The culture of open scholarship

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`kbroman.org`

Slides: `bit.ly/broman2022`

About me

- Applied statistician working in genetics
- Co-author on 170 papers and 1 book
- Reviewer for 89 different journals
- Formerly
  - Associate editor and Senior editor at *Genetics*
  - Associate editor at *Biostatistics*
  - Associate editor at *Journal of the Americal Statistical Association*
  - Academic editor at *PeerJ*
  - Editorial Board member of *BMC Biology*

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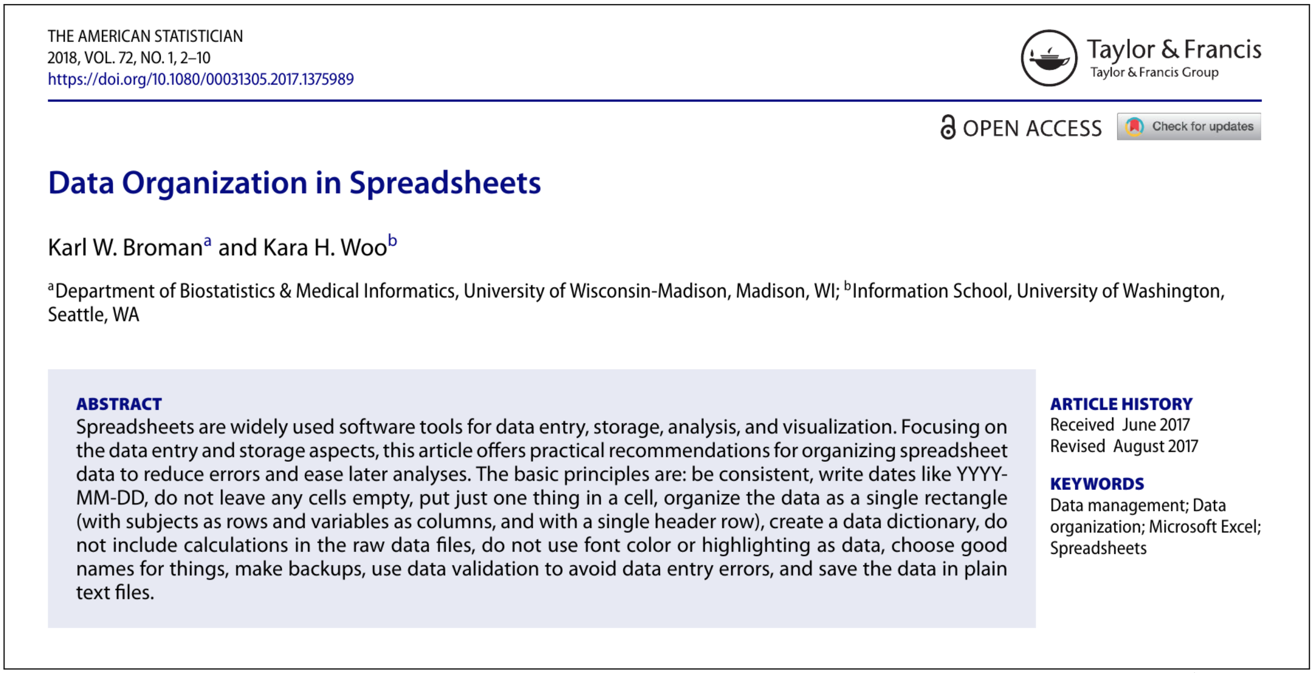

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Data Organization in Spreadsheets

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ABSTRACT
Spreadsheets are widely used software tools for data entry, storage, analysis, and visualization. Focusing on the data entry and storage aspects, this article offers practical recommendations for organizing spreadsheet data to reduce errors and ease later analyses. The basic principles are: be consistent, write dates like YYYY-MM-DD, do not leave any cells empty, put just one thing in a cell, organize the data as a single rectangle (with subjects as rows and variables as columns, and with a single header row), create a data dictionary, do not include calculations in the raw data files, do not use font color or highlighting as data, choose good names for things, make backups, use data validation to avoid data entry errors, and save the data in plain text files.

