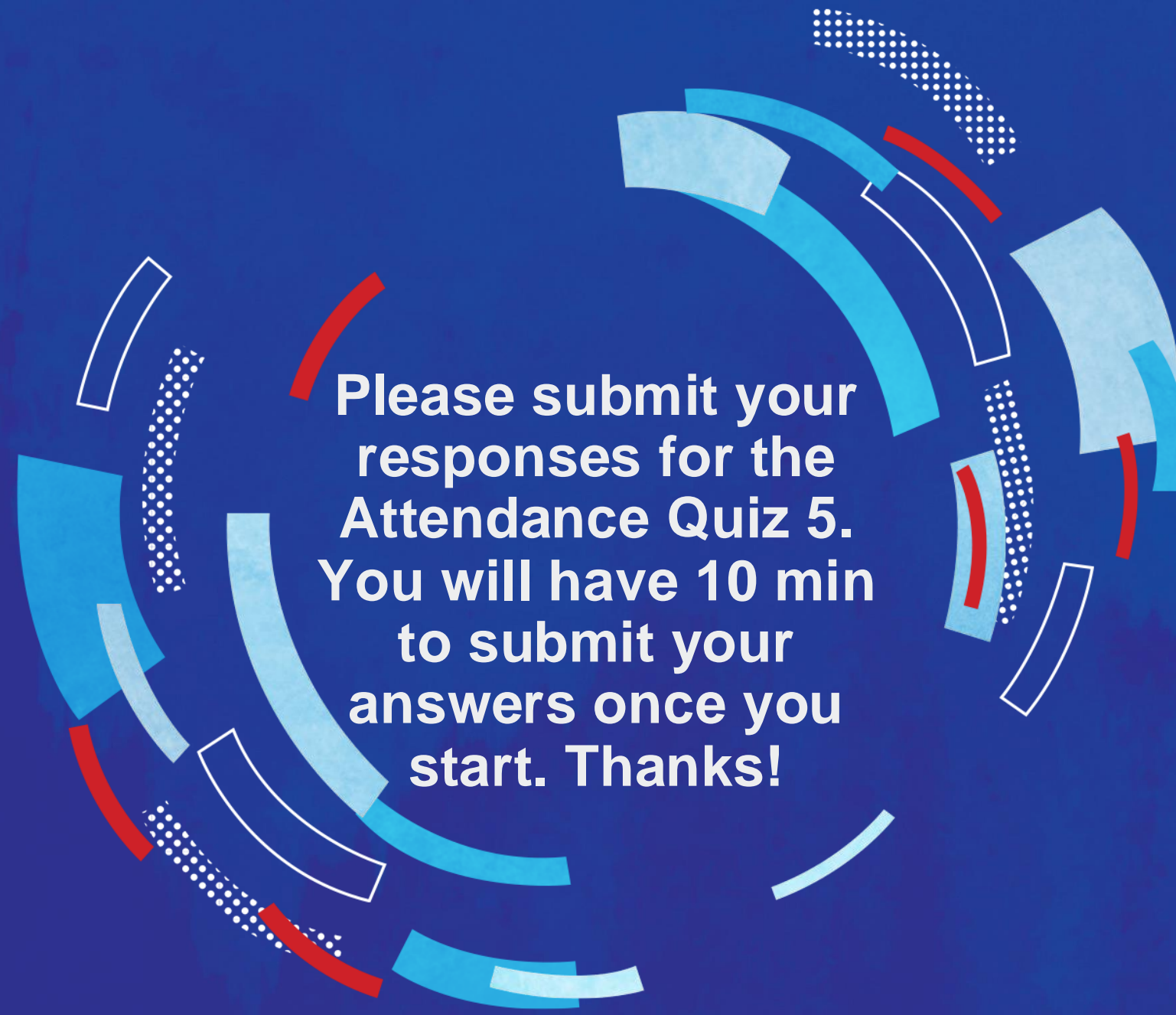




We're starting soon



**Please submit your
responses for the
Attendance Quiz 5.
You will have 10 min
to submit your
answers once you
start. Thanks!**

MSA 8030 – Communicating with Data

Mark Jack mark.a.jack@gmail.com

November 19, 2024



Week 5 – Team Presentations: Present Your Pitch Class Discussions: How To Tell A Great Story With Data

Mark Jack mark.a.jack@gmail.com

November 19, 2024

Course Resources

Recommended textbook:

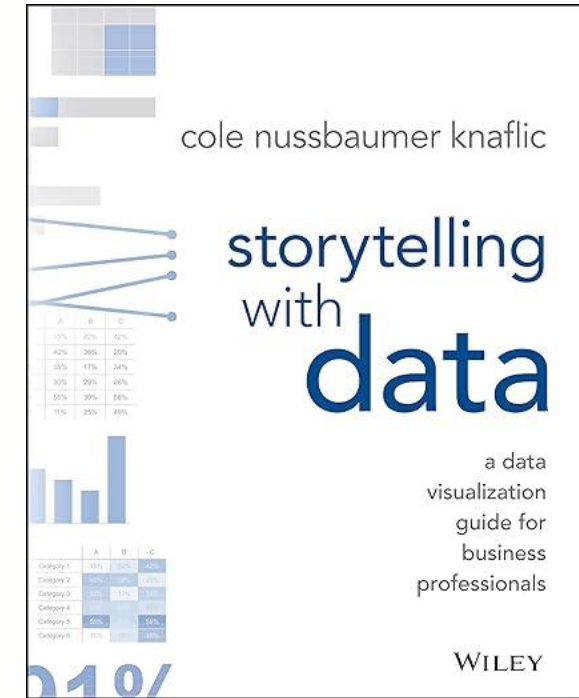
story telling with data - a data visualization guide for business professionals, 1st edition


by Cole Nussbaumer Knaflic ([Wiley](#))

Github site:

CommunicatingWithData

<https://github.com/mjgrav2001/CommunicatingWithData>





It is 12:10 p.m.

Let's start
the Team Presentations

...

Team Presentations (45 min)

Team 1 – Water Potability of Plants dataset

Team 2 – Fossil dataset

Team 3 – U.S. Airbnb Open dataset

Team 4 – U.S. Airbnb Open dataset

Team 5 – Flywise dataset

Team 6 – Flywise dataset

Team 7 – Vehicle Sales dataset

(presentations in no particular order!)



5 min Break

**We will be back
at 1:00 p.m.**

Lecture 1 (30 min): How To Tell A Great Story With Data

What is a data story?

A data story is a narrative constructed around a set of data that puts it into context and frames the broader implications.

Unlike [business intelligence](#) or data science that emphasizes the technical task of turning data into insights, a data story brings these insights together with qualitative analysis and domain expertise to better understand a relevant business goal or objective.

What is data storytelling?

Data storytelling is the skill to craft the narrative by leveraging data, which is then contextualized, and finally presented to an audience.

