

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

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accuracy

thought-provoking  
incommunicable simple misleading  
snapshot  
informative helpful clear  
intimidating  
oversimplified interesting  
daunting publishable highlights 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

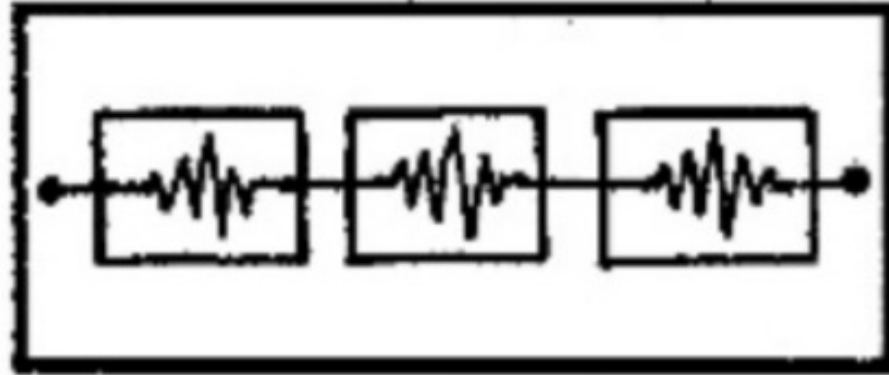


# Data visualization in media

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

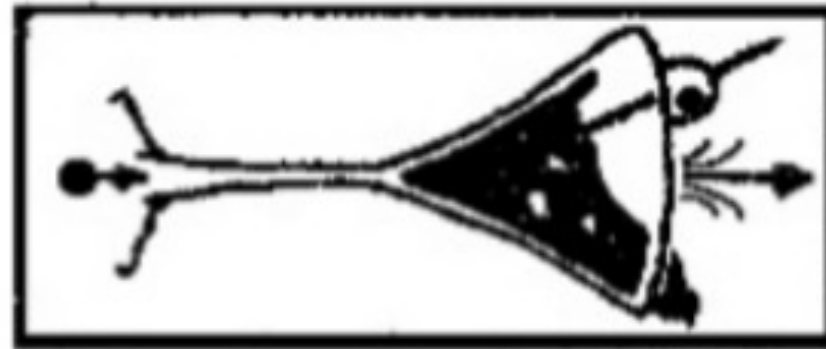
- Understand "**big picture**"
- **View** material in different ways
- Look for **patterns** in data
- **Match** mental image to physical model





