

Did you see that? The role of graphs in media articles

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accuracy

incommunicable

snapshot

informative

intimidating

oversimplified

daunting

publishable

highlights

thought-provoking

simple

misleading

helpful

clear

interesting

useful

over complicated

compelling

Outline

Background

- Data visualization in media
- Importance of colour
- Interactivity



Current Research

- Research question
- Method
- Expected Results

Implications

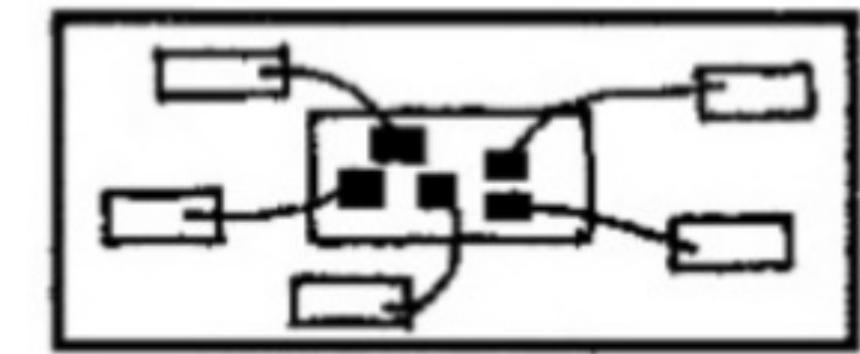
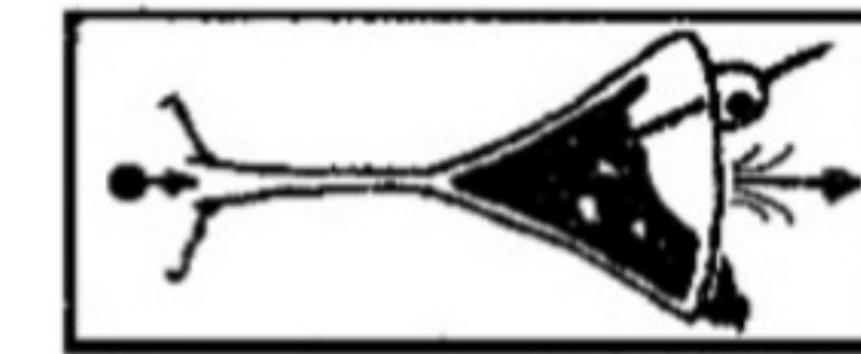
- Implications of study
- General conclusions

Data visualization in media

Helps audience understand material through **4 phases**:

- Understand "big picture"
- View material in different ways
- Look for patterns in data
- Match mental image to physical model





Interactive Slideshow

- Data as slideshow
- Reader can interact
- Author and reader have equal control

Martini Glass Structure

- Author creates data visual
- Leads reader to point
- Author driven

Drill Down Story

- Reader interacts with all points of data
- Reader driven



General Trends

- use of graphs is becoming **more widespread** in media
- **function of visuals**: support verbal claims in text ("text-visualization relationship")
- assumption: graphs are **transparent**, and the message should be immediately obvious
- disagreement on what "**general scientific literacy**" means in education

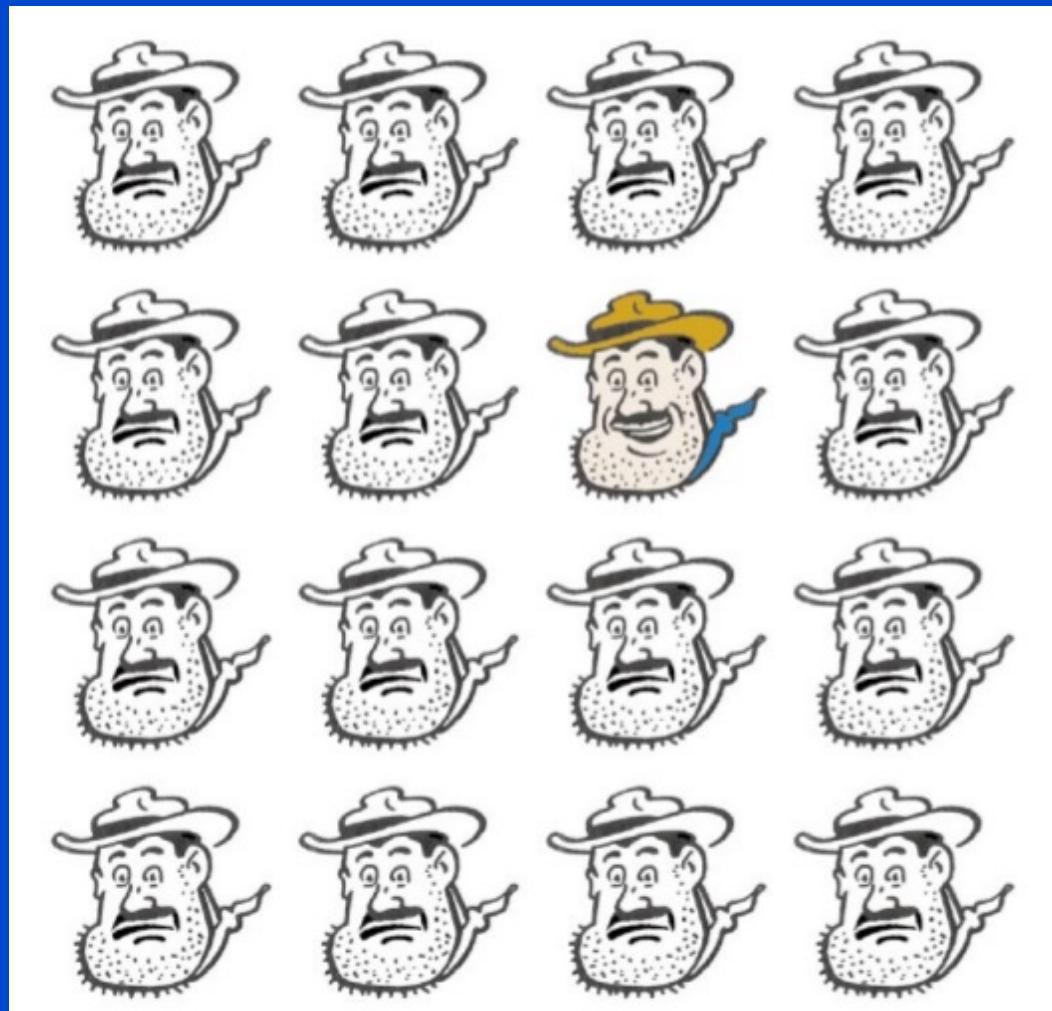


Utility of Graphs



- Interpreting graphs is **complex**
- Difficult to develop "**critical sense**": balancing critiquing data + beliefs, emotion, and knowledge
- Graph reading could include reading:
 - data
 - between the data
 - beyond the data
 - only possible for graphs we learn about, but what about the ones we do not (more practical)?
- **Data display & visual features can impact all the above**

