

# Data Storytelling in Assessment:

## A Practical Guide to Narrative Centered Research Design, Visualizations, and Reporting

Jillian Morn, Jackie Belanger



### DATA STORYTELLING

Evidence-based data storytelling is when **evidence of student learning** is used to **support claims** or arguments about improvement and accountability **through stories** to persuade a specific audience.



Image source: Brent Dykes of <https://www.effectivedatastorytelling.com/>

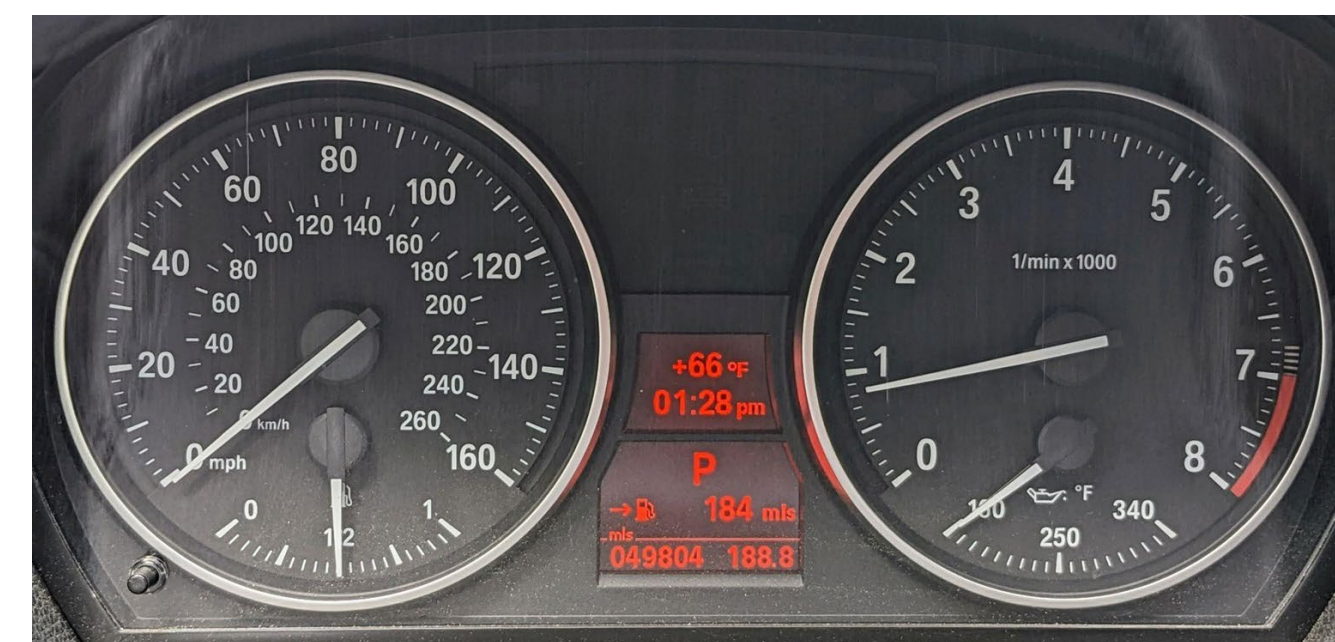
**What stories are you building with your reports?**

### Resources and References

- > **Building a Narrative via Evidence-Based Storytelling: A Toolkit for Practice** NILOA (2019)
- > **The Data Storytelling Workbook** (2020) book by Anna Feigenbaum & Aria Alamalhodaie
- > **DataStory: Explain Data and Inspire Action Through Story** (2019) book by Nancy Duarte
- > **Turning Bad Charts into Compelling Data Stories** (2019) TEDxYouth Talk by Dominic Bohan
- > **The Power in Effective Data Storytelling** (2018) TEDx Talk by Malavica Sridhar
- > **Making Data Mean More Through Storytelling** (2015) TEDx Talk by Ben Wellington
- > **Telling Stories with Data in 3 Steps** (2019) Harvard Business Review video by Scott Berinato

### CONTEXT

Dashboards remain an effective tool for sharing data, supporting transparency, and enabling independent analysis in higher education. However, assessment practitioners are more often called to create data visualizations and reports that compellingly add meaningful plot points to a larger story already in development.



