

Tips for Effective Data Visualization

Angela Zoss · Eric Monson
Data and Visualization Services

STA 199L · Spring 2018

Slides: <http://bit.ly/STA199LVisSpring2018>

1 simple dataset: Which is the best chart? And why?

Even with just 20 values, this is a difficult question to answer.

Andy Cotgreave, Tableau
@acotgreave



0:00 / 5:29



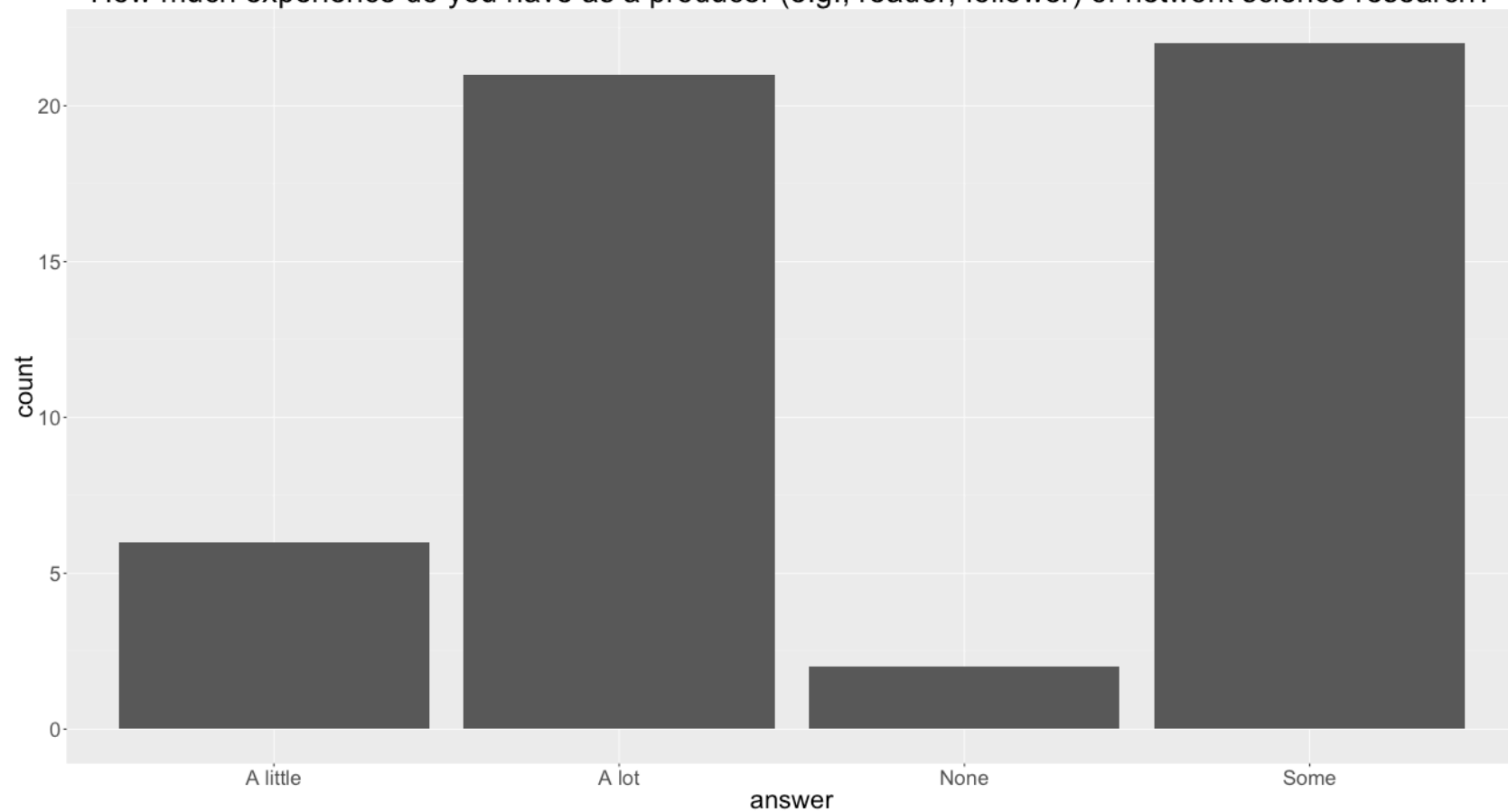
<https://www.youtube.com/watch?v=AuJFuEq-qD8>

ggplot2

Principles for Effective Visualizations

Principle 1: Order
matters

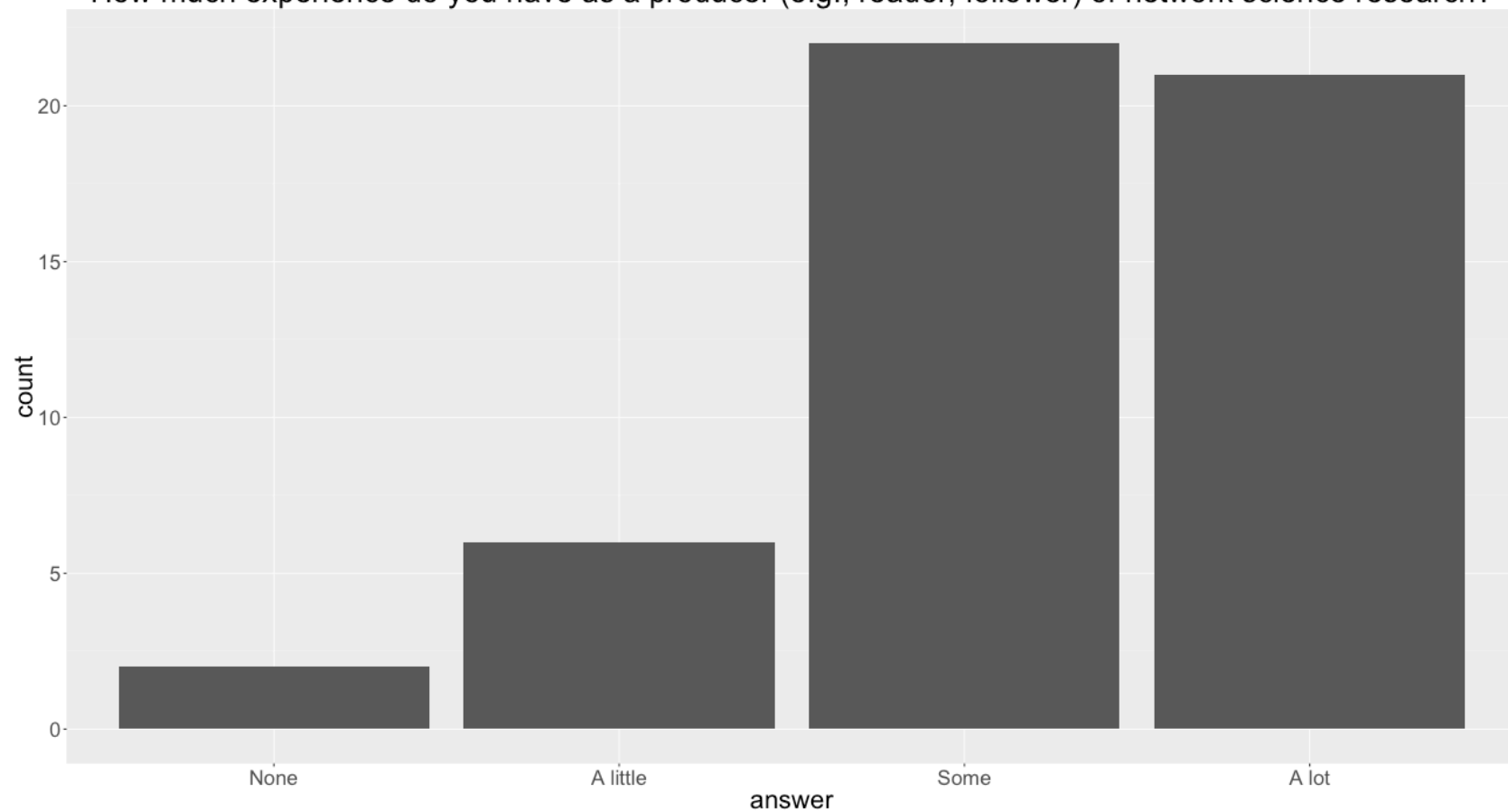
How much experience do you have as a producer (e.g., reader, follower) of network science research?