Colours in Visualization



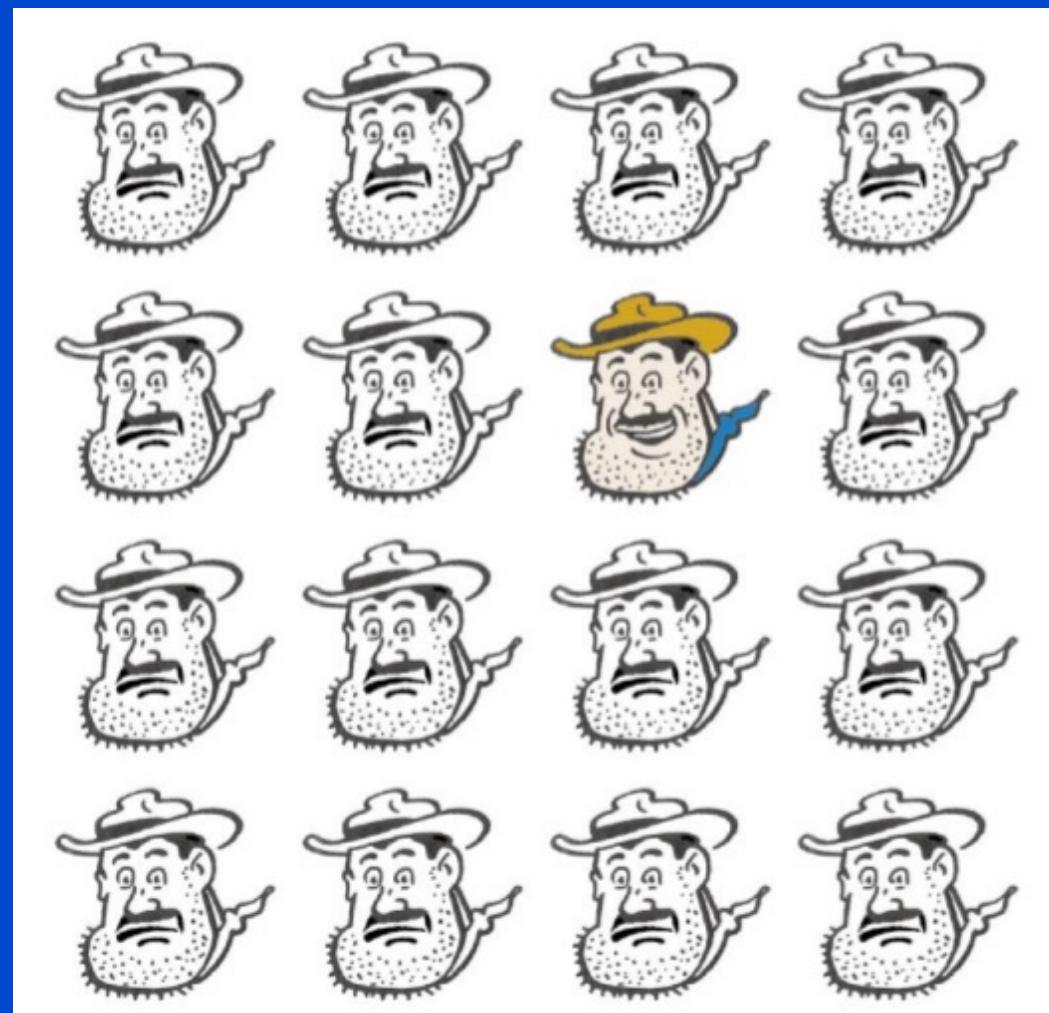
Importance

- Help draw attention and increase understanding
 - *when done right

Macdonald, 1999

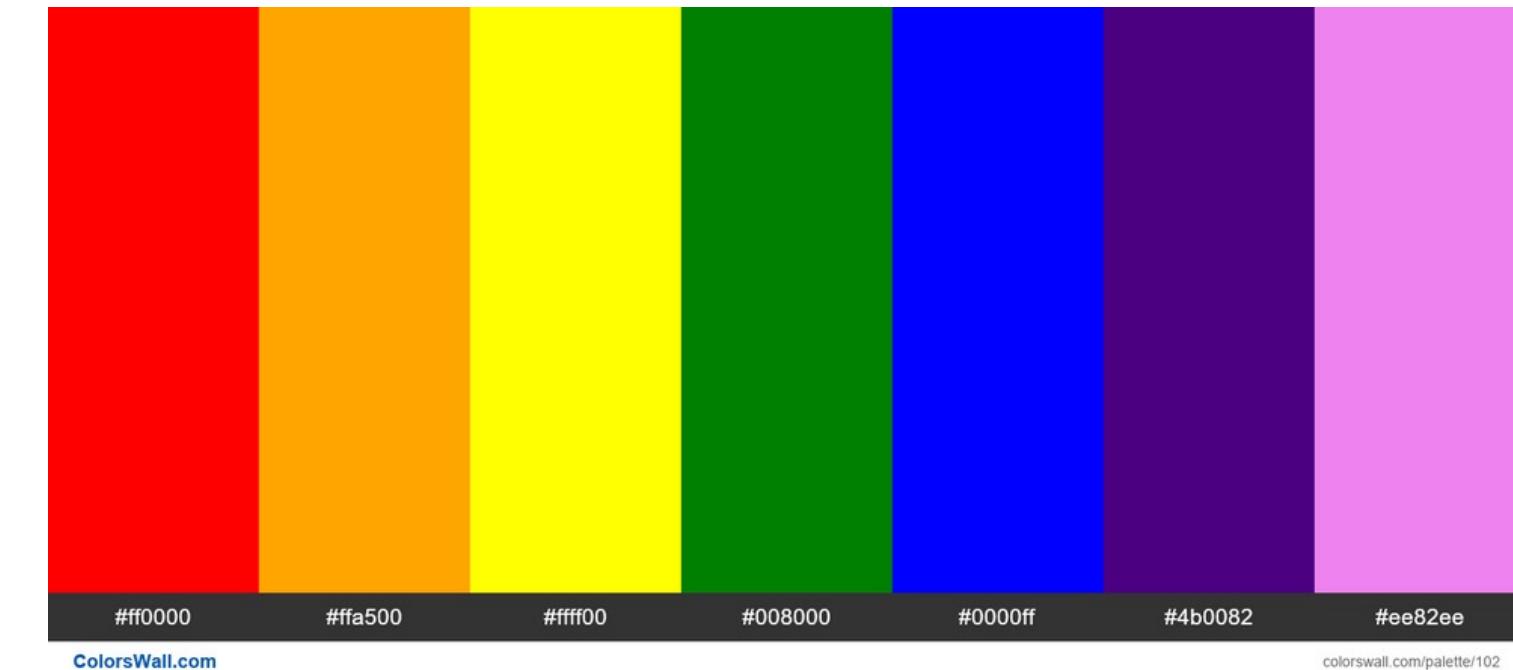


Colours in Visualization



Importance

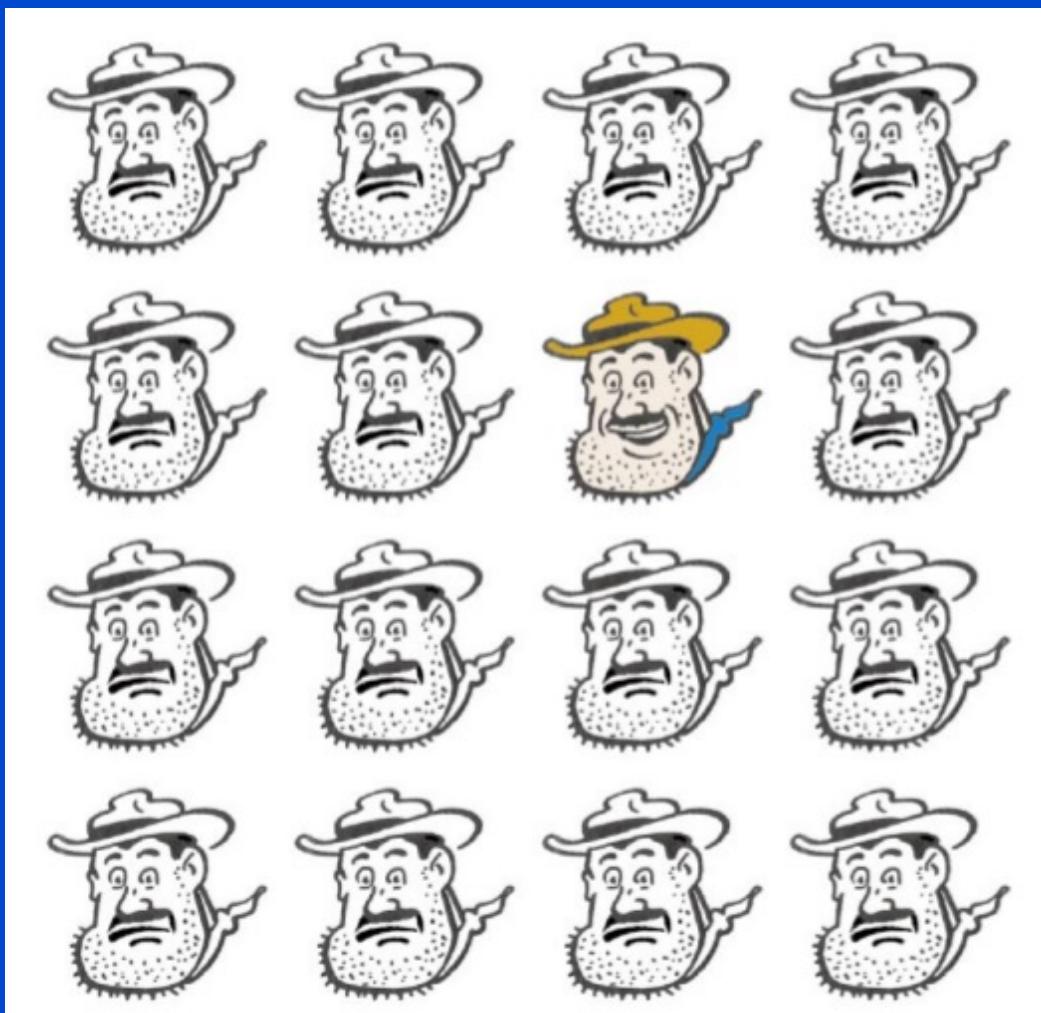
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Macdonald, 1999; Li, 2013