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KEYWORDS
Data management; Data organization; Microsoft Excel; Spreadsheets

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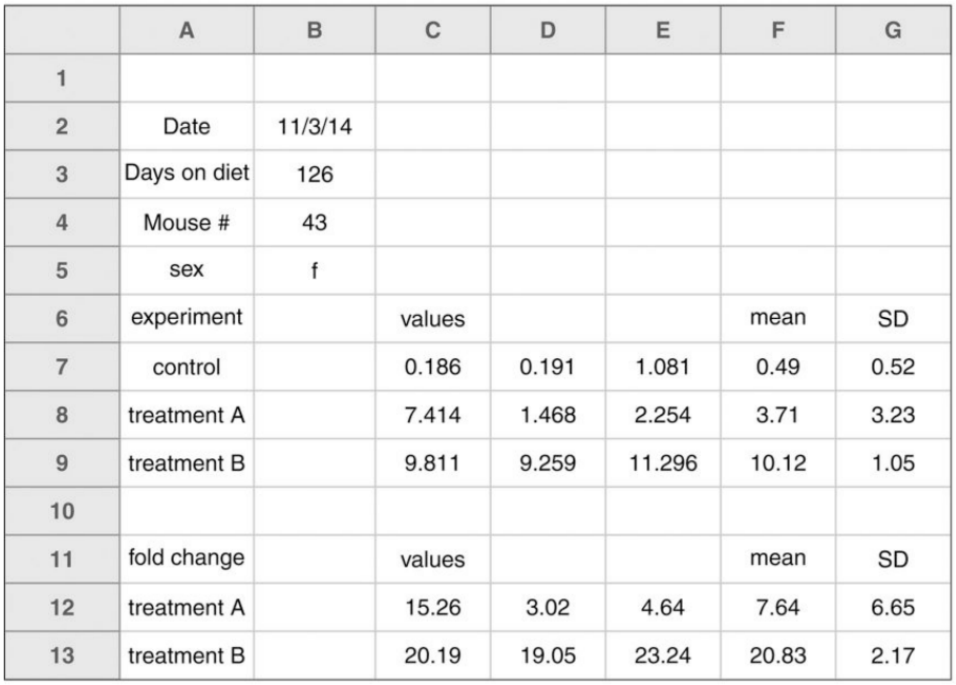
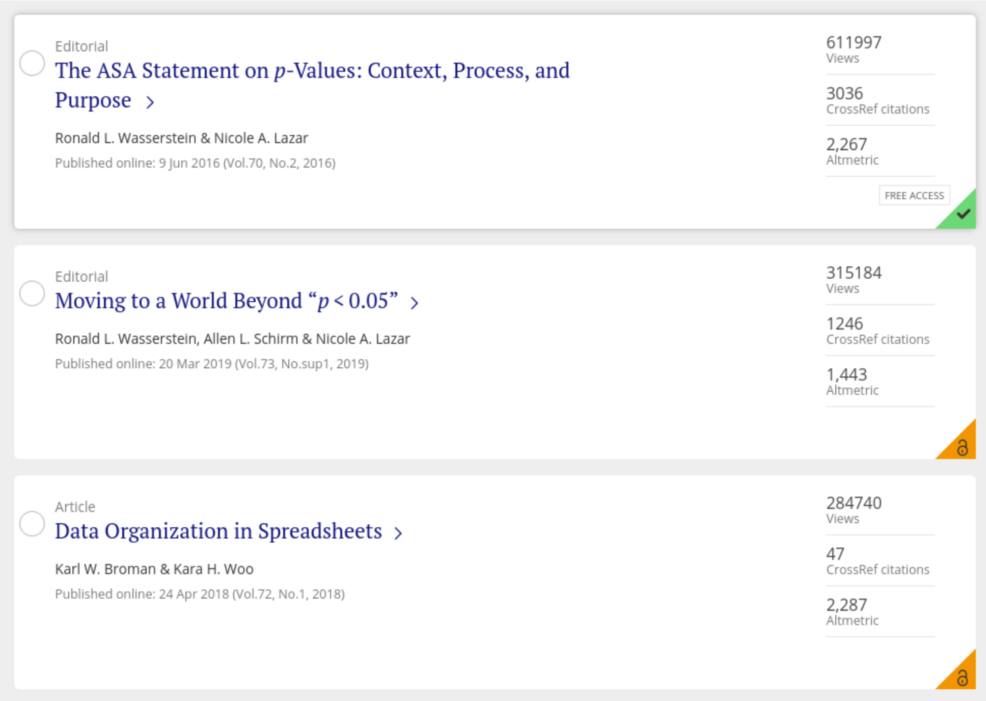


