesis (in progress)
- Open Science part of the guidelines for (1) and (2) supervising Bachelor theses
- Engagement in Open Science practices part of the thesis evaluation protocol

Studium und Lehre

Gute wissenschaftliche Praxis und Open Science im Empiriepraktikum: Wissenschaftlicher Kompetenzerwerb durch Replikationsstudien

Christoph Scheffel[1], Franziska Korb[2], Denise Dörfel[3], Julian Eder[4], Marcus Möschl[2], Martin Schoemann[5] und Stefan Scherbaum[5]

Differences
- Introduction to open data, open code, open material
- Preregistration of own research project with AsPredicted template

Module Research and Intervention
- Lectures/tutorials on how to preregister project ideas

- 3) Open Science Practices: principles and practices including preregistration, open access, data, materials, code and reproducible research
- Optional visits of **OSIP meetings** and open science **lectures**
- Module is currently in pilot phase, will be evaluated

Transparency Workshop

Open Science Meetings

Open Science Lectures

AsPredicted

OSF

[Scheffel et al. (2023)]

Open Science as good practice in doctoral training
Teaching Open Science @ TUD

Open Science criteria as part of the thesis evaluation protocol @ TU Dresden

7. Umsetzung von Open Science Praktiken (wenn vereinbart)					
7.1 Präregistrierung	1	2	3	4	5
7.2 Open Materials (Aufbereitung und Dokumentation)	1	2	3	4	5
7.3 Open Data (Aufbereitung und Codebook)	1	2	3	4	5
7.4 Open Analysis (Aufbereitung und Dokumentation)	1	2	3	4	5

Open Science as good practice in doctoral training

Lab/project manual

README.md

DPP-LabManual

Lab Manual of the Differential and Personality Psychology group (AG.DPP) at TU Dresden

So far, this manual is still under development and its contents have not yet been finally discussed and agreed upon by all team members. Still, it may already now be used for instructing new team members (e.g., master students) on how to use certain tools (see the Wiki) or perform certain routines (e.g., creating a reproducible environment for collaborative work on research projects). One major feature of this manual also will be to elaborate on what we as a group agree upon when it comes to organizing a research project.

Lab Manual DiffPsy TUD

Open Science as good practice in doctoral training
Registered Report as part of the PhD?

M.Sc. Christoph Scheffel

M.Sc. Josephine Zerna

www.nature.com/scientificreports

scientific reports

Check for updates

OPEN

REGISTERED REPORT

Estimating individual subjective values of emotion regulation strategies

Christoph Scheffel[1,3✉], Josephine Zerna[1,3], Anne Gärtner[1], Denise Dörfel[1,2] & Alexander Strobel[1]

Protocol registration
The stage 1 protocol for this Registered Report was accepted in principle on July 19, 2022. The protocol, as accepted by the journal, can be found at: https://doi.org/10.17605/OSF.IO/FN9BT.

www.nature.com/scientificreports

scientific reports

Check for updates

OPEN

REGISTERED REPORT

When easy is not preferred: a discounting paradigm to assess load-independent task preference

Josephine Zerna[1,2,3✉], Christoph Scheffel[1,3], Corinna Kührt[1] & Alexander Strobel[1]

Protocol registration
The stage 1 protocol for this Registered Report was accepted in principle on August 19, 2022. The protocol, as accepted by the journal, can be found at: https://doi.org/10.17605/OSF.IO/CPXTH.

Scheffel* & Zerna* et al. (2023) | Zerna* & Scheffel* et al. (2023)

Open Science as good practice in doctoral training
Benefits for Early Career Researchers

- Be a more **competitive (successful) job applicant**: More and more job postings are asking for Open Science as a desirable or essential criterion (https://osf.io/ 7jbnt/)
- Be a more **competitive (successful) grant applicant**: More and more funders now require Open Science practices (e.g., NIH, European Commission, Wellcome Trust)
- **More citations**: Articles with open access versions are cited more often (**36% more citations**; Fu & Hughey, 2019), Registered reports are cited more often
- **Do Better science!**

