



Supporting Research Reproducibility at Carnegie Mellon University with protocols.io

SEPTEMBER 10, 2020

Melanie Gainey, PhD

Liaison Librarian, Biological Sciences, Biomedical
Engineering, & Psychology

Program Co-director, Open Science & Data
Collaborations

Carnegie Mellon University

- Pittsburgh, PA
- Relatively small but research-heavy institution
 - 14,799 students
 - Top funders: NSF, DOD, DOE, NIH



Open Science Support from University Libraries at CMU

- Open Science & Data Collaborations program
- Started in 2018



Open Science & Data Collaboration Program

- OSDC program supports research transparency, **reproducibility**, reuse, and collaborations across CMU through outreach, training, and digital infrastructure.



Tools



Trainings



Events



Experts

Open Science & Data Collaboration Program



Tools

- protocols.io (April 2019)
- Open Science Framework
- LabArchives
- Institutional Repository, KiltHub



Trainings

- workshops
- Carpentries



Events

- Open Science Symposium
- AI for Data Reuse Symposium
- Hack-a-thons



Experts

- subject experts, schol comm, and RDM experts
- Data Colab

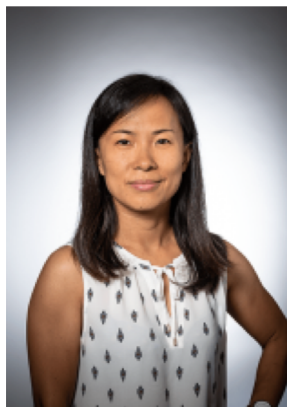
Open Science at University Libraries



Ana Van Gulick, PhD

Former Director of OSDC, currently at figshare

- Ann Marie Mesco, MLIS
- Neelam Bharti, PhD
- Chloe Woida



Huajin Wang, PhD
Director of OSDC



Hannah Gunderman, PhD



Emma Slayton, PhD



Sarah Young, MLIS



David Sherer, MLIS



Katie Behrman

Need for protocols.io: Researcher Perspective

- Protocols not version controlled
 - Have to remember to include the updated date
- Stored on a server that researchers ultimately lose access to
- Looking through old lab notebooks

First Institutional Partners



#Quick Takes

Carnegie Mellon to Share Research Methods

By [Lindsay McKenzie](#) // April 17, 2019

[Carnegie Mellon University](#) has signed up for an institutionwide license to [protocols.io](#) -- an open-access research method sharing platform.

CMU is the first university to do so. The site offers free versions of licenses to researchers, but premium memberships include training and unlimited use of the platform.

"This partnership will support transparent and reproducible research at CMU," Ana Van Gulick, librarian and program director of open science at CMU, said in a [press release](#). "As an open-access methods repository, protocols.io facilitates open-science best practices including research documentation, collaboration and replication."

Outreach Philosophy

- Meet researchers where they are in terms of willingness to engage in open science
- Celebrate small steps towards openness and reproducibility
- Long-term goal of fully open and reproducible research products and workflows

Open Science as a Gradient



Individuals who are
not familiar or
interested in open
science



Open Science
practitioners, might be
used to data sharing
because of mandates



Open Science
advocates and
champions

Factors Influencing Openness

- Disciplinary norms
 - Data use agreements
 - Patents
- Culture of documentation and sharing driven by the head of the work group

Open Science as a Gradient:

Talking Points



Private Protocols

- Improved documentation
- Version Control
- Reproducibility for your later self

Protocols shared with research group

- Reproducibility over time within a lab
- Publishing complete methods

Public protocols

- Transparency
- Discoverability
- Importance for fixing the reproducibility crisis

Challenges of Outreach

Top-down culture of a work group

- Important to reach faculty members with outreach efforts, not just graduate students and postdocs
- Presentations to leadership of each of the colleges for top-down word of mouth

Challenges of Outreach

Decentralized organization of institution

- Communicating to people we already have buy-in with with the newsletter

The logo for the Open Science Newsletter is displayed on a light gray background with a subtle pattern of white diagonal lines. The text "OPEN SCIENCE NEWSLETTER" is centered and rendered in a bold, red, sans-serif font.