	A	B	C	D	E	F	G
1							
2	Date	11/3/14					
3	Days on diet	126					
4	Mouse #	43					
5	sex	f					
6	experiment		values			mean	SD
7	control		0.186	0.191	1.081	0.49	0.52
8	treatment A		7.414	1.468	2.254	3.71	3.23
9	treatment B		9.811	9.259	11.296	10.12	1.05
10							
11	fold change		values			mean	SD
12	treatment A		15.26	3.02	4.64	7.64	6.65
13	treatment B		20.19	19.05	23.24	20.83	2.17



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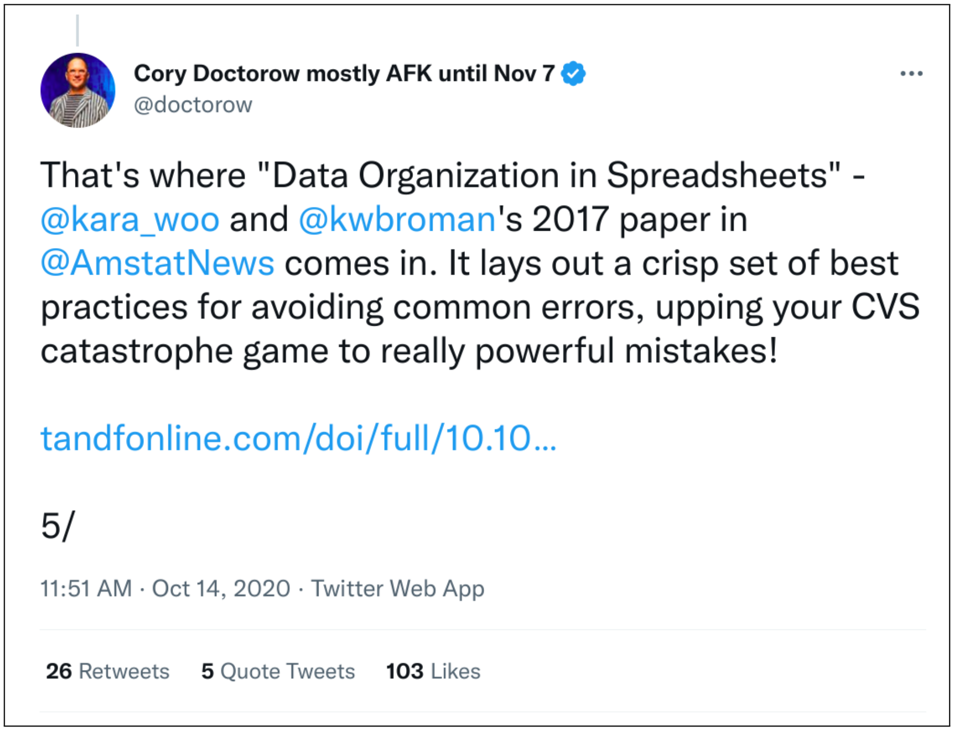