It utilizes not only data analysis and statistics, but also [data visualization](#), qualitative and contextual analysis, and presentation.

Lecture 1 (30 min): How To Tell A Great Story With Data

The Psychological Power of Storytelling:

- The **brain's preference for stories over pure data** stems from the fact that it takes in so much information every day and needs to determine what's important to process and remember and what can be discarded.
- When **multiple areas of the brain are engaged**, the hippocampus—which stores short-term memories—is more likely to convert the experience of hearing a story into a long-term memory.
- Rather than presenting your team with a spreadsheet of data and rattling off numbers, consider how you can **engage multiple parts of their brains**.
- Using data storytelling, you can evoke an **emotional response on a neural level** that can help your points be remembered and acted upon.

Lecture 1 (30 min): How To Tell A Great Story With Data

There are **three key components** to data storytelling:

- 1. Data:** Thorough analysis of accurate, complete data serves as the foundation of your data story. Analyzing data using [descriptive](#), [diagnostic](#), [predictive](#), and [prescriptive](#) analysis can enable you to understand its full picture.
- 2. Narrative:** A verbal or written narrative, also called a storyline, is used to communicate insights gleaned from data, the context surrounding it, and actions you recommend and aim to inspire in your audience.
- 3. Visualizations:** [Visual representations](#) of your data and narrative can be useful for communicating its story clearly and memorably. These can be charts, graphs, diagrams, pictures, or videos.

Lecture 1 (30 min): How To Tell A Great Story With Data

Descriptive analytics: Answers the question, “What happened?”

Diagnostic analytics: Answers the question, “Why did this happen?”

Predictive analytics: Answers the question, “What might happen in the future?”

Prescriptive analytics: Answers the question, “What should we do next?”

Lecture 1 (30 min): How To Tell A Great Story With Data

How to Craft A Compelling Narrative:

Characters: The 'players' (= data science team) and the stakeholders.

Setting: Set the scene – describe the situation.

Conflict: Describe the root issue of the problem.

Resolution: Propose your solution.

Tips for an Effective Data Story:

Visuals are necessary - Relevance is key - Data must be timely - Use data ethically - Create a clear narrative

Lecture 1 (30 min): How To Tell A Great Story With Data

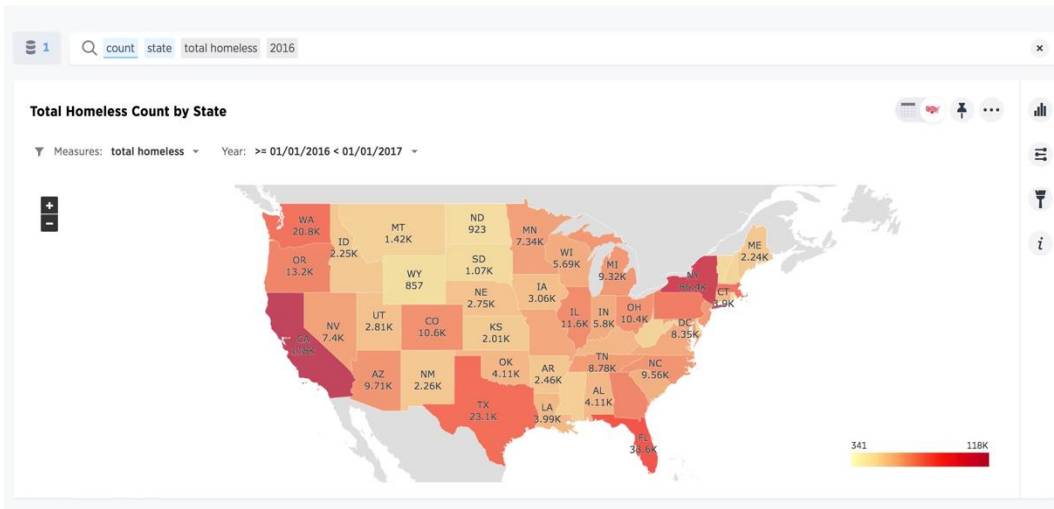
How to Tell a Story with Data:

1. Find the story within the data => **look for correlations, causal links in your data**
2. Consider your audience => **who is your audience, what are their backgrounds?**
3. Determine what data matters => **select the data that can inform the topics to explore**
4. Analyze data and find insights => **create meaning out of data**
5. Identify the most effective data visualizations => **simple is better!**
6. Provide context => **include domain expertise on the business problem**
7. Structure your story => **create tension with a problem and a resolution**
8. Edit until the story is clear and concise => **focus on what really matters, remove clutter**

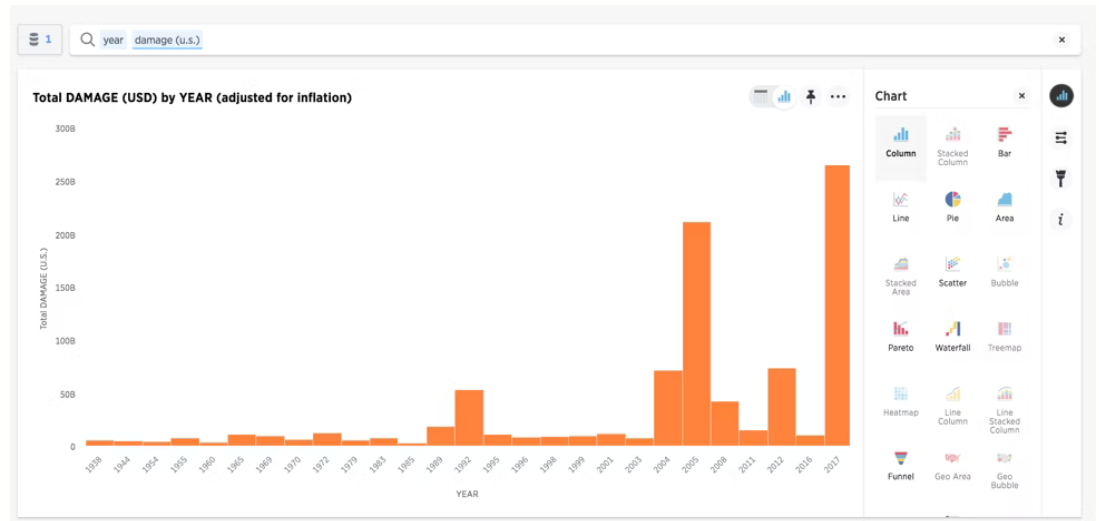
Lecture 1 (30 min): How To Tell A Great Story With Data

Examples of Data Story Telling:

Manisha Verma,
**Homelessness in America:
A Story in 10 Charts,**
<https://www.thoughtspot.com/blog/homelessness-america-story-10-charts>



Ryan Mattison, **Are Hurricanes Getting Worse? A Story Told in 7 Charts,**
<https://www.thoughtspot.com/blog/are-hurricanes-getting-worse-story-told-7-hurricane-strength-charts-thoughtspot>



Lecture 1 (30 min): How To Tell A Great Story With Data

Communicate the Need for Action (to Your Stakeholders):

- Data storytelling can help turn data insights into action.
- Without effective communication, insights can go unnoticed or unremembered by your audience.
- Both hard and soft skills are crucial for leveraging data to its fullest potential.



