

Open Science with OSF

UTD Brain Hack 2019

Kendra Seaman, PhD

Open Science Framework

- Preregistrations
- Sharing project information
- You're turn!

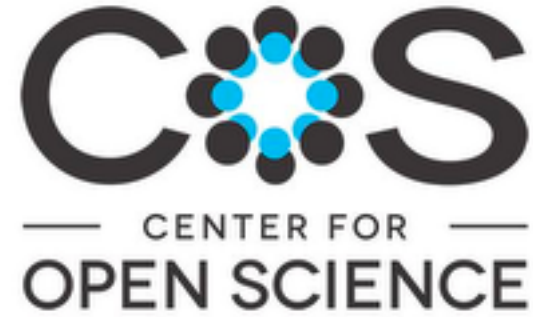


Preregistration



Preregistration

- Specify plans *in* advance:
 - hypotheses
 - data collection plan
 - analysis plan



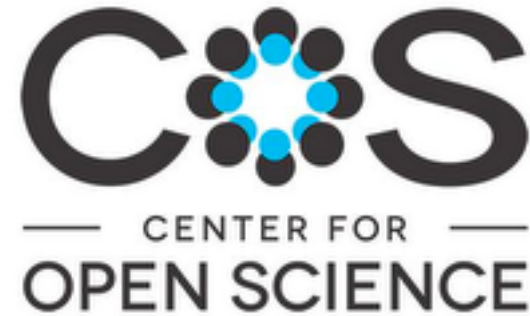
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 - hypotheses
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 - analysis plan
- Allows you to separate **exploratory** (hypothesis-generating) from **confirmatory** (hypothesis-testing) research
- Can preregister at various stages:
 - Before data collection begins
 - Before beginning analysis of an existing data set
 - After being asked to collect more data in peer review

Preregistration



Register

Registration creates a frozen version of the project. Your original project remains editable and will have the registration linked.

Things to know about registration:

- Registrations cannot be edited or deleted.
- Withdrawing a registration removes its contents, but leaves behind basic metadata: title, contributors, date registered, date withdrawn, and justification (if provided).
- Registrations can be public or embargoed for up to four years. Embargoed registrations will be made public automatically when the embargo expires.

Continue your registration by selecting a registration form:

- ☒ **OSF Preregistration** ⓘ
- ☐ **Open-Ended Registration** ⓘ
- ☐ **Registered Report Protocol Preregistration** ⓘ
- ☐ **OSF-Standard Pre-Data Collection Registration** ⓘ
- ☐ **Preregistration Template from AsPredicted.org** ⓘ
- ☐ **Replication Recipe (Brandt et al., 2013): Post-Completion** ⓘ
- ☐ **Replication Recipe (Brandt et al., 2013): Pre-Registration** ⓘ
- ☐ **Pre-Registration in Social Psychology (van 't Veer & Giner-Sorolla, 2016): Pre-Registration** ⓘ

Cancel

Create draft

[fMRI Preregistration - https://osf.io/6juft/](https://osf.io/6juft/)

Preregistration Components

- Study Info (title, authors, hypotheses)
- Design Plan (study type, design, randomization)
- Sampling Plan (existing data?, data collection procedures, sample size, stopping rule)
- Variables (manipulated and measured variables)
- Analysis Plan (statistical models, transformations, data exclusions, missing data, exploratory analyses)

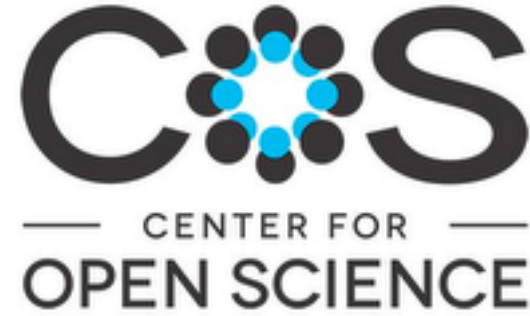
Preregistration

- Examples - My Preregistrations
 - Behavior (boundSkew) - <https://osf.io/vwhxb>
 - fMRI (socialAL) - <https://osf.io/b3au5>
 - Meta-Analysis (timeprefsmeta) - <https://osf.io/e4anc>