Cory Doctorow mostly AFK until Nov 7
@doctorow

That's where "Data Organization in Spreadsheets" - @kara_woo and @kwbroman's 2017 paper in @AmstatNews comes in. It lays out a crisp set of best practices for avoiding common errors, upping your CVS catastrophe game to really powerful mistakes!

tandfonline.com/doi/full/10.10…

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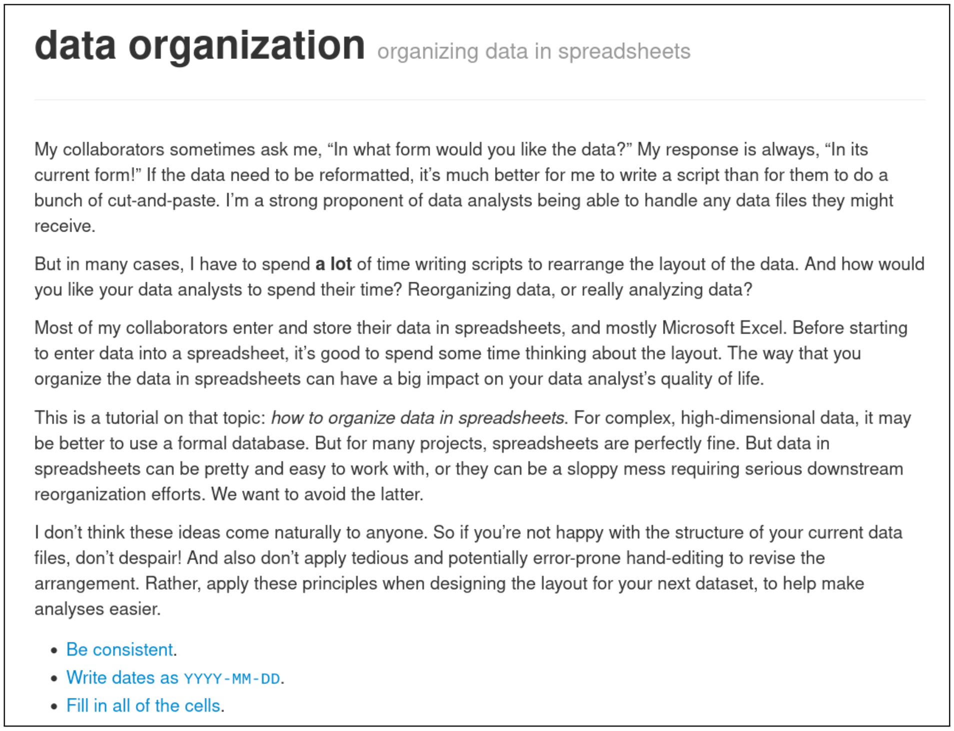


data organization organizing data in spreadsheets

My collaborators sometimes ask me, “In what form would you like the data?” My response is always, “In its current form!” If the data need to be reformatted, it’s much better for me to write a script than for them to do a bunch of cut-and-paste. I’m a strong proponent of data analysts being able to handle any data files they might receive.

But in many cases, I have to spend **a lot** of time writing scripts to rearrange the layout of the data. And how would you like your data analysts to spend their time? Reorganizing data, or really analyzing data?