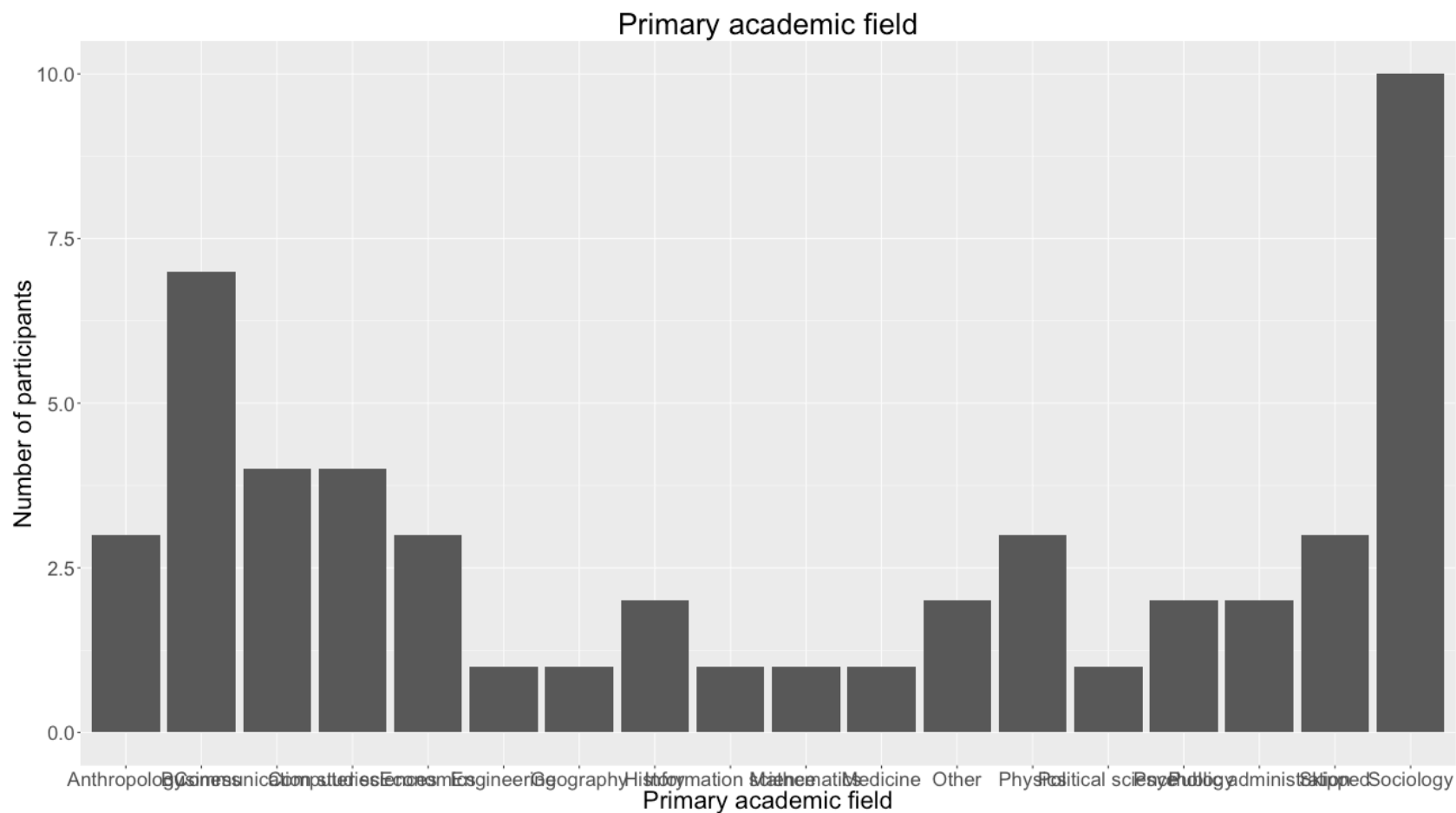


Order by meaning

```
data$answer <-  
  factor(data$answer,  
    levels=c("None", "A little", "Some", "A lot"),  
    ordered = TRUE)
```

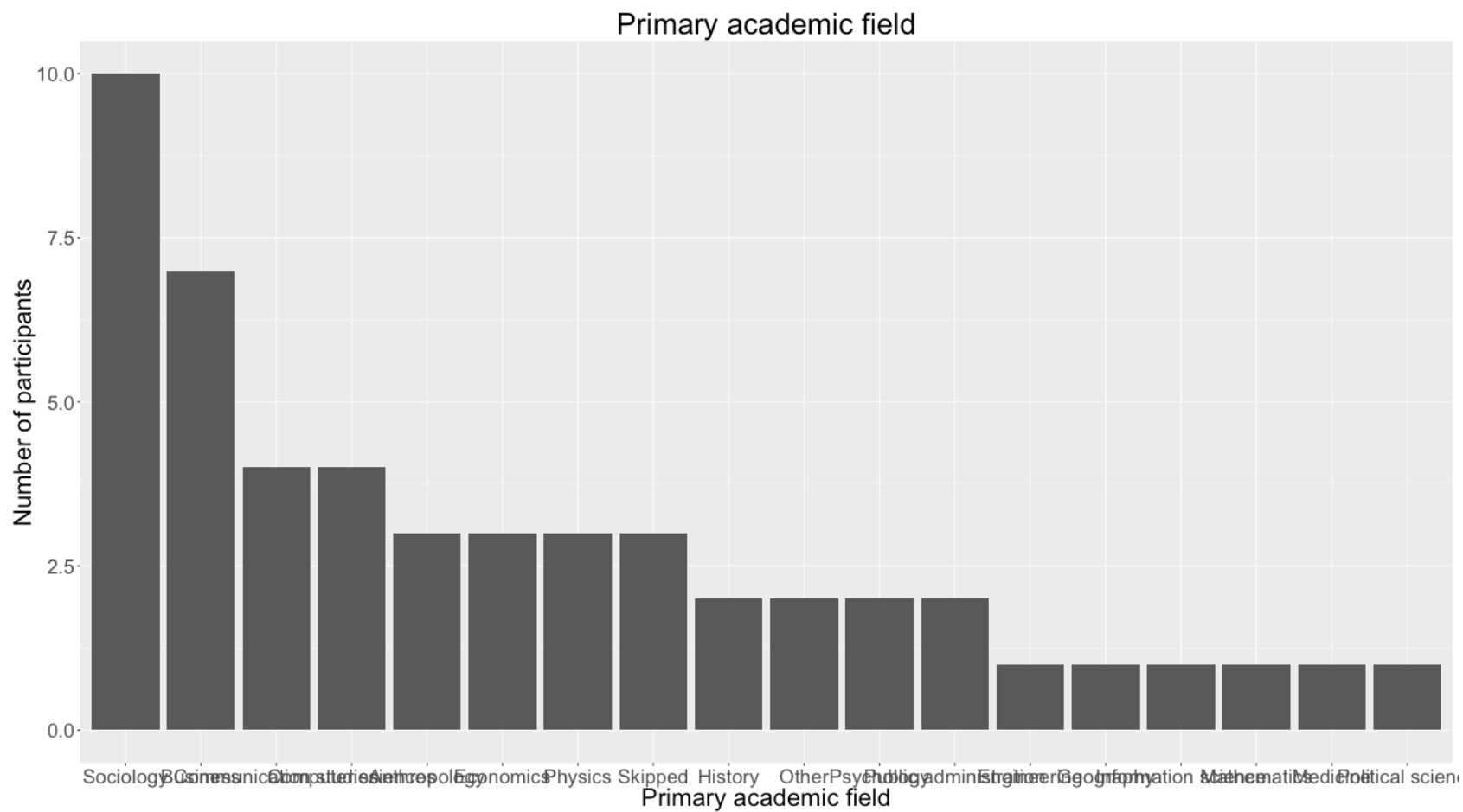
How much experience do you have as a producer (e.g., reader, follower) of network science research?