2 min Break

**We will be back
at 1:30 p.m.**

Group Activity (30 min): How To Tell A Great Story With Data

Brainstorm as a team on how to organize your data story telling:

Discuss and plan out the 7 components of your story:

1. Find the story within the data.
2. Consider your audience.
3. Determine what data matters.
4. Analyze data and find insights.
5. Identify the most effective data visualizations.
6. Provide context.
7. Structure your story.



2 min Break

**We will be back
at 2 p.m.**

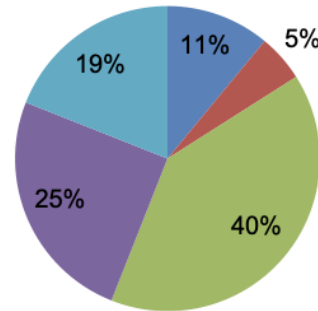
Lecture 2 (30 min): Storytelling With Data – Case Studies

FIG0928

Survey results: summer learning program on science

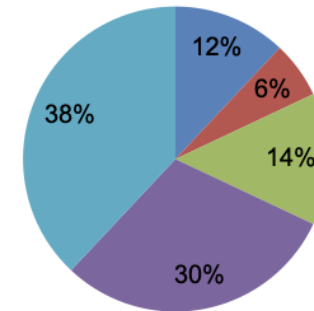
PRE: How do you feel about doing science?

■ Bored ■ Not great ■ OK ■ Kind of interested ■ Excited



POST: How do you feel about doing science?

■ Bored ■ Not great ■ OK ■ Kind of interested ■ Excited



Lecture 2 (30 min): Storytelling With Data – Case Studies

FIG0929

Pilot program was a success

After the pilot program,

68%

of kids expressed interest towards science,
compared to 44% going into the program.

Based on survey of 100 students conducted before and after pilot program (100% response rate on both surveys).

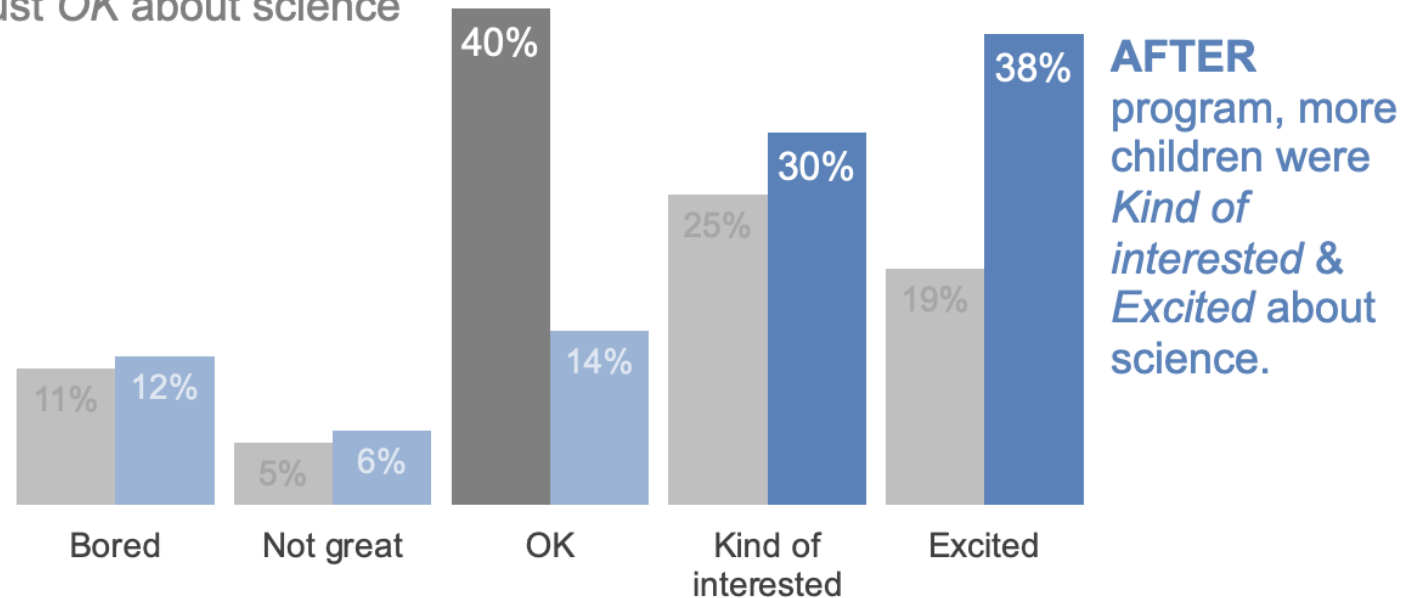
Lecture 2 (30 min): Storytelling With Data – Case Studies

