



??



Deep Questions of Data Visualization

Michael Friendly



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

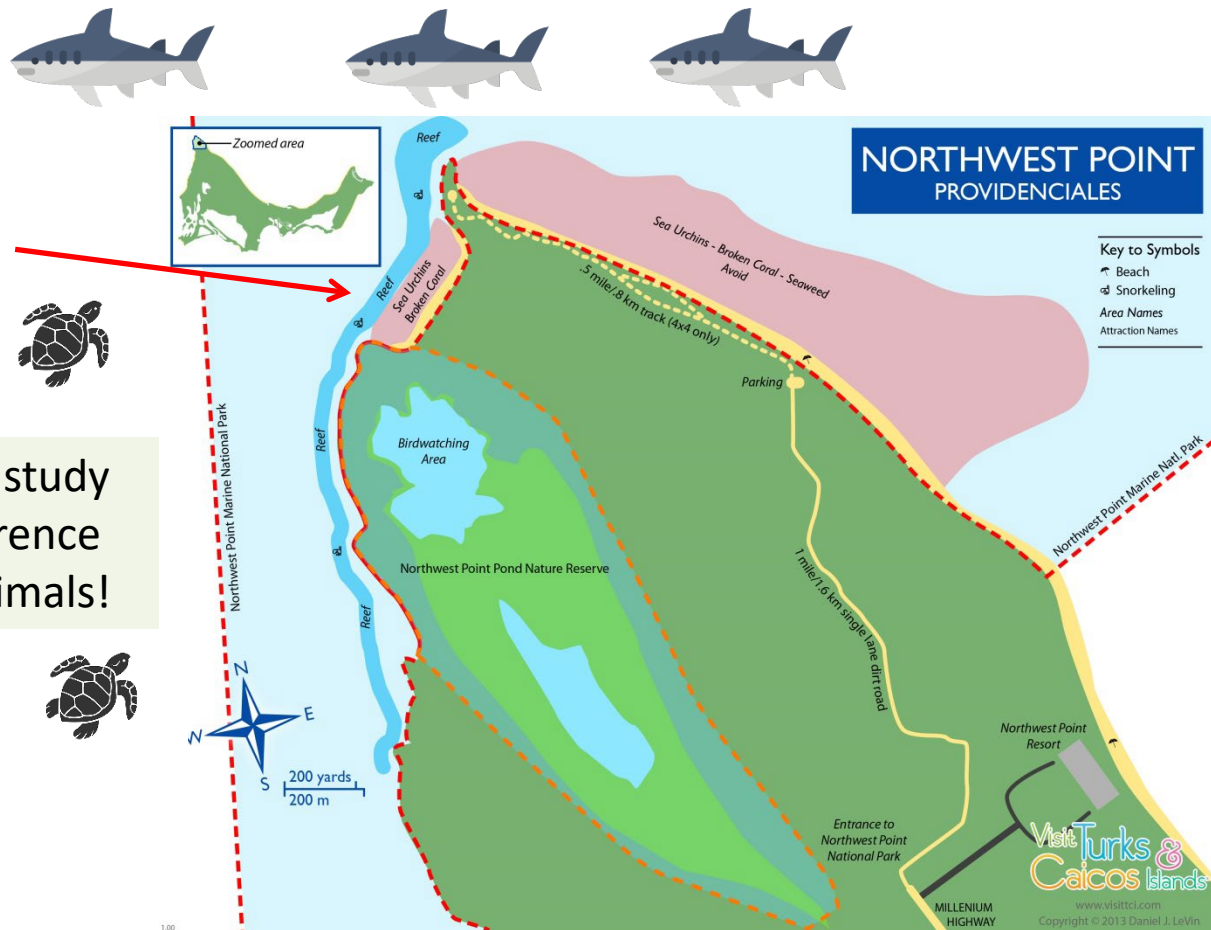
Deep Questions of Data Visualization



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

The Wall
(6000')

The first scientific study
of graphical preference
among marine animals!