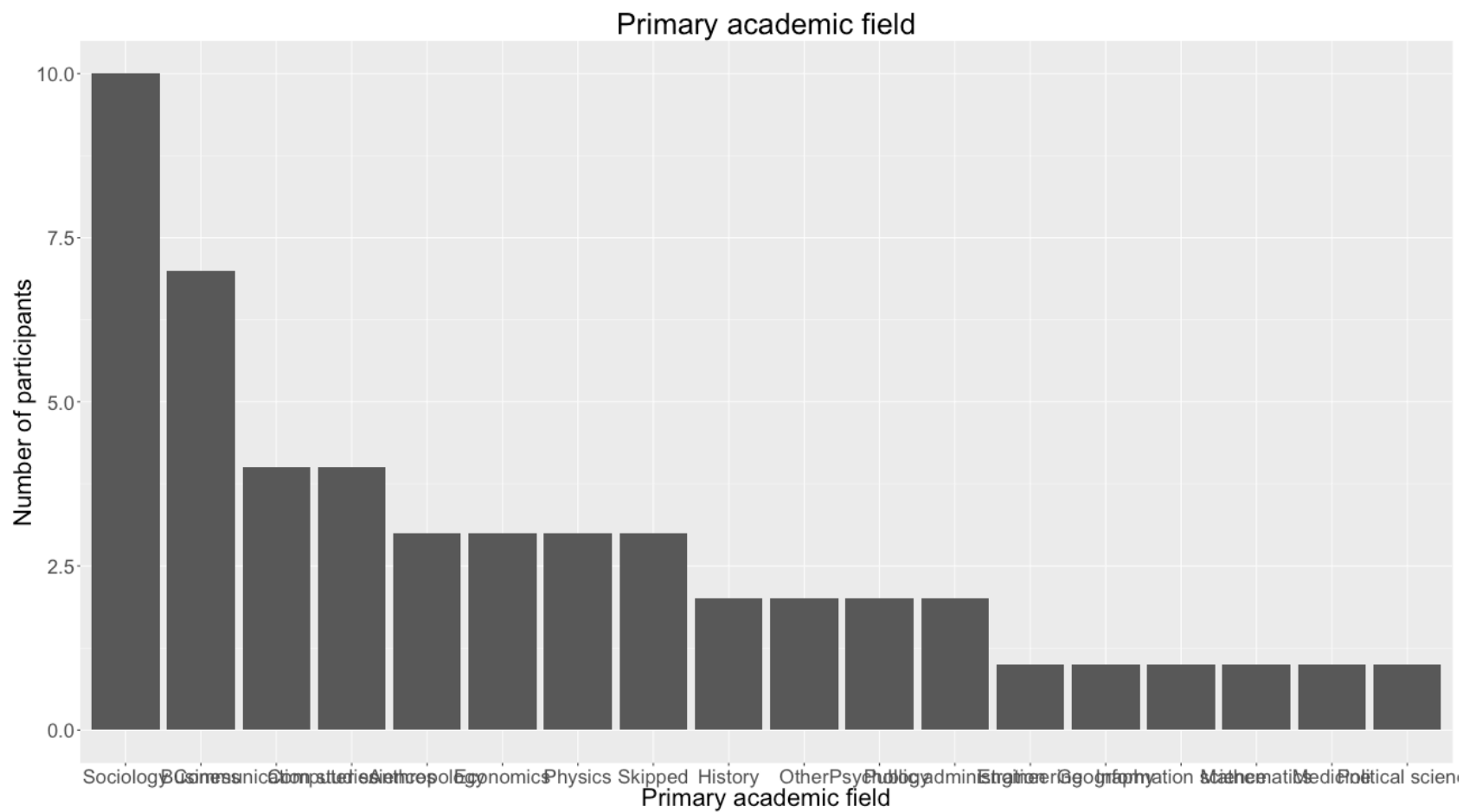


Order by value

```
data$academic_field <-  
  factor(data$academic_field,  
        levels=names(  
          sort(  
            table(  
              data$academic_field),decreasing=TRUE)))
```