FIG0930

Pilot program was a success

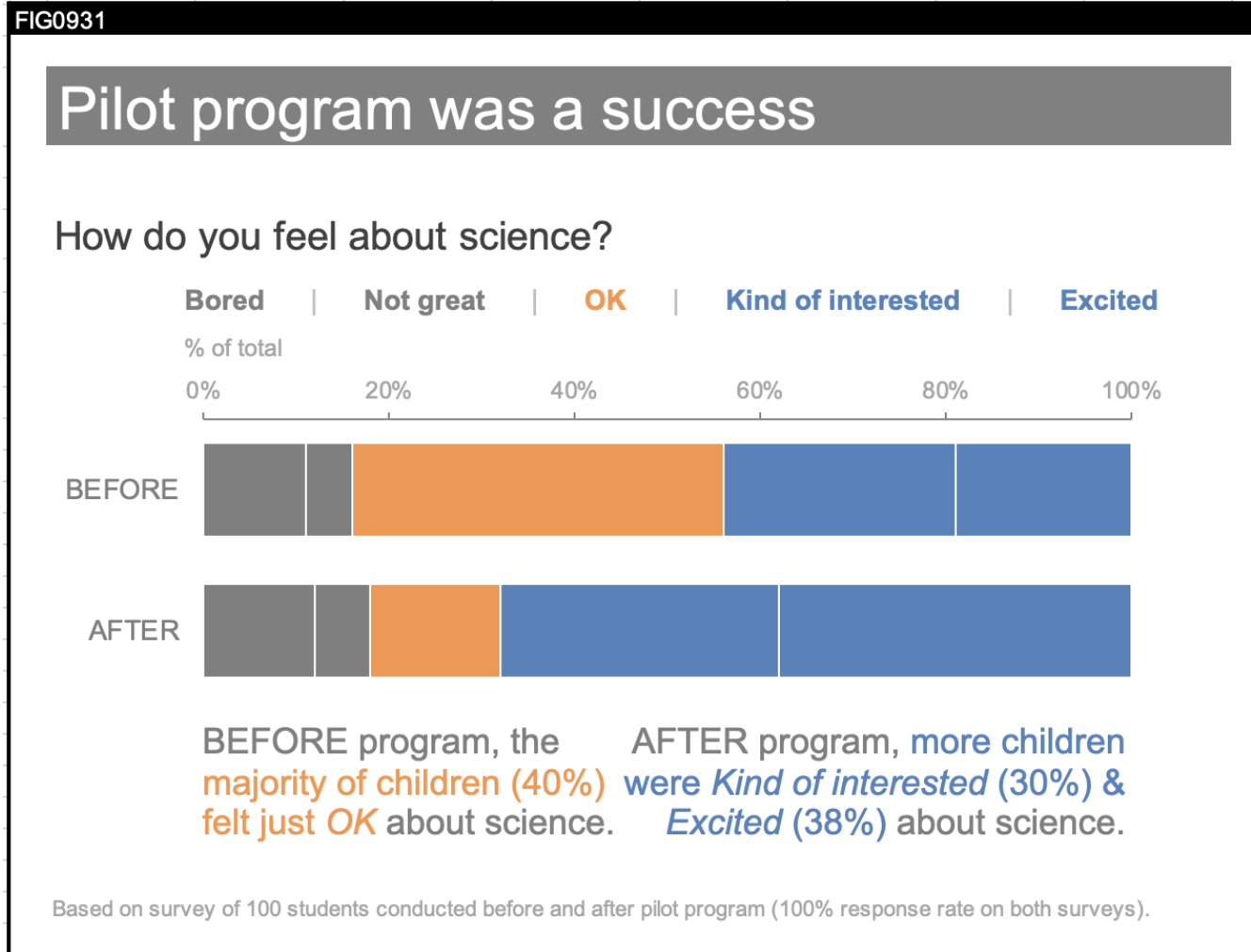
How do you feel about science?

BEFORE program, the majority of children felt just *OK* about science



Based on survey of 100 students conducted before and after pilot program (100% response rate on both surveys).

Lecture 2 (30 min): Storytelling With Data – Case Studies

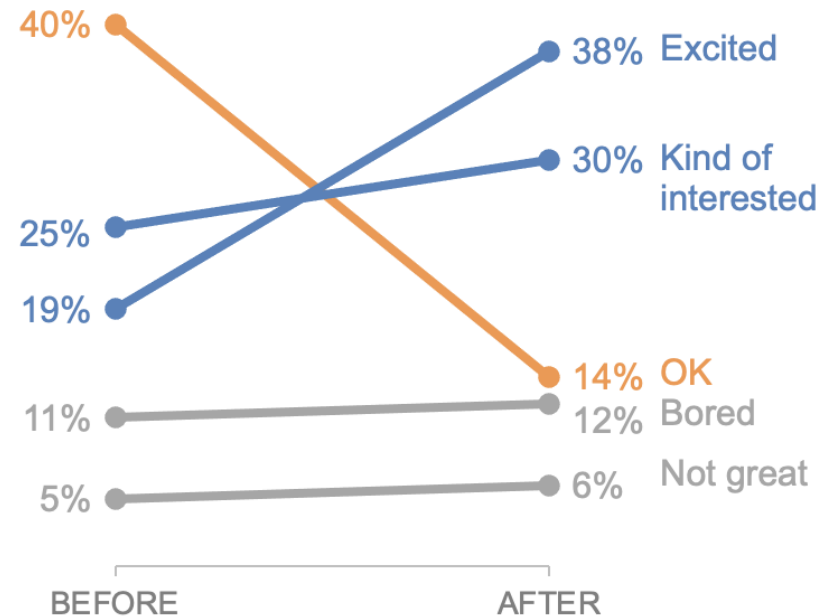


Lecture 2 (30 min): Storytelling With Data – Case Studies

FIG0932

Pilot program was a success

How do you feel about science?



BEFORE program, the majority of children felt just *OK* about science

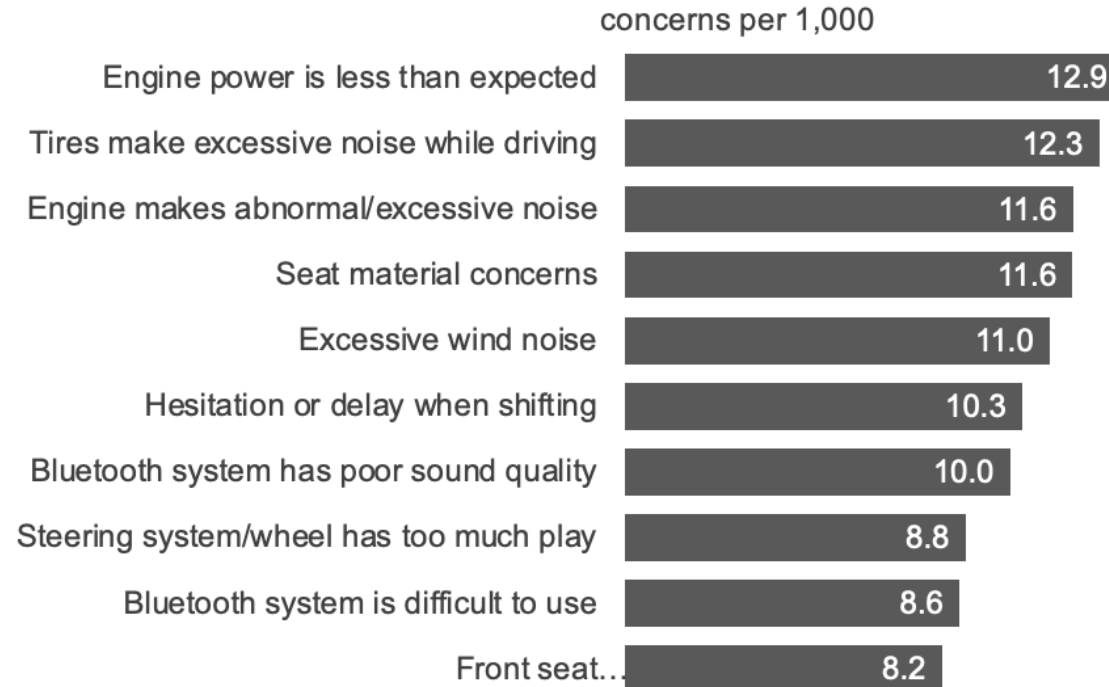
AFTER program, more children were *Kind of interested & Excited* about science.

Based on survey of 100 students conducted before and after pilot program (100% response rate on both surveys).