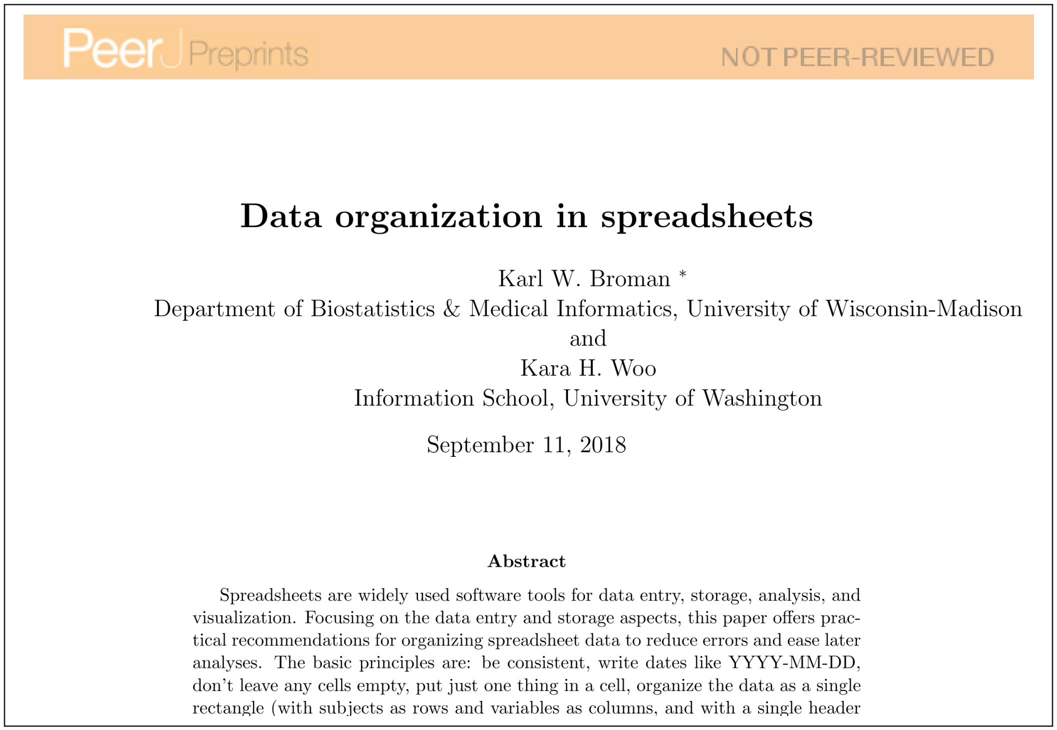
Most of my collaborators enter and store their data in spreadsheets, and mostly Microsoft Excel. Before starting to enter data into a spreadsheet, it’s good to spend some time thinking about the layout. The way that you organize the data in spreadsheets can have a big impact on your data analyst’s quality of life.

This is a tutorial on that topic: *how to organize data in spreadsheets*. For complex, high-dimensional data, it may be better to use a formal database. But for many projects, spreadsheets are perfectly fine. But data in spreadsheets can be pretty and easy to work with, or they can be a sloppy mess requiring serious downstream reorganization efforts. We want to avoid the latter.

I don’t think these ideas come naturally to anyone. So if you’re not happy with the structure of your current data files, don’t despair! And also don’t apply tedious and potentially error-prone hand-editing to revise the arrangement. Rather, apply these principles when designing the layout for your next dataset, to help make analyses easier.

- Be consistent.
- Write dates as `YYYY-MM-DD`.
- Fill in all of the cells.

kbroman.org/dataorg



Data organization in spreadsheets

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September 11, 2018

Abstract

Spreadsheets are widely used software tools for data entry, storage, analysis, and visualization. Focusing on the data entry and storage aspects, this paper offers practical recommendations for organizing spreadsheet data to reduce errors and ease later analyses. The basic principles are: be consistent, write dates like YYYY-MM-DD, don't leave any cells empty, put just one thing in a cell, organize the data as a single rectangle (with subjects as rows and variables as columns, and with a single header