OPEN SCIENCE NEWSLETTER

Challenges of Outreach

Decentralized organization of institution

- Pursuing new methods of communication with partnerships across campus
 - CMU Software Catalog
 - Graduate Student Association

Software Title	Download	Virtual Andrew		Department Request
		General Use	Design* Engineering and Science (DES)	
7zip		x		
ACDLabs ChemSketch		x		
ActivePerl		x		
Adobe Acrobat Pro DC	<u>x</u>		x	<u>x</u>
Adobe Creative Cloud	<u>x</u>		x	<u>x</u>
Adobe Reader		x		

Challenges of Outreach

Reaching non-bench work researchers on campus

- CMU Libraries Cookie Recipes

Swedish Traditional Gingersnap

Angelina Spotts¹

¹Carnegie Mellon University

Angelina Spotts

Feb 04, 2020

Publications



Ann Marie's Sugar Cookies

Hannah Gunderman¹

¹Carnegie Mellon University

Hannah Gunderman

Feb 09, 2020

Publications



Emma's Snickerdoodles

Emma Slayton¹

¹Carnegie Mellon University

Hannah Gunderman

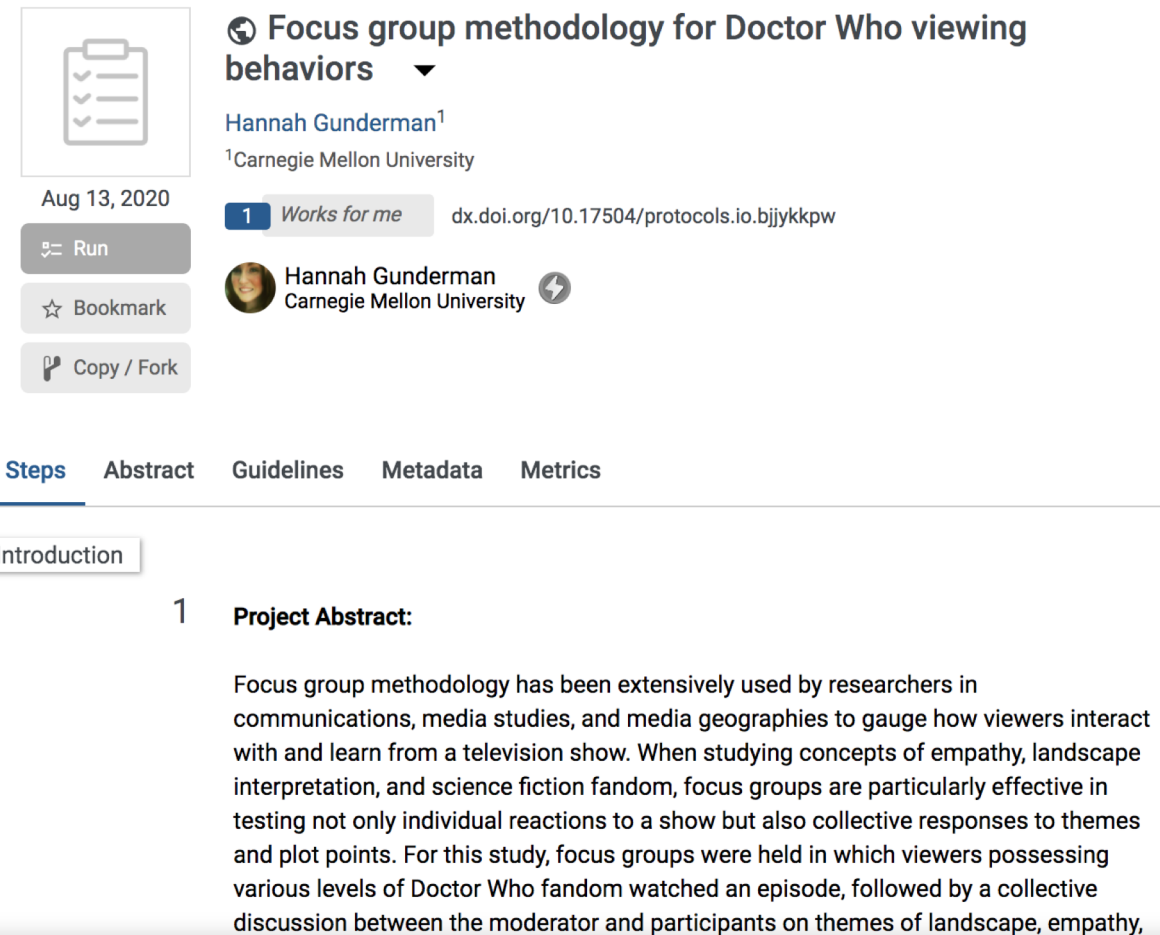
Publications



Challenges of Outreach

Reaching non-bench work researchers on campus

- Humanities protocols from our Data Management Consultant, Hannah Gunderman



The screenshot displays a research protocol page. At the top, the title 'Focus group methodology for Doctor Who viewing behaviors' is shown with a dropdown arrow. Below the title is the author's name, 'Hannah Gunderman¹', followed by her affiliation, 'Carnegie Mellon University'. A date stamp 'Aug 13, 2020' is visible. To the right of the title, there is a 'Works for me' button and a DOI link: 'dx.doi.org/10.17504/protocols.io.bjjykkpw'. Below the title, there are three buttons: 'Run', 'Bookmark', and 'Copy / Fork'. The page has a navigation bar with tabs: 'Steps', 'Abstract', 'Guidelines', 'Metadata', and 'Metrics'. The 'Steps' tab is selected, and the 'Introduction' sub-tab is active. The main content area shows a numbered list starting with '1 Project Abstract:'. The abstract text describes the use of focus group methodology in communications, media studies, and media geographies to gauge viewer interactions with a television show, specifically Doctor Who.