Lecture 2 (30 min): Storytelling With Data – Case Studies

FIG0407

Top 10 design concerns



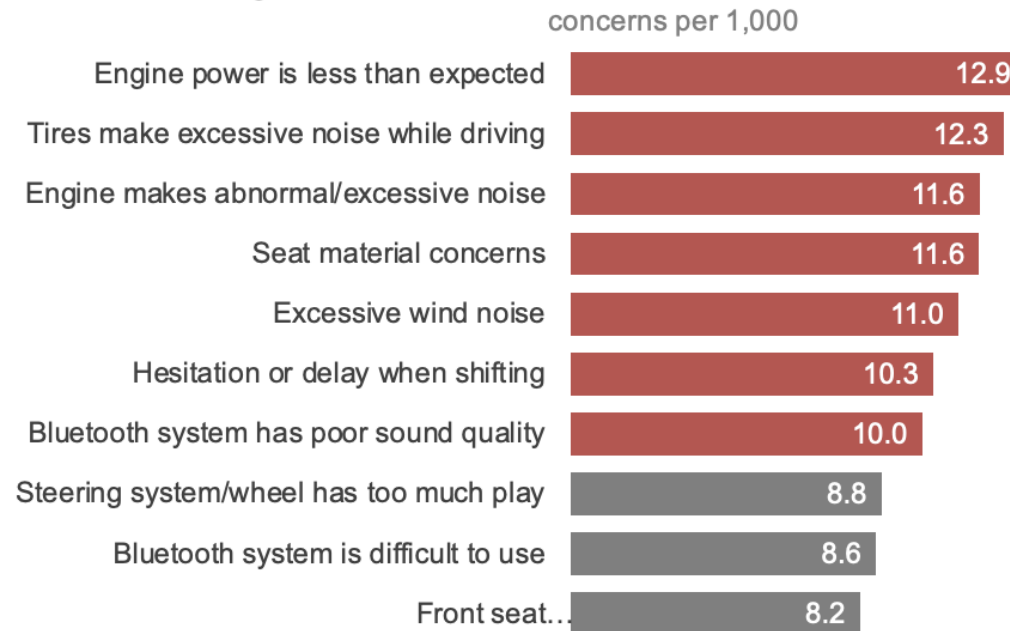
Lecture 2 (30 min): Storytelling With Data – Case Studies

FIG0408

7 of the top 10 design concerns have 10 or more concerns per 1,000.

Discussion: is this an acceptable default rate?

Top 10 design concerns

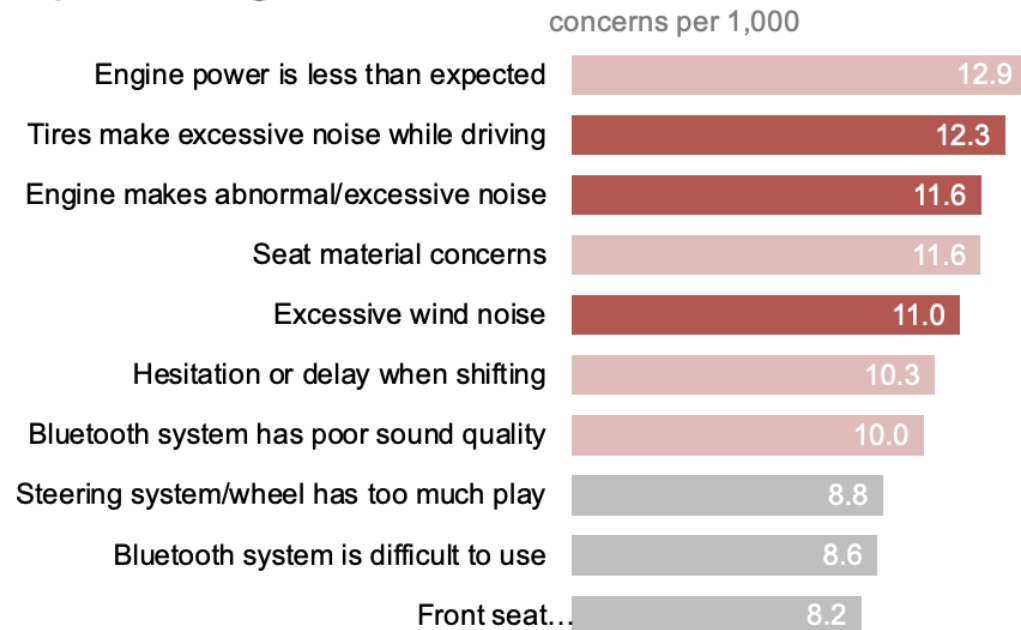


Lecture 2 (30 min): Storytelling With Data – Case Studies

FIG0409

Of the top design concerns, three are noise-related.