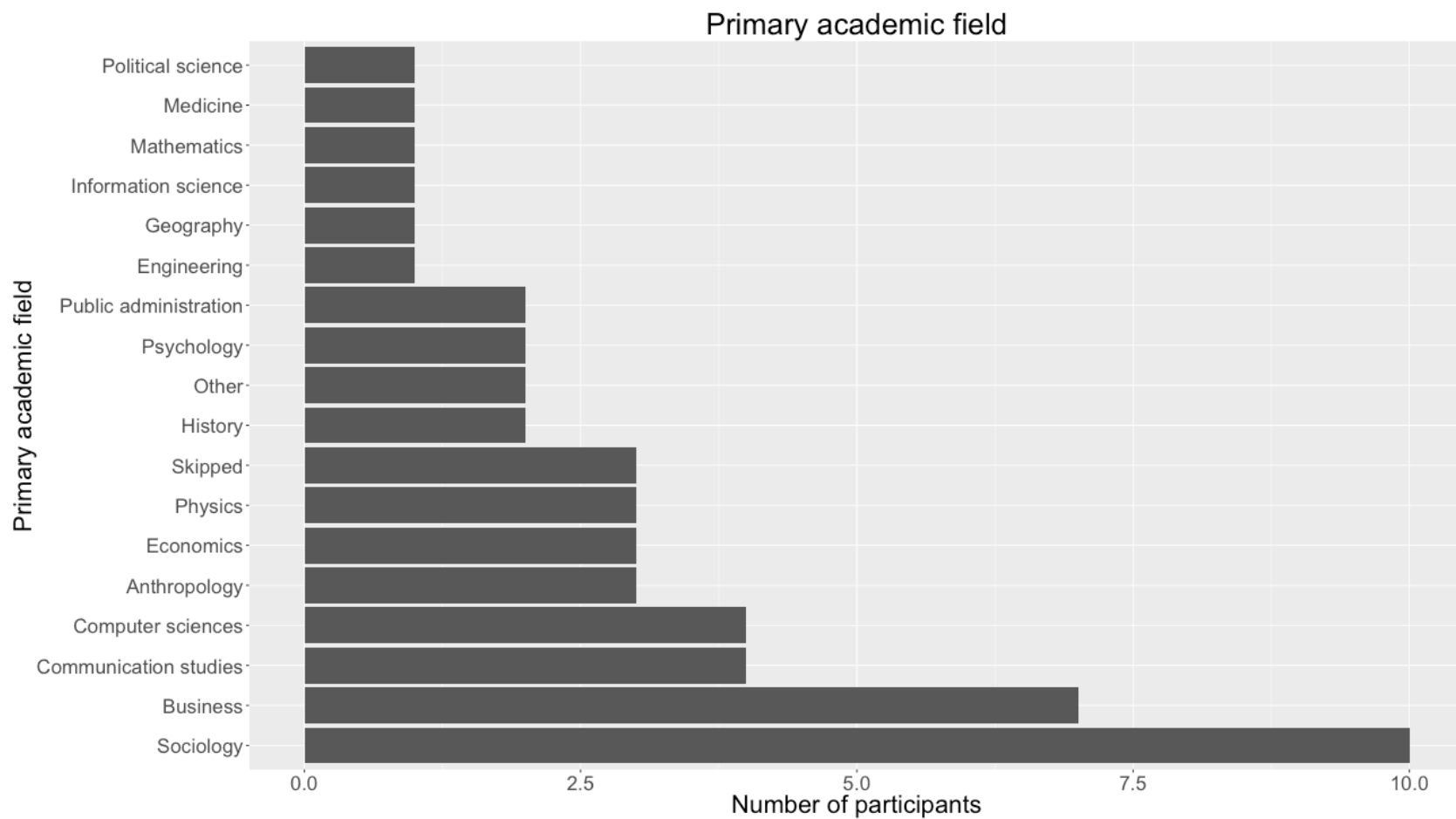


Principle 2: Put long
categories on y-axis



Flip the axes

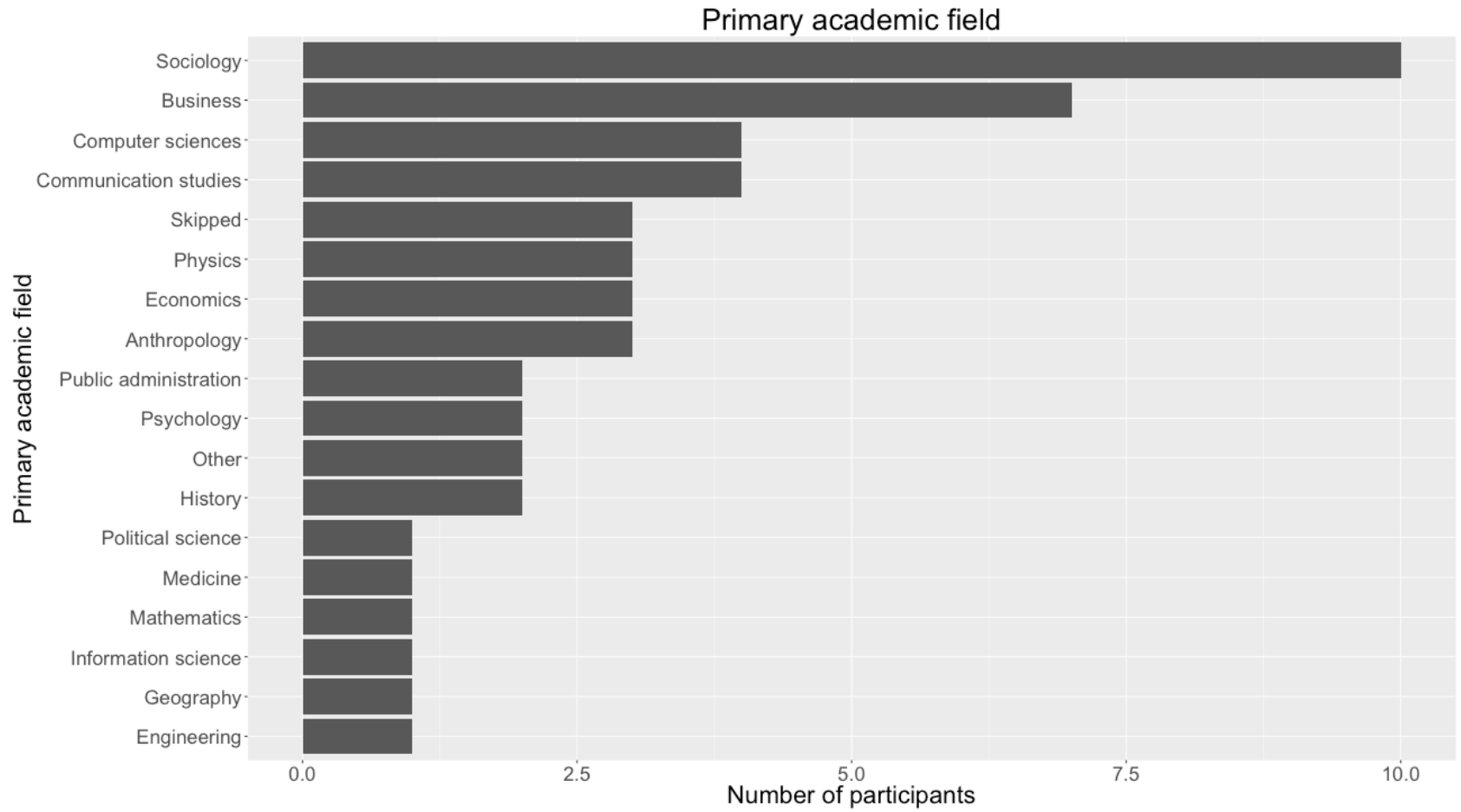
```
coord_flip()
```



Oops!

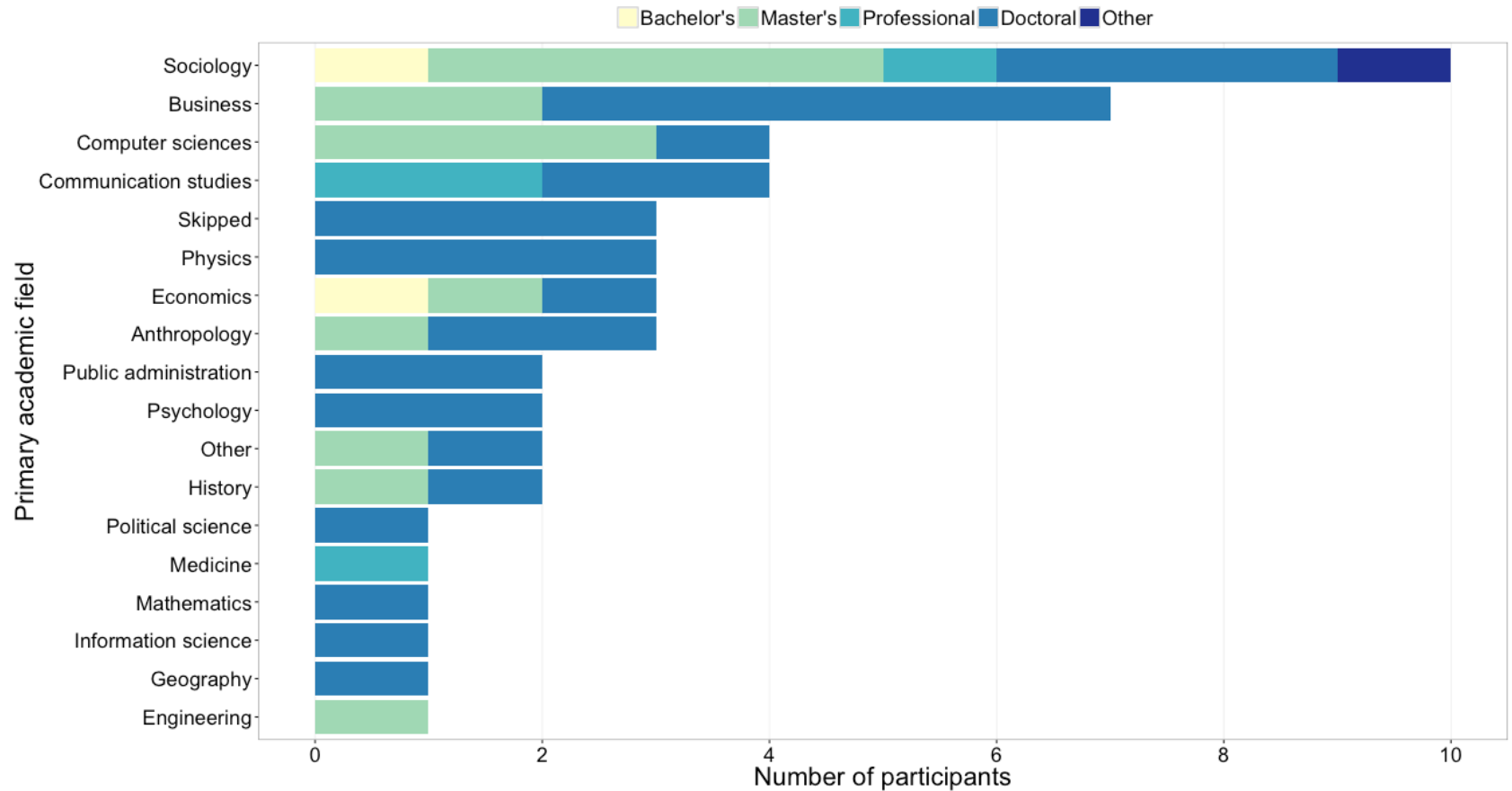
```
data$academic_field <-  
  factor(data$academic_field,  
        levels=names(  
          sort(  
            table(data$academic_field),  
            decreasing=TRUE)))
```

```
data$academic_field <-  
  factor(data$academic_field,  
        levels=names(  
          sort(  
            table(data$academic_field))))
```

