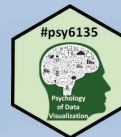


Deep Questions of Data Visualization



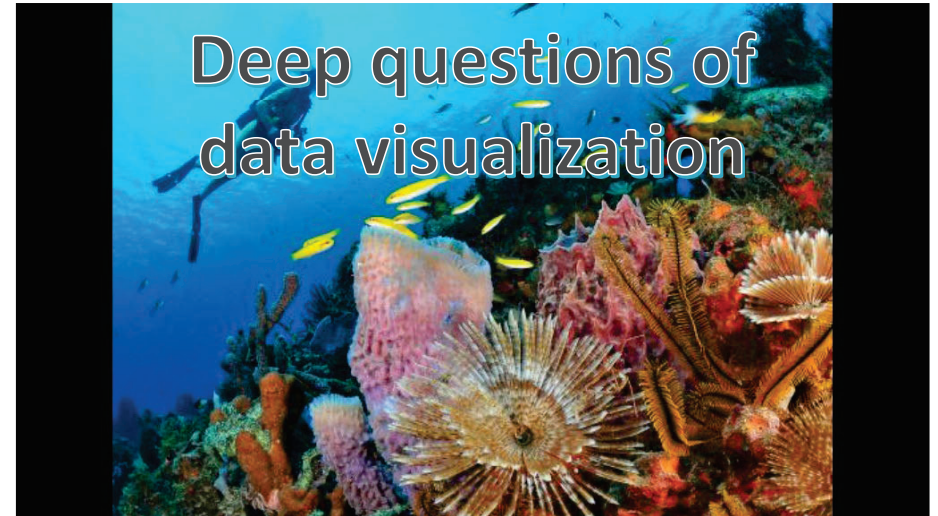
Michael Friendly
Psych 6135

<https://friendly.github.io/6135>



While you were enjoying a relaxing week without classes, I was working hard, pondering the:

Deep questions of data visualization



The Deep Question Research Institute,
NorthWest Point, Providenciales, Turks & Caicos

The Wall
(6000')

The first scientific study
of graphical preference
among marine animals!



Deep Questions Research Institute
Great Exuma, Bahamas



Stocking Island Beach
Recently viewed

hari Resort



How to study graph
preference in
marine animals?

Dive Exuma
George Town

Crab Cay 4

Research team*
aboard the *MV Playfair*

Divers suit up



* Thanks for technical assistance from Dive Exuma

5

Shark experiment: Pies vs. Bars

Do sharks prefer **conch pie charts** or **granola bar charts**?

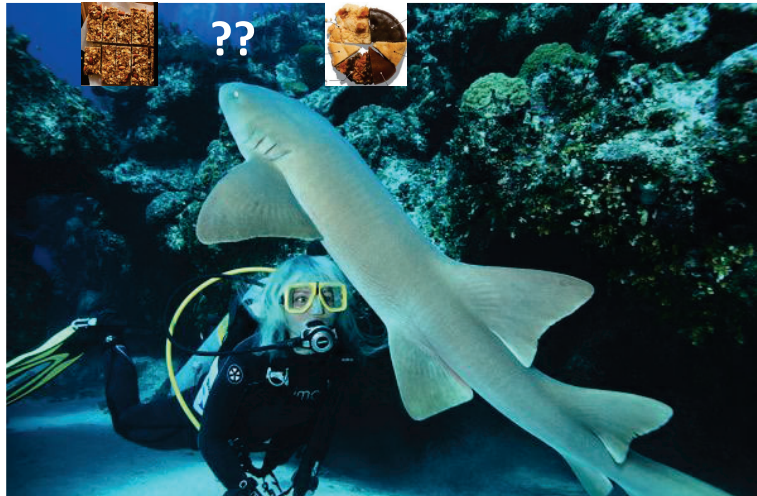
Design: Two-alternative forced-choice, $n=50$ trials



6

Shark experiment

One experimental trial:

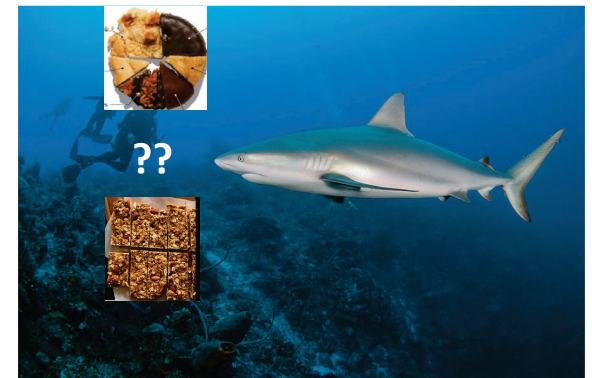


7

Shark experiment: Pies vs. Bars

Results: Sharks show an overwhelming preference for conch pie

Choice	n
Pie	45
Bar	4
Diver *	1



* Ethics disclosure: All divers were volunteers. None were consumed in this experiment.

8

Turtle experiment

Does this generalize? What about turtles?

Results: Turtles show an overwhelming preference for granola bar charts

Choice	n
Pie	3
Bar	47
Diver	0



9

Visualizing the results

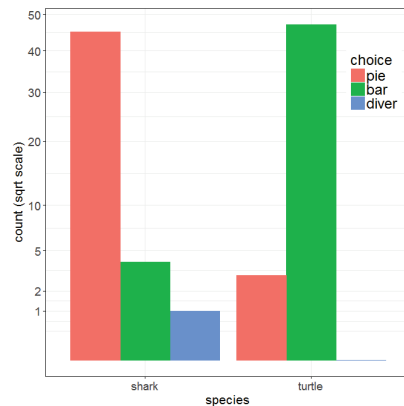
Successful visualizations require some time for reflection



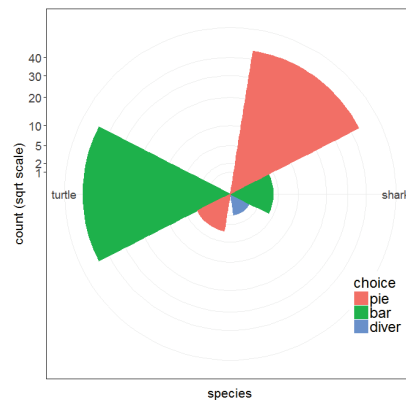
10

Visualizing the results

Bar chart



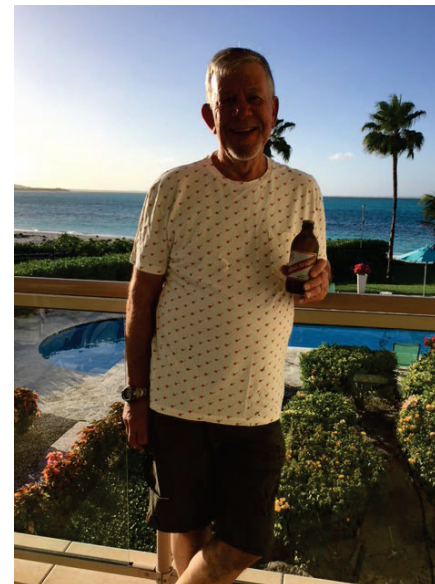
Windrose = bar chart + polar coords



Which do you prefer? Is there something better before I publish this?

11

The Red Stripe Award



The research reported* here was given the February 2024 *Red Stripe Award* by the **Deep Question Research Institute**



* This research was **not** supported by the National Sciences and Engineering Research Council of Canada

12

Further research

- Include the obvious and necessary control conditions in a 2 x 2 factorial design (chart type × food type):
 - conch bar charts vs. conch pie charts
 - granola pie charts vs. granola bar charts



Further research

- Extend this to another species:
 - dolphins: known to be much smarter than sharks and turtles; is graphical preference related to intelligence?
 - parrot fish, groupers, lobsters: what can we do??
- Investigate influence of **color** on graph preference
 - This can be also be studied as a function of depth, because colors become more muted at greater depth

