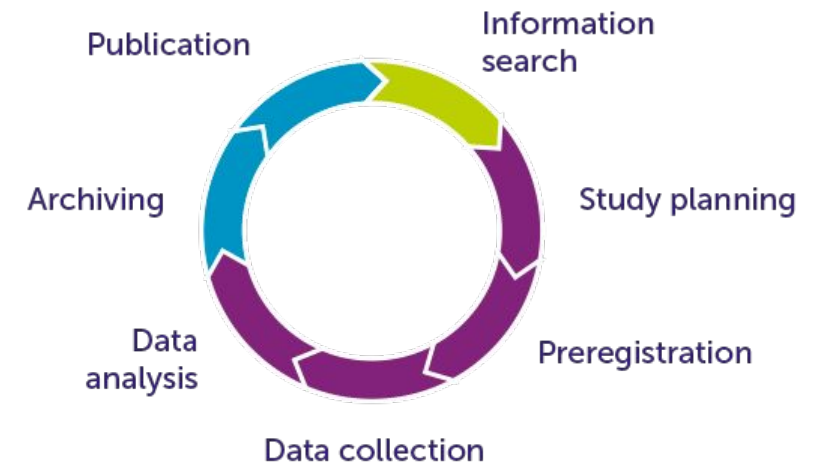


Identifying the Determinants of (Non-) Replicability: The Theory of Planned Behavior

October 17, 2018

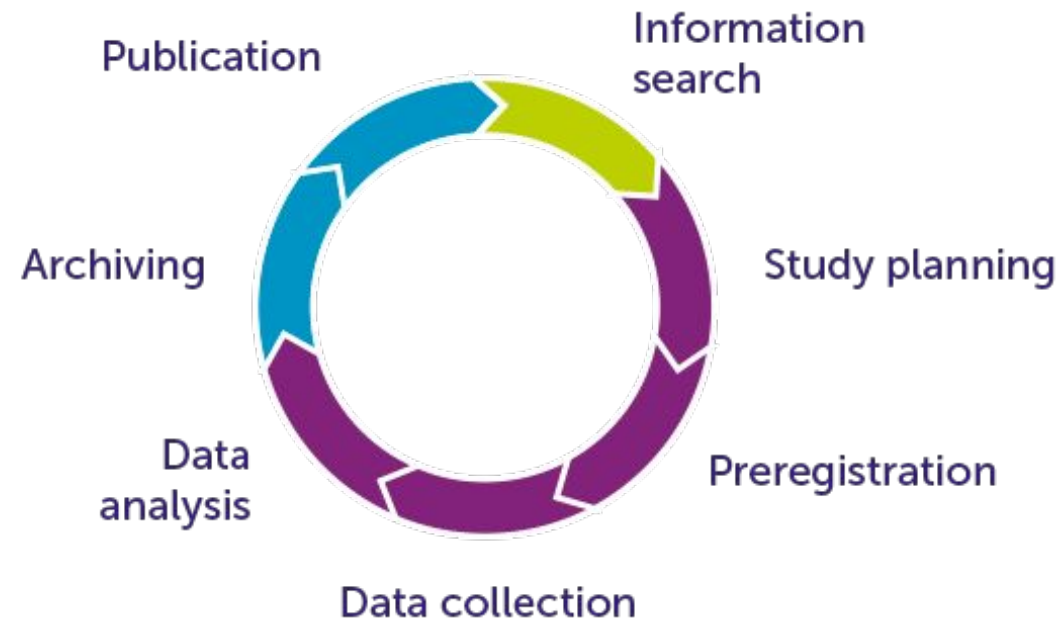
Michael Bosnjak

mb@leibniz-psychology.org



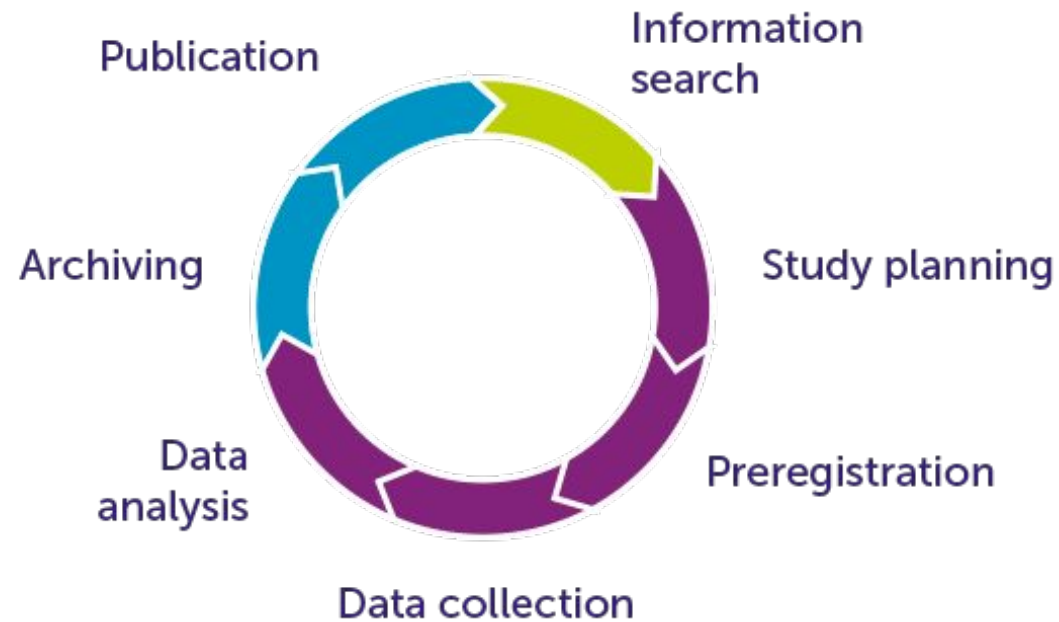
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- ... is a Public Open Science Institute for Psychology and related disciplines
- ... is in the process of strategic expansion towards a one-stop research support organization (i.e., research infrastructure), providing services for the entire research cycle:



Leibniz-Psychology.org (ZPID)

Supporting the (scientific) community in Psychology (and beyond) to make research **accessible, transparent, reproducible, and replicable.**



Aims and Scope

- General conference series:
Identifying the factors rendering well established psychological theories replicable
- The present event focusing on the Theory of Planned Behavior:
 - Large number of successful replications of the TPB (40+ meta-analyses)
 - What can we learn from the TPB in view of the ongoing discussion about (the seemingly low) replicability of psychological findings?

Program and Special Issue



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Identifying the Determinants of (Non-)Replicability: The Theory of Planned Behavior

October 17, 2018 – October 19, 2018

organized by the Leibniz Institute for Psychology Information (ZPID)
Event location: [University of Trier, Building P, Room P 12](#)

An associated special issue will appear in 2020 in Europe's Journal of Psychology.
For further details, see: <https://goo.gl/wMwtpN>

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<http://tpb-replication2018.leibniz-psychology.org/>

 Europe's Journal of Psychology
ejop.psychopen.eu | 1841-0413



Call for Papers: 2020 (February) EJOP Special Issue

Identifying the Determinants of (Non-)Replicability: The Theory of Planned Behavior

Guest Editors: Michael Bosnjak, Icek Ajzen, Peter Schmidt

An associated conference will take place at ZPID – Leibniz Institute for Psychology Information in Trier, Germany, on October 17–19, 2018. For further details, see: <http://tpb-replication2018.leibniz-psychology.org>

The overall aim of this special issue is to empirically identify, discuss, and critically evaluate the factors rendering psychological theories replicable. Because of the large number of replications available the focus will be on the Theory of Planned Behavior (TPB; Ajzen, 1985, 1991, 2012). The topics covered may address:

- (Pre-registered) replications of past primary studies applying the TPB to any substantive domain identifying the conditions that promote or inhibit replicability of findings. Correlational tests of the TPB might focus on the replicability of the structural model in terms of model fit and the path coefficients' magnitudes. In experimental studies (i.e., interventions), replications of the effect of the intervention on intention and/or behavior may deserve specific attention. Submitted studies might also want to focus on the replicability of auxiliary hypotheses, that is, additional predictors of intention and/or behavior, and the effect of background factors such as personality traits, personal values, gender, age and contextual factors like traffic infrastructure.
- (Pre-registered) systematic reviews and meta-analytic syntheses of TPB studies identifying the determinants of the (non-)replicability of the TPB. Studies identifying the factors potentially contributing to the heterogeneity of effects such as, for instance, open science practices, procedures, populations, and/or changed circumstances, are of specific interest.
- Methodological contributions encompassing, for instance, the degree of literal/exact versus conceptual replication on the TPB's model fit and parameter values, bayesian approaches to testing the TPB, modeling the belief part of the theory, test of moderation and mediation effects, time (in)variability and dynamic modeling for the specification and test of the TPB.

<https://goo.gl/wMwtpN>

Keynote talk by

Icek Ajzen

University of Amherst:

**Doing the Same Thing Over and Over Again
and Expecting Different Results:
Replication in the Theory of Planned Behavior**

Keynote talk by

Peter Schmidt
University of Gießen:

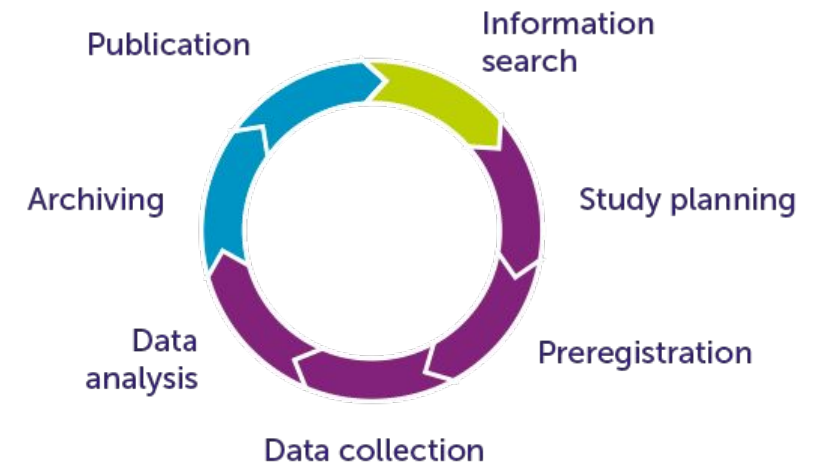
Meta-Analyses of the Theory of Planned Behavior