Sharing on OSF

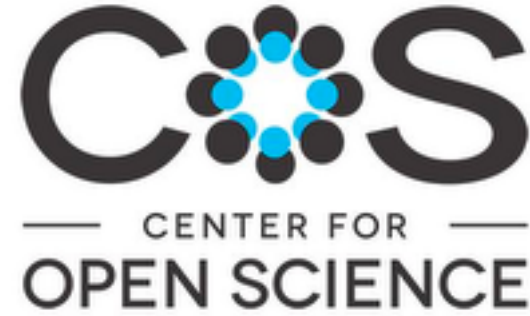


Sharing on OSF



- What to share?
 - Stimuli
 - Data - make sure it's deidentified!
 - Code - can link to GitHub repo
 - Literature - can link to Mendeley or Zotero library
 - Data products (posters, preprints) - links to PsyArXiv, but not BioRxiv
 - Notes and documentation

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 - Neuroimaging data (unless you want to...)

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 - Notes and documentation
- What not to share?
 - Neuroimaging data (unless you want to...)
- Project template: <https://osf.io/ce8p4/>

Sharing on OSF



Aging Well Lab Project Template

FilesWikiAnalyticsRegistrationsContributorsAdd-onsSettings

Aging Well Lab Project Template

– OSF Storage (United States)

– Analysis Scripts

– OSF Storage (United States)

– Data Files

– OSF Storage (United States)

– Stimuli and Materials

– OSF Storage (United States)

– Literature

– OSF Storage (United States)

– Data Products

– OSF Storage (United States)

– Notes and Documenttion

– OSF Storage (United States)

Data Files

Seaman

This is where behavioral data for the project will be shared. For each data file, there should be a corresponding data dictionary.

Stimuli and Materials

Seaman

Literature

Seaman

This is a space for you to keep and organize relevant literature for this project.

Data Products

Seaman

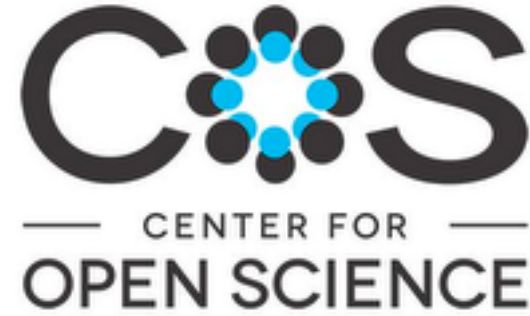
This is where you will share any data products for this project - conference posters, conference presentations, preprints, etc.

Notes and Documenttion

Seaman

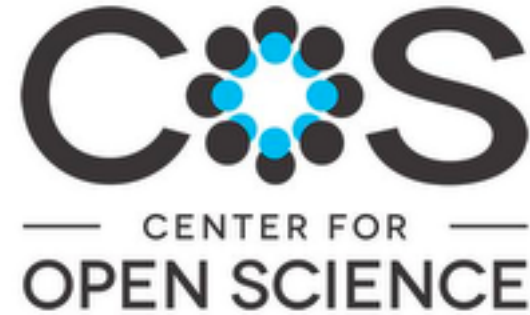
This is a space to collect all documentation for a project, including lab protocols and IRB forms.

Sharing on OSF - My Journey



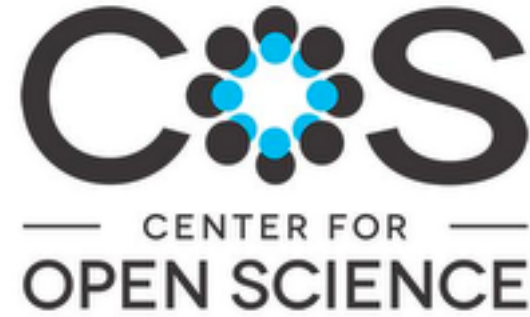
- Post-hoc
 - ageHDisc - <https://osf.io/94225/>
- With publication -
 - ageSkew - <https://osf.io/vbw3v/> - NOT RECOMMENDED
 - Subval - <https://osf.io/26mqt/>
- Planned in advance
 - Lab Template - <https://osf.io/ce8p4/>

Sharing on OSF - Share when you're ready



- You can embargo your preregistration for up to 4 years.
 - How to (Step 4. Register): <https://help.osf.io/hc/en-us/articles/360019738834-Create-a-Preregistration>
- You can make a project (or any component of a project) private:
 - Example: <https://osf.io/d56b2/>
 - How to: <https://help.osf.io/hc/en-us/articles/360018981414-Control-Your-Privacy-Settings>