Part 2
Shifting incentives for Open Science in academia

The problem
Quantity, not quality

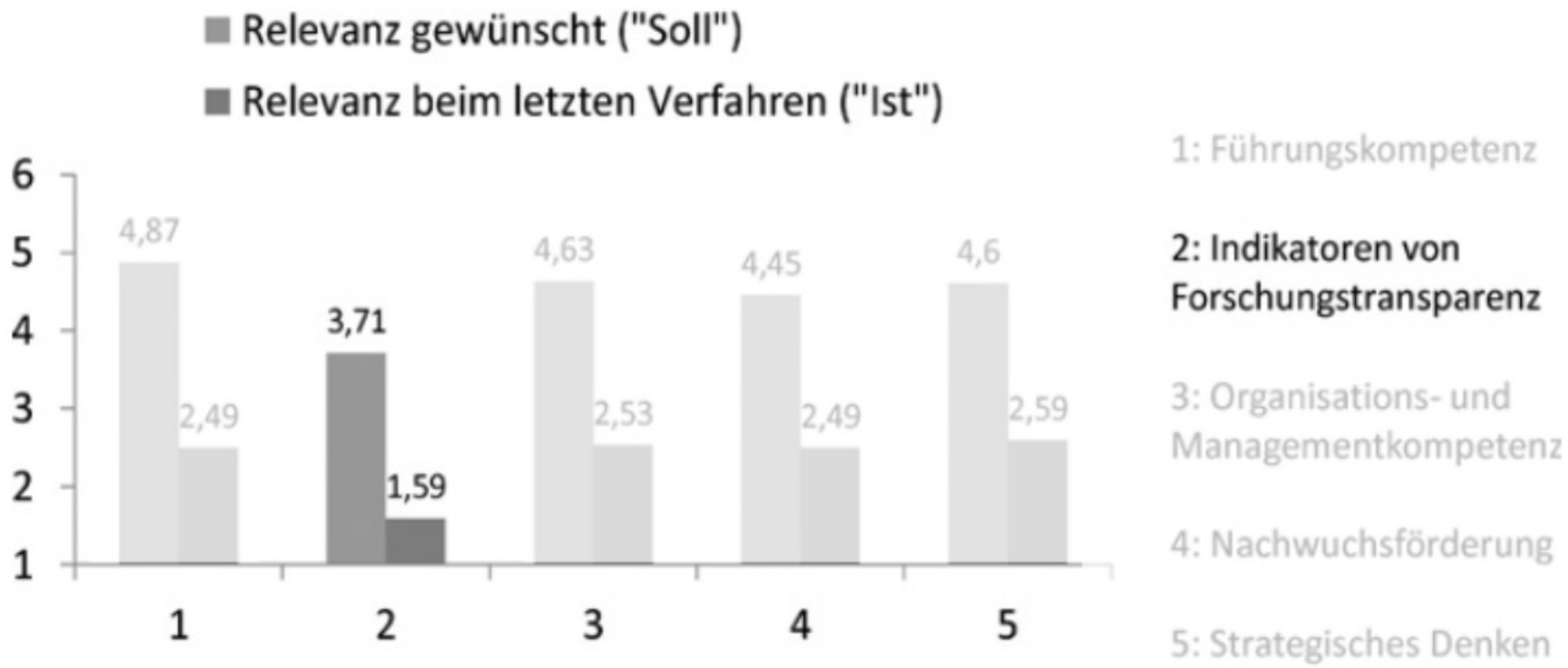
Actual (not desired) relevance in professorship hiring committees	Rank
Number of peer-reviewed publications	1
Fit of research profile to the hiring department	2
Quality of research talk	3
Number of publications	4
Volume of acquired third-party funding	5
Number of first authorships	6
…	…
Indicators of research transparency	**41 (of 41)**

N = 1453 psychology researchers, 66% were actually members of a professorship hiring committee

Abele-Brehm & Bühner (2016). *Psychologische Rundschau, 67*(4), 250-261.

The problem
Quantity, not quality

Indicators with the largest discrepancy between „desired“ and „actual“ relevance



→ Researchers want to have indicators of research transparency in hiring committees!

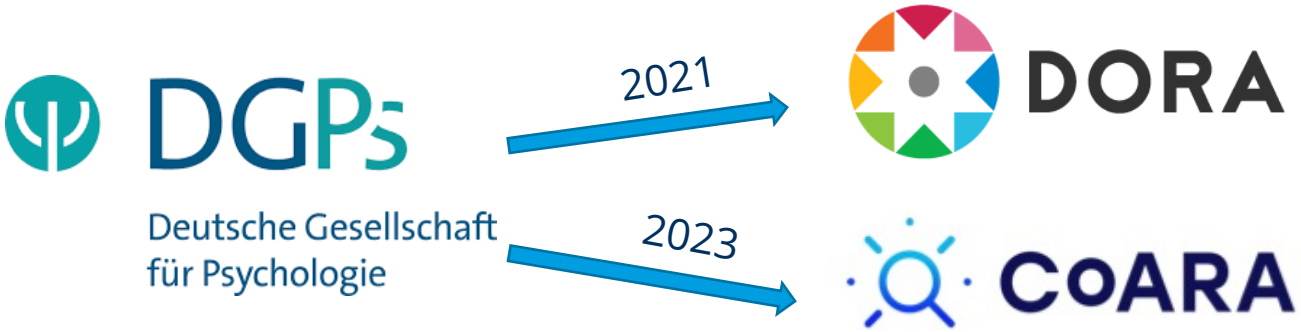
Abele-Brehm & Bühner (2016). *Psychologische Rundschau, 67*(4), 250-261; adapted from Felix Schönbrodt

Shifting incentives for Open Science in academia

DORA & CoARA

- Call to abandon the use of invalid quantitative metrics of research quality + productivity (e.g., IF)
- H-index, number of citations, number of (co)authorships, number of papers are only loosely connected to scientific quality (publish-or-perish culture)

→ We need a change in the incentive structure



https://sfdora.org | https://coara.eu | Abele-Brehm & Bühner (2016)

Shifting incentives for Open Science in academia

Responsible Research Assessment (RRA)

2022

Ten Steps towards better Personality Science

Quality rating scheme for publications

19 commentaries

- ✓ **Community-proofed**
- ✓ Collaboratively improved with multiple breakout groups focusing on specific indicators
- ✓ Development **backed by DGPs**
- ✓ **Ready-to-use templates**, **adaptable** to local needs

RESQUE Framework

- 4 principles
- 2-phase assessment
- How-Tos for hiring and promotion
  - Rating Schemes
  - Interactive Web Form