Top 10 design concerns

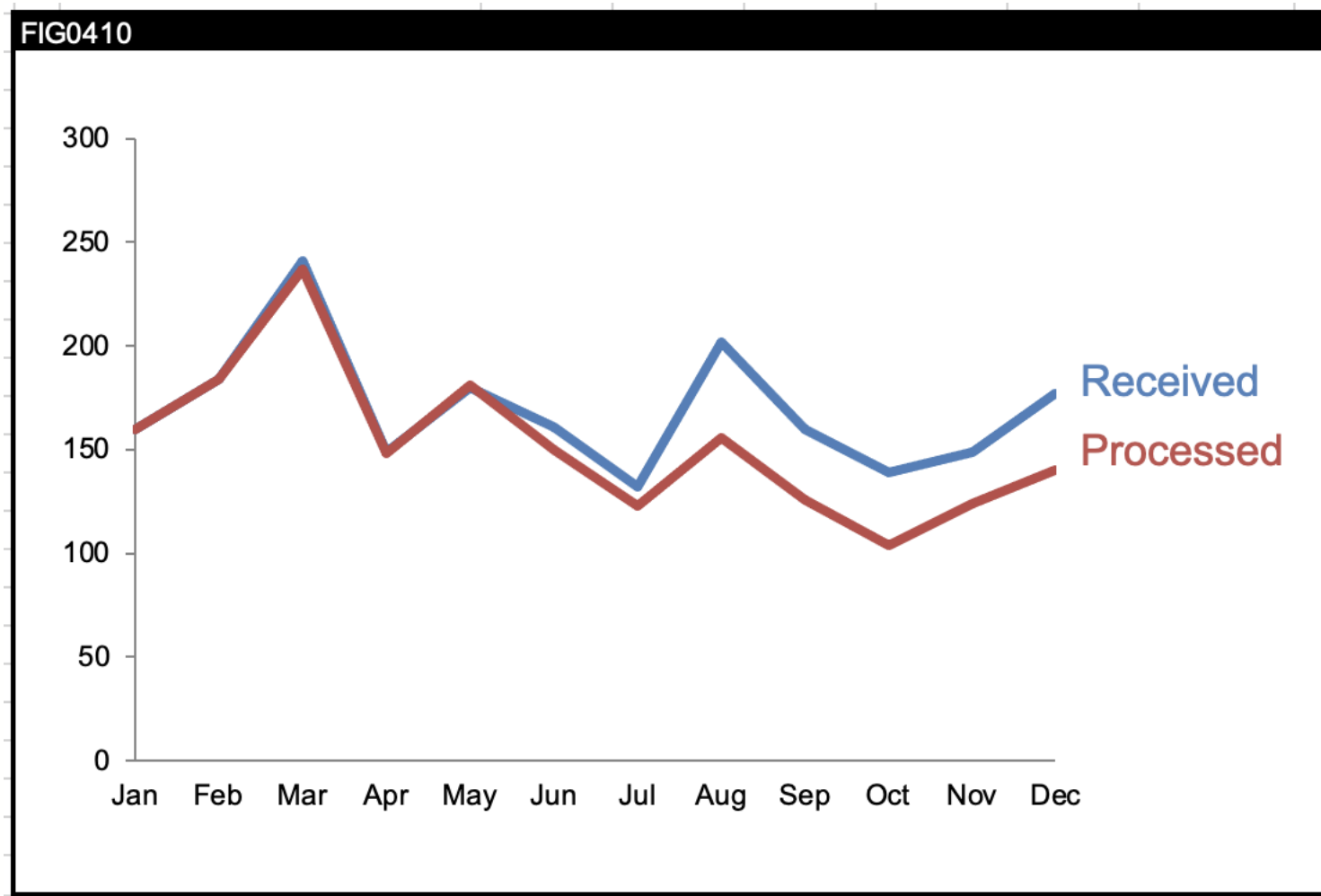


Comments indicate that **noisy tire issues** are most apparent **in the rain**.

Complaints about **engine noise** commonly cited **after the car had not been driven for a while**.

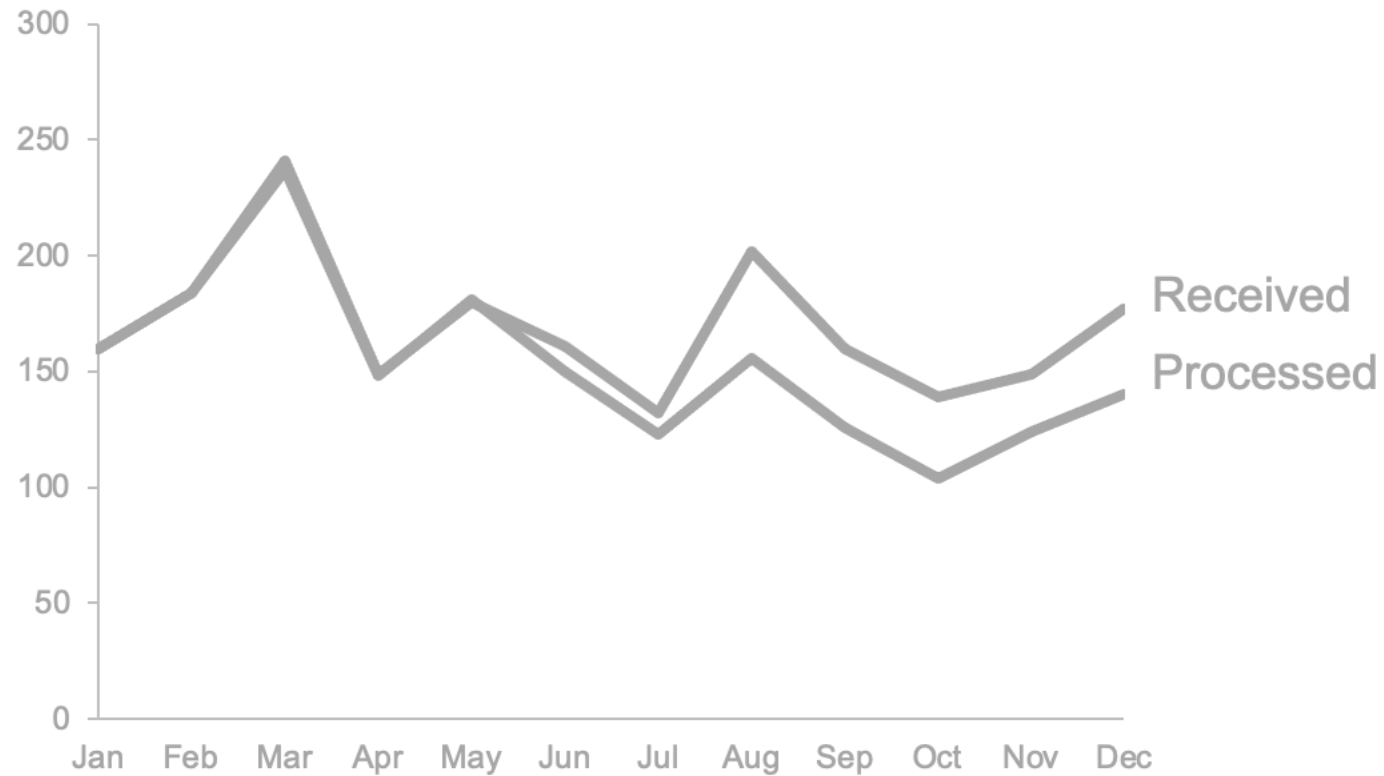
Excessive **wind noise** is noted primarily in **freeway driving at high speeds**.