Focus group methodology for Doctor Who viewing behaviors

Hannah Gunderman¹
¹Carnegie Mellon University

Aug 13, 2020

1 Works for me dx.doi.org/10.17504/protocols.io.bjjykkpw

Hannah Gunderman
Carnegie Mellon University

Run Bookmark Copy / Fork

Steps Abstract Guidelines Metadata Metrics

Introduction

1 **Project Abstract:**

Focus group methodology has been extensively used by researchers in communications, media studies, and media geographies to gauge how viewers interact with and learn from a television show. When studying concepts of empathy, landscape interpretation, and science fiction fandom, focus groups are particularly effective in testing not only individual reactions to a show but also collective responses to themes and plot points. For this study, focus groups were held in which viewers possessing various levels of Doctor Who fandom watched an episode, followed by a collective discussion between the moderator and participants on themes of landscape, empathy,

The Value of Digital Tools During the Pandemic for Research

Data Collaboration Tools Support Remote Research



Blog Channels

[Back in the Stacks](#)
[The Information Environment](#)
[Intrepid Research & Learning](#)
[Open Science at CMU](#)
[SCONE](#)
[Scotty Tales](#)
[Tartan Dataspaces](#)

The Value of Digital Tools During the Pandemic for Research

“ Sarah appreciates the platform’s ability to help research teams collaborate from a distance through individual and group accounts, and the version control provided by the platform.”

The Value of Digital Tools During the Pandemic for Instruction

- Need for digital tools for collaboration during hybrid instruction of labs
- Faculty appreciate cost savings since have to use many tools now

Success of Outreach

	Feb 21, 2019	Sept 7, 2020	growth
Users	13	87	569.23%
Private protocols	3	42	1,300%
Public protocols	0	9	100.00%

Thank You!

<https://www.library.cmu.edu/datapub/open-science>

[#CMUOpenScience](#)