2023

RRA 1 Principles

RRA 2 Implementation

15 commentaries

Empfehlungen zur Bewertung wissenschaftlicheer Leistungen in BV in Psy

6 commentaries

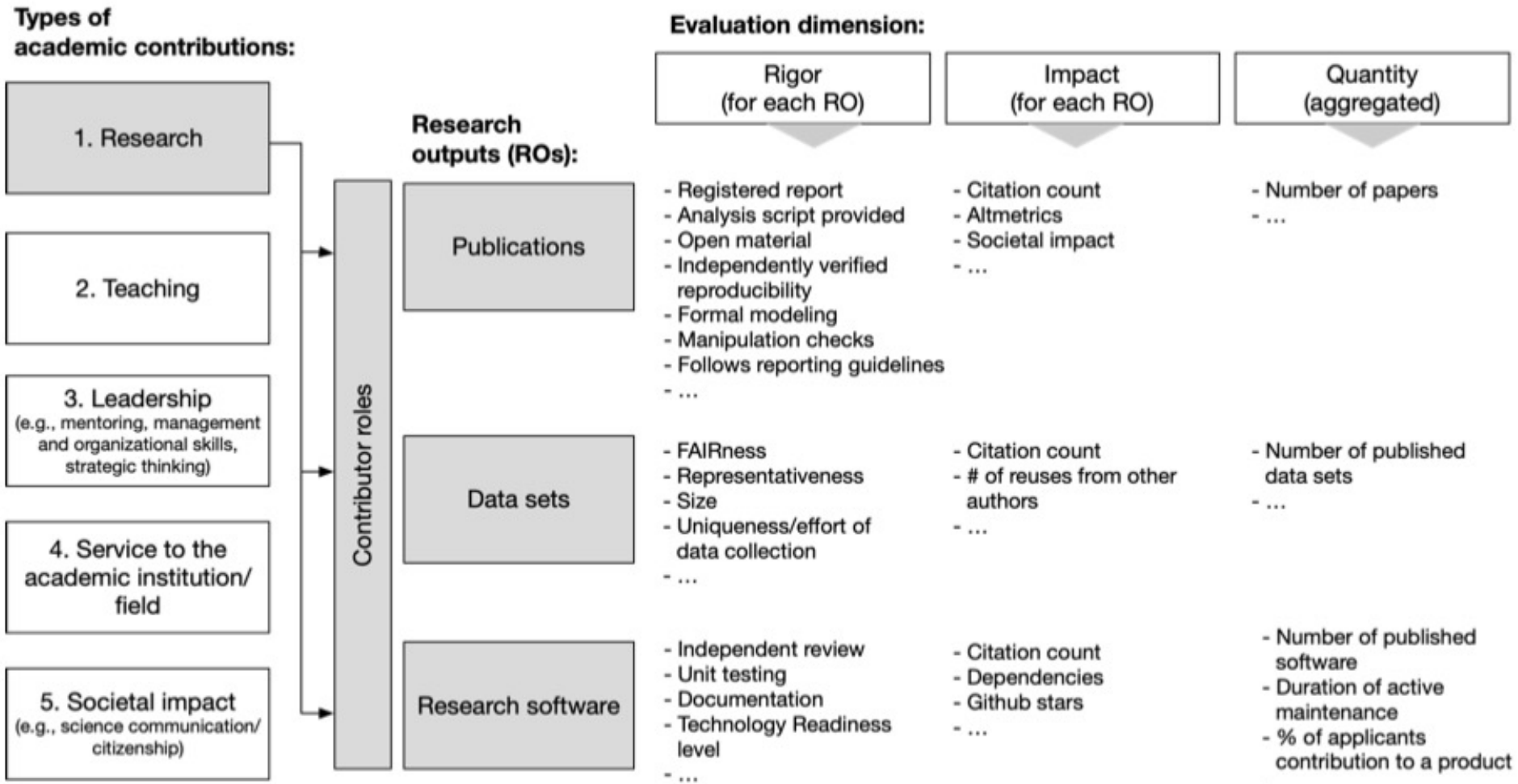
Revision & Rejoinder

flaticon.com

[Ten Steps (Leising et al., 2022a; 2022b)] | [RR1 (Schönbrodt et al., 2022)] | [RR2 (Gärtner et al., 2022)] | [Gärtner et al., 2023] | [RESQUE Framework, adapted from Felix Schönbrodt]