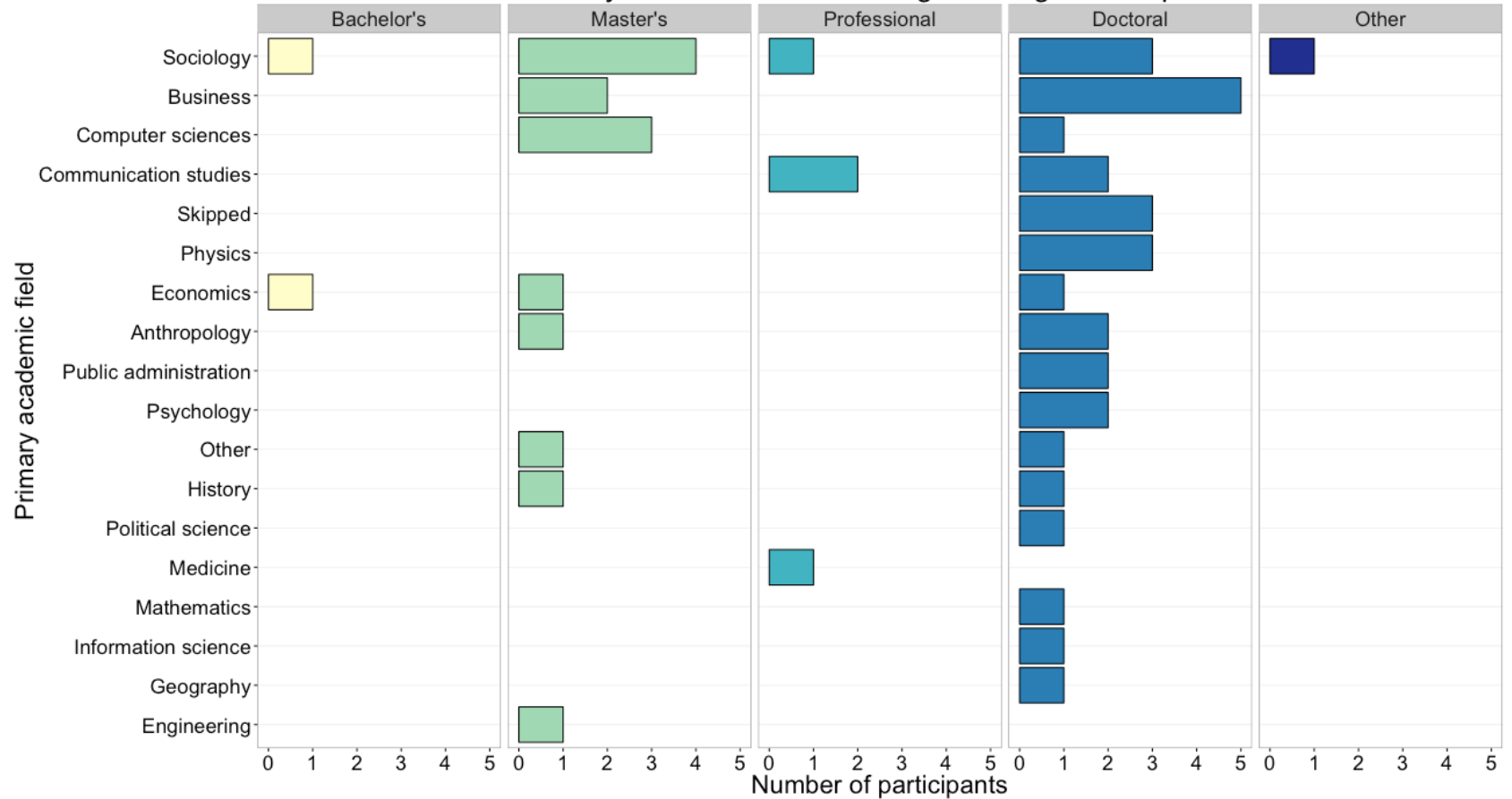



Principle 3: Pick a
purpose

Primary academic field and highest degree completed



Primary academic field and highest degree completed



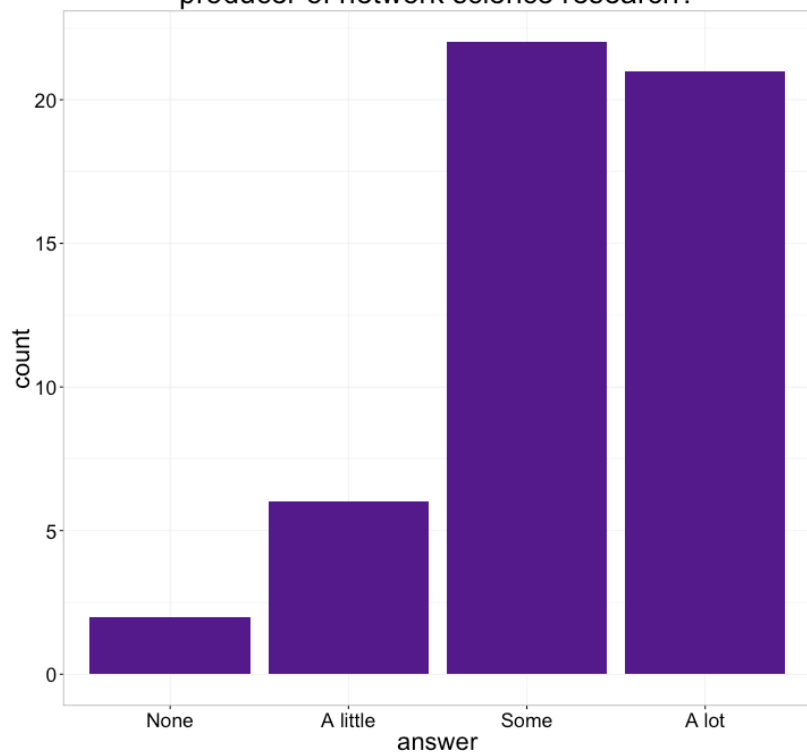
Different placement helps with different comparisons

```
fill=highest_degree
```

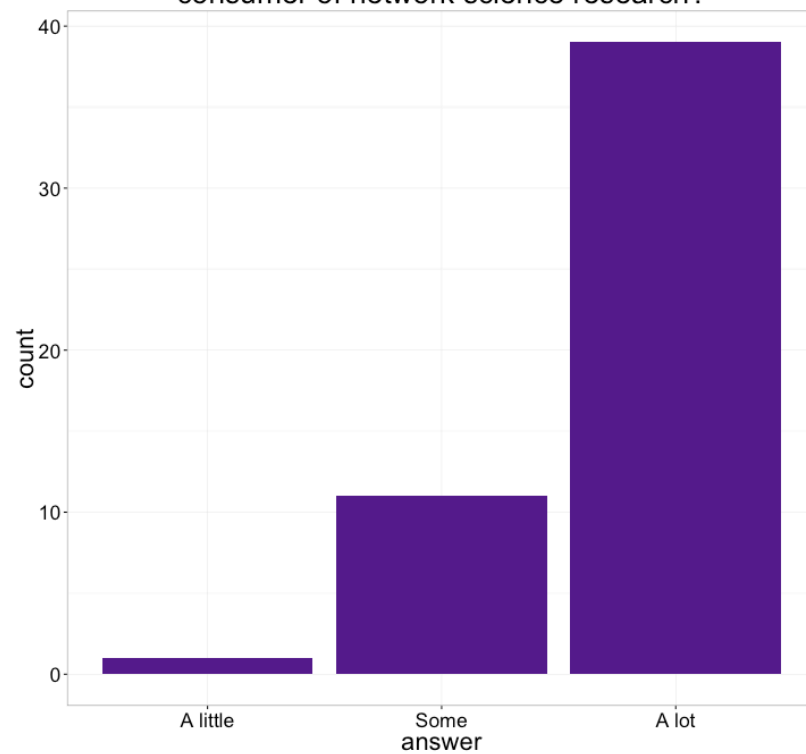
```
facet_grid(.~highest_degree)
```

Principle 4: Keep scales
consistent

How much experience do you have as a
producer of network science research?