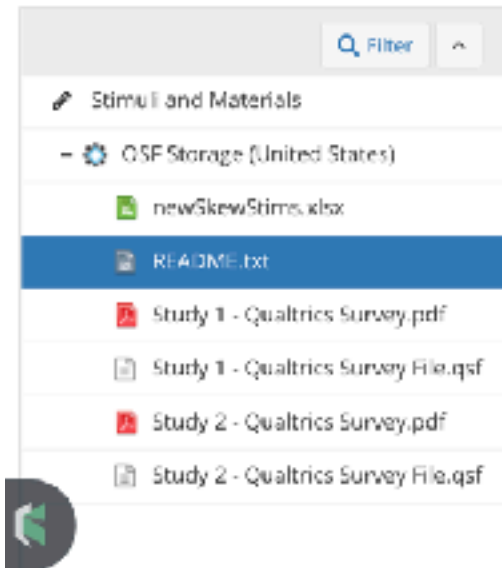
Sharing Best Practices: README



- Text file at the top of each directory
 - General info about the contents of that directory.
 - Contents with a *brief* description of each file in the directory.

README.txt (Version: 1)

Check out Delete Download Toggle view: View Edit Revisions



Stimuli and Materials

General Info:

This folder contains the stimuli and materials used in Boundary Conditions for Age-Related Positive-Skew Bias project.

Contents:

newSkewStims.xlsx & an excel file determining the proportions and amounts used in study stimuli.

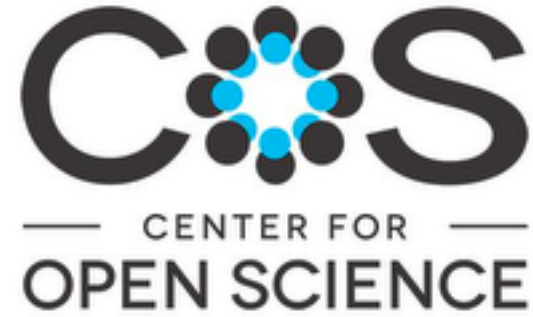
Study 1 & Qualtrics Survey.pdf & A .pdf displaying every possible question a participant could have been asked to answer.

Study 1 & Qualtrics Survey File.qsf & A Qualtrics -formatted file that can be uploaded into Qualtrics to replicate the survey.

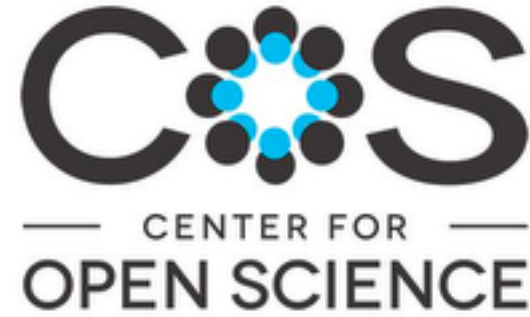
Study 2 & Qualtrics Survey.pdf & A .pdf displaying every possible question a participant could have been asked to answer.

Study 2 & Qualtrics Survey File.qsf & A Qualtrics -formatted file that can be uploaded into Qualtrics to replicate the survey.

Sharing Best Practices: Data Dictionary

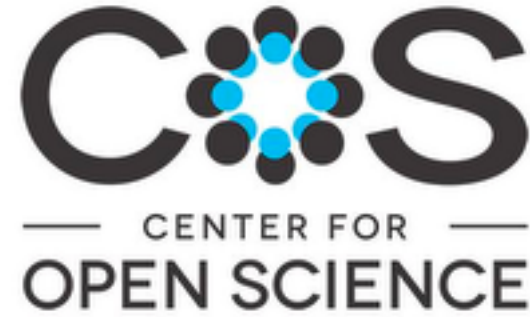


Sharing Best Practices: Data Dictionary



- Ideally, there is one of these for each dataset shared.