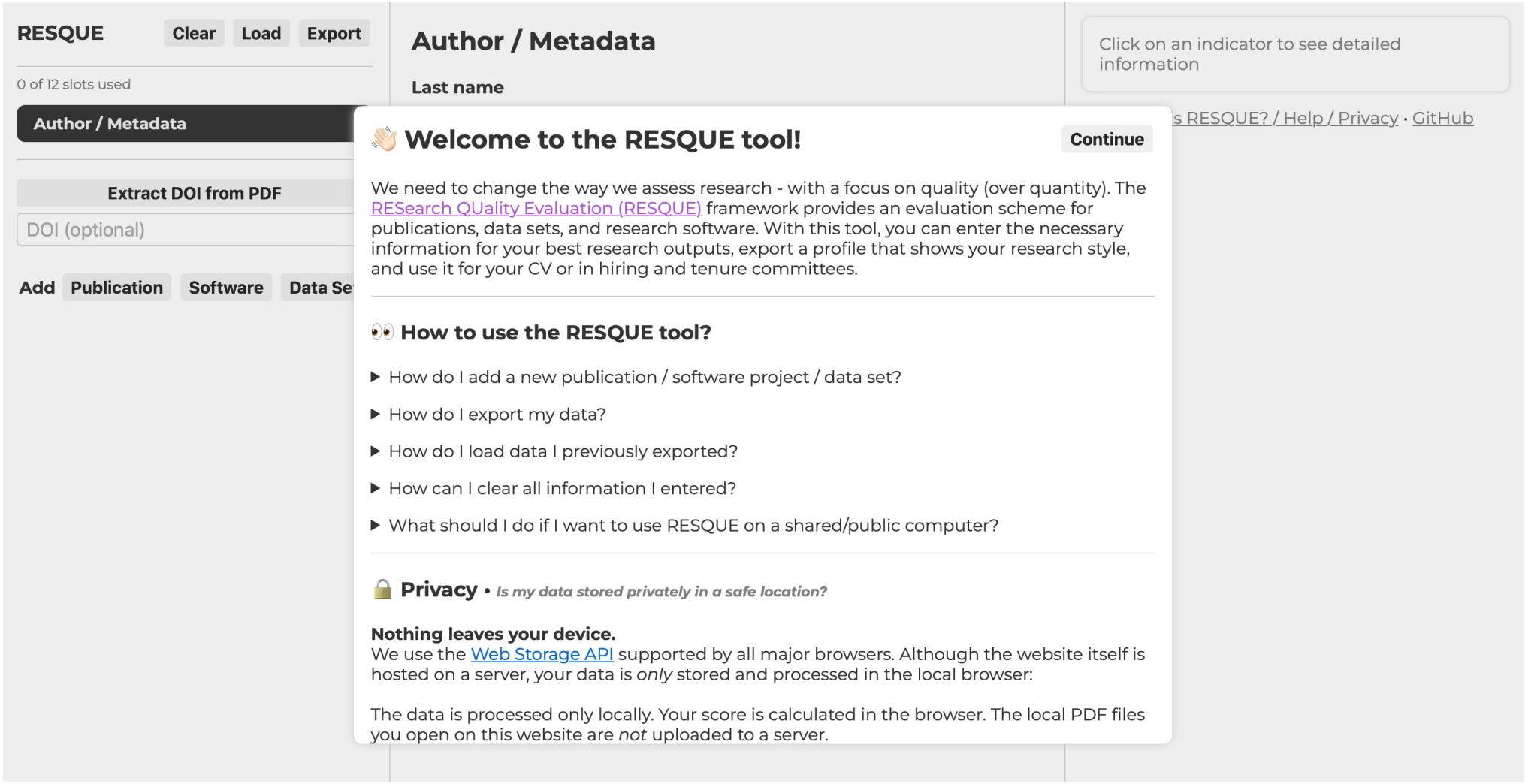
Shifting incentives for Open Science in academia

Academic contributions are multifaceted



Schönbrodt et al. (2022)

The RESQUE Web form



https://nicebread.github.io/RESQUE/web/

The RESQUE Web form

Correctness of computational results has been independently verified

- ◯ Not applicable [provide explanation]
- ◯ No
- ◯ Yes [provide doi or URL to verification report]

Open reproducible scripts

- ◯ Not applicable [provide explanation]
- ◯ Not available
- ◯ Yes, parts of scripts [provide doi or URL]
- ◯ Yes, entire scripts [provide doi or URL]

Open materials (beyond the open reproducible scripts entered above)

- ◯ Not applicable [provide explanation]
- ◯ Not available
- ◯ Yes, parts of material [provide doi or URL]
- ◯ Yes, entire material [provide doi or URL]

Preregistration

- ◯ Not applicable [provide explanation]
- ◯ No
- ◯ Yes (but not RR) [provide doi or URL]
- ◯ Registered Report [provide doi or URL]

Formal modeling of a theory

- ◯ Not applicable [provide explanation]
- ◯ No
- ◯ Yes

The paper contains a preregistered replication attempt (either direct/close or conceptual)

- ◯ Not applicable [provide explanation]
- ◯ No
- ◯ Yes

Please report all considerations regarding statistical power (assumed effect size, power, N, ...)

0

Official o
apply)

- ☐ Open D
- ☐ Open M
- ☐ Preregi

Score

3.3% • 0.4 / 12

Sample s

0

Merit / impact statement (narrative, max. 150 words)

0 / 150

https://nicebread.github.io/RESQUE/web/

RESQUE Github Repository

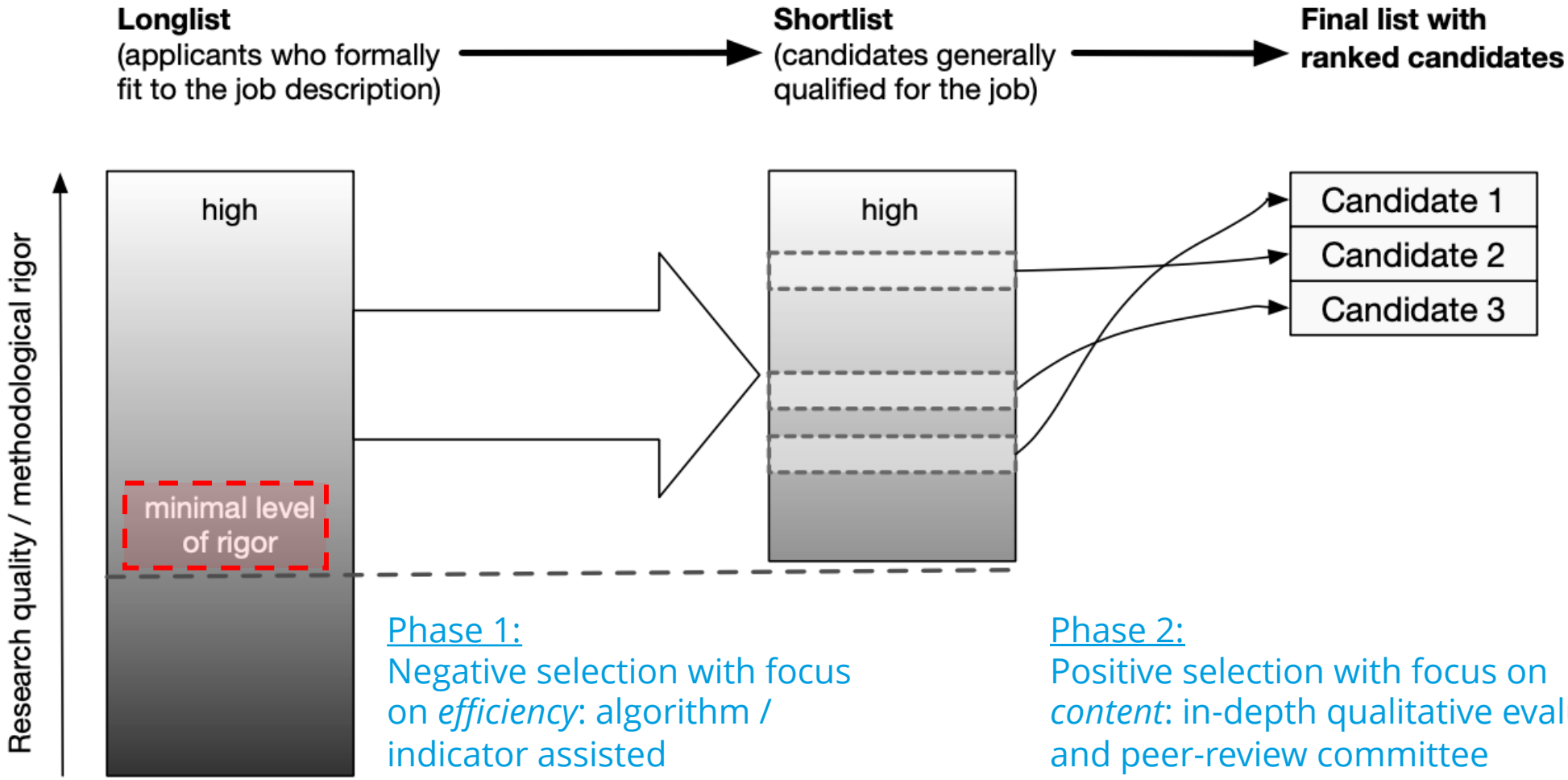
Table of content:

- RESQUE: The Research Quality Evaluation scheme for psychological research
  - Publications and commentaries by the scientific community
    - Publications
    - Commentaries
  - Resources
    - ☑ Rating sheets (core set)
    - ☑ Rating sheets (expansion packs)
    - Coding manual
    - Analysis scripts for R
  - How to get started
    - ...as hiring committees
    - ...as tenure track committees
    - ... as applicants
  - 🚀 How to contribute

- still work in progress and constantly updated
- contains links to RESQUE **core set** and future **expansion packs** of evaluation criteria (e.g. for each DGPs section, will be collected soon!)
- **Coding manual** with further information
- **R Analysis scripts** for hiring and promotion committees that provide summary export file

Efficiency in hiring committees

Can it handle 100+ applicants?



Phase 1:
Negative selection with focus on *efficiency*: algorithm / indicator assisted

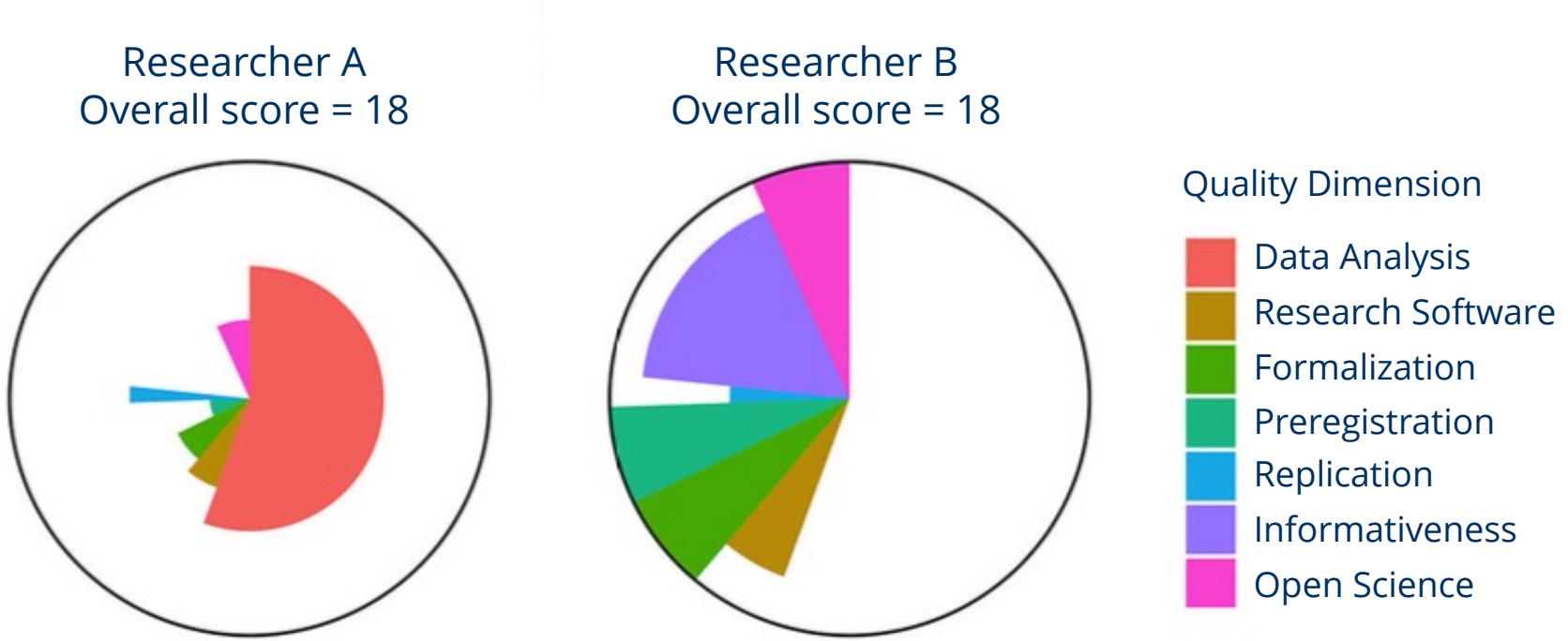
Phase 2:
Positive selection with focus on *content*: in-depth qualitative evaluation and peer-review committee