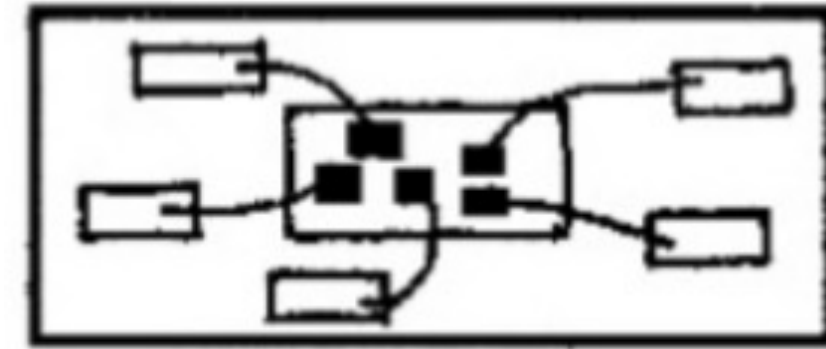
### Interactive Slideshow

- 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

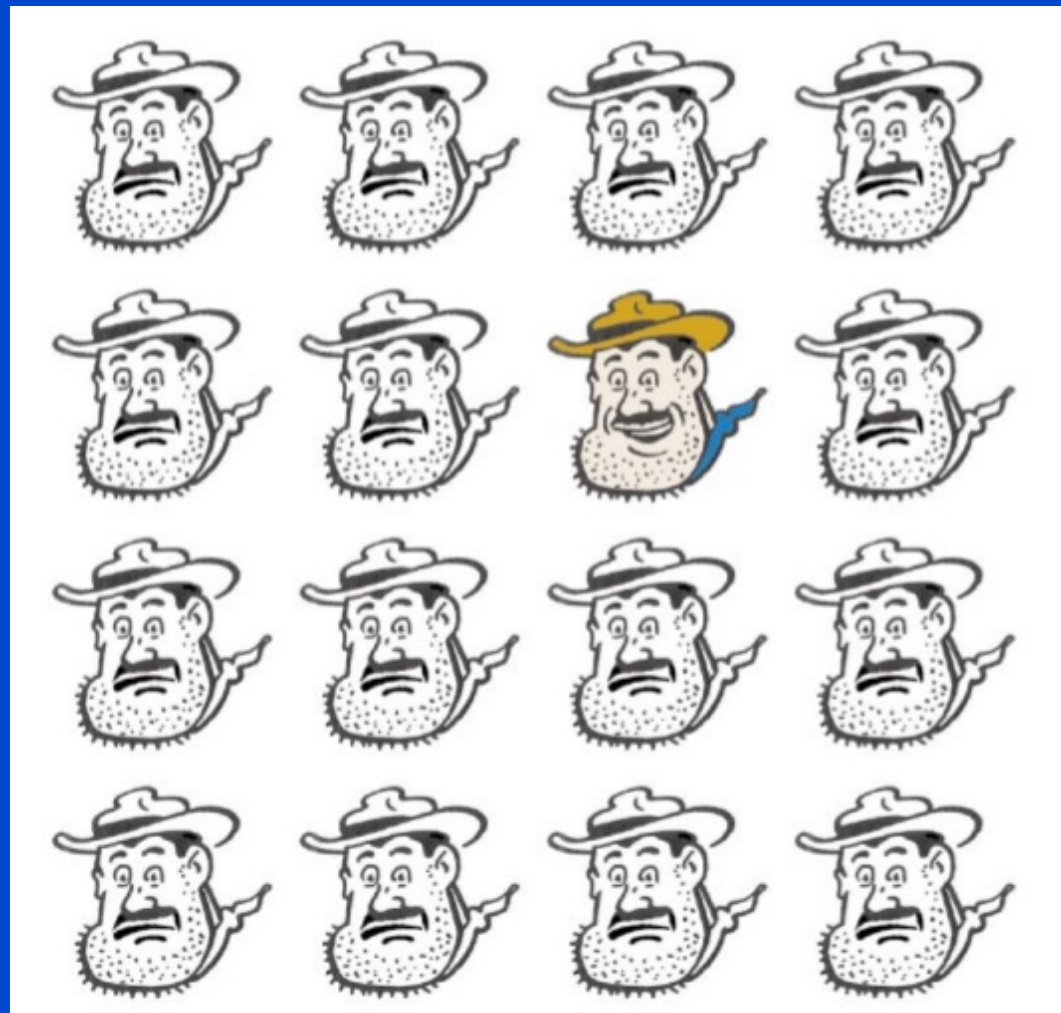


# Utility of Graphs



- 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



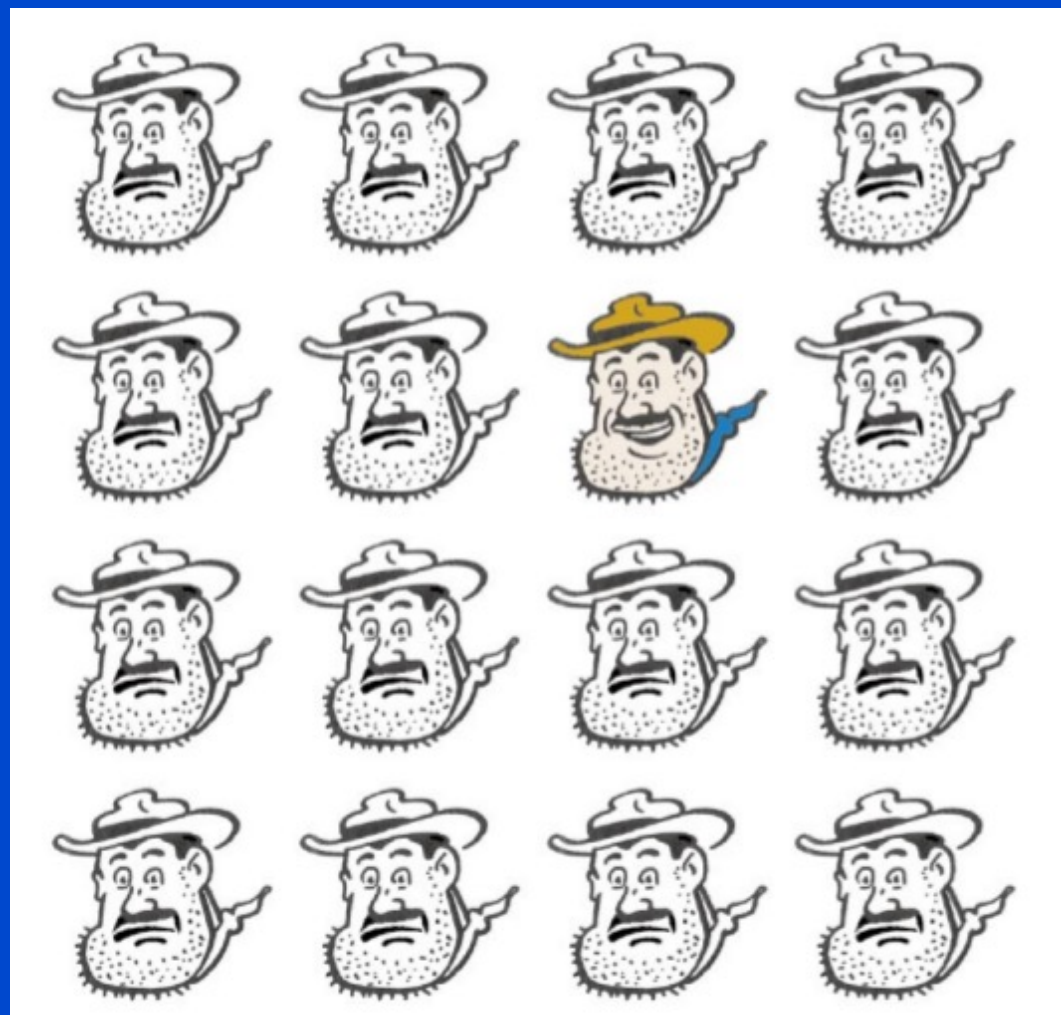