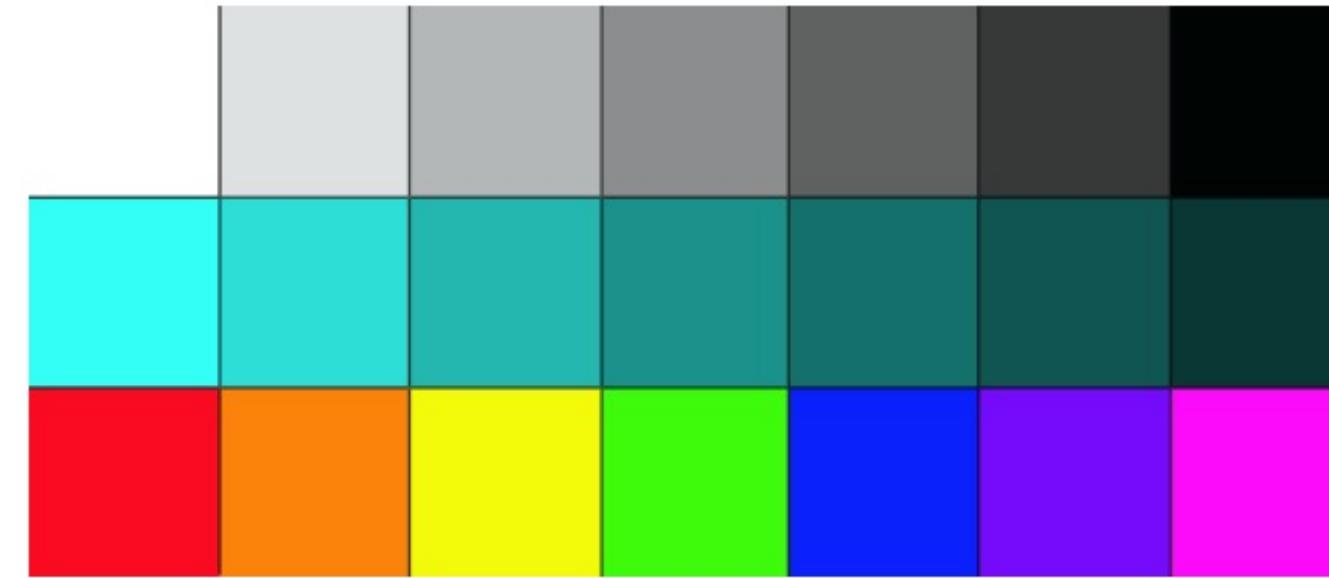


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Colours in Visualization

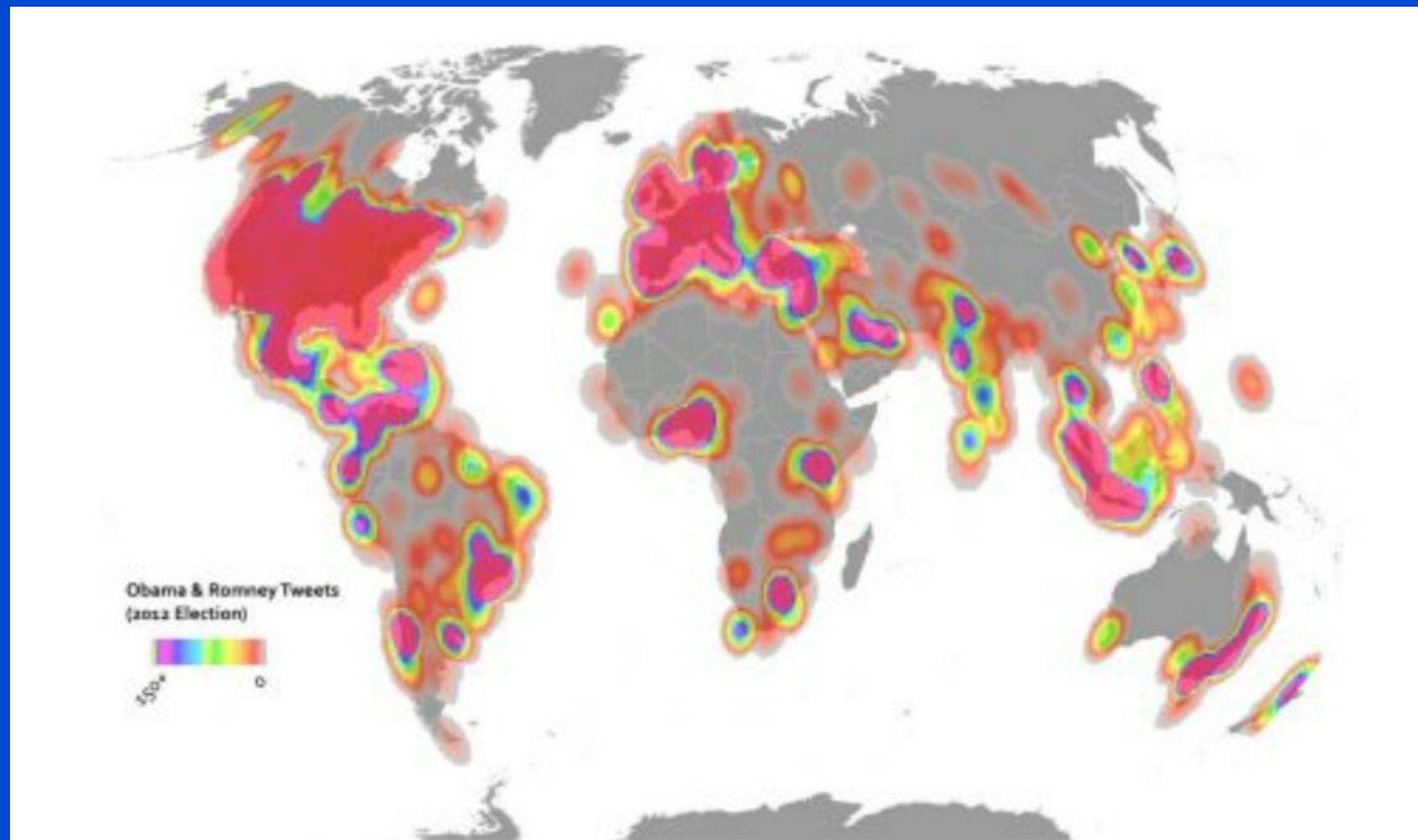


Practicality

- Make sure it works in black and white
 - Add colour after
- Pick a specific palette & use throughout
- Stick with a soft palette when possible
- Avoid fancy effects

Macdonald, 1999; Few, 2018

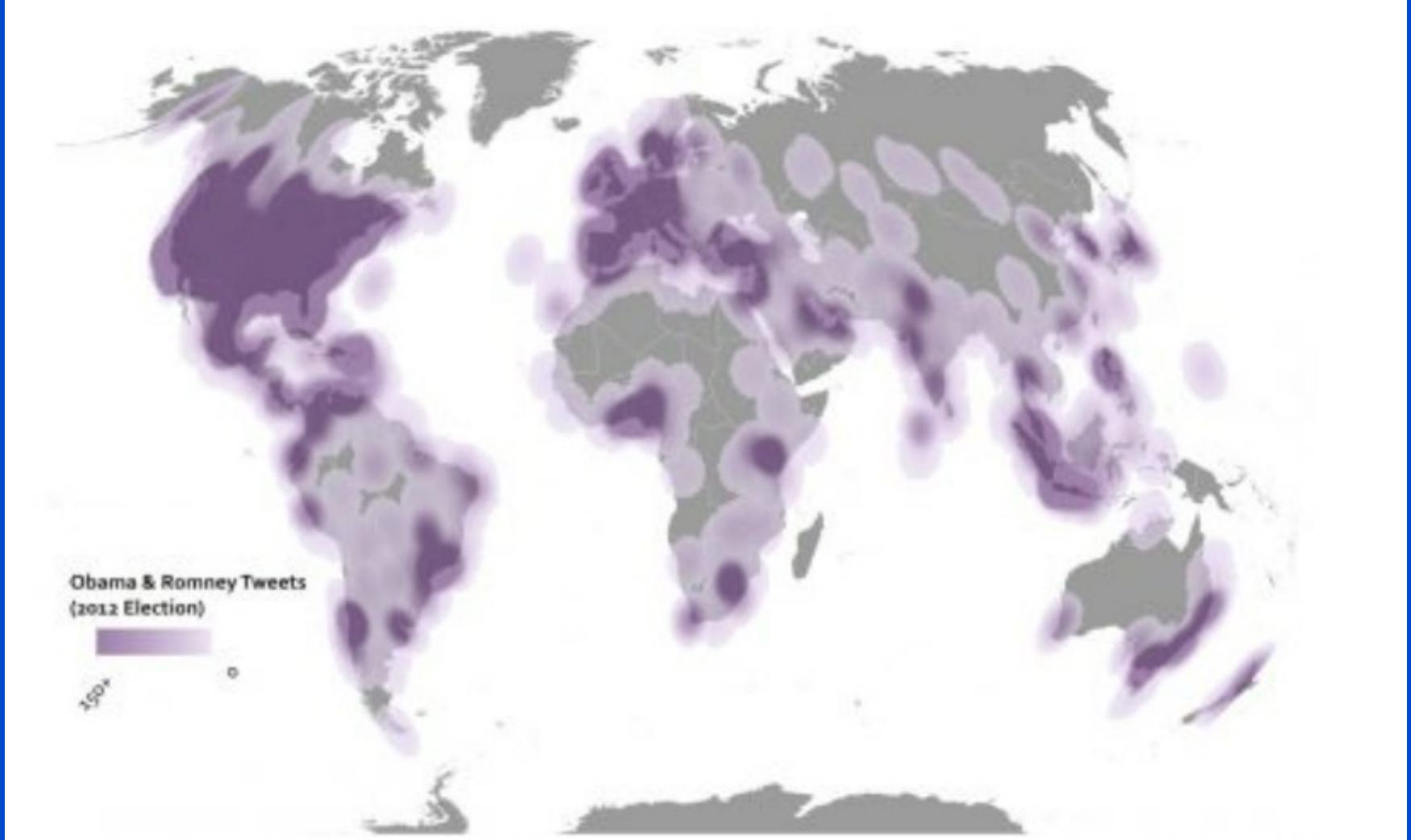




This map shows the volume of Obama and Romney tweets from the 2012 presidential elections, using spectral colors.

(Image: Dr. Anthony C. Robinson / Penn State)