Schönbrodt et al. (2022)

Shifting incentives for Open Science in academia

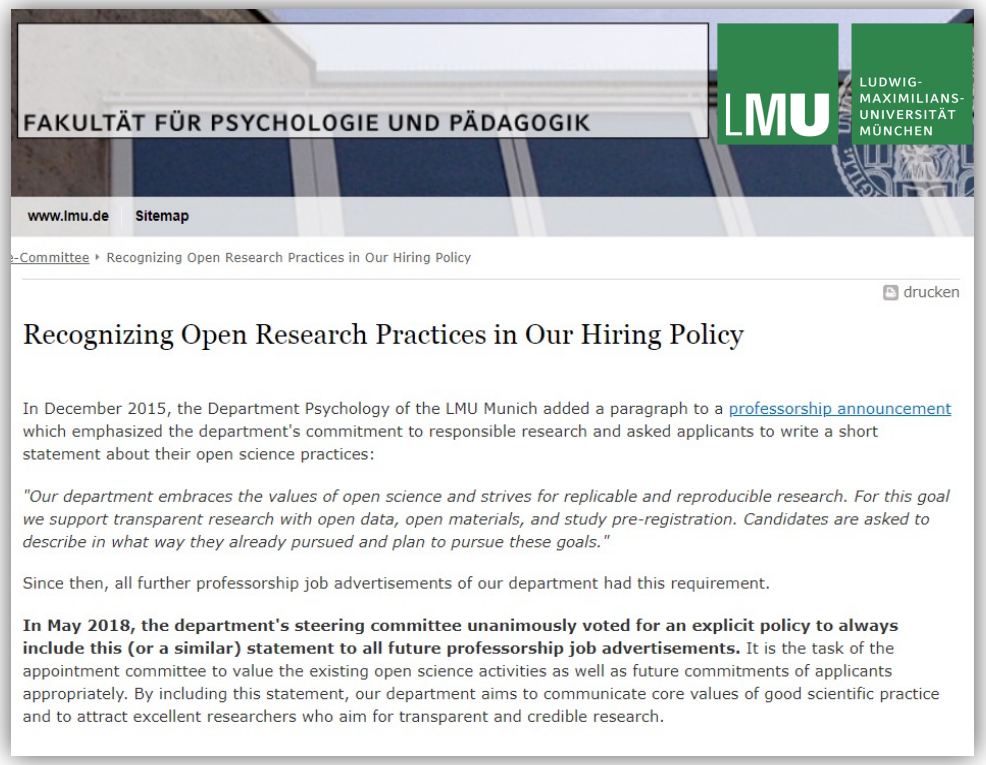
Use of researcher profiles

Broaden the range of relevant research contributions (e.g., research articles, datasets, research software), focus on methodological rigor and **consider profiles** (see Figure)



Shifting incentives for Open Science in academia

In committees, in faculty positions, during peer review



FAKULTÄT FÜR PSYCHOLOGIE UND PÄDAGOGIK

LMU LUDWIG-MAXIMILIANS-UNIVERSITÄT MÜNCHEN

www.lmu.de Sitemap

...-Committee ▸ Recognizing Open Research Practices in Our Hiring Policy

drucken

Recognizing Open Research Practices in Our Hiring Policy

In December 2015, the Department Psychology of the LMU Munich added a paragraph to a professorship announcement which emphasized the department's commitment to responsible research and asked applicants to write a short statement about their open science practices:

"Our department embraces the values of open science and strives for replicable and reproducible research. For this goal we support transparent research with open data, open materials, and study pre-registration. Candidates are asked to describe in what way they already pursued and plan to pursue these goals."

Since then, all further professorship job advertisements of our department had this requirement.