Lecture 2 (30 min): Storytelling With Data – Case Studies

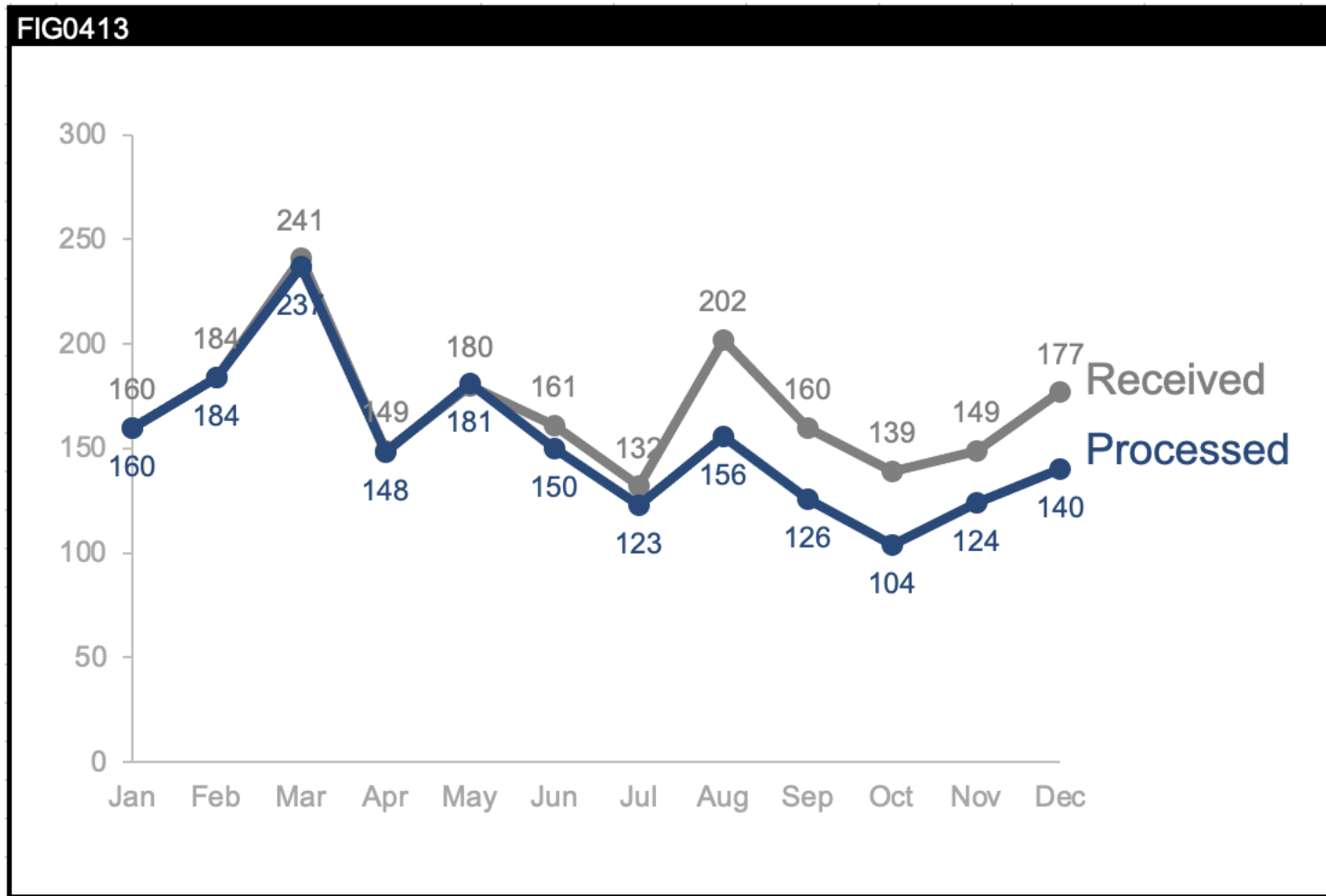


Lecture 2 (30 min): Storytelling With Data – Case Studies

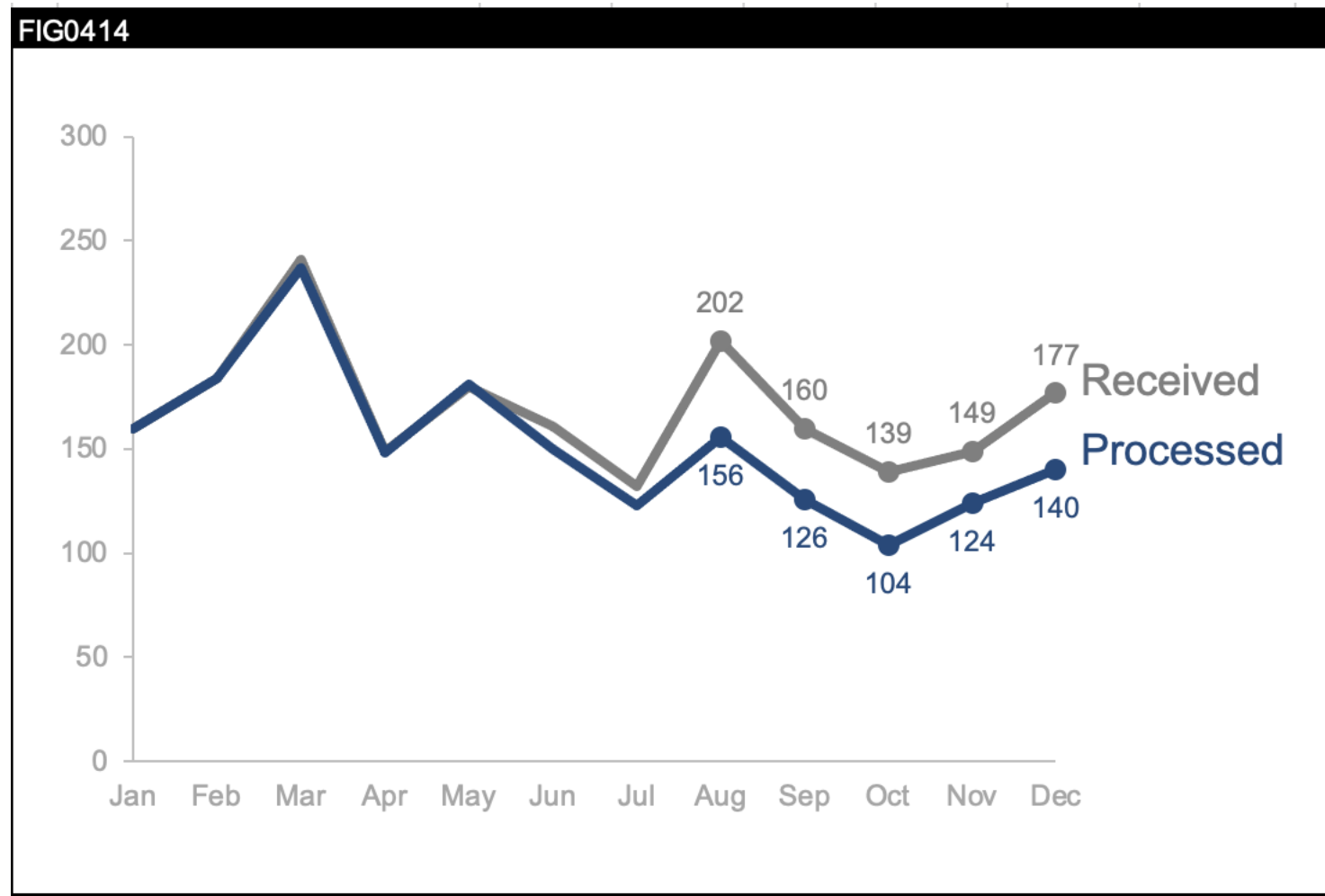
FIG0411



Lecture 2 (30 min): Storytelling With Data – Case Studies



Lecture 2 (30 min): Storytelling With Data – Case Studies



Lecture 2 (30 min): Storytelling With Data – Case Studies

FIG0415

Country Level Sales Rank Top 5 Drugs

Rainbow distribution in color indicates sales rank in given country from #1 (red) to #10 or higher (dark purple)