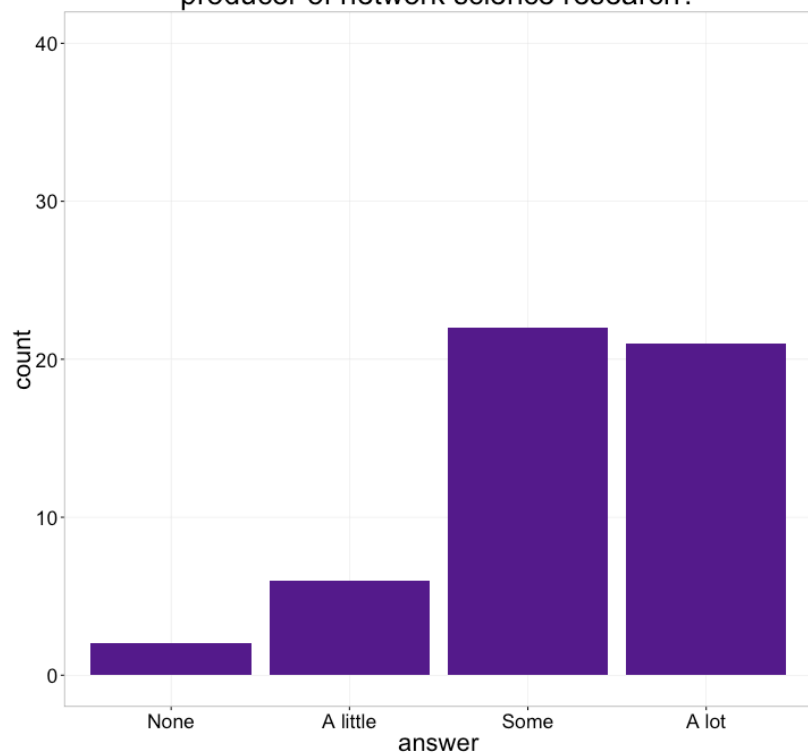
How much experience do you have as a
consumer of network science research?



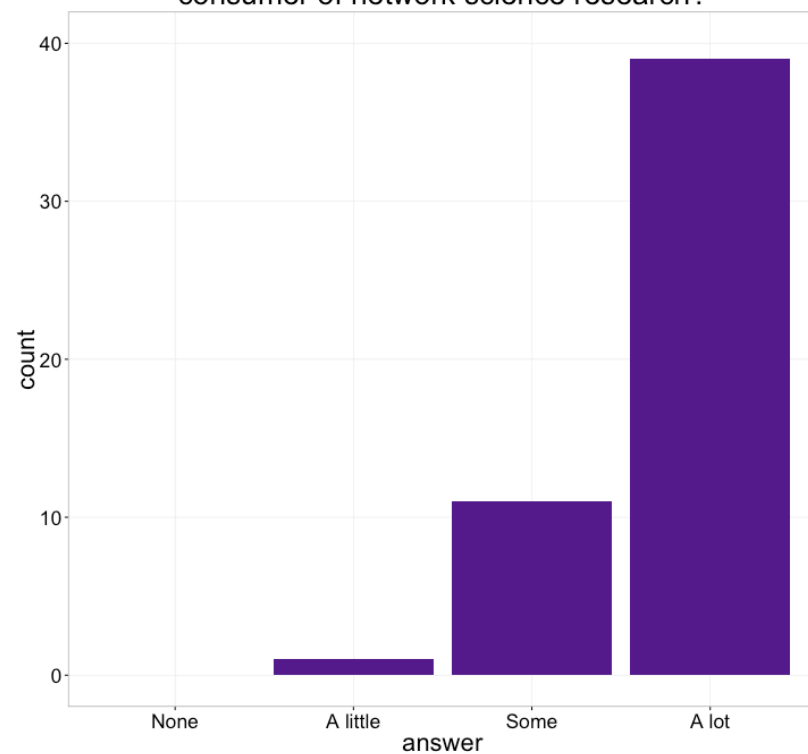
Keep all categories, manually set axes

```
scale_x_discrete(drop=FALSE)  
scale_y_continuous(limits=c(0,40),  
                   breaks=c(0,10,20,30,40),  
                   minor_breaks=NULL)
```


How much experience do you have as a producer of network science research?

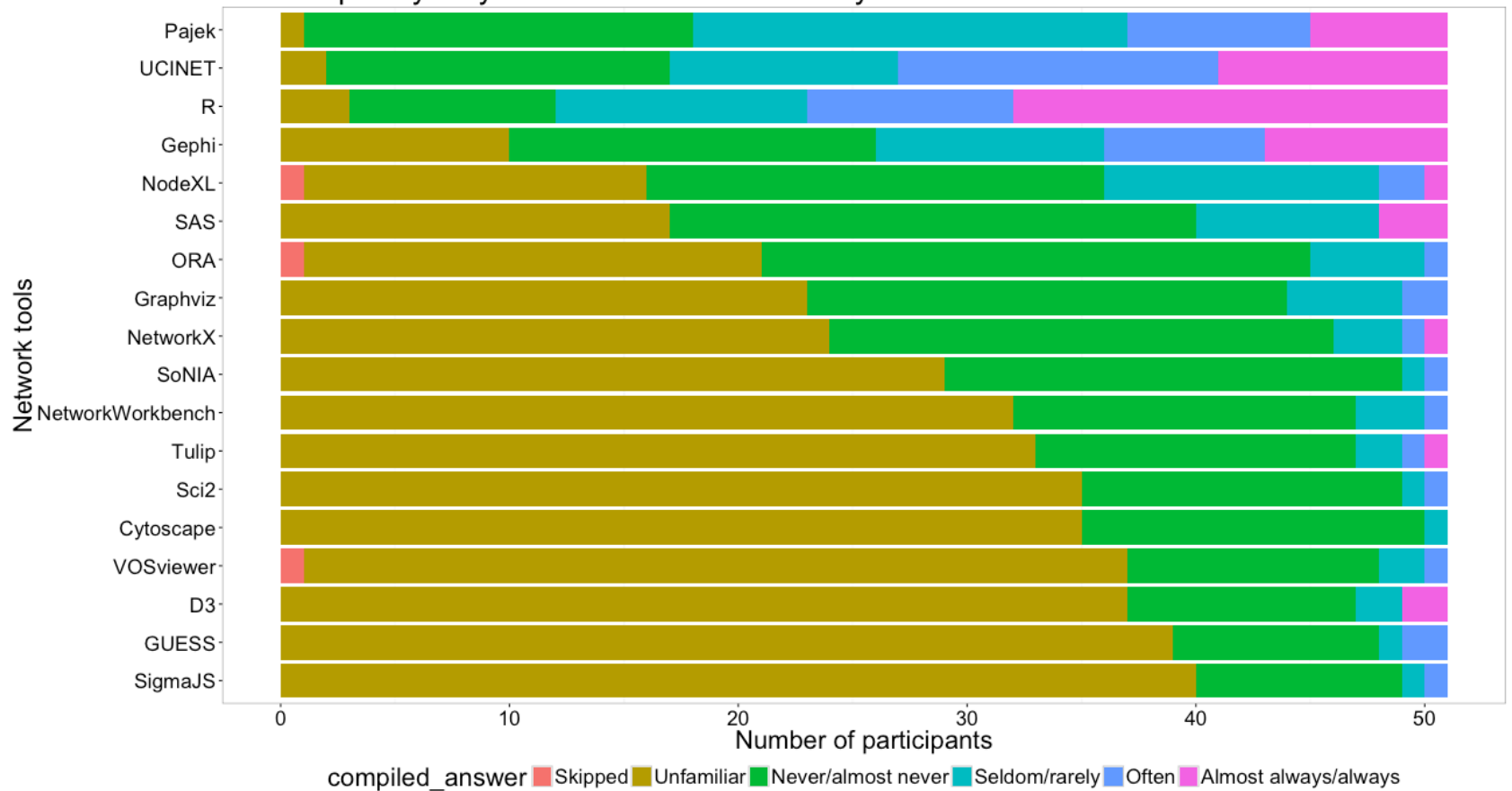


How much experience do you have as a consumer of network science research?