Workshop given by Icek Ajzen and Peter Schmidt

October 18, 2018

Michael Bosnjak

mb@leibniz-psychology.org

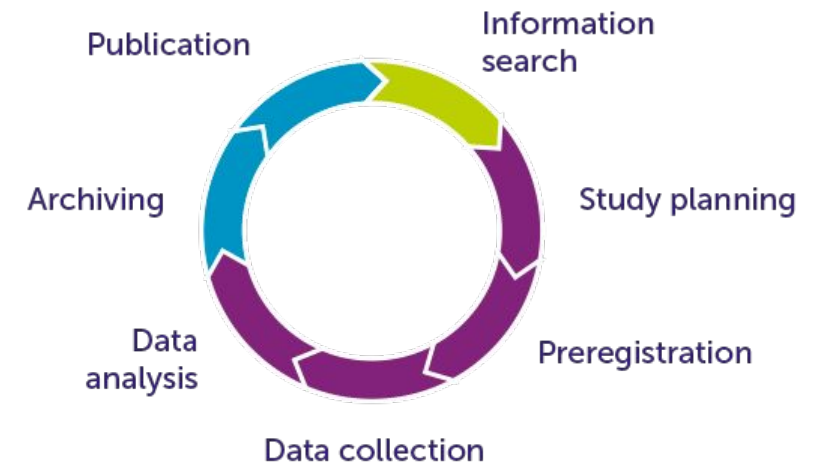


Theory of Planned Behavior Hackathon

October 19, 2018

Michael Bosnjak

mb@leibniz-psychology.org





Chris Chambers

RESEARCHERS HAVE CONTROL OVER THE DESIGN OF THEIR STUDY, THEIR HYPOTHESES, ETC. WHAT IS THE ONLY PART OF THE RESEARCH PROCESS THAT SHOULD NOT BE UNDER THE CONTROL OF THE RESEARCHER?

THE RESULT! WE ASK NATURE A QUESTION, AND NATURE GIVES US AN ANSWER. RESEARCH IS AN „OPEN OUTCOME“ PROCEDURE. RESEARCHERS CAN AND SHOULD NOT CONTROL THE RESULT.

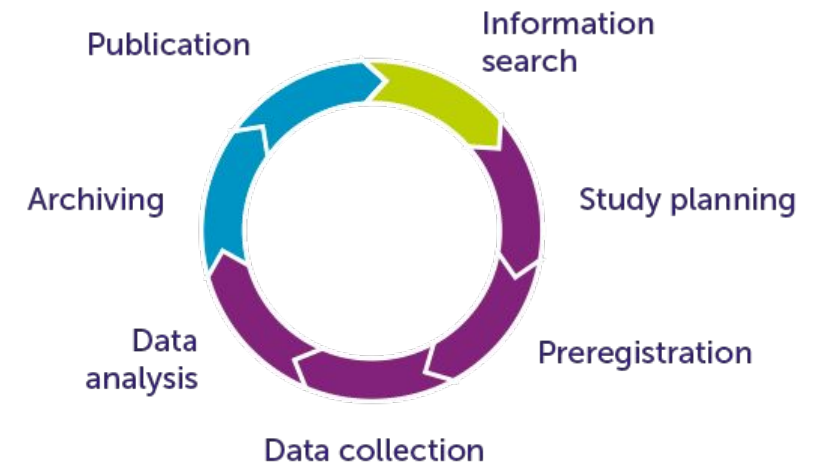


Theory of Planned Behavior Hackathon: Pre-registration of a TPB study

October 19, 2018

Michael Bosnjak

mb@leibniz-psychology.org



What the heck is a “Hackathon”?

- Portmanteau of the words "hack" and "marathon", where "hack" is used in the sense of developing something (usually: programming, here: study protocol)
- *In general:* Event in which computer programmers and others involved in software development collaborate intensively on software projects.
- *In our case:* Workshop-like event in which we are going to develop the core parts of TPB study protocols. Blueprint: [SIPS conferences](#).

Incentives to submit a pre-reg. protocol

- Taking advantage of first-hand recommendations about how to design TPB-based studies.
- Free data collection in ZPID's online quota-based panel (D, GB) for studies with IPA.
- Special issue in Europe's Journal of Psychology:
<https://goo.gl/wMwtpN>

Overall goal/s

- Developing pre-registered replications of past primary studies applying the TPB to any substantive domain identifying the conditions that promote or inhibit replicability of findings.
- Developing pre-registered systematic reviews and meta-analytic syntheses of TPB studies identifying the determinants of the (non-)replicability of the TPB.
- Any other TPB study you would like to pre-register.

Agenda

- Pre-registration / Registered reports overview
 - Concept and workflow
 - Why pre-registration?
 - New hot topic or old wine in new bottles?
 - What are the barriers preventing pre-registration becoming the default approach for hypothesis-driven research?
 - How to overcome the barriers ?
- How to pre-register your study (primary or meta-analytic)?