## *Importance*

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



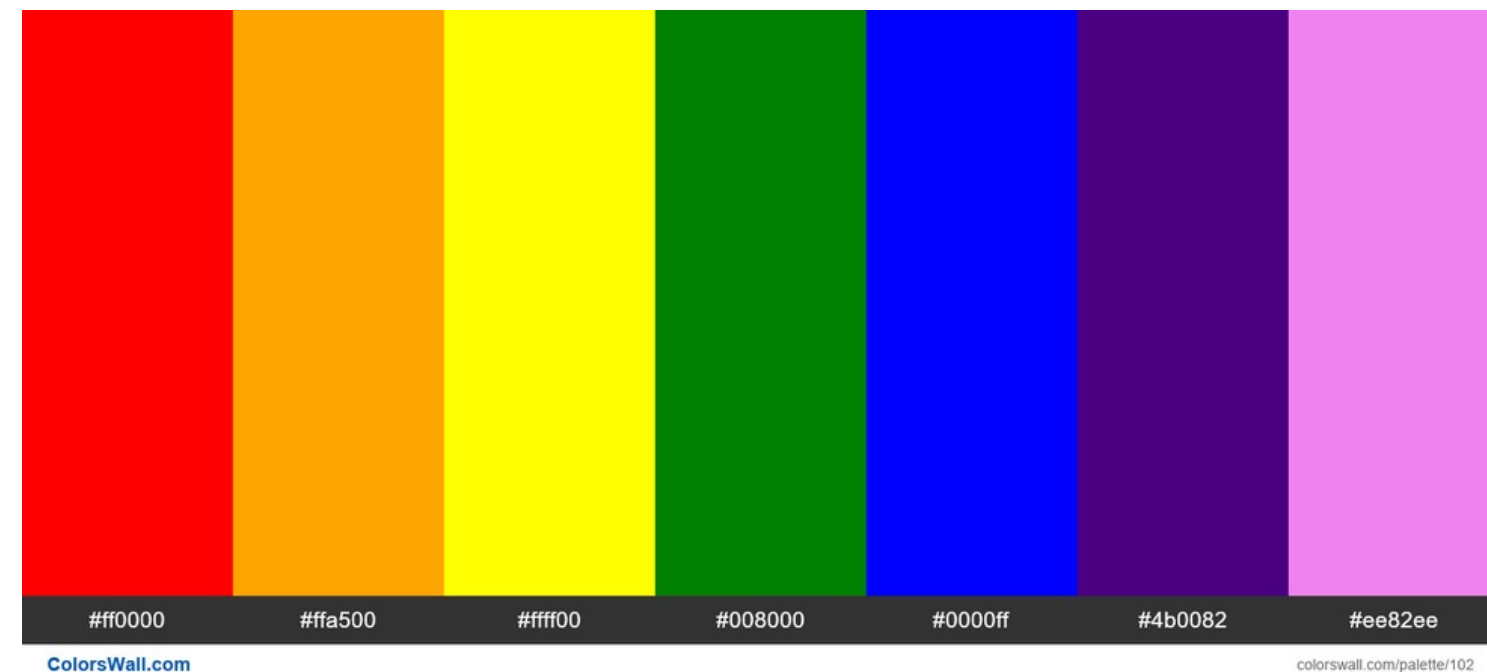


# Colours in Visualization



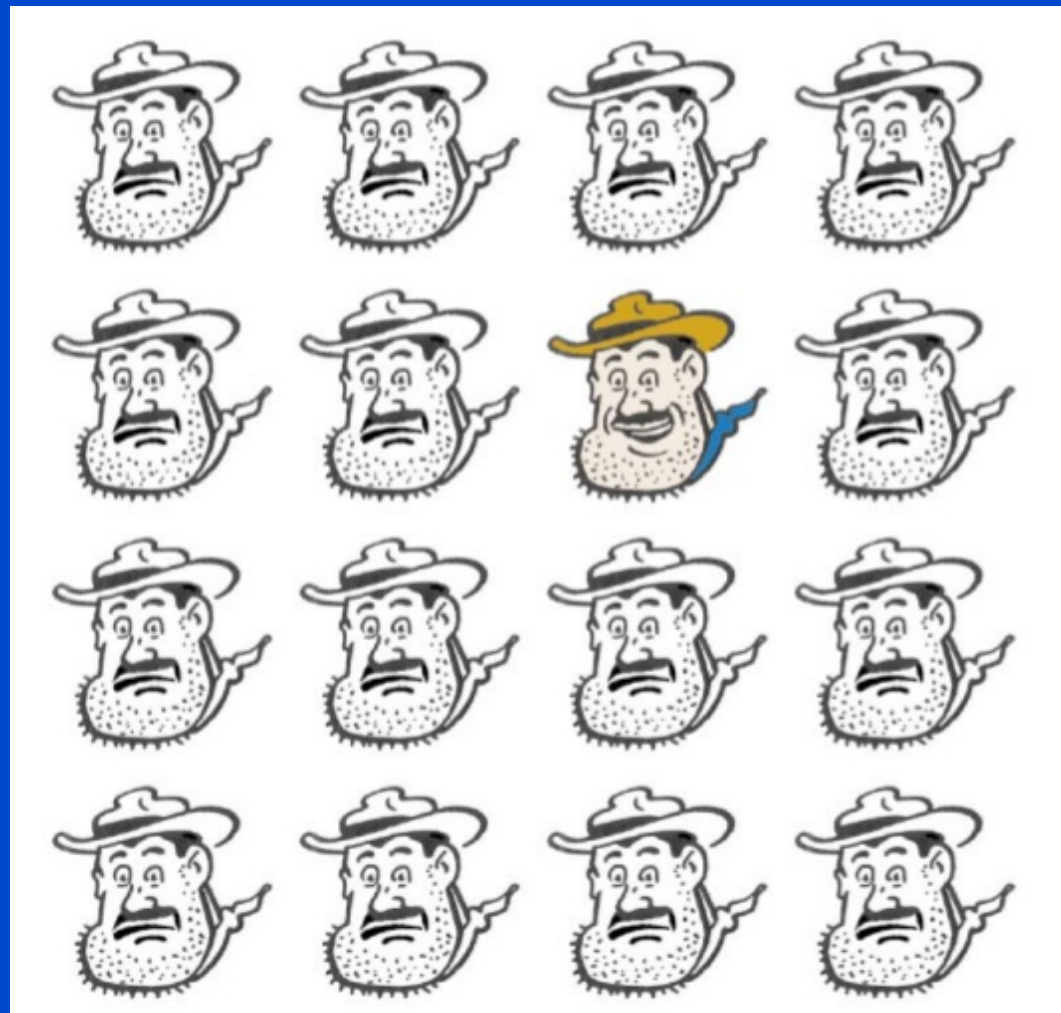
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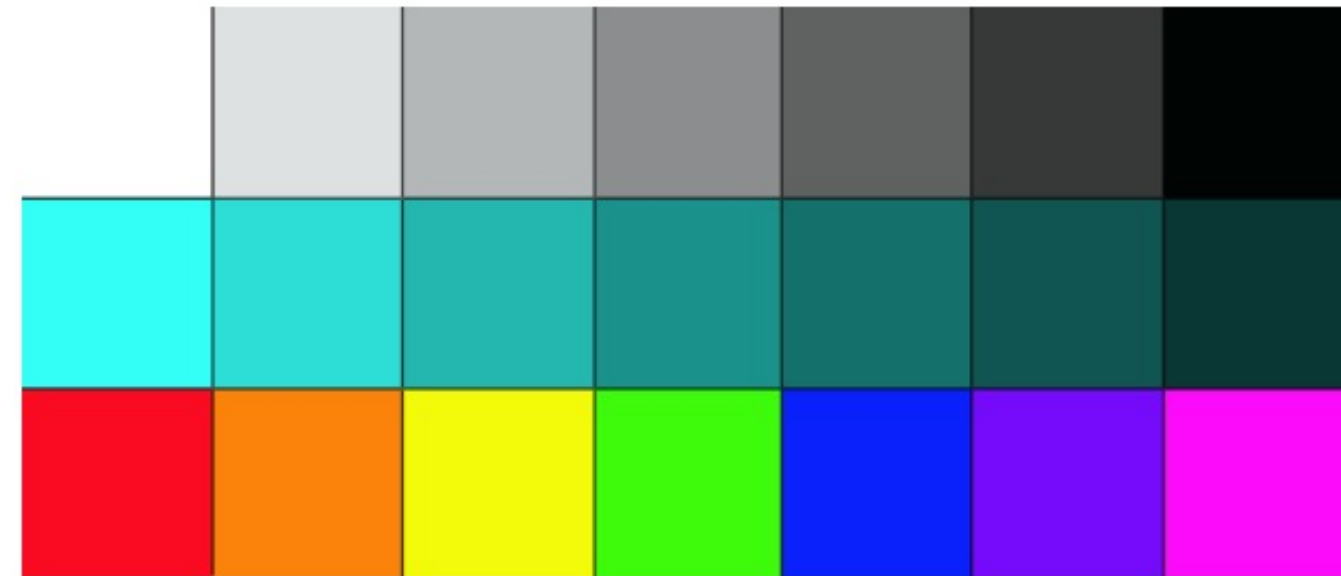
Macdonald, 1999; Li, 2013