Sharing Best Practices: Data Dictionary



- Ideally, there is one of these for each dataset shared.
- Provides metadata for your dataset
 - Variable names
 - Readable variable names
 - Measurement units
 - Allowed values
 - Description

Sharing Best Practices: Data Dictionary

Skew_Data_Dictionary.xlsx (Version: 3)

[Check out](#)[Delete](#)[Download](#)[Share](#)[View](#)[Revisions](#)

Data

OSF Storage (United States)

+ First-level fMRI maps

+ Second-level fMRI maps

Skew_4_5_Average_TC.csv

Skew_Data_Dictionary.xlsx

Skew_Demo_Neuro_Task.csv

skew_online.csv

Demo-Neuro-Task

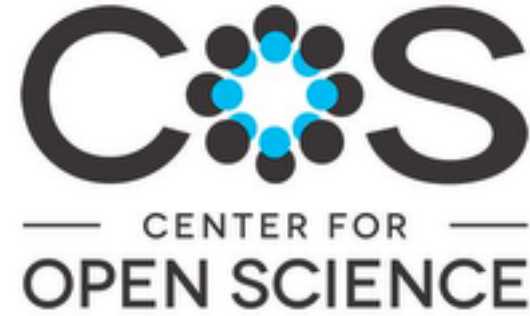
4_5_Average_TC

Skew_online

Show rows with cells including:

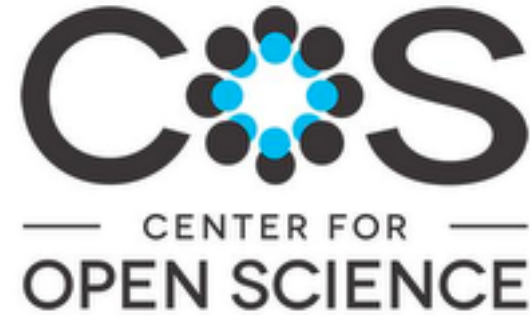
Variable Name	Measurement Units	Allowed Values	Description of Variable
ID	string	xxxxxxxx	Subject ID based on initials (two strings) and date...
age	numeric	18-85	Age (in years)
gender	string	m = male, f = female	Gender
numeracy	numeric	0-9	Numeracy Inventory - 9 items
trailDIFF	numeric		Trail Making Test (B-A)
dsSUM	numeric		WAIS III Digit Span Test (Forward + Backward)
LNseq	numeric		Letter-Number Sequencing
MMSE	numeric	0-30	Mini-Mental Status Exam
shipley_vocab	numeric	0-40	Shipley Vocabulary Test
defraud_detect	numeric	1-7	SAFE Question 39: How able are you to detect a f...
defraud_likely	numeric	1-7	SAFE Question 40: How likely are you to make a f...
defraud_resist	numeric	1-7	SAFE Question 41: How able are you to resist hig...

Sharing Best Practices: Data Dictionary



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Sharing Best Practices: Data Dictionary



- Ideally, there is one of these for each dataset shared.
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 - Description
- Tutorial: <https://help.osf.io/hc/en-us/articles/360019739054-How-to-Make-a-Data-Dictionary>

Sharing Best Practices - Link with GitHub

Sharing Best Practices - Link with GitHub

Differential Regional Age Effects on D2 Binding Potential

Edit

[Manage topics](#)

28 commits

2 branches

0 packages

0 releases

1 contributor

MIT

Branch: master

New pull request

Create new file

Upload files

Find file

Clone or download



Kendra Seaman and Kendra Seaman Revise webapp models to include Study as a factor

Latest commit e05c5db on Mar 6

data

.DS_Store banished!

10 months ago

functions

Upload functions

last year

scr

Fix broken regression output on web app

8 months ago

shiny

Revise webapp models to include Study as a factor

8 months ago

tables

Update study comparison

10 months ago

.gitignore

Banish pem!

8 months ago

LICENSE

Initial commit

last year

README.md

Initial commit

last year

Sharing Best Practices - Link with GitHub

Differential Regional Age Effects on D2 Binding Potential

[Manage topics](#)

28 commits

2 branches

0 packages

0 releases

1

Branch: master

[New pull request](#)

[Create new file](#)

[Upload](#)



Kendra Seaman and Kendra Seaman Revise webapp models to include Study as a factor

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LICENSE

Initial commit

README.md

Initial commit

Differential regional decline in dopamin...

[Files](#)

[Wiki](#)

[Analytics](#)

[Filter](#)



Name

Modified

Differential regional decline in dopamine recep...