Principle 5: Select
meaningful colors

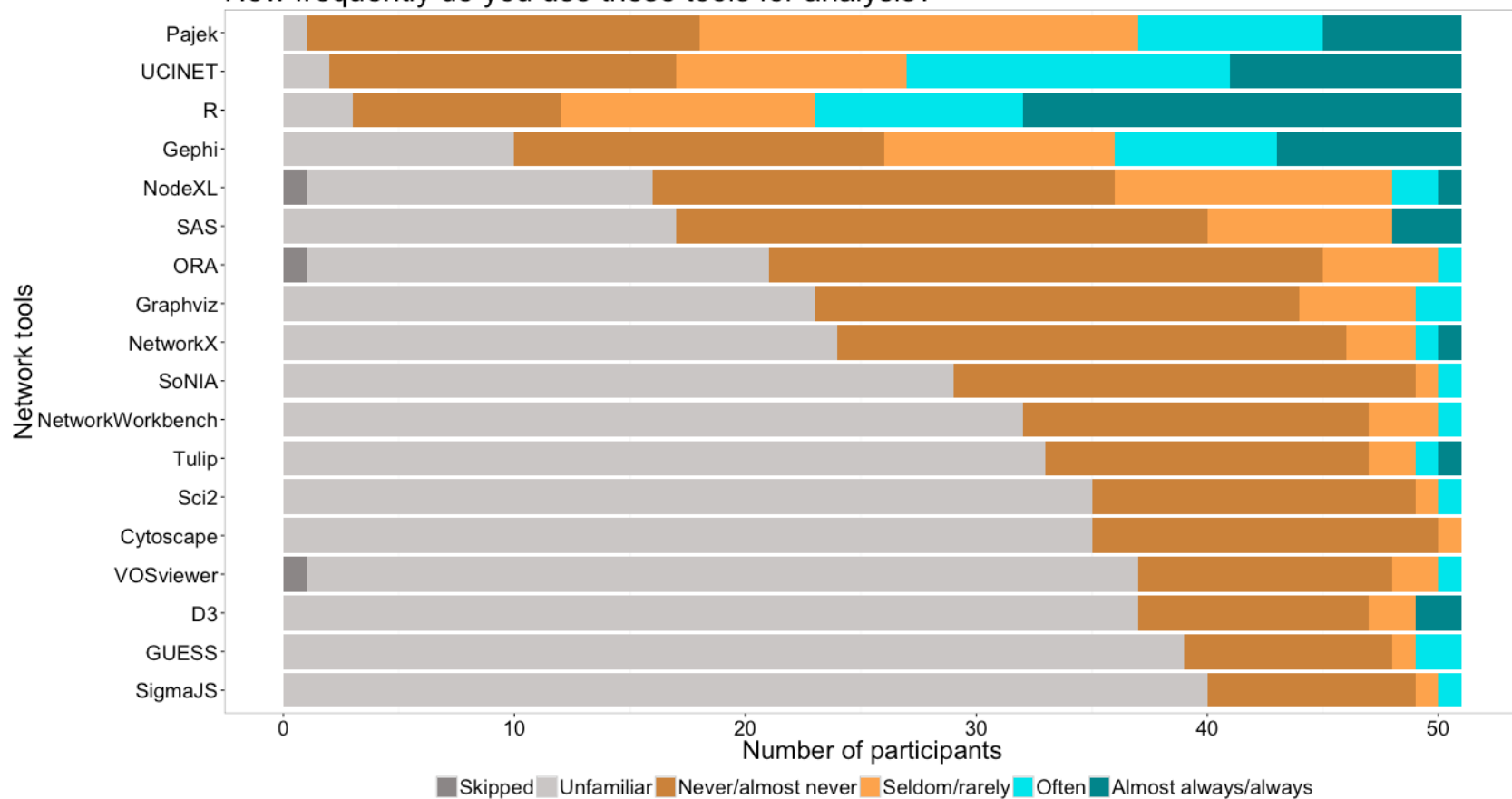
How frequently do you use these tools for analysis?



Select colors manually, or use alternate palette

```
scale_fill_manual(  
  values=c("snow4", "snow3",  
           "tan3", "tan1",  
           "turquoise2", "turquoise4"))  
  
scale_fill_manual(  
  values=c("#fee391", "#fe9929", "#cc4c02"))  
  
# Also see package RColorBrewer  
scale_fill_brewer(palette="BrBG")
```

How frequently do you use these tools for analysis?

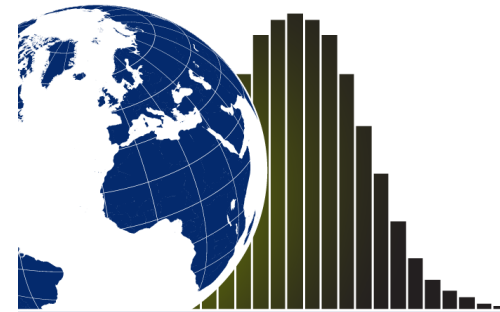
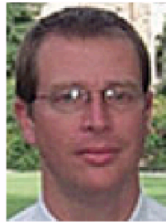


ggplot2 Resources

- General ggplot2 information
<http://ggplot2.tidyverse.org/>
- R Graphics Cookbook (recipes for plots)
<http://www.cookbook-r.com/Graphs/index.html>
- R for Data Science (online book that includes ggplot2)
<http://r4ds.had.co.nz/>
- ggplot2: Elegant Graphs for Data Analysis (book by Hadley Wickham)
<http://ggplot2.org/book/>
- ggplot2 cheatsheet (also in RStudio)
<http://bit.ly/ggplot2-cheatsheet>

Resources

Data and Visualization Services



**Data and Visualization
Services Department**

<http://library.duke.edu/data>
askdata@duke.edu

Information about DVS

- Data collections, LibGuides, etc.
<http://library.duke.edu/data/>
- Blog (tutorials, announcements, etc.)
<http://blogs.library.duke.edu/data/>
- E-mail consultations
askdata@duke.edu
- Mailing list for announcements:
<https://lists.duke.edu/sympa/subscribe/dvs-announce>
- Twitter accounts
@duke_data, @duke_vis