# Colours in Visualization



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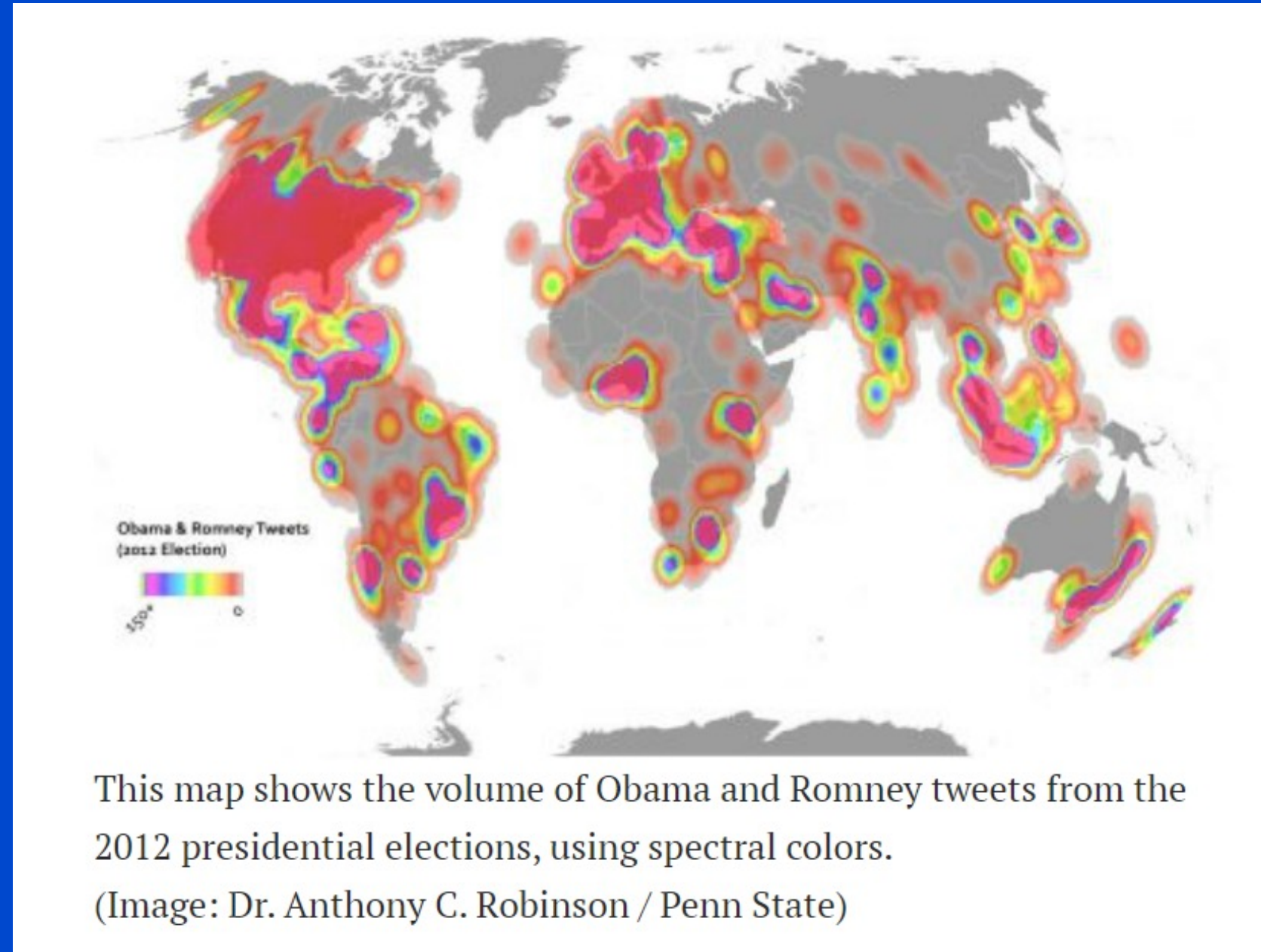
# Colours in Visualization



## *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

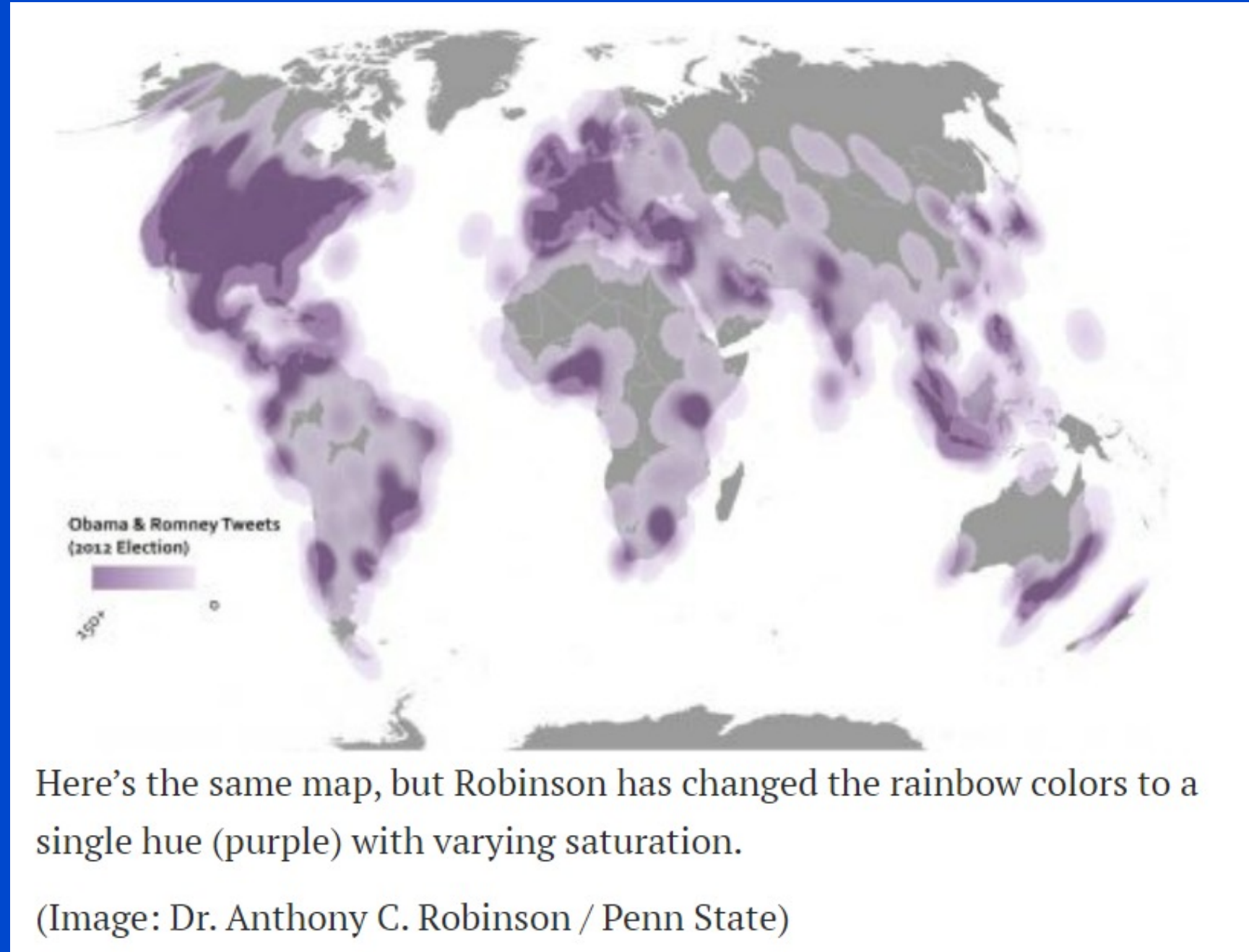




This map shows the volume of Obama and Romney tweets from the 2012 presidential elections, using spectral colors.