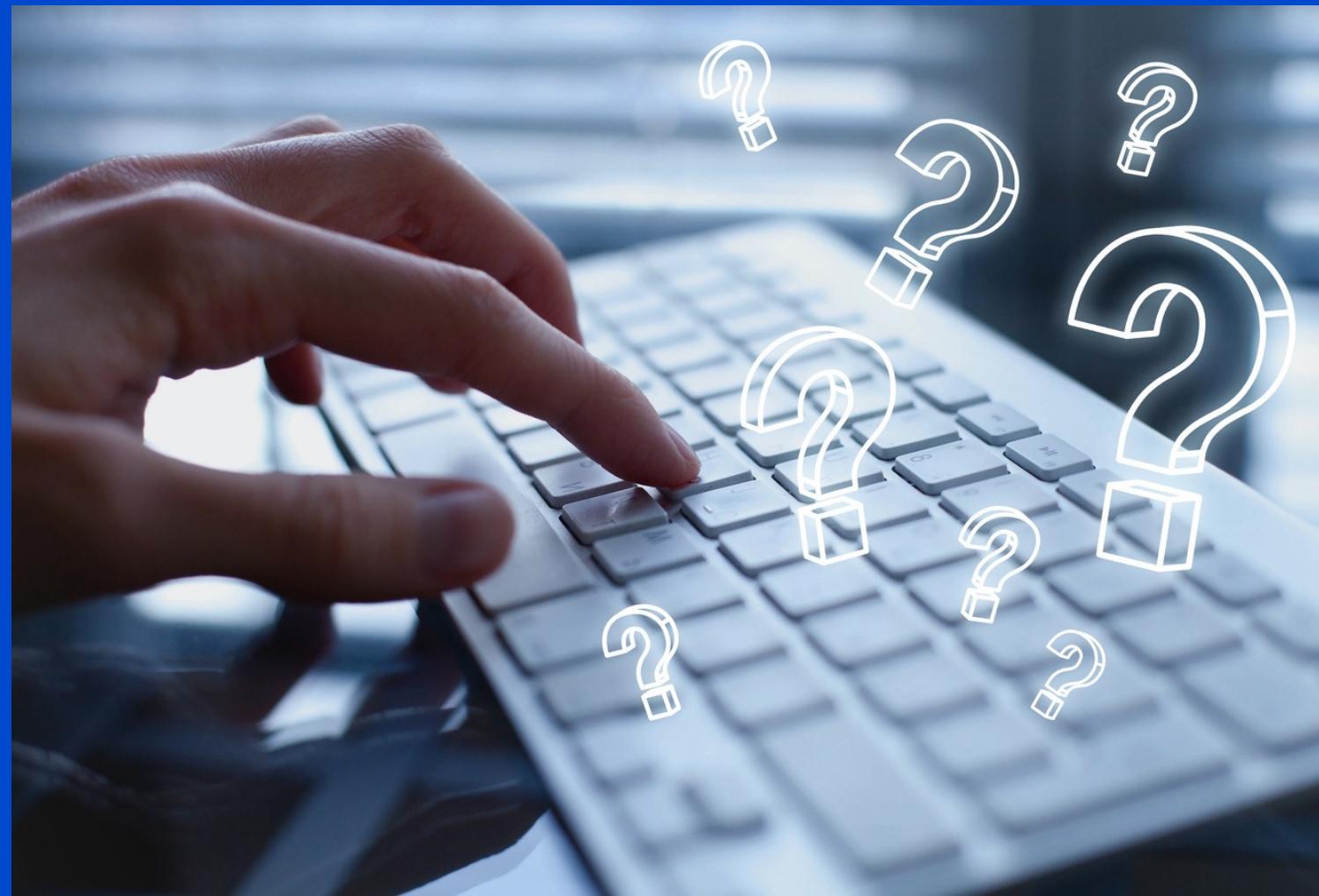


Here's the same map, but Robinson has changed the rainbow colors to a single hue (purple) with varying saturation.

(Image: Dr. Anthony C. Robinson / Penn State)



Interactivity in Data Visualization



Importance

- increased engagement and time spent
- empowerment
- information recall
- inclusive
- better/more successful journalism

Aitamurto et al. (2011); Young et al. (2018)



