The culture of open scholarship

Karl Broman

Biostatistics & Medical Informatics
Univ. Wisconsin–Madison

kbroman.org
Slides: bit.ly/broman2023

These are slides for a 10-15 min talk on open scholarship for the Big 10 Academic Alliance libraries, in Jan 2023.

Slides (pdf): https://kbroman.org/Talk_Big10Libs/oa2023.pdf

Slides with notes (pdf): https://kbroman.org/Talk_Big10Libs/oa2023_notes.pdf

Source: https://github.com/kbroman/Talk_Big10Libs

open access

open source

open science

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*

`kbroman.org/broman_cv.pdf`

I thought I should say a bit about my experience with the publication process.

My research spans genetics and statistics, but the majority of my publications are in the genetics or biology literature; I only have a couple of papers in statistics journals.

I've reviewed for a lot of different journals, and I spent a decade as an editor for the society journal, Genetics.

THE AMERICAN STATISTICIAN
2018, VOL. 72, NO. 1, 2–10
https://doi.org/10.1080/00031305.2017.1375989

Taylor & Francis
Taylor & Francis Group

Data Organization in Spreadsheets

Karl W. Broman[a] and Kara H. Woo[b]

[a]Department of Biostatistics & Medical Informatics, University of Wisconsin-Madison, Madison, WI; [b]Information School, University of Washington, Seattle, WA

ABSTRACT

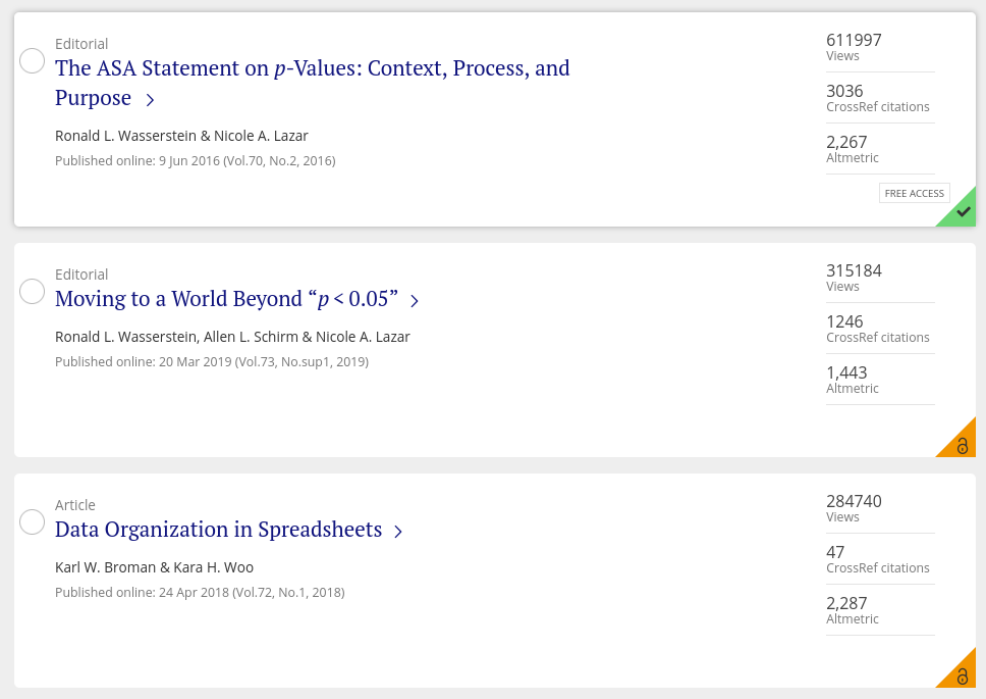
Spreadsheets are widely used software tools for data entry, storage, analysis, and visualization. Focusing on the data entry and storage aspects, this article offers practical recommendations for organizing spreadsheet data to reduce errors and ease later analyses. The basic principles are: be consistent, 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.

ARTICLE HISTORY
Received June 2017
Revised August 2017

KEYWORDS
Data management; Data organization; Microsoft Excel; Spreadsheets

doi.org/gdz6cm

	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


Editorial
The ASA Statement on p-Values: Context, Process, and Purpose
Ronald L. Wasserstein & Nicole A. Lazar
Published online: 9 Jun 2016 (Vol.70, No.2, 2016)
611997
Views
3036
CrossRef citations
2,267
Altmetric
FREE ACCESS
Editorial
Moving to a World Beyond "p < 0.05"
Ronald L. Wasserstein, Allen L. Schirm & Nicole A. Lazar
Published online: 20 Mar 2019 (Vol.73, No.sup1, 2019)
315184
Views
1246
CrossRef citations
1,443
Altmetric
Article
Data Organization in Spreadsheets
Karl W. Broman & Kara H. Woo
Published online: 24 Apr 2018 (Vol.72, No.1, 2018)
284740
Views
47
CrossRef citations
2,287
Altmetric

bit.ly/3TRWuYj

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

Karl W. Broman *
Department of Biostatistics & Medical Informatics, University of Wisconsin-Madison
and
Kara H. Woo
Information School, University of Washington

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

doi.org/10.7287/peerj.preprints.3183v2

INVOICE

INVOICE NUMBER:
943345712

INVOICE DATE:
10/06/2017

TAX INVOICE

CUSTOMER NUMBER:
3551015
Please quote your customer number on all correspondence

TERMS:
Payable in 30 Days

Taylor & Francis
Taylor & Francis Group

PAID

INVOICE TO:
Biostatistics & Medical Informatics
University of Wisconsin-Madison
Biostatistics & Medical Informatics
2126 Genetics-Biotechnology
Center
425 Henry Mall
MADISON WI 53706
UNITED STATES OF AMERICA

DESPATCH TO:
Mr Karl Broman
Biostatistics & Medical Informatics
University of Wisconsin-Madison
2126 Genetics-Biotechnology
Center
425 Henry Mall
MADISON WI 53706
UNITED STATES OF AMERICA

YOUR TAX REF:

OUR REF:

OUR TAX REF:
04-3801744

ORDER NUMBER:
4490118
CUSTOMER ORDER:
10.1080/00031305.2017.1375989

ORDER REF.	QTY	ISBN/ISSN	TITLE	UNIT PRICE	DISC	NET VALUE	TAX	TAX %
T&F iOpen Access Fee	1	1537-2731	The American Statistician Online	2,950.00	0.00%	2,950.00	0.00	

bit.ly/3sIRtVY

Lessons

- Continued attachment to journal articles
- Open access $\longrightarrow$ more readers

What has changed?

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

What hasn't changed?

- Attachment to Impact Factor
- Attachment to Science, Nature, and Cell
- Researchers don't read much

The journal Genetics recently sent out a newsletter that included an announcement of new associate editors. The bio for one of them had "...including more than 30 articles in Nature, Science, Cell, and Nature Genetics."

Barriers to OA

- Most scientists don’t seem to care
- Cost