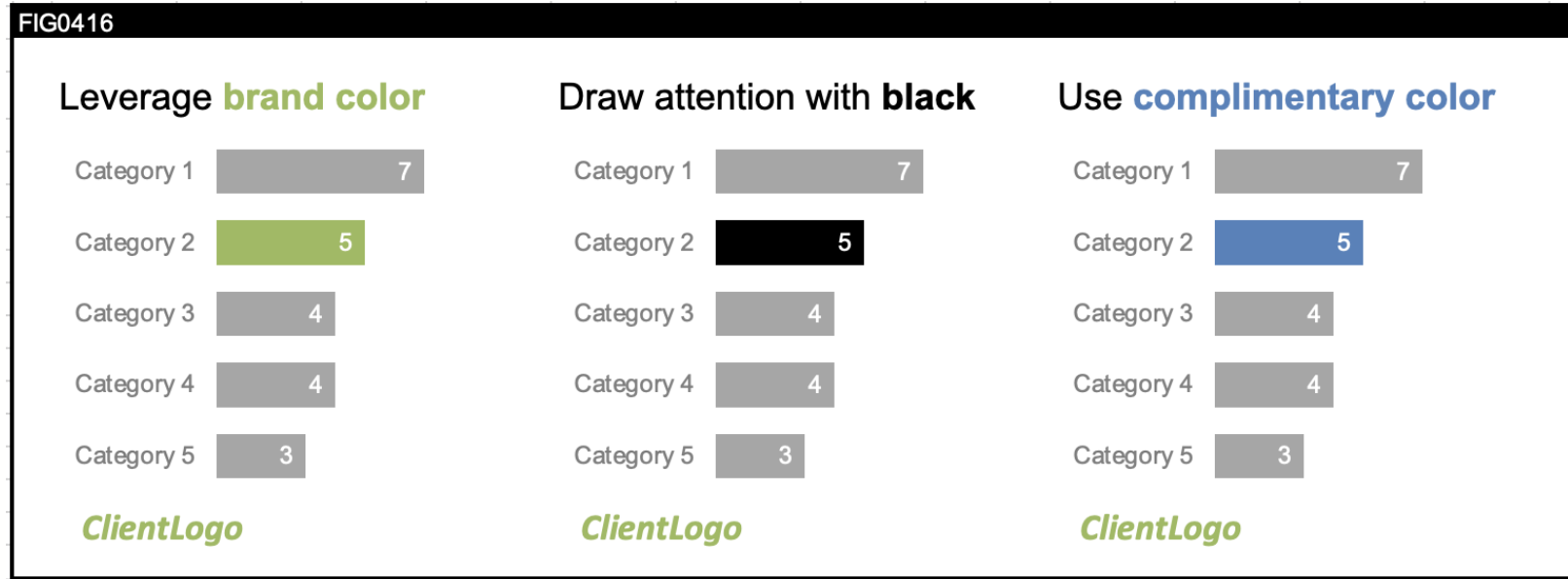
Country	A	B	C	D	E
AUS	1	2	3	6	7
BRA	1	3	4	5	6
CAN	2	3	6	12	8
CHI	1	2	8	4	7
FRA	3	2	4	8	10
GER	3	1	6	5	4
IND	4	1	8	10	5
ITA	2	4	10	9	8
MEX	1	5	4	6	3
RUS	4	3	7	9	12
SPA	2	3	4	5	11
TUR	7	2	3	4	8
UK	1	2	3	6	7
US	1	2	4	3	5

Top 5 drugs: country-level sales rank

RANK 1 2 3 4 5+

COUNTRY DRUG	A	B	C	D	E
Australia	1	2	3	6	7
Brazil	1	3	4	5	6
Canada	2	3	6	12	8
China	1	2	8	4	7
France	3	2	4	8	10
Germany	3	1	6	5	4
India	4	1	8	10	5
Italy	2	4	10	9	8
Mexico	1	5	4	6	3
Russia	4	3	7	9	12
Spain	2	3	4	5	11
Turkey	7	2	3	4	8
United Kingdom	1	2	3	6	7
United States	1	2	4	3	5

Lecture 2 (30 min): Storytelling With Data – Case Studies





Class ends at 2:30 p.m.

Course Schedule

#	Topic and Objectives
1	Intro & Getting Started <ul style="list-style-type: none"> Course Overview (relevance, examples, etc.) Market-Ready-to-do List (MRTDL) by Career Advancement Center Pick a dataset (Datasets will be provided by instructor on first day of class. If you already have formed a team of 4 students to collaborate and work together and want to use your own dataset, this needs to be vetted and approved by the instructor. Examples: something you are working on from another project, Walmart data on Kaggle, synthetic data from Synthea, etc.) Explanation of peer-to-peer evaluation of presentations every week Instruction: Exploratory data analysis Assignment: Prepare 1-minute “describe your dataset” presentation
2	<p>Start with Presentations: (present what was assigned in the previous class)</p> Understand the Business (and core business processes) <ul style="list-style-type: none"> Activity (for a specific case or example business): Describe the business for an example business (inputs, activities, outputs/metrics), develop a simple flowchart, identify opportunities Instruction: Understanding the business problem, extracting the use case(s) Assignment (for your selected business): Prepare 3-minute presentation that describes the business, core business process(es), and opportunities for your selected business
3	<p>Start with Presentations: (present what was assigned in the previous class)</p> Identify a Business Problem (and why it needs to be addressed) <ul style="list-style-type: none"> Activity (for a specific case or example business problem): Developing persuasive arguments; Create tension with a visualization (draft) Instruction: Story telling with data - visualizations Assignment (for your selected business problem): Create a 3-minute “tension” presentation; only 1 visual

Course Schedule

4	<p>Start with Presentations: (present what was assigned in the previous class)</p> <p>Develop a Solution Pitch (for solving the identified business problem)</p> <ul style="list-style-type: none"> • Activity (for an example business problem): Big idea, exec summary, peer review • Instruction: Feasibility study, selection of final use case (big idea) • Assignment (for your selected business problem): Create a 1-minute pitch (includes business overview, tension, and solution)
5	<p>Start with Presentations: (present what was assigned in the previous class)</p> <p>Provide a Progress Update (for an ongoing project)</p> <ul style="list-style-type: none"> • Activity (for your selected solution): Strong visualizations, exploration, status, revisions, issues, lessons learned • Instruction: Data exploration and feedback loops with business stakeholders • Assignment (for your selected solution): Prepare a 5-minute presentation; 5 slides (excluding title slide); 3 visualizations
6	<p>Start with Presentations: (present what was assigned in the previous class)</p> <p>Planning a Final Presentation and Final Report (for a completed project)</p> <ul style="list-style-type: none"> • Activity (for your project): 1st draft of headlines only and main messages per slide; Python Notebook for technical audience and Word document for leadership: clear connections to final presentation, i.e., same structure/order, etc., including a narrative in the final report • Instruction: Technical writing skills • Assignment (for your project): Complete final presentation and reports; 7-minute presentation; 5-7 slides (excluding title slide); appendix if required
7	<p>Final Presentations (and final reports, notebook and Word document) are due</p>