Research team* aboard the *MV* *Playfair*

Divers suit up



* Thanks for technical assistance from Provo Divers

Shark experiment: Pies vs. Bars

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

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

Conch pie



Granola bar

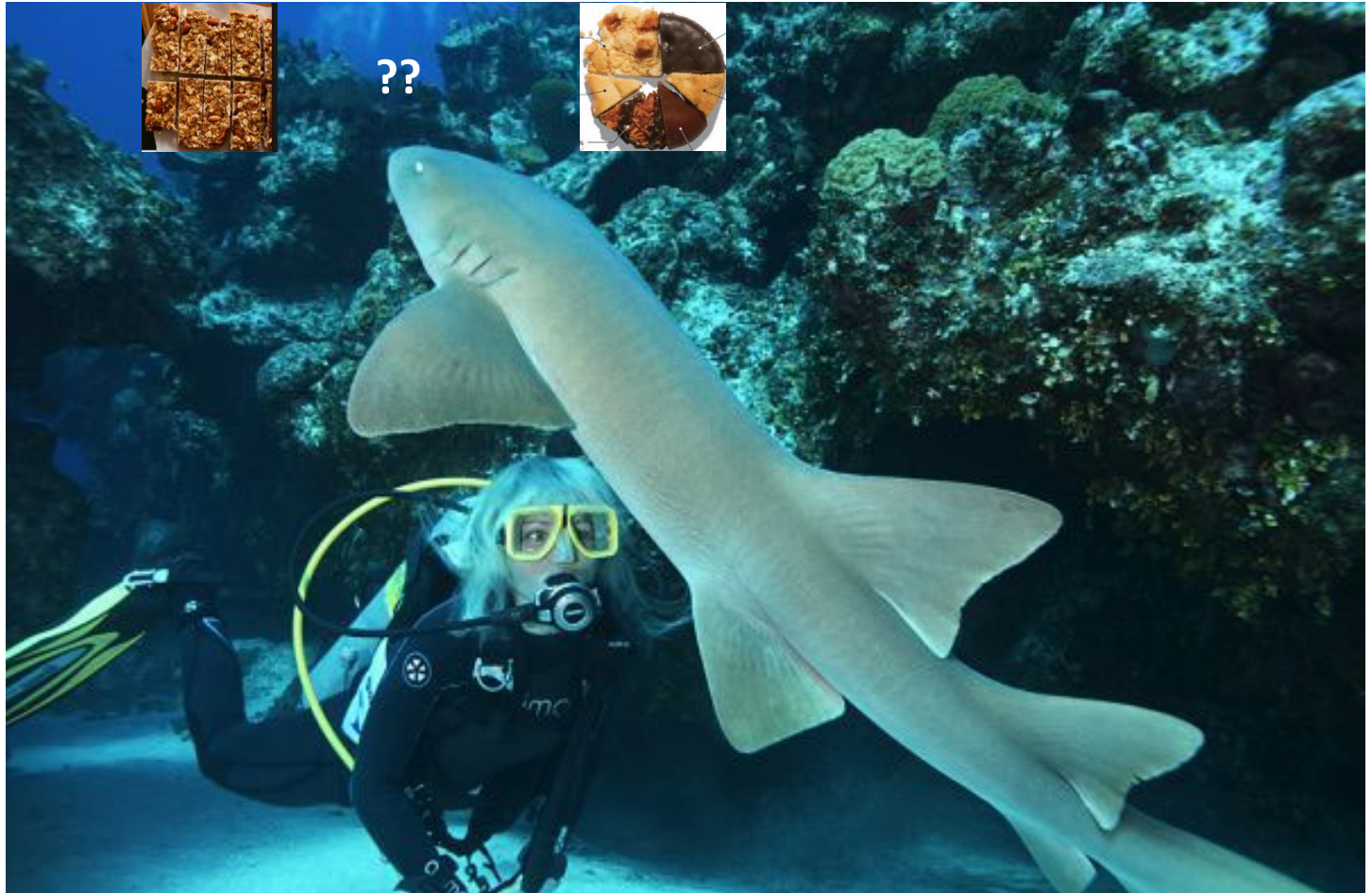


Sample stimulus items



Shark experiment

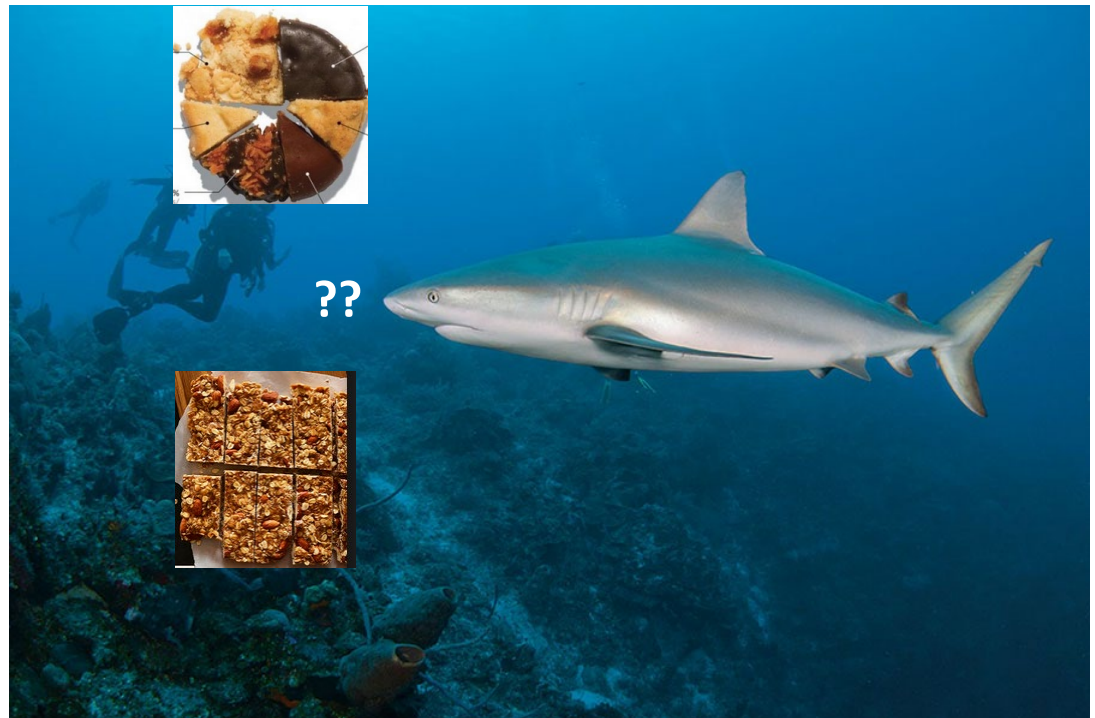
One experimental trial:



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.