GitHub: klsear/agebp (master)

.gitignore

+ data

+ functions

LICENSE

README.md

+ scr

+ shiny

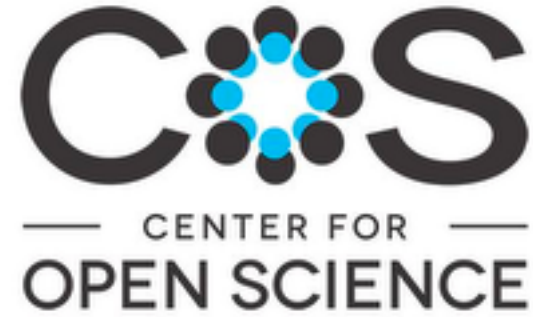
+ tables

OSF Storage (United States)

Sharing Best Practices - Link with GitHub

- My example - ageBP -
 - GitHub: <https://github.com/klsea/agebp>
 - OSF: <https://osf.io/h67k4/>
- More info: <https://help.osf.io/hc/en-us/articles/360019929813-Connect-GitHub-to-a-Project>

Sharing Best Practices - Other Resources



- Check out OSF website - <https://help.osf.io/hc/en-us/categories/360001530634-Best-Practices>

It's Your Turn

- Create an OSF account - <https://help.osf.io/hc/en-us/articles/360019929673-Create-an-OSF-Account>
 - UTD is an affiliated institution
- Create something!
 - OSF preregistration - <https://help.osf.io/hc/en-us/articles/360021390833-Preregistration>
 - OSF project page - <https://journals.sagepub.com/doi/full/10.1177/2515245918757689>
 - My lab project template (you're welcome to use): <https://osf.io/ce8p4/>

Standard format

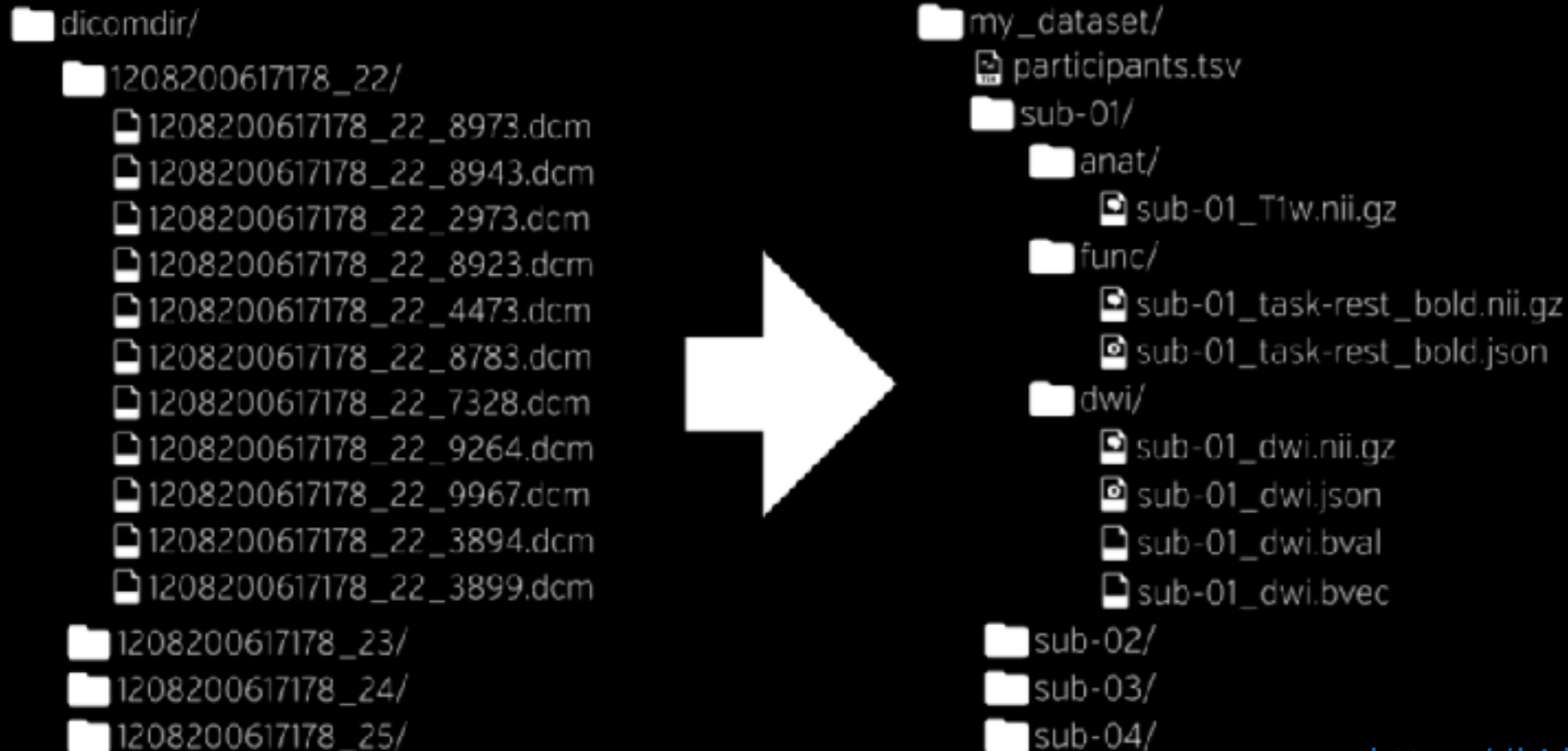
```
dicomdir/  
  1208200617178_22/  
    1208200617178_22_8973.dcm  
    1208200617178_22_8943.dcm  
    1208200617178_22_2973.dcm  
    1208200617178_22_8923.dcm  
    1208200617178_22_4473.dcm  
    1208200617178_22_8783.dcm  
    1208200617178_22_7328.dcm  
    1208200617178_22_9264.dcm  
    1208200617178_22_9967.dcm  
    1208200617178_22_3894.dcm  
    1208200617178_22_3899.dcm  
  1208200617178_23/  
  1208200617178_24/  
  1208200617178_25/
```