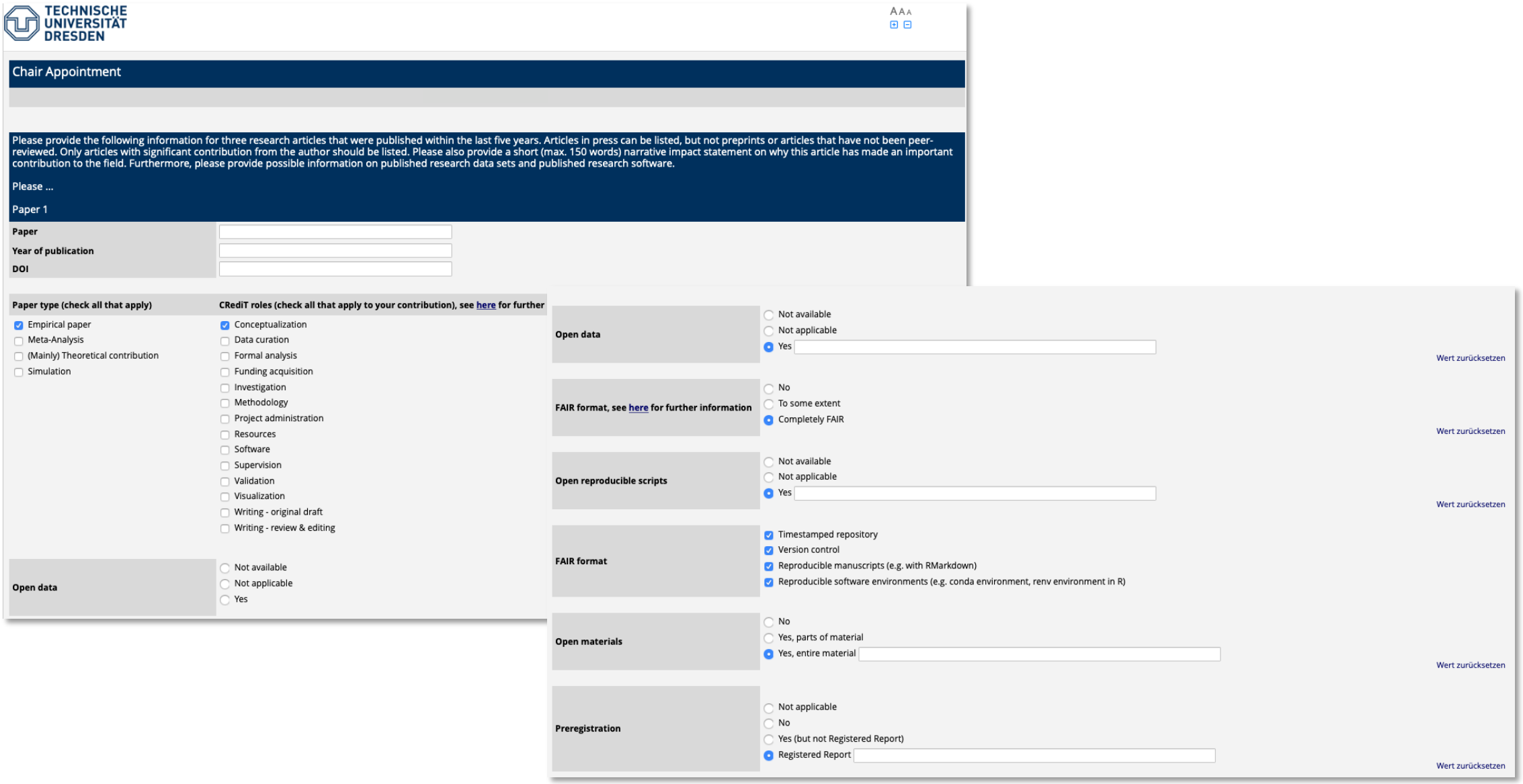
In May 2018, the department's steering committee unanimously voted for an explicit policy to always include this (or a similar) statement to all future professorship job advertisements. It is the task of the appointment committee to value the existing open science activities as well as future commitments of applicants appropriately. By including this statement, our department aims to communicate core values of good scientific practice and to attract excellent researchers who aim for transparent and credible research.

TECHNISCHE UNIVERSITÄT DRESDEN

The chair holder will be responsible for teaching Clinical Child and Adolescent Psychology including Psychotherapy in the Bachelor's program "Psychology" and in the Master's program "Psychology with a focus on Clinical Psychology and Psychotherapy". In research, an empirical orientation in Clinical Child and Adolescent Psychology including Psychotherapy is planned. We explicitly wish for your active cooperation in interdisciplinary projects with the other faculties of TU Dresden. The Faculty of Psychology values transparent and replicable research and explicitly welcomes all measures that can contribute to this (e.g. "open data/materials/code", pre-registration). We expect you to be willing to actively participate in academic self-administration, in the institute and in the Universitätsambulanz und Forschungszentrum für Psychotherapie (UFP) der TU Dresden gGmbH.

(preferably for the last three years), 8) copies of the academic certificates of the highest degree obtained, 9) a description of previous consideration of open data, open material and pre-registrations in your research (one page max.).

Open Science criteria in hiring committee at TU Dresden (selection)



TECHNISCHE UNIVERSITÄT DRESDEN

AAA

Chair Appointment

Please provide the following information for three research articles that were published within the last five years. Articles in press can be listed, but not preprints or articles that have not been peer-reviewed. Only articles with significant contribution from the author should be listed. Please also provide a short (max. 150 words) narrative impact statement on why this article has made an important contribution to the field. Furthermore, please provide possible information on published research data sets and published research software.

Please ...

Paper 1

Paper	
Year of publication	
DOI	

Paper type (check all that apply)

- [x] Empirical paper
- [ ] Meta-Analysis
- [ ] (Mainly) Theoretical contribution
- [ ] Simulation

CRediT roles (check all that apply to your contribution), see here for further

- [x] Conceptualization
- [ ] Data curation
- [ ] Formal analysis
- [ ] Funding acquisition
- [ ] Investigation
- [ ] Methodology
- [ ] Project administration
- [ ] Resources
- [ ] Software
- [ ] Supervision
- [ ] Validation
- [ ] Visualization
- [ ] Writing - original draft
- [ ] Writing - review & editing

Open data

- ( ) Not available
- ( ) Not applicable
- ( ) Yes

Open data

- ( ) Not available
- ( ) Not applicable
- (•) Yes

Wert zurücksetzen

FAIR format, see here for further information

- ( ) No
- ( ) To some extent
- (•) Completely FAIR

Wert zurücksetzen

Open reproducible scripts

- ( ) Not available
- ( ) Not applicable
- (•) Yes

Wert zurücksetzen

FAIR format

- [x] Timestamped repository
- [x] Version control
- [x] Reproducible manuscripts (e.g. with RMarkdown)
- [x] Reproducible software environments (e.g. conda environment, renv environment in R)

Open materials

- ( ) No
- ( ) Yes, parts of material
- (•) Yes, entire material

Wert zurücksetzen

Preregistration

- ( ) Not applicable
- ( ) No
- ( ) Yes (but not Registered Report)
- (•) Registered Report