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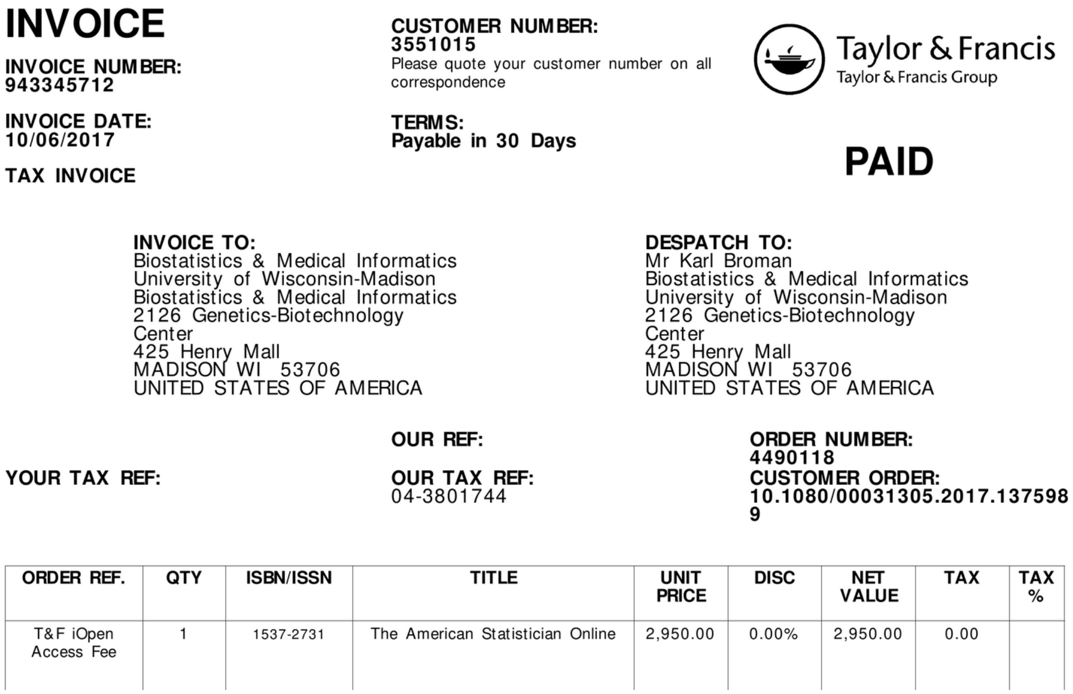

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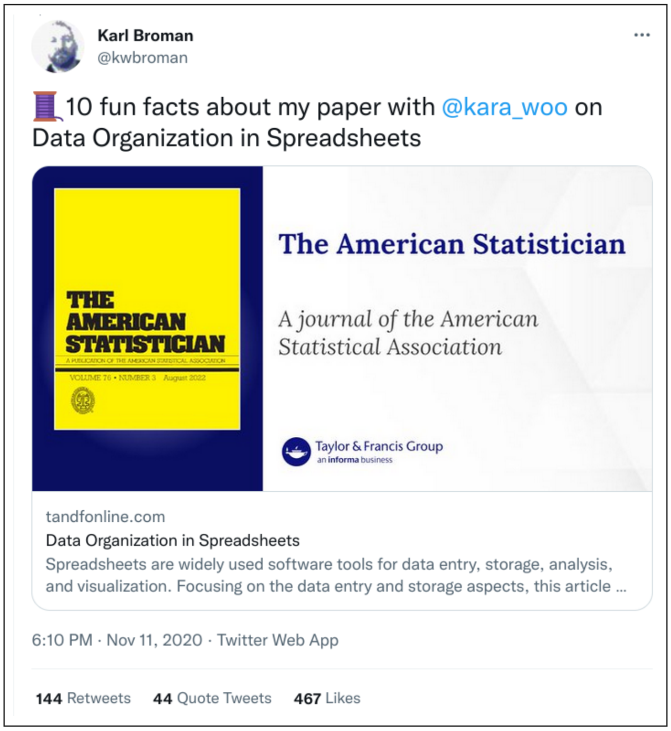

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🧵10 fun facts about my paper with @kara_woo on Data Organization in Spreadsheets

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Lessons

- Continued attachment to journal articles
- Open access ⟶ more readers

What has changed?

- Rise of preprints in biology
- Rise of *Nature Communications*
- PubMed Central: expansion, with no embargo

What hasn’t changed?

- Attachment to Impact Factor
- Researchers don’t read much

Barriers to OA

- Most scientists don’t seem to care
- Cost