> Like the dashboard of a car, **a well-crafted visualization quickly and easily conveys the vital information** about the story of an event.

- > Compelling narratives can transform **data** into **insight** into **actions** more effectively.
- > And centering data analysis on people rather than data can **support institutional equity goals**.

### COGNITIVE SCIENCE

Limitations of human cognition & data processing: **one chance** to convey complex meaning at a glance.

- > Rapid cognition (Kahneman, 2014)
- > Thin slicing (Gladwell, 2005).

Limitations in **working memory and attention** (Kosslyn, 2006)

Kosslyn's (2006) **maxims of human cognition**:

- > The mind is not a camera- we develop schema influencing what we "see."
- > The mind judges a book by its cover: we need compatibility between data presentation & the message conveyed.
- > The spirit is willing, but the mind is weak- we retain 4 perceptual groups at once → group information into sets of 4

### STEPS TO TAKE

**4 key elements of data storytelling:**

- 1. Evidence:** quantitative or qualitative data
- 2. Stories:** characters, narrative arc, conflict
- 3. Persuasion:** making a case for change
- 4. Audience:** different stories for different audiences

**Key questions when writing a data story:**

- > What **stories** do we need to tell?
- > Who is our **audience** (who needs to hear the stories)?
- > What is the **purpose** of the story?
- > Who are the **characters**? (e.g., students, faculty)
- > What's the **plot/narrative arc**?
- > What **action** should be inspired as a result of the story?

**Good stories have:**

- > A **set up**- reality, situation, the before state
- > A **conflict** - change to that reality, how the data changed
- > A **resolution** - new reality the change creates, after state

### KEEP IN MIND

- Human-friendly chart type
- Ruthless minimalism
- Clear key takeaways

> Choose a human friendly chart, **consider cognitive science** limitations, don't use position randomly

> Be a ruthless minimalist, eliminate all chart junk, keep it simple and **convey one clear idea**.

> Narrative! Define a **clear quest**, only present data that contributes to that take away.