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



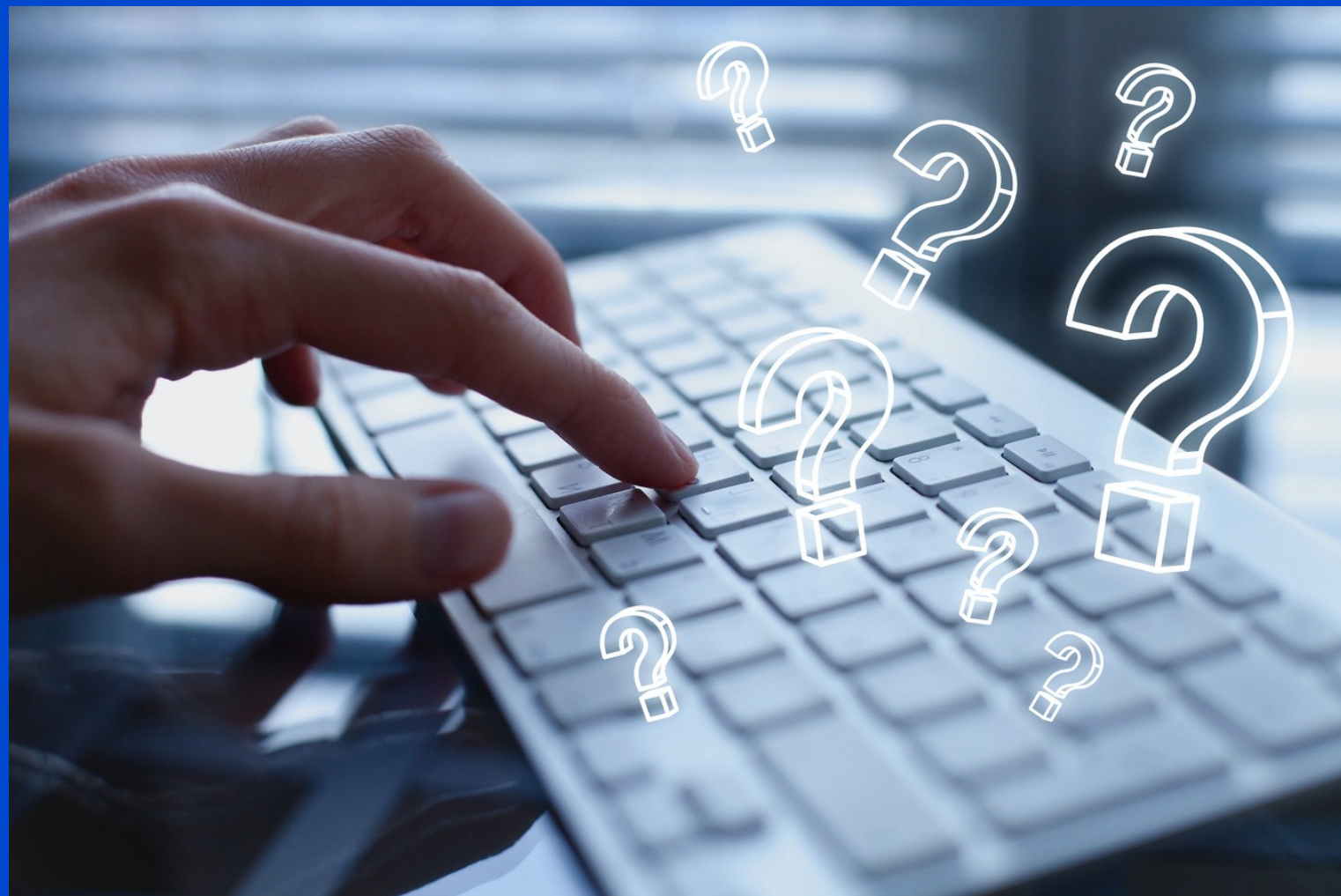


Here's the same map, but Robinson has changed the rainbow colors to a single hue (purple) with varying saturation.