Pre-registration / Registered Reports

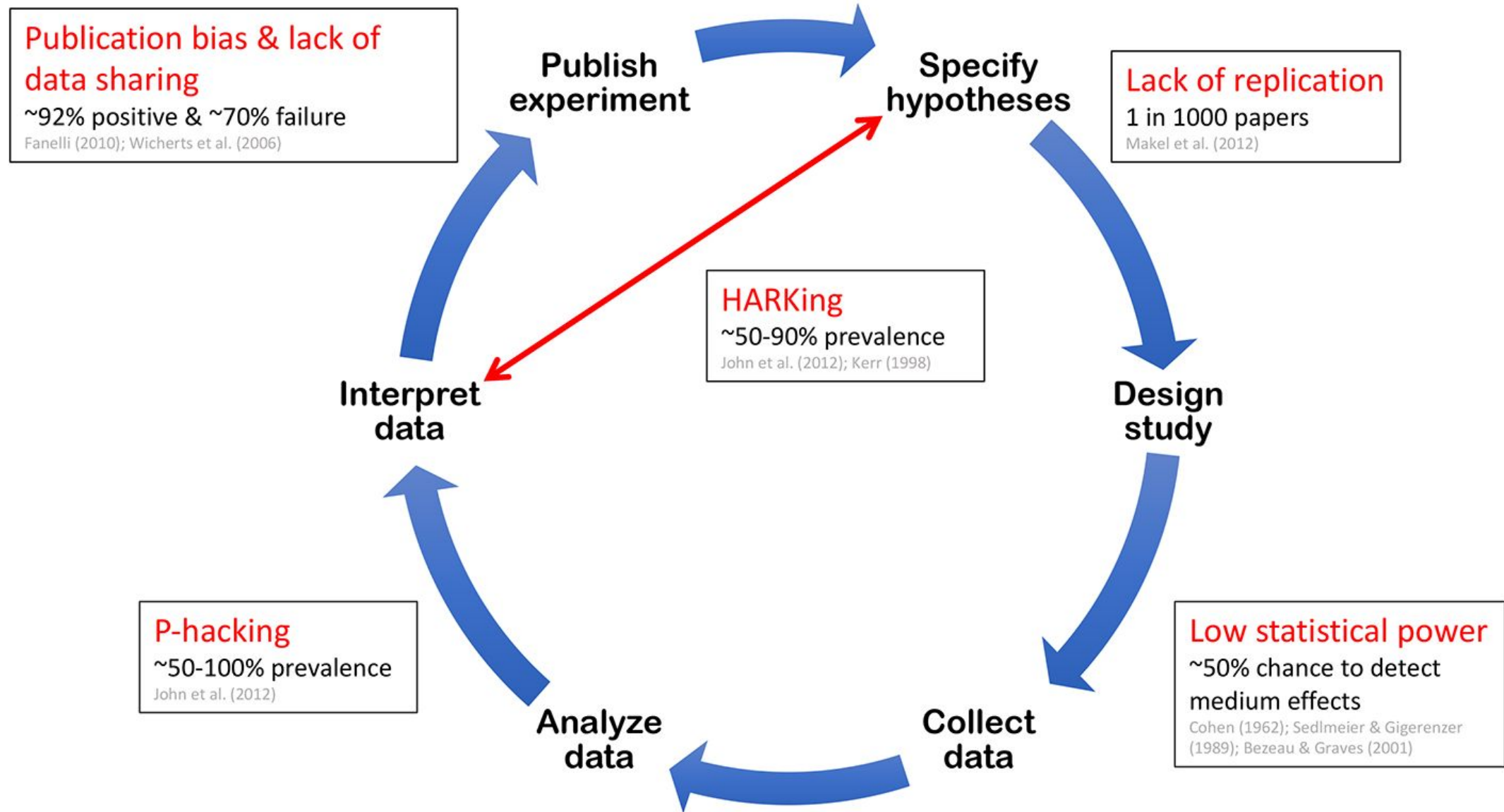


Further details and participating journals:

<https://cos.io/rr/>

Why pre-registration?

- Negative frame:
Preventing, or at least alleviating, questionable research practices:
 - inadequate study designs (e.g., low statistical power, missing manipulation checks)
 - changing hypotheses retrospectively to fit obtained data (“HARKing”),
 - selective reporting of results,
 - manipulation of methods and criteria of analysis (“p-hacking”),
 - publication bias
- Positive frame (= ZPID position): Enabling researchers to demonstrate that their studies have been conducted, analyzed, and reported as initially planned.



New hot topic or old wine in new bottles?

A few selective historical milestones tackling pre-registration issues:

- **2018 (Oct.):** Registered reports offered by [approx. 150 journals](#), but heterogeneous pre-registration standards, and adoption rates still very low.
- **2017:** Chris Chambers “The seven deadly sins of psychology” ([ZPID Video, Jan 2018](#))
- **2015:** Open Science Collab: Estimating the reproducibility of psychological science
- **2012:** The journal Cortex introduces registered reports.
- **1987:** Newcombe: Towards a reduction in publication bias (British Medical Journal)
- **1970:** Walster and Cleary: A new editorial policy in the social sciences aimed at facilitating transparency, reproducibility/replicability (American Statistician)
- **1966:** Robert Rosenthal recommends pre-registration

The cultural/habitual barrier

- Non-perishable things (e.g., intellectual artifacts) have fundamentally different survival patterns than perishable things (e.g., organisms) (Taleb, 2012; Mandelbrot, 1982; Goldman, 1964)
- “Lindy effect”:
 - the future life expectancy of some non-perishable thing (like an idea, cultural habit or research practice) is proportional to their current age, so that every additional period of survival implies a longer remaining life expectancy
 - mortality rate decreases with time, following a power law distribution

Other barriers to pre-registration

- Cultural habits (see above)
- Current incentive structures for:
 - Researchers
 - Editors
 - Publishers
- Missing disciplinary agreed-upon guidelines and standards for
 - pre-registration
 - handling of protocol deviations

Overcoming barriers (selection)