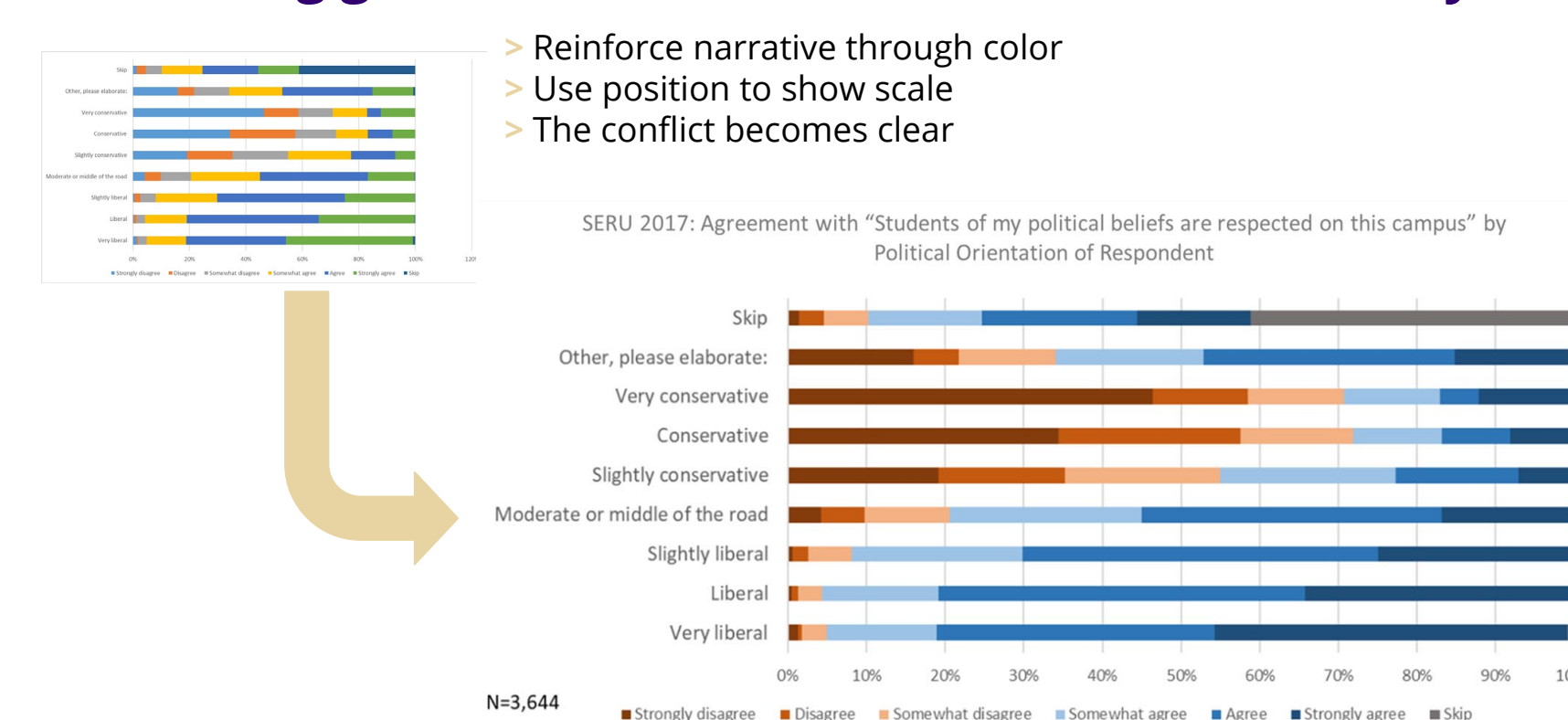
> Consider using a **ghost deck**- imaginary graphs and slides on what the data will show before running any analysis.

> Reinforce connection through the use of **color**.

### DATA STORYTELLING IN PRACTICE

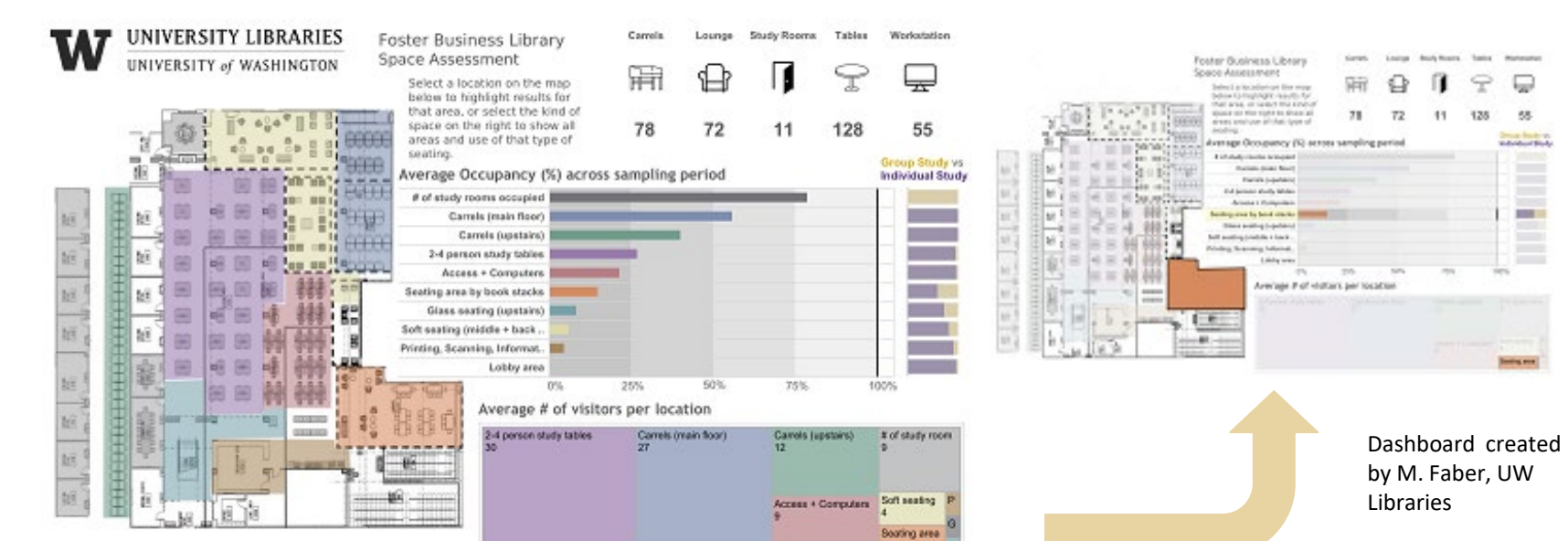
When reviewing data and tables in reports, see if you can explain the story that is being presenting in the visualization with just one sentence. Consider the key questions for data storytelling.