Wert zurücksetzen

Shifting incentives for Open Science in academia

Change in hiring policy

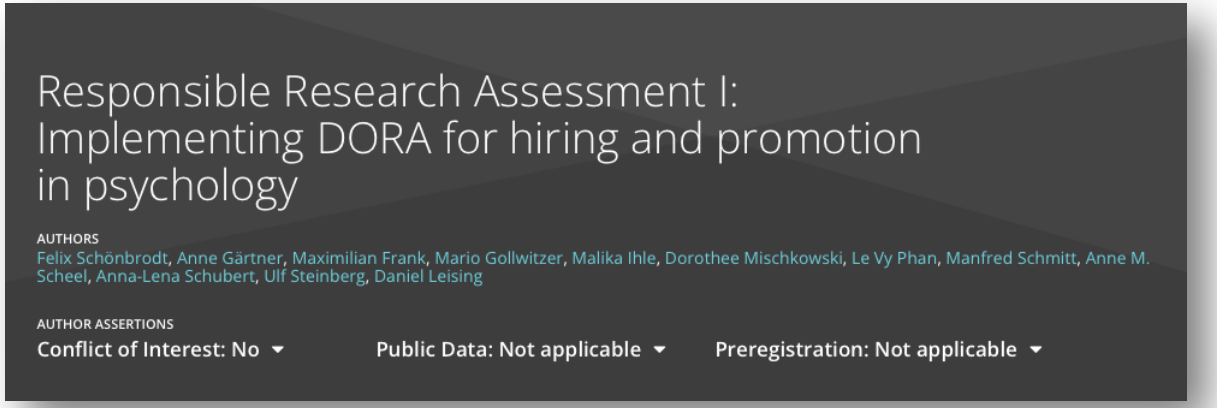
Analysis of job offers in the field of psychology:

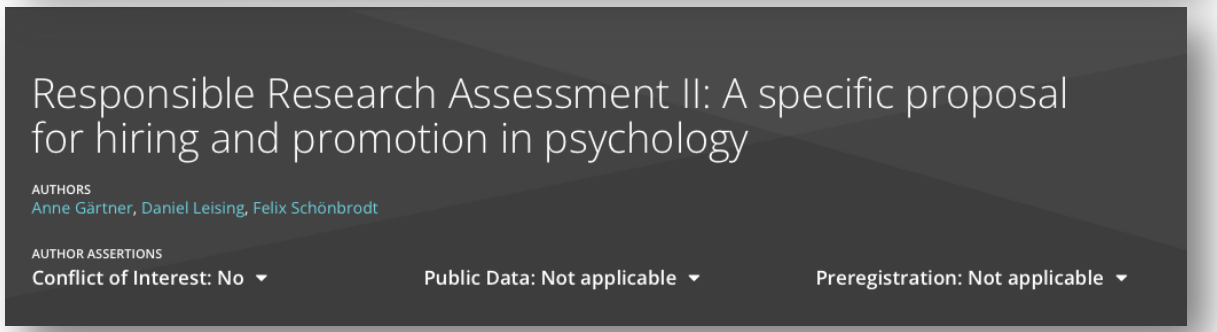
- 1626 job ads (1484 in German, 142 in English); from **February 2017 to December 2020**
- Keyword search for open science, reproduc*, replication, research transparency, etc.
- **Across all analyzed years, 2.2% (n=36)** of job offers mentioned replicability and transparency as **desired or essential job criteria**

➞ upward trend!

Nosek et al. (2022); adapted from Felix Schönbrodt

Shifting incentives for Open Science in academia
Further information





Meta-Psychology
(Special Issue with 15 commentaries)

Psychologische Rundschau
(Diskussionsforum with 6 commentaries)

Schönbrodt et al. (2022) | Gärtner et al. (2022) | Gärtner et al. (2023)

Thank You!

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Slides: https://osf.io/gd3ze/

RESQUE Web form:
https://nicebread.github.io/RESQUE/web/

Outlook

Sample paragraph highlighting the importance of responsible research evaluation could be included in the job posting as follows:

"Our department values transparent, robust and reproducible research and therefore supports 'open' research practices such as FAIR research data, open and reproducible code and preregistration." We expect successful applicants to follow the same principles. In addition, we aim for responsible research assessment that focuses on qualitative rather than quantitative indicators of research performance. Therefore, applicants must provide some relevant information about their own published articles, published datasets and published research software."

Musterabsatz, der die Bedeutung einer verantwortungsvollen Forschungsbewertung hervorhebt, könnte wie folgt in die Stellenausschreibung aufgenommen werden:

"Unsere Abteilung legt Wert auf transparente, robuste und reproduzierbare Forschung und unterstützt daher "offene" Forschungspraktiken wie FAIR-Forschungsdaten, offenen und reproduzierbaren Code und Präregistrierungen. Wir erwarten von erfolgreichen Bewerber:innen, dass sie denselben Grundsätzen folgen. Darüber hinaus streben wir eine verantwortungsbewusste Forschungsbewertung an, die sich eher auf qualitative als auf quantitative Indikatoren der Forschungsleistung konzentriert. Daher müssen die Bewerber einige relevante Informationen über ihre eigenen veröffentlichten Artikel, veröffentlichten Datensätze und veröffentlichte Forschungssoftware vorlegen."

Credentials

Some slides were taken or adapted from the Open Science Workshop Materials of the LMU Open Science Center (https://osf.io/zjrhu/wiki/home/) or from Ulrich Dirnagl (http://bit.ly/dresdendirnagl).

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