

Reproducible paper writing

Some practical recommendations¹

Sebastian Sauer (FOM) Christoph Kurz (Helmholtz)

DGPs conference 2016 in Leipzig

¹Slides on Github, <http://bit.ly/29N7YH0>

Is science broken?

Echo in academia press



Reproducible paper writing

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Is science broken?

What is reproducible writing?

Why should I write my paper in a reproducible manner?

How to do it?

Style sheets

Echo in non-academia press

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The collage features several overlapping elements:

- The Economist** article: "Problems with scientific research" with the headline "How science goes wrong". Sub-headline: "Scientific research has changed the world. Now it needs to change itself". Date: Oct 19th 2013. Includes social media icons for Like, +1, and Tweet.
- German news snippet**: "Geben Sie dem Bildungssystem in MV noch heute ein Update." (Give the education system in MV an update today).
- Science article snippet**: "reveals that a lot of psychology research really is just 'psycho-babble'". Sub-headline: "More than half could not be reproduced using the same method". Date: Thursday 27 August 2015. 91 shares.
- The New York Times** article: "The New York Times Science, Now Under Scrutiny Itself". By BENEDICT CAREY. Date: JUNE 15, 2015.
- Süddeutsche Zeitung** article: "Es mussten unbedingt bahnbrechende Ergebnisse produziert werden". Date: 17. Juli 2016, 14:15 Uhr. Topic: Wissenschaftsethik.
- Video title**: "Krise in den Wissenschaften? Ist Wissenschaft ein Mythos geworden?"
- Video description**: "Video: Ganze Sendung 'Krise in den Wissenschaften'"

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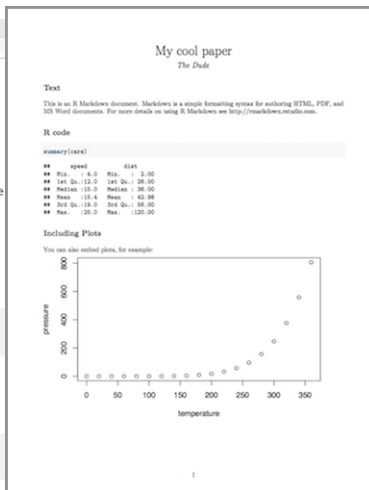
What is reproducible writing?

Write plain text with computer code included

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```
1 ---
2 title: "My cool paper"
3 author: "The Dude"
4 output: pdf_document
5 ---
6
7 ## Text
8
9 This is an R Markdown document. Markdown is a simple
10 formatting syntax for authoring HTML,
11 PDF, and MS Word documents.
12 For more details on using R Markdown
13 see <http://rmarkdown.rstudio.com>.
14
15 ## R code
16
17 ```{r cars}
18 summary(cars)
19 ```
20
21 ## Including Plots
22
23 You can also embed plots, for example:
24
25 ```{r pressure, echo=FALSE}
26 plot(pressure)
27 ```
28
```



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Why should I write my paper in a reproducible manner?

Re-do analysis with no pain



*Dude,
I sent you the wrong data. Find attached new
dataset. You must re-do all analyses. Did I
mention we submit tommorrow?
Regards,
C. Kirk*

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Match R code to results in paper easily

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Paper with ~1,000 lines of wild R code.

In results section:

“After some wild computation, we found accuracy to be
78%...”

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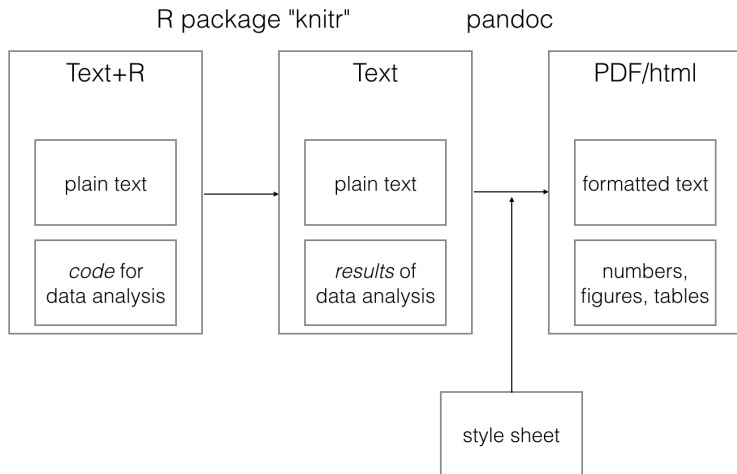
Style sheets

How to do it?

Process of repro paper writing

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Style sheet for thesis/assignment

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```
1 ---
2 title: "Titel der Arbeit:mit Doppelpunkt"
3 subtitle: Ein schöner Subtitel
4 referee: Prof. Dr. I. Weiß-Ois
5 course: Seminararbeit im Fach Raketenwissenschaft
6 field: Studiengang Sophismus
7 author: Max Mustermann
8 ID: "Matrikelnummer: 12345679"
9 street: Meine Straße 1
10 zipcity: 12345 Hausenhausen
11 date: 13\. Mai 2016
12 graphics:
13 toc: true
14 lof: true
15 lot: true
16 lang: de-De
17 bibliography: Literatur.bib
18 logo: logo.png
19 documentclass: scrartcl
20 highlight-style: kate
21 output:
22   pdf_document:
23     number_sections: true
```



Style sheet for APA papers

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Install PAPAJA and open new APA template in RStudio

```
---
title: "How to use papaja: An Example Manuscript Including Basic Instructions"
shorttitle: "How to use papaja"
author:
  - name: Frederik Aust
    affiliation: 1
    corresponding: yes # Define only one corresponding author
    department:
    address: "Department Psychology, University of Cologne, Herbert-Lewin-Str. 2, 50931
    Köln, Germany"
    email: "frederik.aust@uni-koeln.de"
  affiliation:
  - id: 1
    institution: "University of Cologne"

abstract: |
  This manuscript demonstrates how to use R Markdown and papaja to
  create an APA conform manuscript. papaja builds on R Markdown, which
  uses pandoc to turn Markdown into PDF or Word documents. The conversion
  to Word documents currently supports only a limited set of features.

autor_note: |
  `papaja` has not yet been submitted to CRAN; a development version is available at
  https://github.com/crsh/papaja.

keywords: "APA style, knitr, R, R markdown, papaja"
```

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Acknowledgments/ more infos

- ▶ Yihui Xie for knitr - http://kbroman.org/knitr_knutshell/
- ▶ John Gruber & Aaron Swartz for markdown - <https://de.wikipedia.org/wiki/Markdown>
- ▶ John MacFarlane for pandoc - <http://pandoc.org>
- ▶ RStudio team for RStudio - <https://www.rstudio.com/home/>
- ▶ R community for R - <https://cran.r-project.org>
- ▶ Frederik Aust for papaja - <https://github.com/crsh/papaja>
- ▶ Get my thesis template - https://github.com/sebastiansauer/Markdown_paper_template
- ▶ Github team for github - <https://github.com>
- ▶ Steven V. Miller for beamer template- <https://github.com/svmiller/svm-r-markdown-templates>

Thank you. That's it.

- ▶ **Get this talk here:** https://github.com/sebastiansauer/talk_repro_writing_DGPs_2016
- ▶ **Contact:**
Mail: sebastian.sauer@fom.de
Twitter: [sauer_sebastian](#)

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