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



# Interactivity in Data Visualization



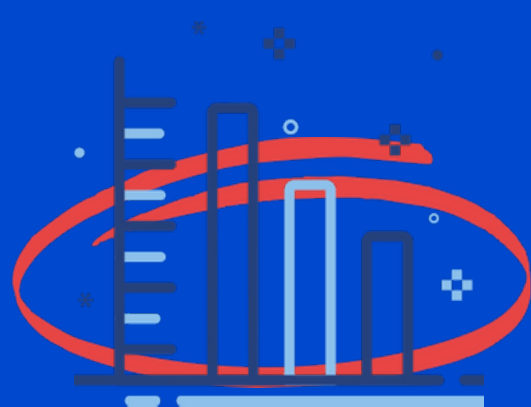
## *Importance*

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



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

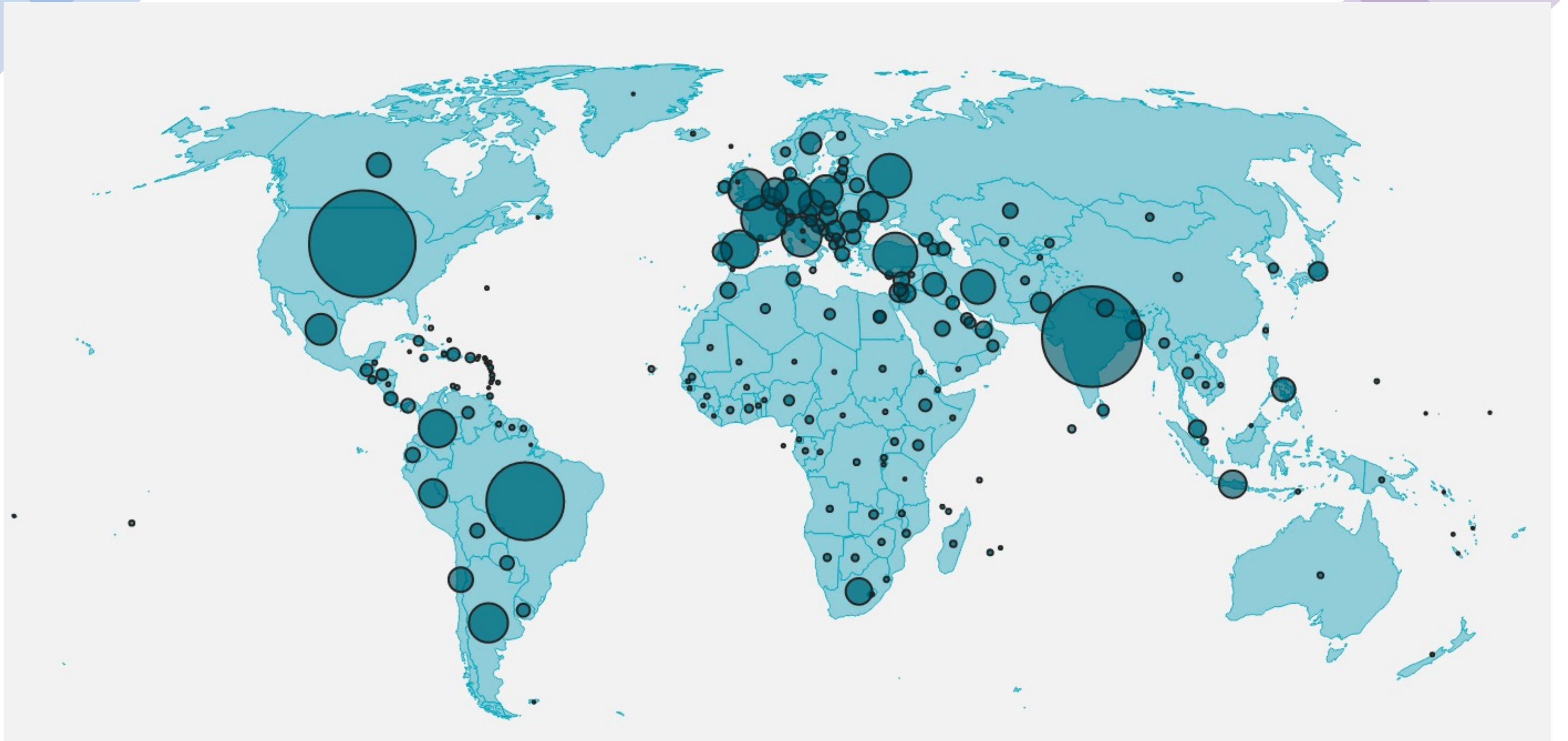