Support Areas



Data Sources



Data Management



Data Cleaning



Data Analysis



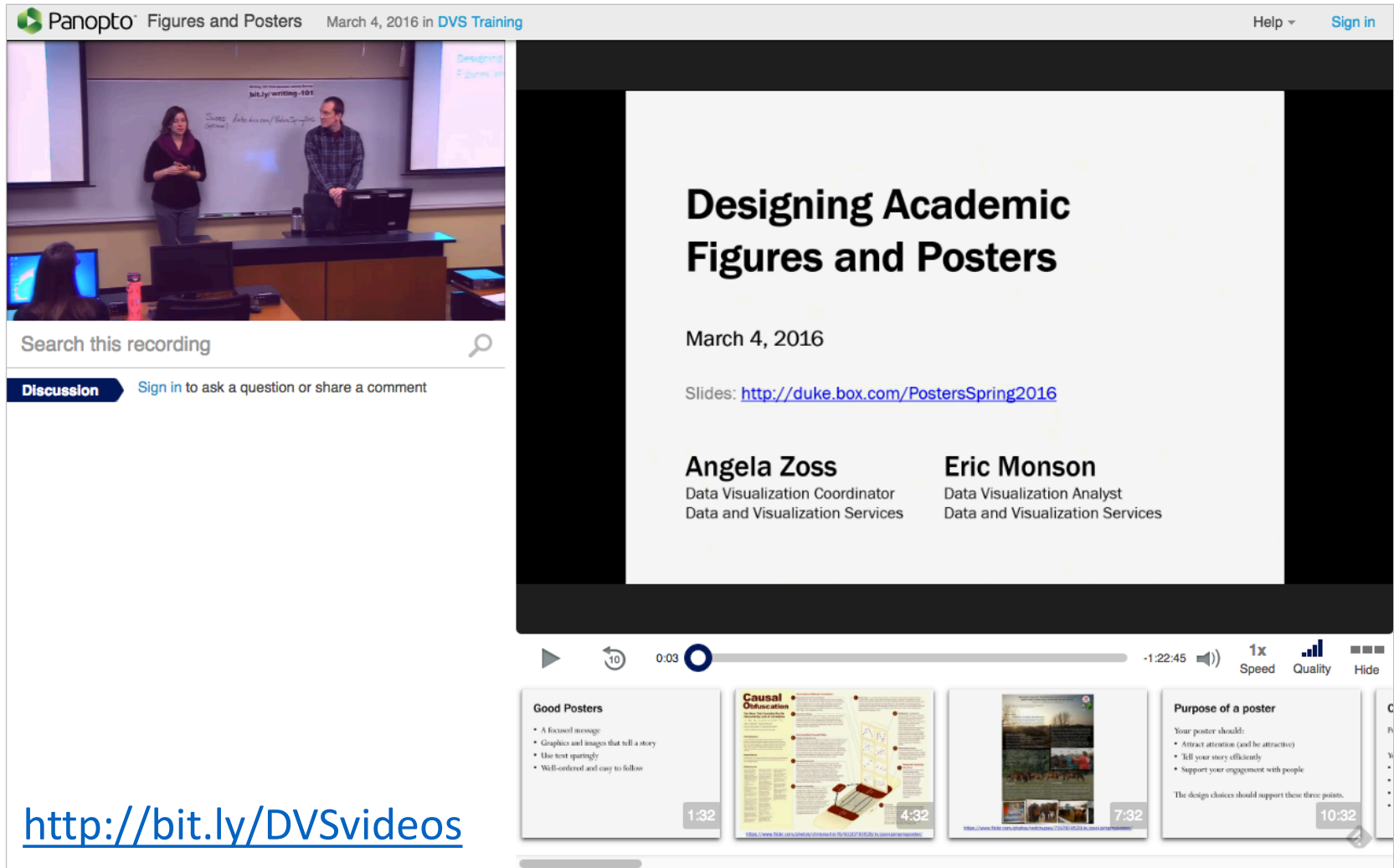
Mapping and GIS



Data Visualization

Videos of past workshops

Panopto Figures and Posters March 4, 2016 in DVS Training Help Sign in



Search this recording

Discussion Sign in to ask a question or share a comment

Designing Academic Figures and Posters

March 4, 2016

Slides: <http://duke.box.com/PostersSpring2016>

Angela Zoss
Data Visualization Coordinator
Data and Visualization Services

Eric Monson
Data Visualization Analyst
Data and Visualization Services

1:32 4:32 7:32 10:32

<http://bit.ly/DVSvideos>

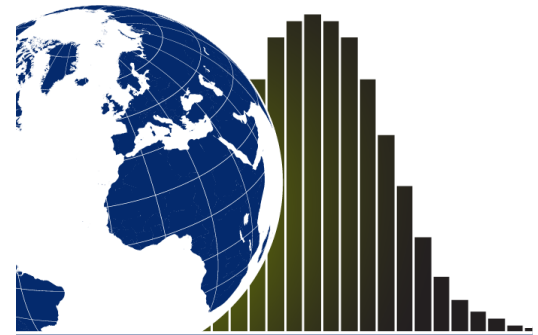
Questions?

askdata@duke.edu

Slides: <https://duke.box.com/v/IntroDataVisS18>

Resources

Data and Visualization Services



**Data and Visualization
Services Department**

<http://library.duke.edu/data>
askdata@duke.edu



Information about DVS

- Data collections, LibGuides, etc.
<http://library.duke.edu/data/>
- Blog (tutorials, announcements, etc.)
<http://blogs.library.duke.edu/data/>
- E-mail consultations
askdata@duke.edu
- Mailing list for announcements:
<https://lists.duke.edu/sympa/subscribe/dvs-announce>
- Twitter accounts
[@duke_data](#), [@duke_vis](#)

Support Areas



Data Sources



Data Management



Data Cleaning



Data Analysis



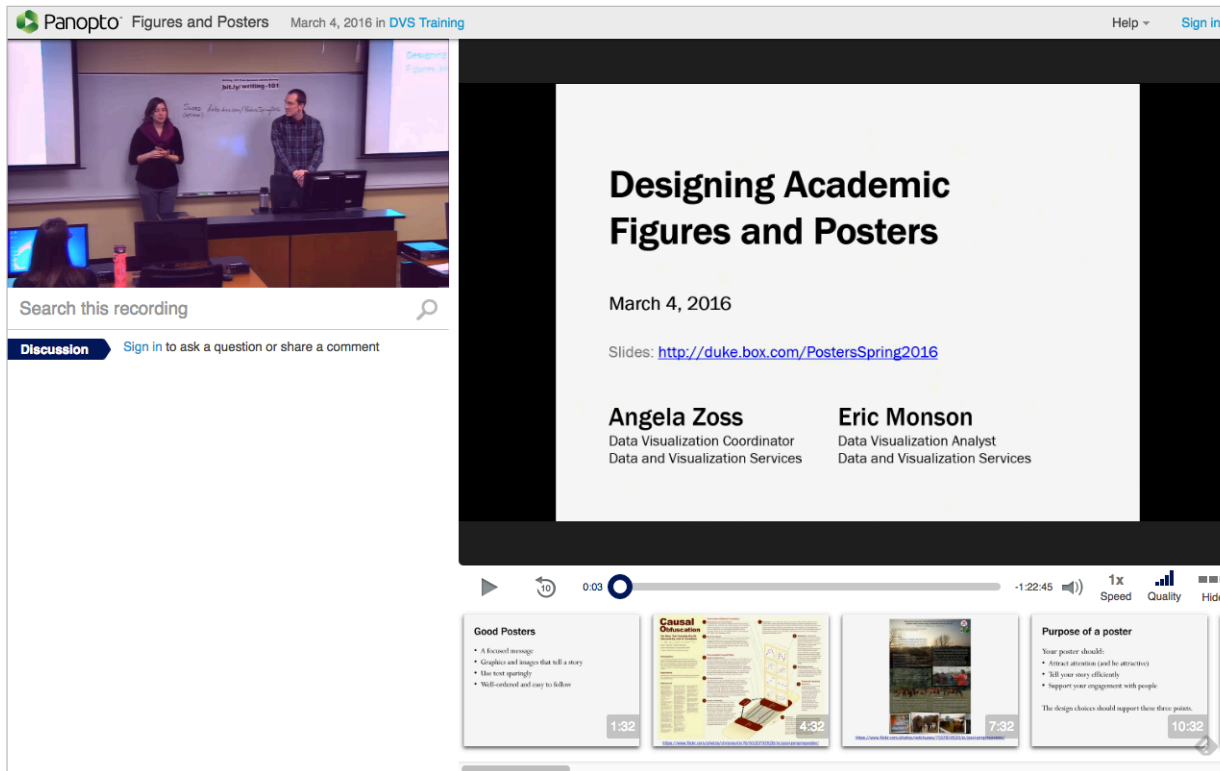
Mapping and GIS



Data Visualization

Videos of past workshops

Panopto® Figures and Posters March 4, 2016 in DVS Training Help Sign in



Search this recording

Discussion Sign in to ask a question or share a comment

Designing Academic Figures and Posters

March 4, 2016

Slides: <http://duke.box.com/PostersSpring2016>

Angela Zoss
Data Visualization Coordinator
Data and Visualization Services

Eric Monson
Data Visualization Analyst
Data and Visualization Services

1:32 4:32 7:32 10:32

Good Posters

- A focused message
- Graphics and images that tell a story
- Use text sparingly
- Well-ordered and easy to follow

Causal Inference

Purpose of a poster

Your poster should:

- Attract attention (and be attractive)
- Tell your story efficiently
- Support your engagement with people

The design choices should support these three points.

<http://bit.ly/DVSvideos>

Questions?

askdata@duke.edu

<http://bit.ly/STA199LVisSpring2018>