Deep Questions of Data Visualization

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Psych 6135

http://euclid.psych.yorku.ca/www/psy6135/

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

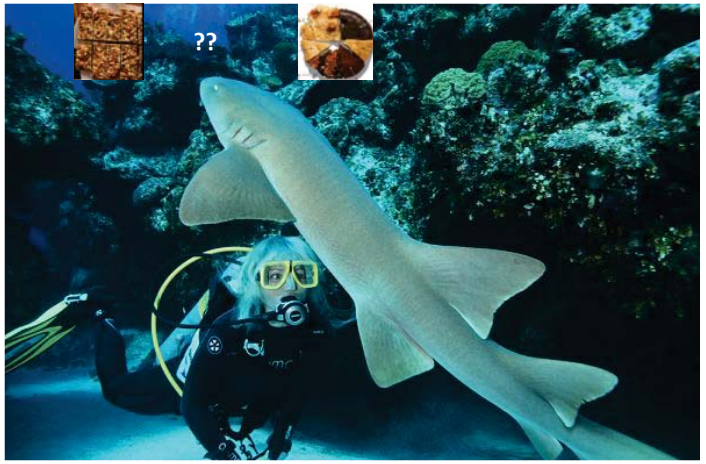
Conch pie

Granola bar

Sample stimulus items

Shark experiment

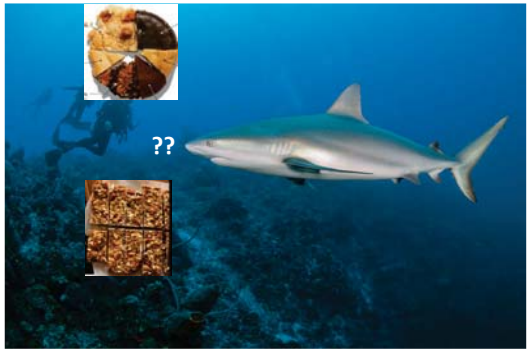
One experimental trial:



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

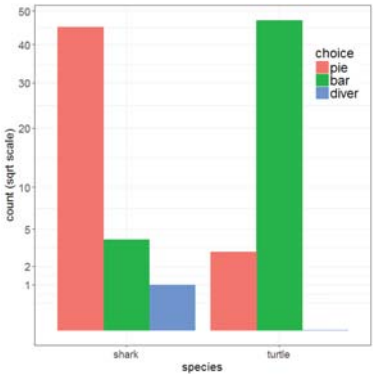
Choice	n
Pie	3
Bar	47
Diver	0

Visualizing the results

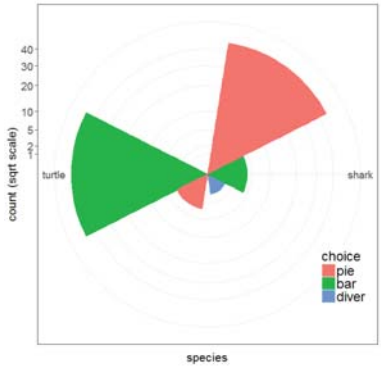
Successful visualizations require some time for reflection

Visualizing the results

Bar chart



Windrose = bar chart + polar coords



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

The *Red Stripe* Award

The research reported* here was given the February 2019 *Red Stripe* Award by the **Deep Question Research Institute**

* 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
- 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