# Interactivity in Data Visualization



## *Practicality*

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

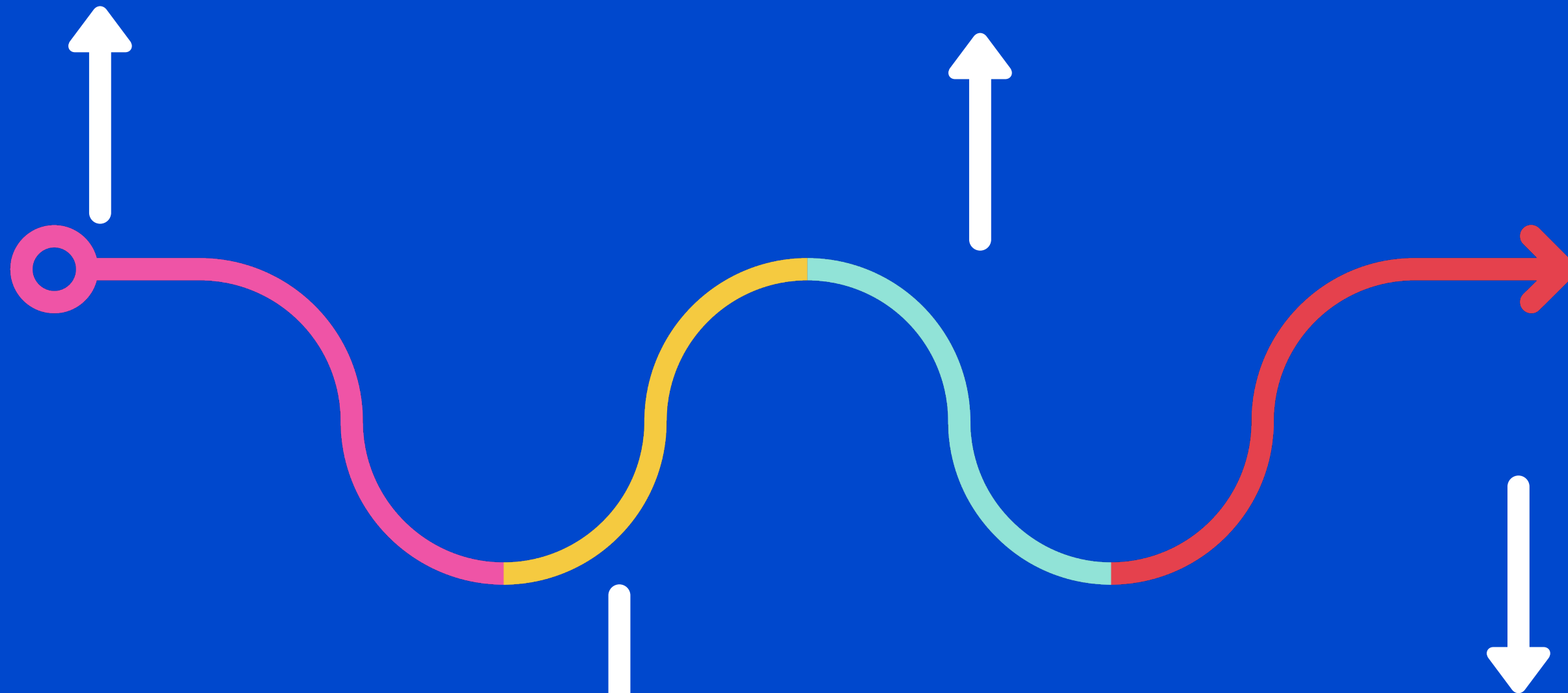






importance

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

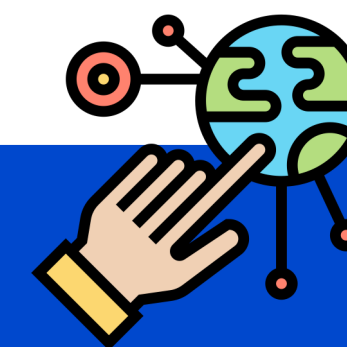
No Colour +  
Interactive



Colour  
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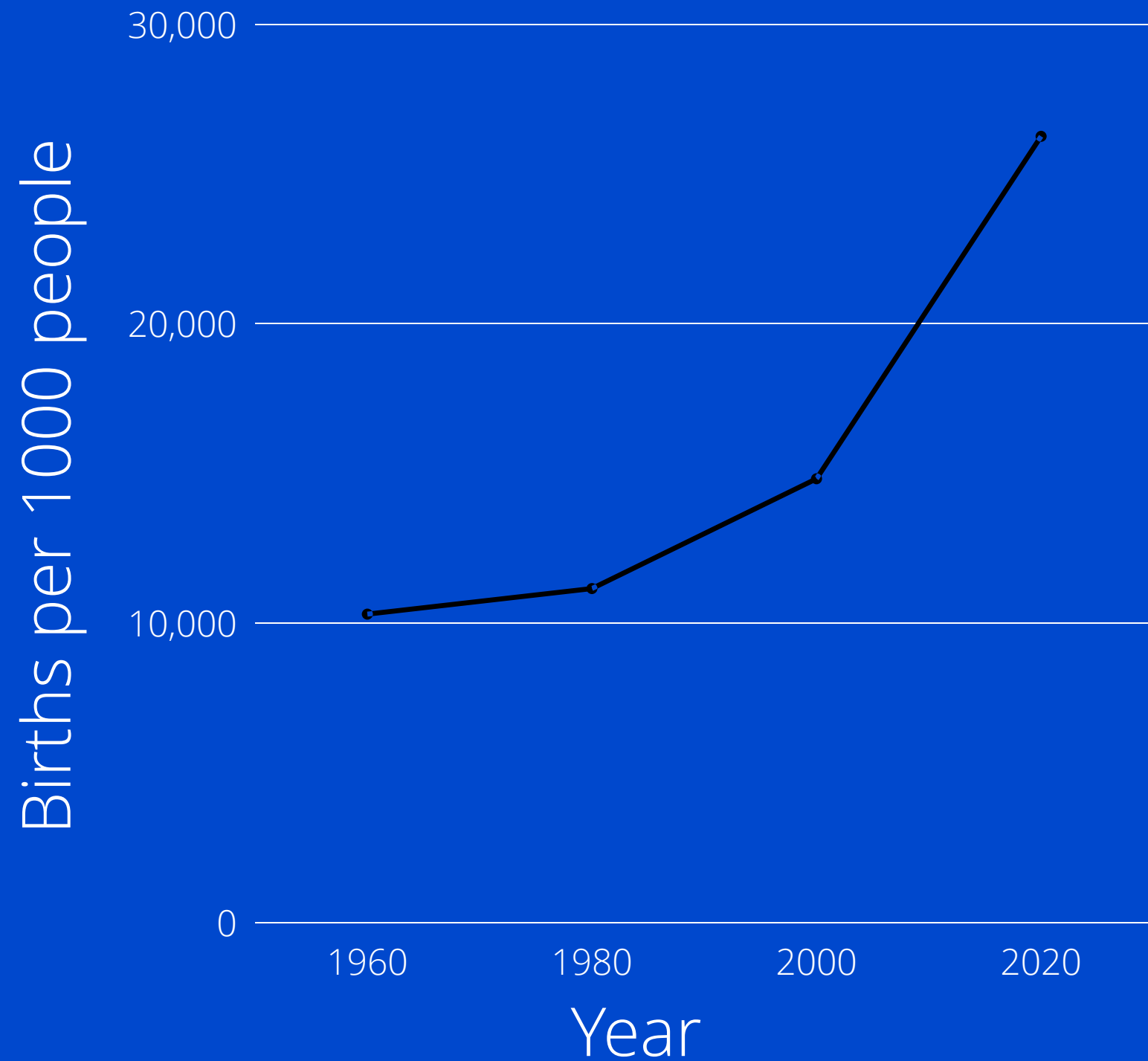