Cultural habits	<ul style="list-style-type: none">• Teaching & Regulation: Pre-registration becomes obligatory• Gentle paternalism, e.g. by changing defaults (pre-registration as default, changes must be well justified)• Incentive-based approach (see below)
Current incentive structures	<ul style="list-style-type: none">• Introducing a blockchain-based 'currency' as a notarization service and to incentivize pre-registration• 'Badges' rendering pre-registration prominently visible• Pre-registration challenges offering \$ (OSF approach)• Free data collection and curation services (ZPID approach)
Missing guidelines and standards	<ul style="list-style-type: none">• Developing joint <u>disciplinary</u> standards for pre-registration, encompassing<ul style="list-style-type: none">○ measures against 'open washing' (e.g., SMART working group)○ rules for handling deviations

Pre-registration services & First steps

- OSF Registries
<https://osf.io/registries/>
- AsPredicted
<https://aspredicted.org/>
- Protocols.io (ZPID partner)
<https://www.protocols.io/>

**Register with the OSF >
Create new project (My Projects > Create Project) >
Go to new project >
Registrations > New Registration**

**Create >
Provide names (“I am just trying things out.”) >
Fill out form with 8 questions**

**Register >
My Library >
NEW Protocol (and use your own template)**

Pre-registration templates: Primary studies

- APA Styleguides for Publications (please retrieve and read)
 - Quantitative research:
<http://dx.doi.org/10.1037/amp0000191>
 - Qualitative and Mixed-Methods Research:
<http://dx.doi.org/10.1037/amp0000151>
 - [Collection of tables](#)
- Journal specific styleguides: <https://cos.io/rr/>
- Pre-registration service specific styleguides: See above

Pre-registration templates: Meta-analysis

- APA MARS Styleguide, Table 9, p. 21:
<http://dx.doi.org/10.1037/amp0000191>
- [MARS overview in tabular format](#)
- [SIPS 2018 Reviews Preregistration Form \[Draft\]](#)

How to proceed?

---- today ---

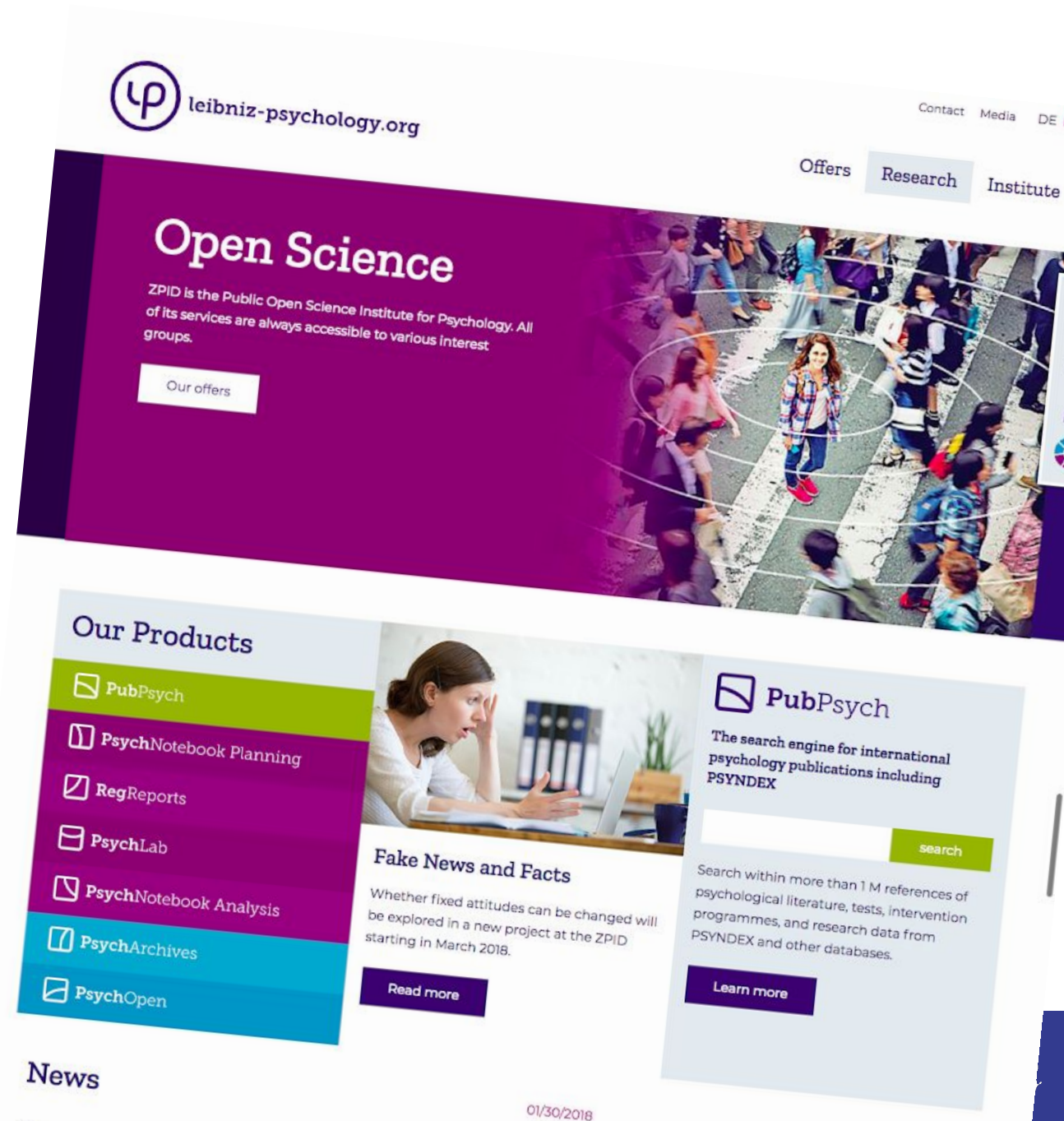
- Develop and discuss your TPB research question
- Select the APA styleguide template corresponding to your study design
- Develop, discuss, and present the core parts of your protocol