Standard format

```
dicomdir/  
  1208200617178_22/  
    1208200617178_22_8973.dcm  
    1208200617178_22_8943.dcm  
    1208200617178_22_2973.dcm  
    1208200617178_22_8923.dcm  
    1208200617178_22_4473.dcm  
    1208200617178_22_8783.dcm  
    1208200617178_22_7328.dcm  
    1208200617178_22_9264.dcm  
    1208200617178_22_9967.dcm  
    1208200617178_22_3894.dcm  
    1208200617178_22_3899.dcm  
  1208200617178_23/  
  1208200617178_24/  
  1208200617178_25/
```

```
Zald_109337_01_01.PAR  
Zald_109337_01_01.REC  
Zald_109337_01_01.V41  
Zald_109337_01_01.XML  
Zald_109337_01_02.PAR  
Zald_109337_01_02.REC  
Zald_109337_01_02.V41  
Zald_109337_01_02.XML  
Zald_109337_01_03.PAR  
Zald_109337_01_03.REC  
Zald_109337_01_03.V41  
Zald_109337_01_03.XML  
Zald_109337_04_01.PAR  
Zald_109337_04_01.REC  
Zald_109337_04_01.V41  
Zald_109337_04_01.XML  
Zald_109337_05_01.PAR  
Zald_109337_05_01.REC  
Zald_109337_05_01.V41
```

Standard format



Standard format: BIDS



<https://bids.neuroimaging.io/>

Standard format: BIDS



OpenNEURO

- What is it?
 - All neuroimaging data is converted into as a .nii file.
 - Each .nii file has a corresponding .json with metadata for that file.
 - Critical metadata (e.g. subject ID) info included in filenames

<https://bids.neuroimaging.io/>

Standard format: BIDS



OpenNEURO

- What is it?
 - All neuroimaging data is converted into as a .nii file.
 - Each .nii file has a corresponding .json with metadata for that file.
 - Critical metadata (e.g. subject ID) info included in filenames
- Why does it help?
 - Metadata is both human AND machine readable
 - “Name Redundancy” reduces errors
 - Hierarchical structure and inheritance reduce *unnecessary* redundancy

Standard format benefits

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- Data reusability
 - It's easier for another researcher (or yourself in 6 months) to work with the data because the data and filenames are human-readable.

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- Data sharing
 - Standardized with documentation so other researchers will understand the data organization and can more easily use the data
- Study reproducibility
 - Standard organization will streamline the process to replicate the results from studies and write analysis pipelines that can be used across different datasets

BIDS Resources

- Converter: <https://github.com/nipy/heudiconv>
- Validator: <https://bids-standard.github.io/bids-validator/>
- MRIQC: <https://mriqc.readthedocs.io/en/stable/>
- fMRIPrep: <https://fmriprep.readthedocs.io/en/stable/>