Colour +  
Interactive

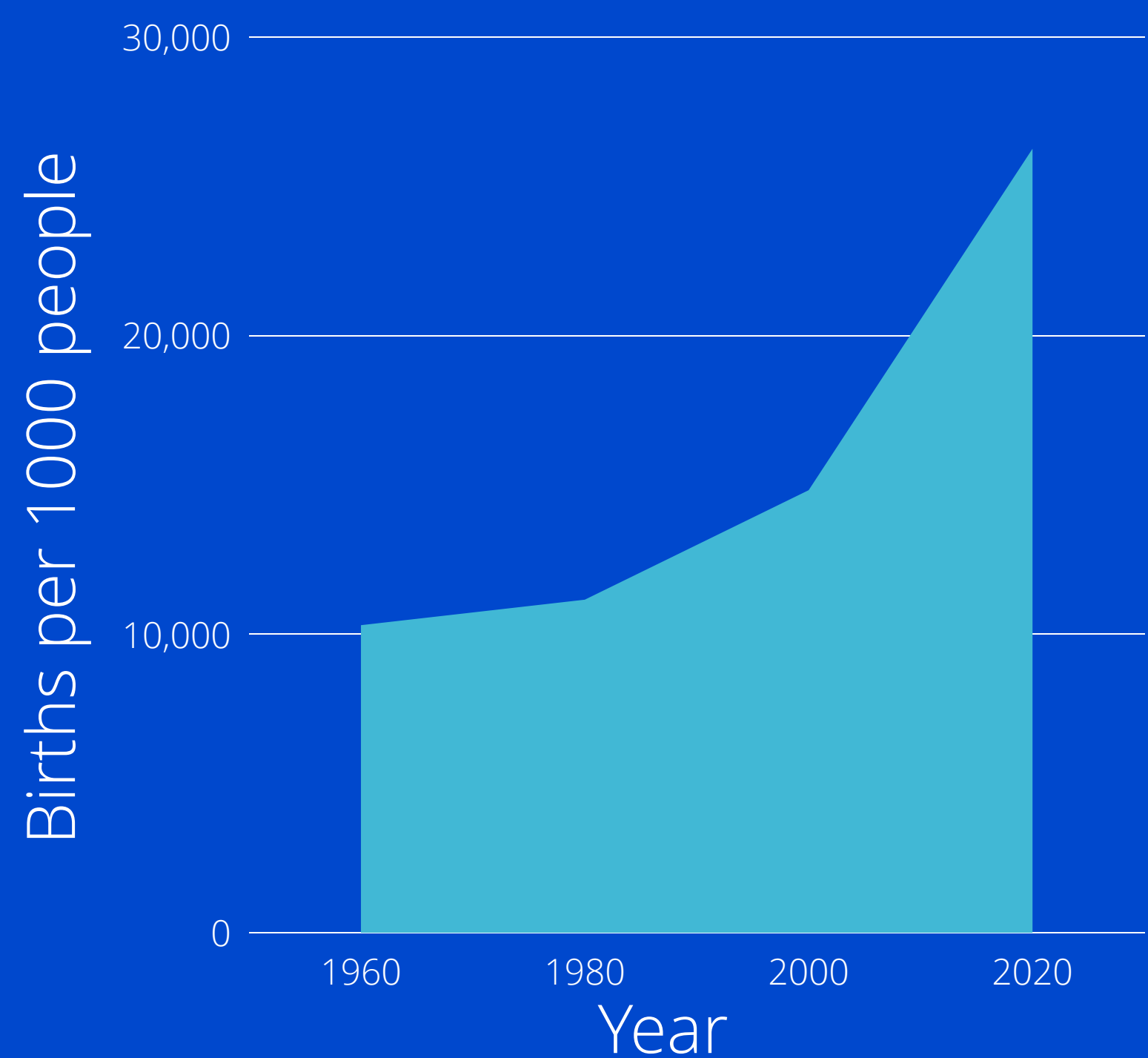


# Method: no colour vs. colour

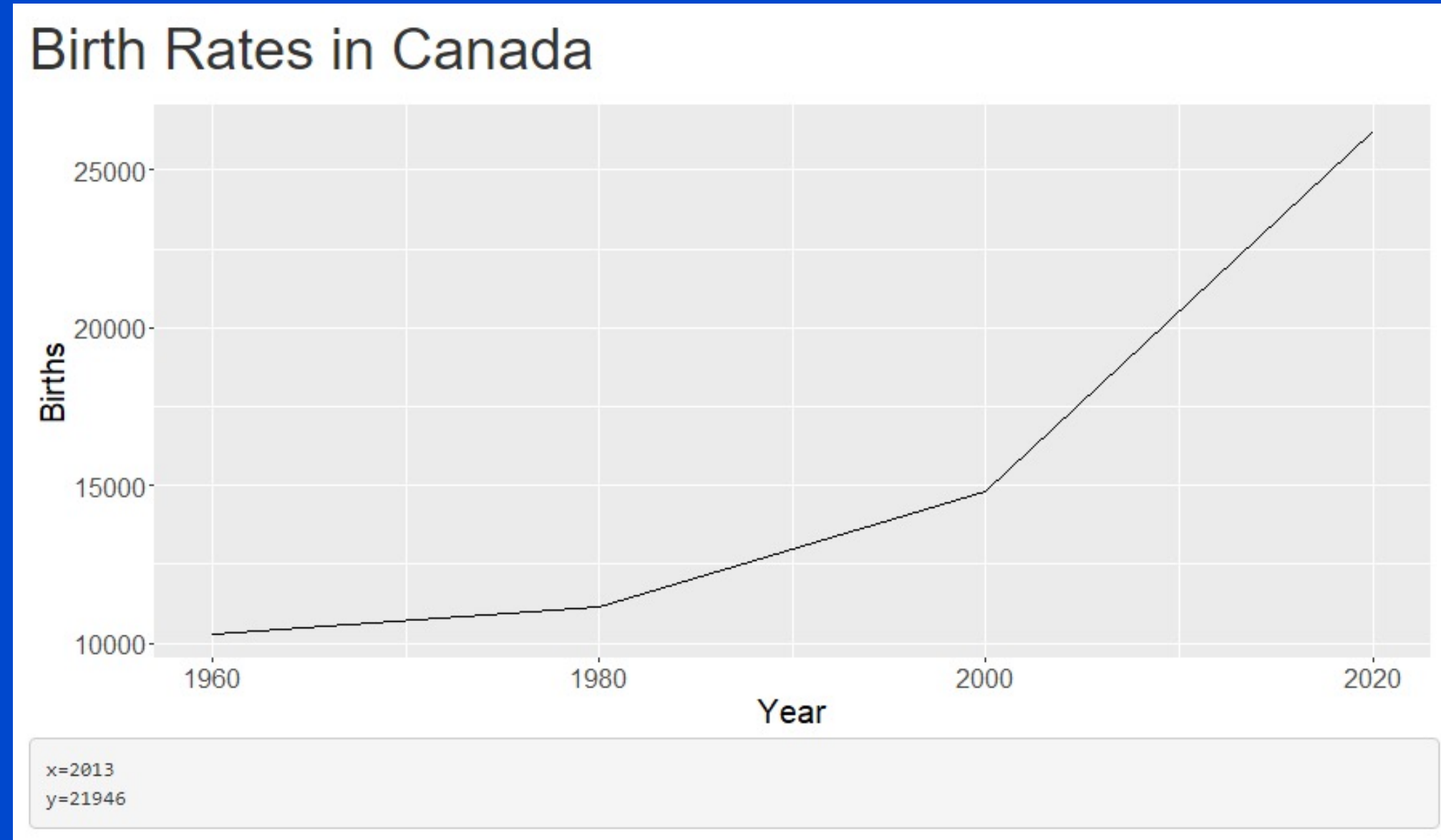
Black And White + Not Interactive



Colour+ Not Interactive



# Method: static vs. interactive





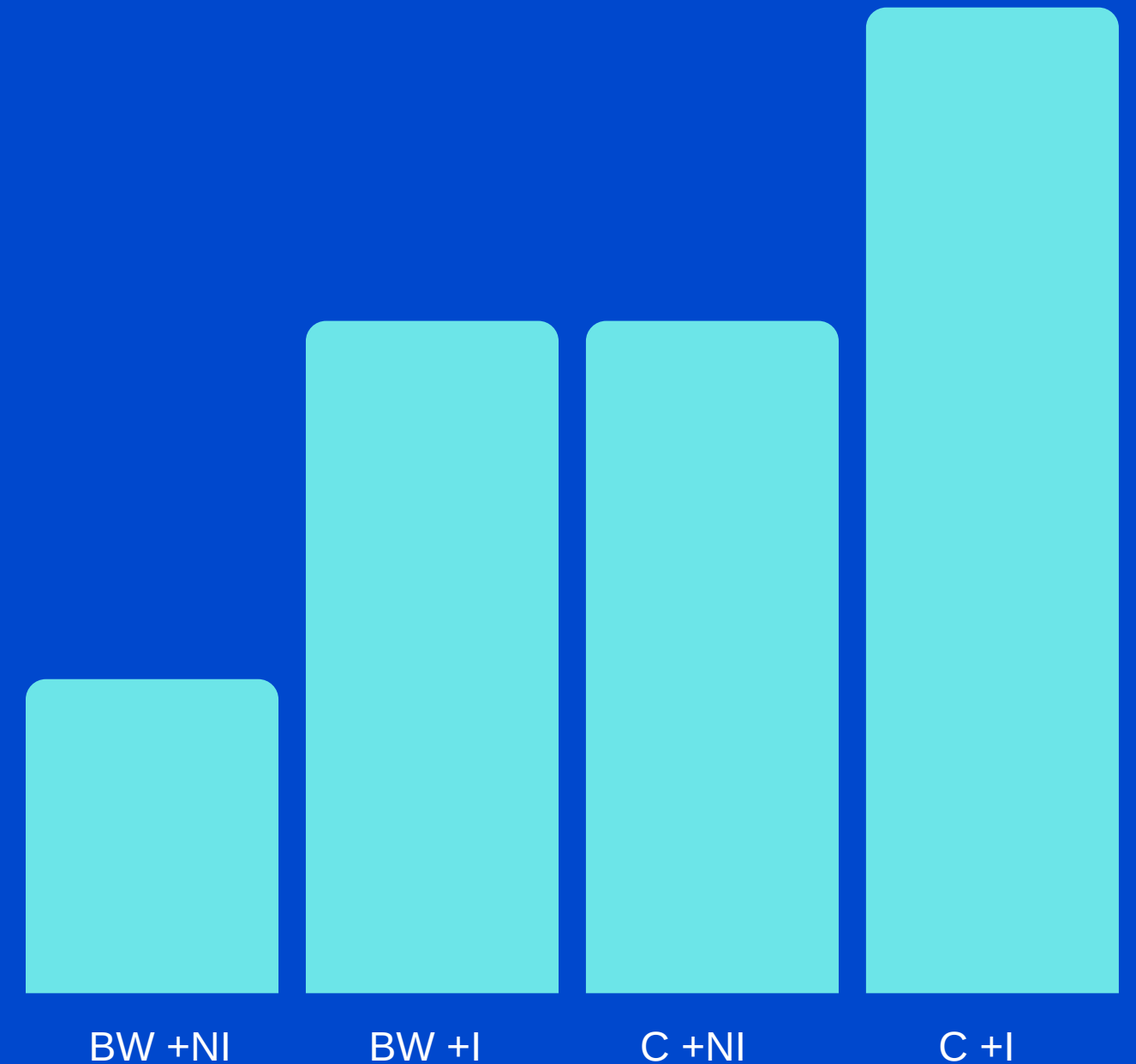
# Expected Results

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)

accuracy

thought-provoking  
incommunicable **simple** misleading  
snapshot  
informative **helpful** clear  
intimidating  
oversimplified **interesting** skip  
daunting **useful**  
publishable highlights  
over complicated

compelling

Thank You!