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



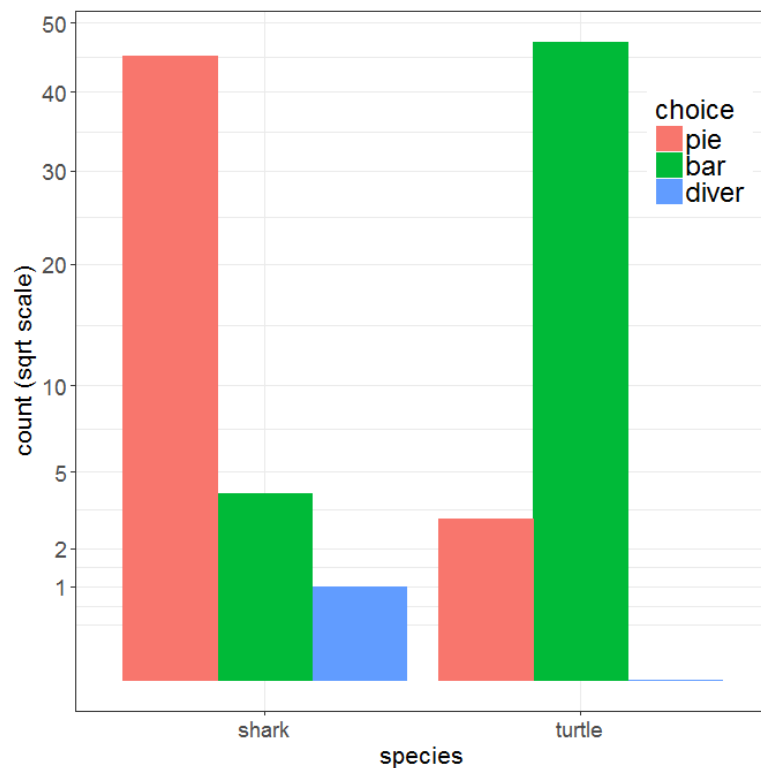
Visualizing the results

Successful visualizations require some time for reflection

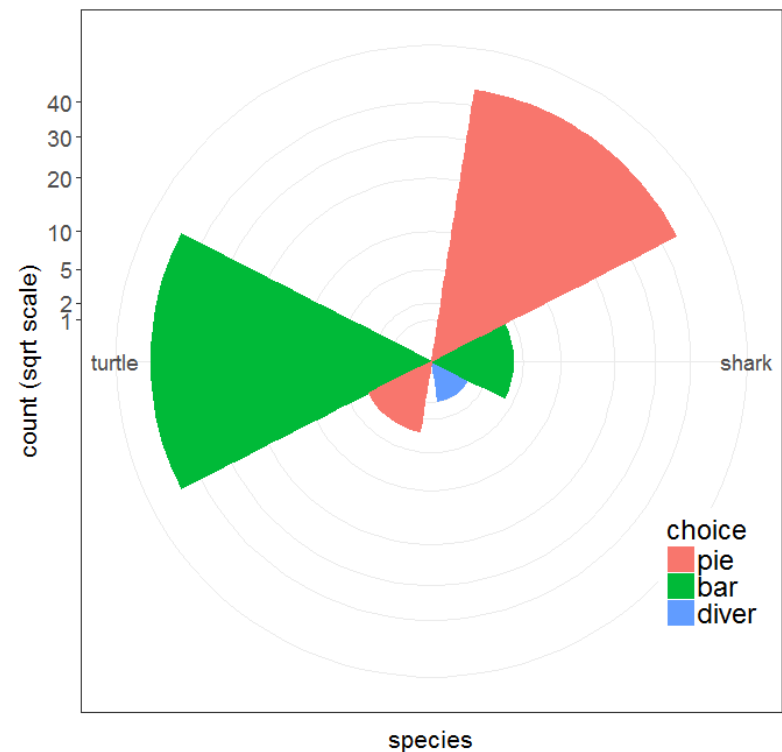


Visualizing the results

Bar chart



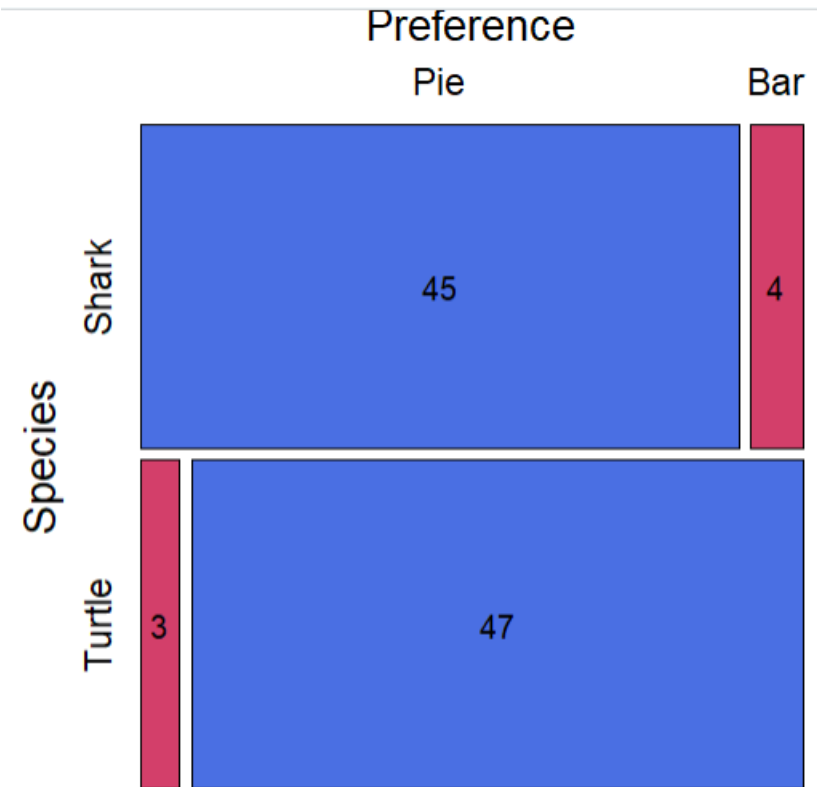
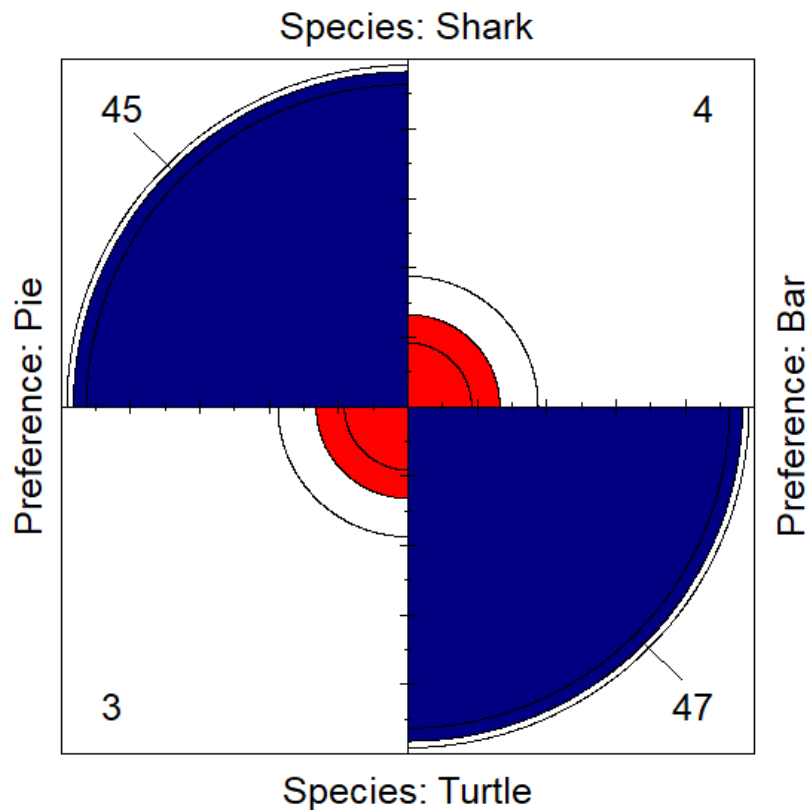
Windrose = bar chart + polar coords



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

Visualizing the results

What about fourfold plots & mosaic displays?



The *Red Stripe* Award



The research reported* here was given the February 2023 *Red Stripe* Award by the **Deep Question Research Institute**



“A Four Stripe research project!”

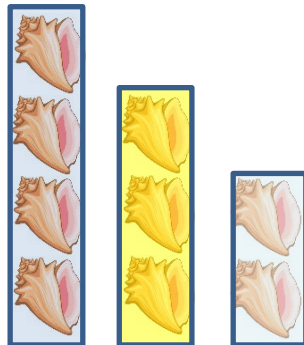
* This research was **not** supported by the National Sciences and Engineering Research Council of Canada

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



Conch pie



Conch bar



Granola pie



Granola bar

Extend this to other species

- Dolphins: known to be much smarter than sharks & turtles
- Caribbean lobsters (no claws!) are stupider
- Is graphical preference related to intelligence?



Image ID: MHT6P0
www.alamy.com





Dramatis personnae