--- post-event ---

- Finalize and submit your protocol
- Request data collection at ZPID (online panel studies only)
- Submit to EJOP special issue (or another journal)

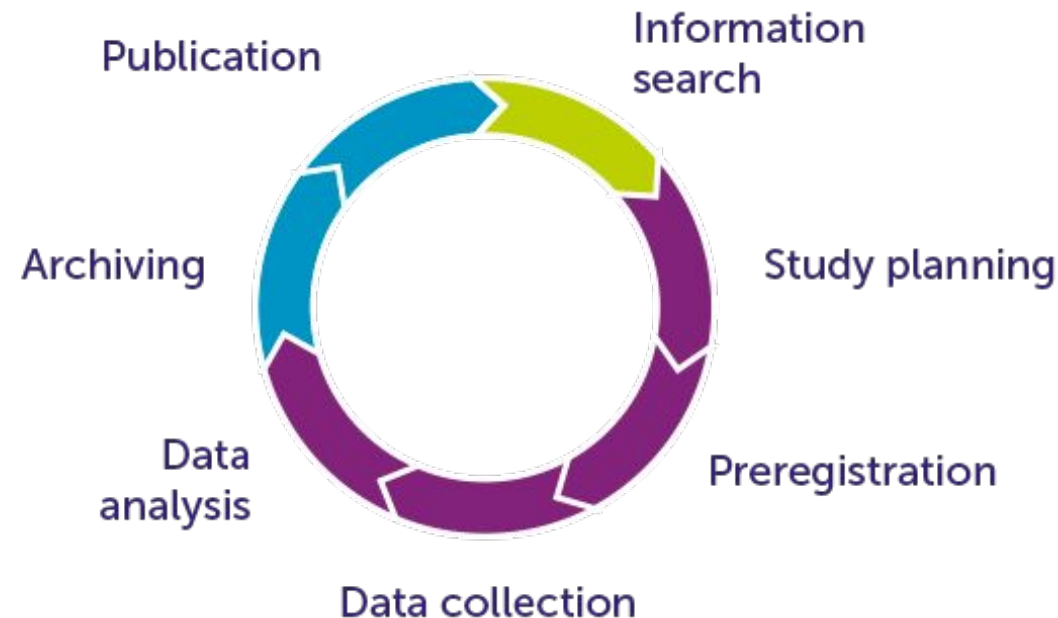


Prof. Dr. Michael Bosnjak
director@leibniz-psychology.org



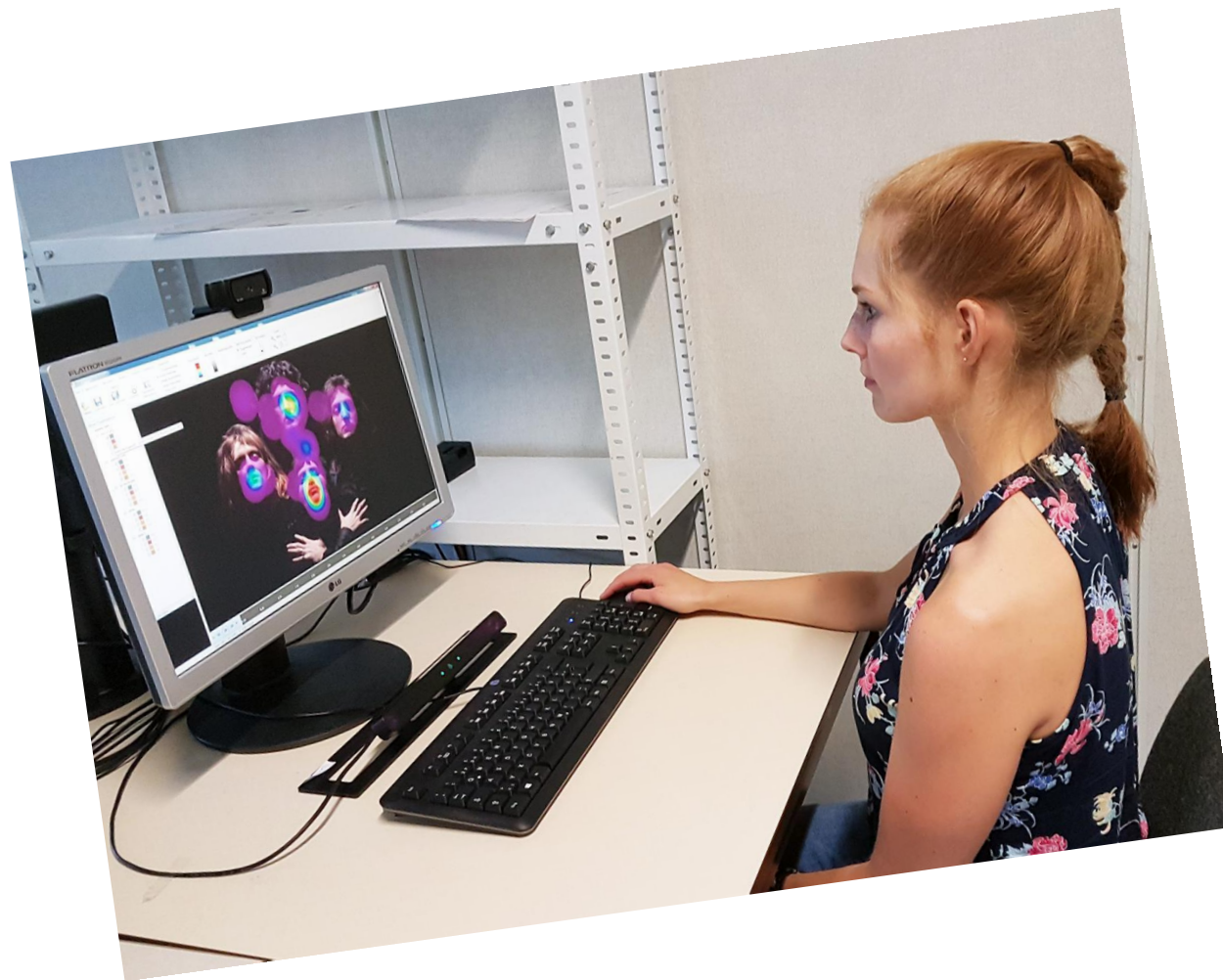
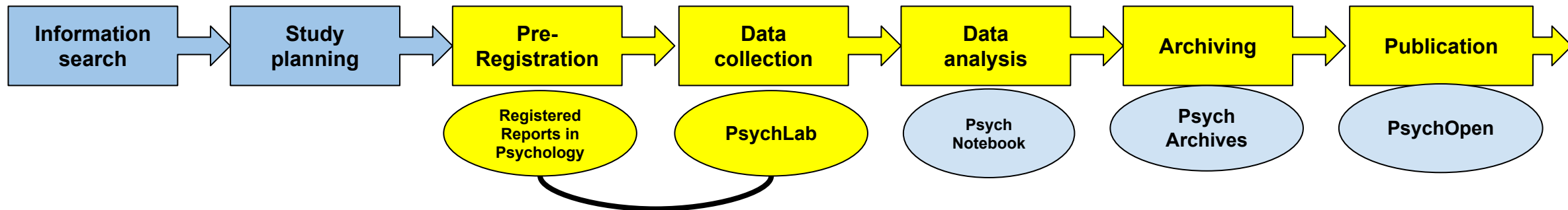
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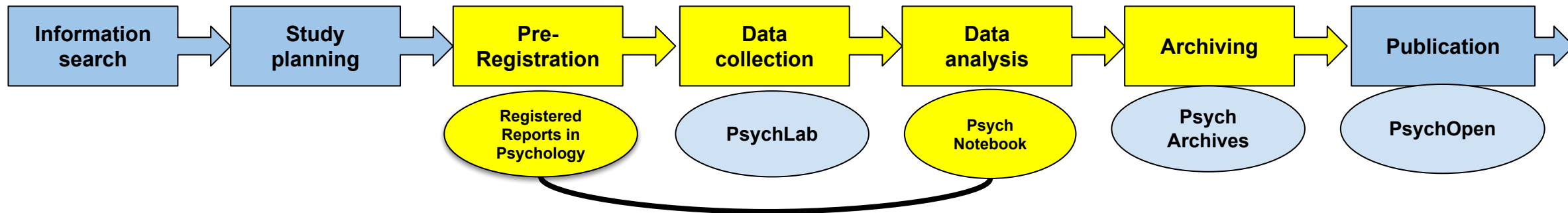
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ZPID's take on pre-registration

- No normative statements (mission of DGPs, APA, among others)
- Supporting pre-registration by:
 - embedding pre-registration into a research cycle
 - participating in developing and implementing joint standards (currently with: DGPs, Hogrefe, SIPS, etc.)
 - offering free and independent data collection services for successfully reviewed protocols
 - offering data curation and long-term preservation services (e.g., self-archiving, DataWiz, PsychData service)
 - implementing SMART-preregistration in PsychOpen GOLD (OA journals)






PsychNotebooks

Jupyter **sai(2)** Last Checkpoint: 4 minutes ago (autosaved) [Logout](#)

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 Code Select Psychological method

How smart do you think you are?

A meta-analysis on the validity of self-estimates of cognitive ability

Philipp Alexander Freund and Nadine Kasten

Hypotheses

Overall Relationship: Most studies investigating the relationship between self-estimates of cognitive ability and psychometric test scores report significant, positive correlations. We therefore expect to find a significant, positive overall relationship between the two variables