> **Revising generated bar charts to tell a clearer story**



> **Using dashboards to direct action**

- > Map connects visual to experience of space
- > Action about student needs for group study space identified



> **Leveraging qualitative data to show real characters in the quantitative story**

### Climate Survey Results: Quotes by Campus

UW Seattle qualitative comment themes:

- Inaccessibility of facilities

"University is doing bare minimum to meet ADA requirements, it's hardly a welcoming environment for someone with mobility issues: i.e., buildings that lack elevators, push buttons for entrances where you have to hit more than one to enter/building, difficulty locating elevators: long, long, long disability routes between buildings, long pathways, door handles that are difficult to operate/difficult to open, too short of time for lights getting onto campus, especially off of 15th Ave NE, lack of convenient bus service from 1st of Campus to East Campus which is difficult for anyone with mobility issues, long distance from E Campus to light rail stations, lack of transportation from E Campus to light rail stations"

"Orientation was also really bad. I literally got left behind in the rain while people climbed hills and stairs, listening to FFP harp about how important making friends is and then not being able to sit near anyone because of physical barriers was heart-breaking"

"Why is the path at the Vista by the fountain still gravel? It is the only place on campus that is gravel. Every day twice a day to and from light rail, experience that path as a sign that I don't belong on this campus"

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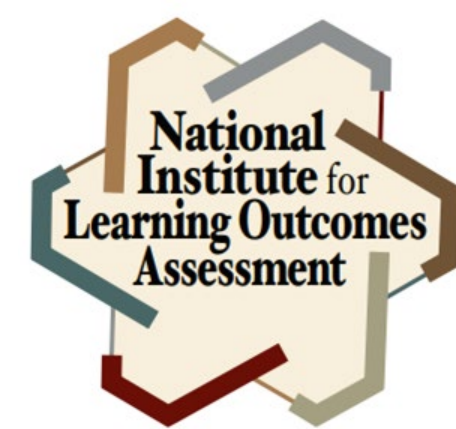
> **Building a Narrative via Evidence-Based Storytelling: A Toolkit for Practice** NILOA (2019)

Toolkit link:

<https://www.learningoutcomesassessment.org/wp-content/uploads/2019/10/EBST-Toolkit.pdf>

Overview page link:

<https://www.learningoutcomesassessment.org/evidence-based-storytelling/#1613707771766-335edf21-b21c>



> **The Data Storytelling Workbook** (2020) book by Anna Feigenbaum & Aria Alamalhodaiei

Book link:

[https://alliance-primo.hosted.exlibrisgroup.com/permalink/f/lvbsh/TN\\_cdi\\_askewsholts\\_vlebooks\\_9781351684712](https://alliance-primo.hosted.exlibrisgroup.com/permalink/f/lvbsh/TN_cdi_askewsholts_vlebooks_9781351684712)