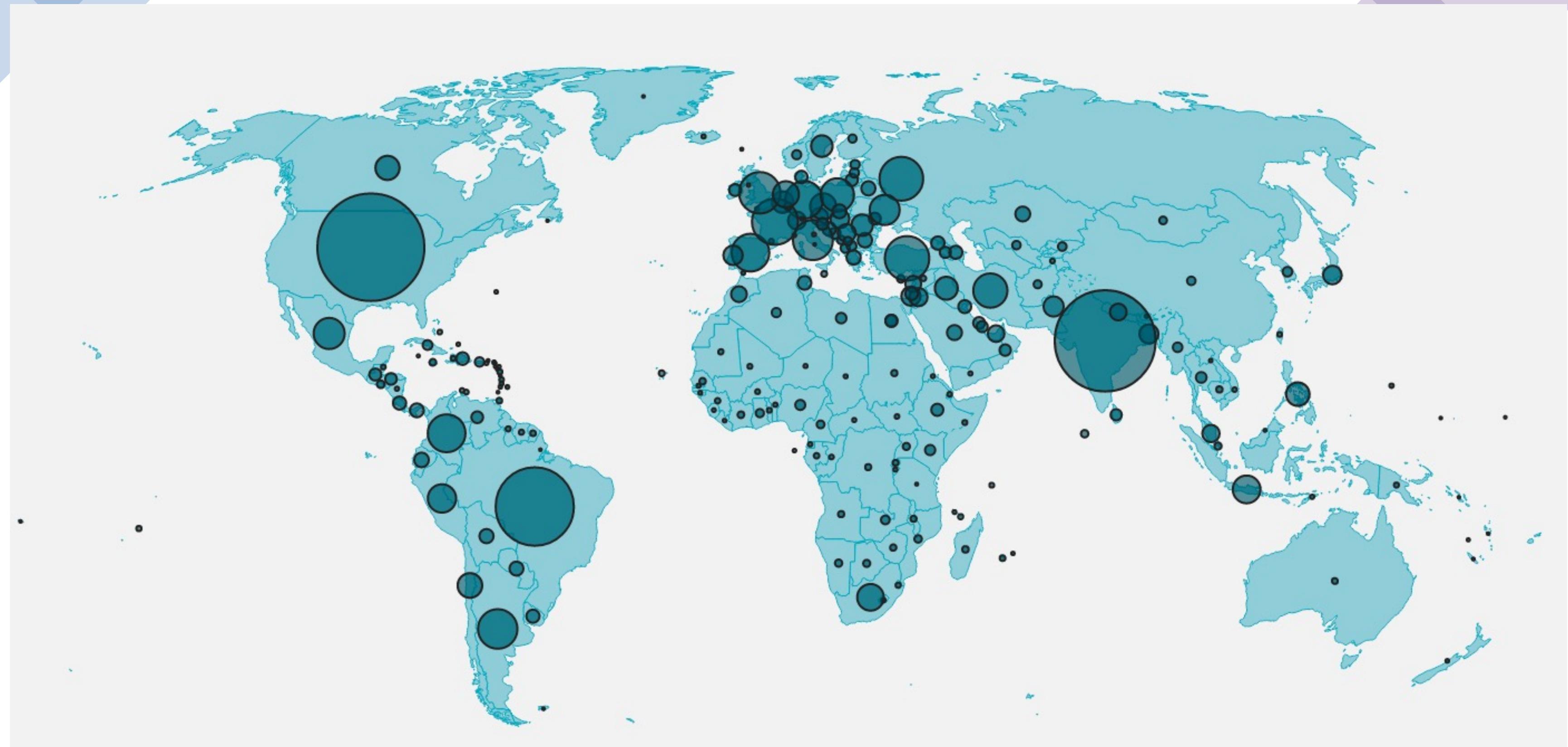
Interactivity in Data Visualization



Practicality

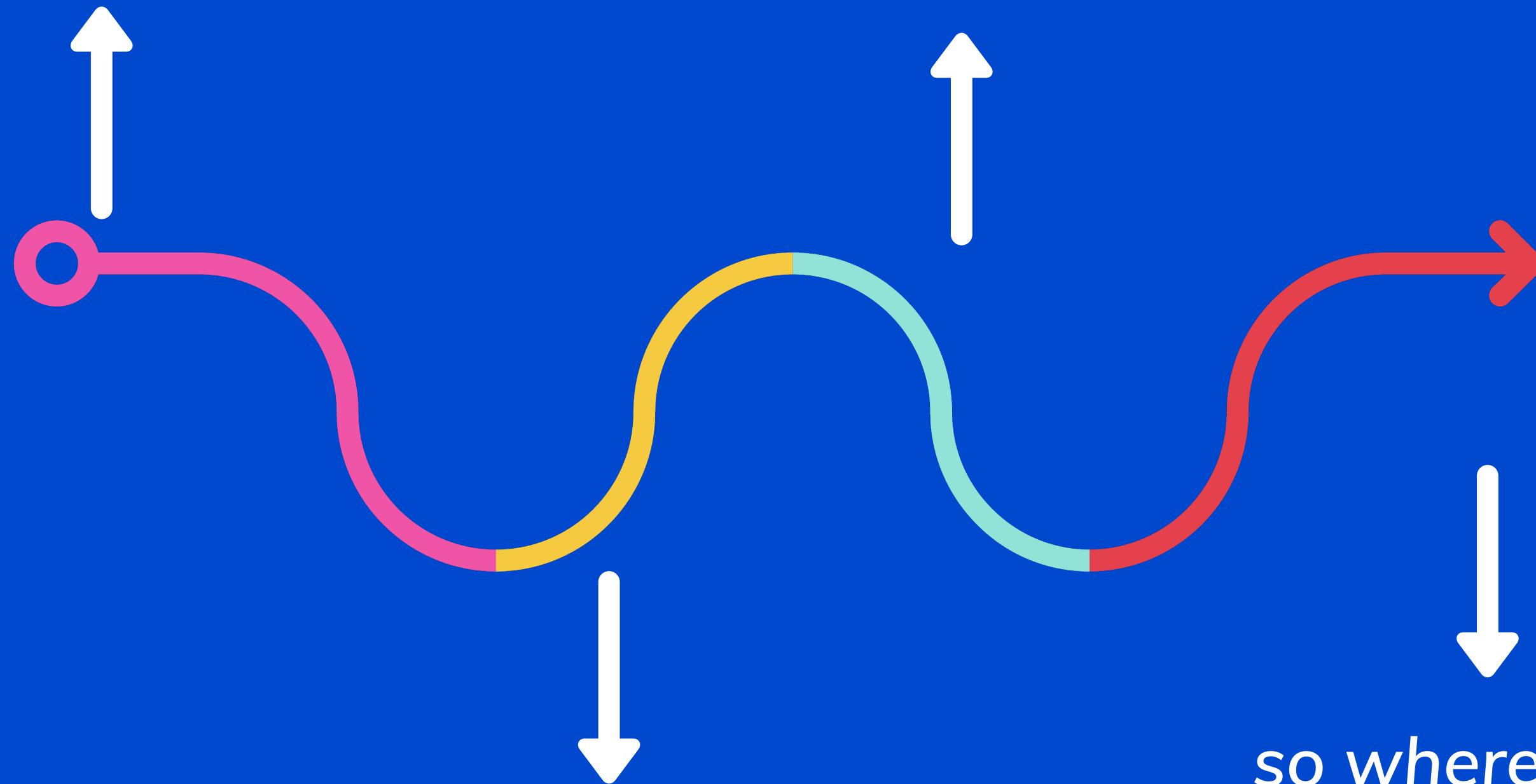
- several types of interactive elements
- most-used: dynamic maps, inspect features, sharing content
- reliance on simplest/free techniques
- overwhelming and easy to misinform

Young et al. (2018); Zion & Craig (2014)



importance

ease of interpretation



colour & interactivity

*so where do we
go from here?!*

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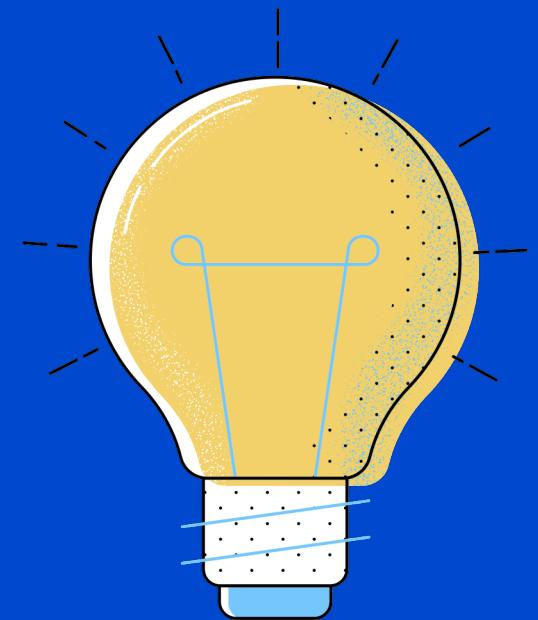
Research Questions

1

When people read media articles, do they pay more attention to the main message from graphs or written content? If so, does focusing on one or the other influence how people interpret the main message?

2

Do features of graphs influence what people focus on and interpret?



Participants



- Representative sample of Canadian adults
 - Recruited through Qualtrics Panels
- Exclusion criteria:
 - Under 18
 - Missing key dependent variables



Method

1

- Participants given article about birth rate in Canada

2

- Written content shows birth rate decreasing
- Associated graph shows it increasing