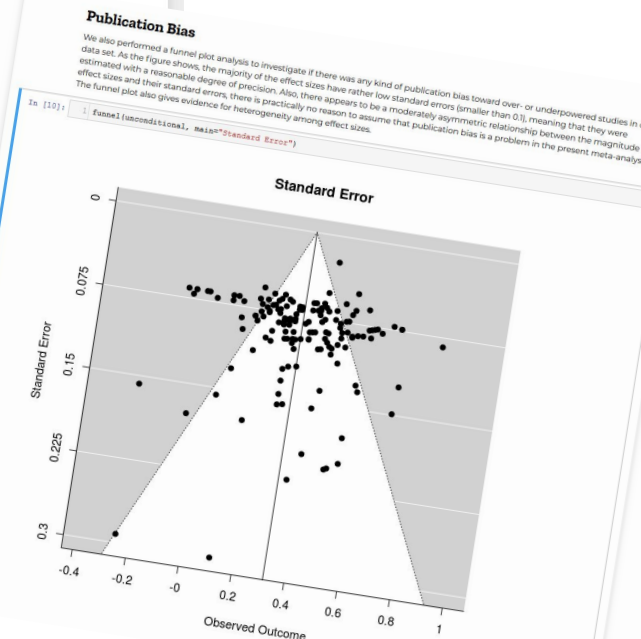
Moderator Analysis: We hypothesize that self-estimates concerning verbal, numerical, or spatial abilities should be more valid than self-assessments of general cognitive ability, which in turn is usually a compound of different subabilities (as implemented in omnibus test batteries). Consequently, use of these "standard" abilities should also result in more valid self-estimates than use of more rarely assessed abilities, such as memory or processing speed, for instance.

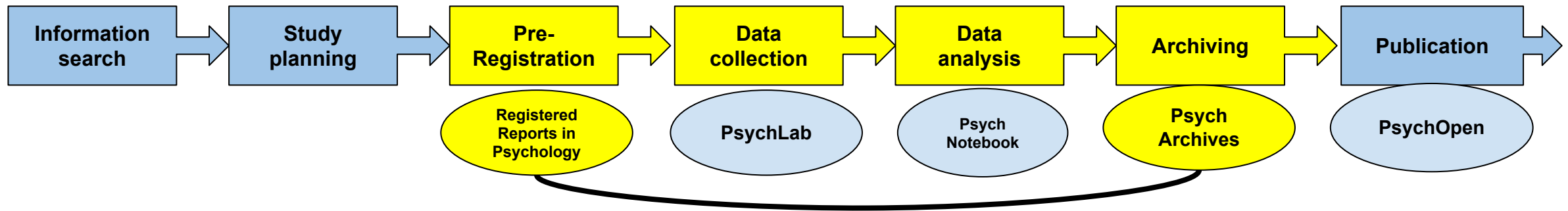
```

In [4]: 1 ##install packages
        2 #install.packages("ggplot2")
        3 #install.packages("metafor")
        4
        5 ##load packages
        6 library(ggplot2)
        7 library(metafor)
        8
        9 ##load data
       10 sai <- read.csv(file="SAI_Beiispiel.CSV",header=TRUE, sep=";", dec = ",")
  
```

Results

Descriptive Statistics





PsychArchives

Open-Access-Repository for psychology

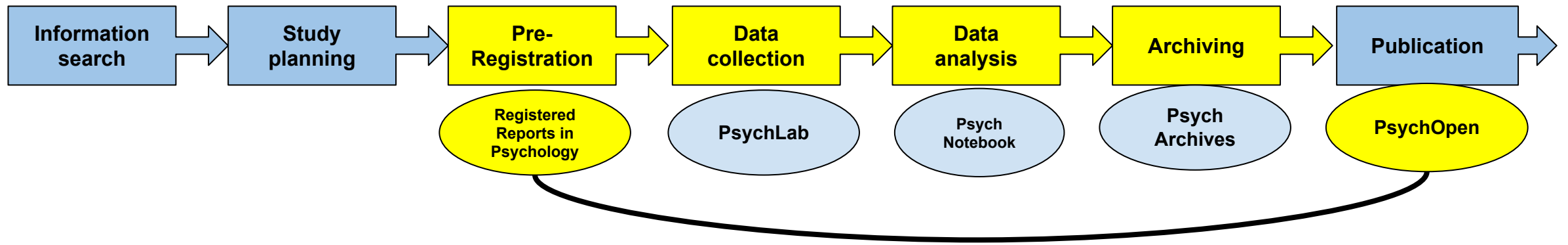
PsychArchives is the disciplinary repository for Open Access contents in psychology. We safeguard and provide access to all kind of publications, tests, data and code that are related to the discipline of psychology. PsychArchives thereby is well embedded into the other services offered by ZPID. We make it easy to pre-register your studies, work on your study data, publish them following the Open Access principles and get cited by automatically assigned DOIs.

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New Content		
Publication: European Psychology Publication Platform: Issues and Perspectives (Weichselgartner, Erich)		14
Data: Psychology Publication Issues in the Czech Republic (Švancara, Josef)		4
Code: The development of scientific psychological publishing in Italy		2
Publication: SPANISH PSYCHOLOGY JOURNALS: DEMOGRAPHY, EDITORIAL TENDENCIES AND IMPACT		45
Publication: Shortening the intellectual distances in Europe: Psychological Publishing Activity in Bulgaria		199

The screenshot shows the 'DataWiz' interface for project management. It includes a sidebar with navigation links like 'Projektübersicht', 'Beispielprojekt: Längsschnittstud...', 'Projektmaterialien', and 'Projektmitarbeiter'. The main content area is titled 'Forschungsdatenmanagement planen' and contains text about planning research data management. It also features a 'Zum User Guide' link and a 'Beispielprojekt: Längsschnittstudie zur Entwicklung individueller Kompetenzen' section. The interface is designed to help users plan and manage their research data, including administrative data, research data, documentation, data sharing, storage and infrastructure, organization and policies, ethical and legal aspects, and costs.



In the paper

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

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.

From the pre-registered protocol

SMART-preregistration by Tom Hardwicke et al. (2018)

