Report on Progress with Registry for Research on the Responsible Conduct of Research (RRRCR)

Klaas Sijtsma

Paper presented at 6th World Conference on Research Integrity

University of Hong Kong, June 5, 2019
Who am I (that is, What do I do)?

- 1997—Present  Full professor of Methods of Psychological Research, Tilburg University (TiU)
- 2000—2010  Head Department of Methodology and Statistics, TiU
- 2010—2011  President of the Psychometric Society
- 2011—2017  Dean of the School of Social and Behavioral Sciences, TiU
- 2011—Present  As administrator involved in a couple of integrity scandals

And so on
Why preregistration?
Weather forecasting:

- “Predicting” yesterday’s weather is no big deal, but you can learn a lot from studying the weather in the previous period, e.g., look for patterns that repeat and the conditions that repetitions share; **inductive** process, may give rise to theories
- From theories deduce hypotheses, and empirically test the hypotheses; aim is to improve predicting tomorrow’s weather; **deductive** process
Reichenbach (1938)

**Context of discovery** (of knowledge): Refers to the psychological thought processes as they actually occur in scientific discovery or inference. The way existing “data” enable

- A meteorologist to infer a theory about weather systems
- A health researcher to discover relations between variables

**Context of justification**: Refers to logical analysis of the truth of the “knowledge” discovered, involves scientific procedures for establishing the (empirical) validity of a prediction. Concretely,

- The correctness of the prediction of the weather in the next ten days
- The resilience of the hypothesis when faced with newly collected data
Nosek, Ebersole, DeHaven, & Mellor (2018)

**Postdiction:** Generating new ideas based on **existing** data, exploring patterns that support an idea or generate a new idea; that is, **exploration** to generate hypotheses

**Prediction:** Testing hypotheses inspired by existing data in **newly** collected data, using
- Frequentist approach: Test null hypothesis against alternative hypothesis
- Bayesian approach: Identify the hypothesis that receives most support from data

**Notice:**

Data are noisy, contain many unexpected and unrepeateable signals; **exploration** finds those signals and takes them seriously; see Ioannidis (2005)

Preregistering your research—committing yourself to an *a priori* plan—limits your possibilities to present results as if you predicted them when you actually found them by *exploring* your data.

Goals:

- Self-protection: temptation to play with your data is irresistible
- Publish results for what they are; context must be made explicit
Item from statistics exam contains options illustrating data exploration with the purpose of making hypothesis testing look like prediction when in fact it is not:

24. A researcher expects that the mean anxiety level is greater than 25 \( (H_1: \mu_X > 25) \), so that the null hypotheses is \( H_0: \mu_X \leq 25 \). In a sample, she finds \( M = 23 \). Based on the sample results, the researcher should

a. Replace the alternative hypothesis by \( H_2: \mu_X < 25 \) and then test \( H_0: \mu_X \geq 25 \) against \( H_2 \)

b. Given the sample results, replace a one-sided test by a two-sided test

c. Refrain from testing and draw a conclusion based on the sample alone
Amsterdam Agenda

Establish a Registry for Research on the Responsible Conduct of Research (RRRCR)

Registration should at least contain 6 key elements outlined in the Amsterdam Agenda:

- **Problem.** Shortcomings one addresses, e.g., selective reporting, misuse of statistics
- **Impact.** Estimate of impact of shortcomings on trustworthiness research, responsible use of research funds, etc.
- **Intervention.** How plan to address identified shortcomings? E.g., quality checks, training, encouragement responsible behavior
- **Hypothesis or Anticipated Outcomes.** Changes expected as result of intervention
- **Assessment.** How does one plan hypothesis testing and assessing whether outcomes are as expected
- **Data sharing.** How data, qualitative and quantitative, will be shared

After registration, upload full study protocol, data-analysis plan, data set, and reports describing results
What are we going to do?

Provide you with feedback on the degree to which the Amsterdam Agenda resonated among researchers; that is, You!
Data come from registration files for 6th WCRI (24 April 2019, probably not final)

Independent Variables

- **Presentation Mode** (1 = paper, 2 = poster)
- **Early Career Scholar** (0 = No, 1 = Yes)
- **Category of research** (1 = Qualitative, 2 = Quantitative, 3 = Descriptive)
- **Continent** presenter (6 continents)
- **Discipline** (8 disciplines: 1—Ethics, Integrity, Data Quality; 2—Exact Sciences; 3—Human Sciences; 4—Library, Information; 5—Medicine, Health; 6—Publishing, Journals; 7—Governance, Funding, Support; 8—Non-Academic)

Dependent Variables

- **Preregistration** (0 = No, 1 = Yes)
- **Registry** (1 = RRRCR; 2 = OSF; 3 = Other)
- **Completeness** (0 = 0 entries; 1 = 1—4 entries; 2 = 5—6 entries; 8 = Wrong URL; 9 = Diff Title; 10 = No Info; 11 = Request Sign In / Access)
N = 308 papers and posters (24 April 2019), Frequencies Dependent Variables

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58*: 2 participants provided no further information, hence columns Regis and Compl add to 56
Conclusions

- 19% (58) of the 6th WCRI participants preregistered; 81% did not
- Of 58 participants who preregistered,
  - 56 provided information about registry and completeness of preregistration;
    - 56 of them
  - 41 used RRRCR/OSF; basically, the same thing
  - 21 provided info on at least 1/6 entries of the Amsterdam Agenda, 14 of them
    - 21 on 5—6 entries
  - 24 provided URLs requiring to sign in or that led to another (irrelevant) site,
    - 24 such as a general statement of a university about research integrity

**Homework** for next conference: *everybody preregister*
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**Conclusions:**

- No difference between Qualitative and Quantitative
- Guidelines needed for Descriptive Research?
- Little preregistration for Ethics and Integrity background; however, 51% of the presentations there are Descriptive (not tabulated)
Main Conclusions

- 19% preregistration may look modest, **but it is a start!**
- **Similar results** were found for
  - clinical trials reported in Top 5 General Medicine Journals (Ioannidis, Caplan, & Dal-Ré, 2017): 9 of 67 studies were “perfectly reported”
  - absence preregistering changes in research published in *Psych.Science* (article not published yet)
- Preregistration involves a working routine **completely different** from what we are used to; takes discipline and time; training, job requirement?
- Preregistration must become routine in **academic education**; students pick it up easily, because they do not have a routine they first have to shake off
- I found the 6 key elements outlined in the Amsterdam Agenda **not unambiguous**, and had difficulty defining them for my own study
- **We need to improve ourselves for the next conference: 7th WCRI**
Thank You

Suggestions are welcomed

k.sijtsma@uv.t.nl