3

- Asked to summarize the key takeaway from the article

4 Conditions (Random Assignment)

No Colour
+ Not
Interactive

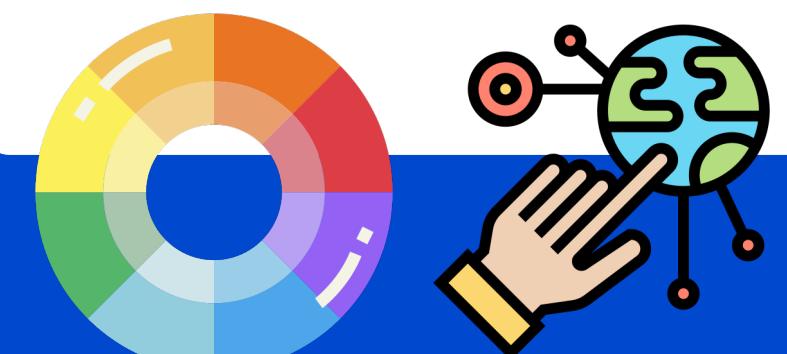


No Colour +
Interactive

Colour
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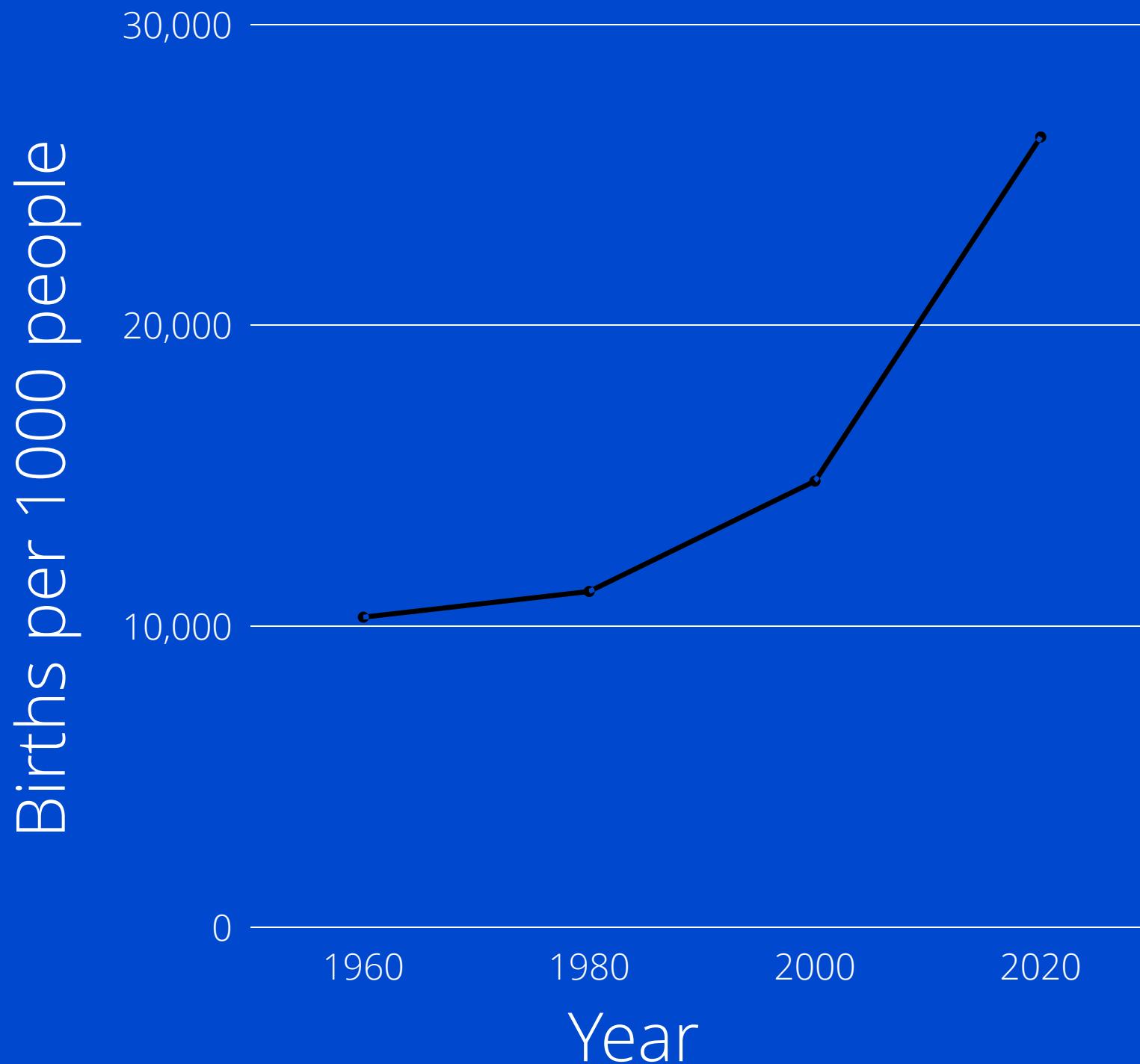


Colour +
Interactive

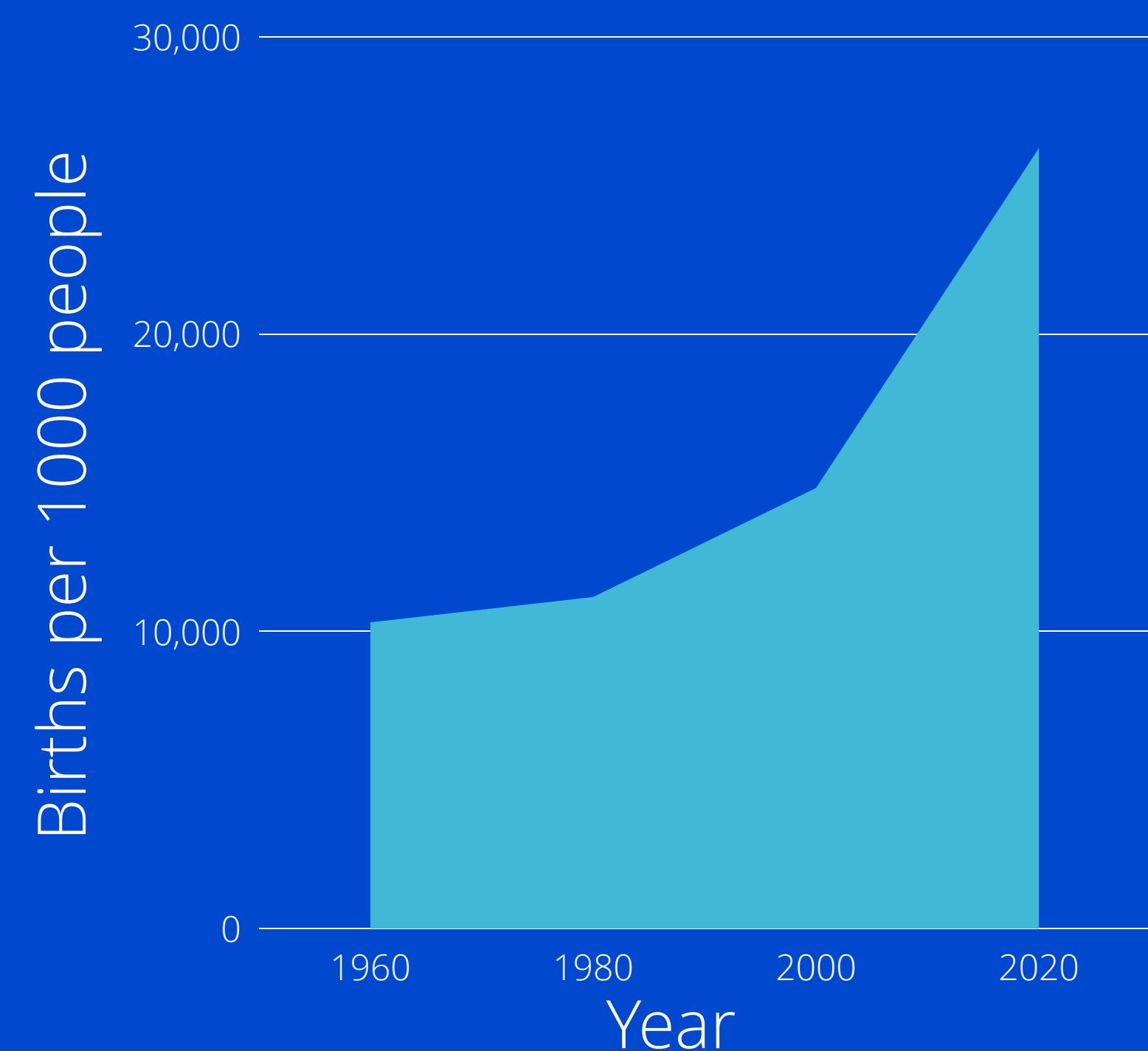


Method: no colour vs. colour

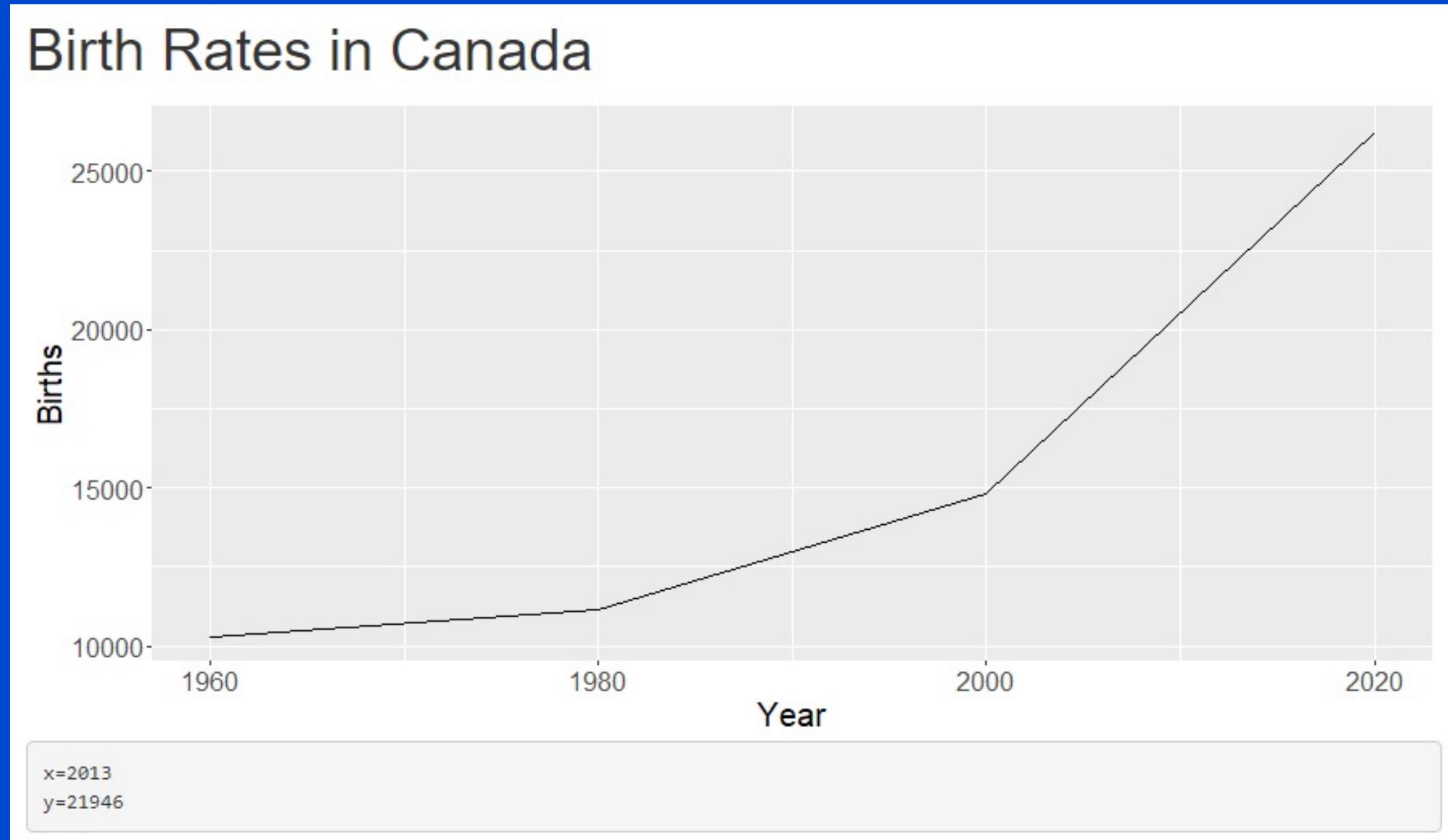
Black And White + Not Interactive



Colour+ Not Interactive



Method: static vs. interactive



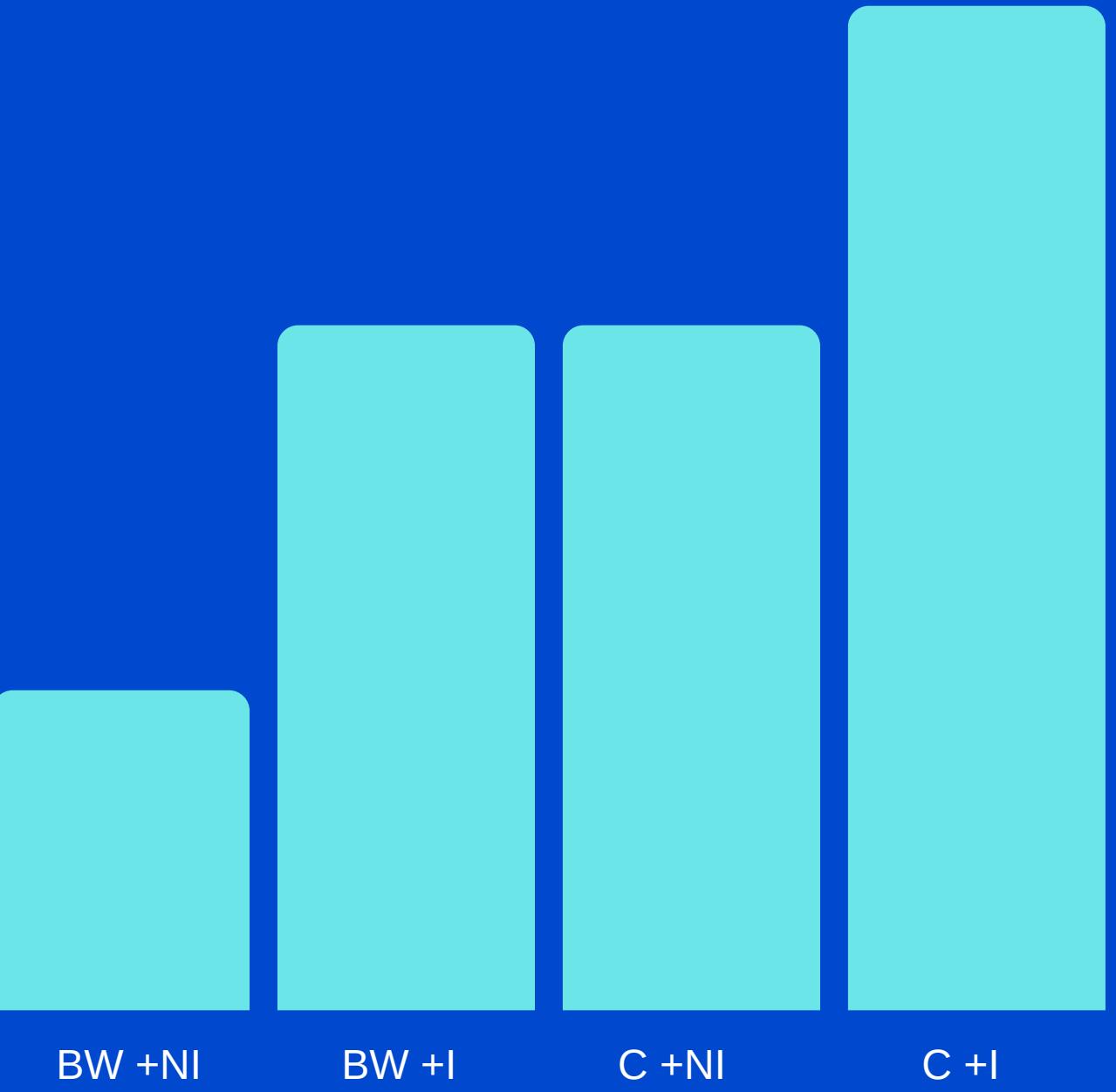
Expected Results

In general, we expect that people will report birth rate increasing (i.e., as per the graph)

Black and white + not interactive: Least # reports of birth rate increasing.

Black and white + interactive and just colour + not interactive: Moderate # reports of birth rate increasing, with little difference between conditions

Colour + interactive: Highest # reports of birth rate increasing.



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Implications

- Demonstrate **importance** of including graphs in media articles
- Highlight need for more **easily interpretable** graphs and data visualization education
- Importance of **design and interactivity** when making in graphs



Future Directions



- Consider other **features** of colour & interactivity (sharing, commenting)
- Consider new **methods** (eye tracking) with more **complex** visualizations (thematic maps, etc.)
- Consider graph **placement** within article
- Explore underlying **mechanisms** for focusing on graphs vs. written content (comfort, function)

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Thank You!