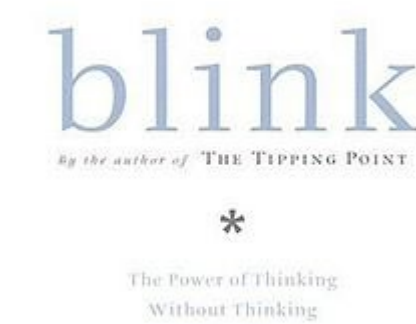
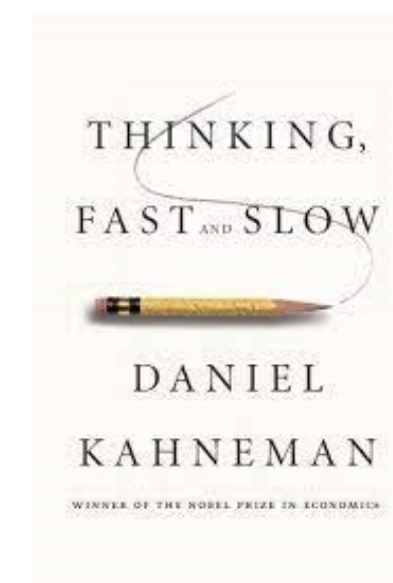
> **DataStory: Explain Data and Inspire Action Through Story** (2019) book by Nancy Duarte

Book link:

<https://alliance-primo.hosted.exlibrisgroup.com/permalink/f/kituig/C71340300490001451>

### Cognitive Science References

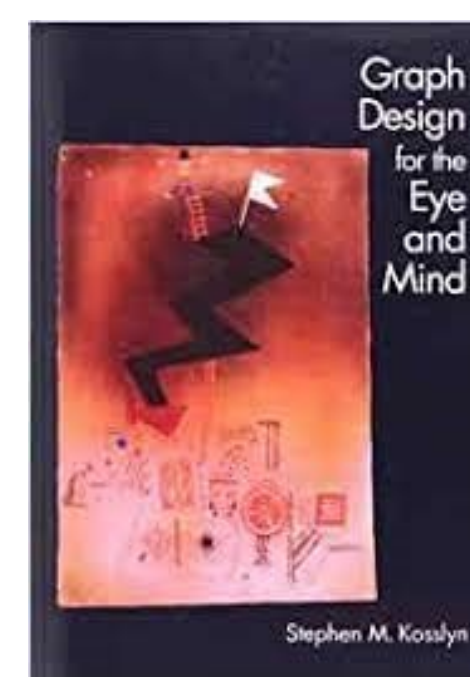
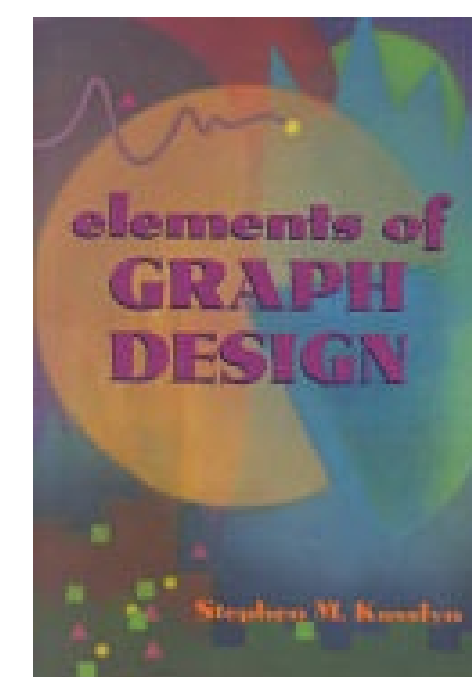
> Kahneman, D. (2011). **Thinking, fast and slow**. Farrar, Straus and Girouz.



> Gladwell, M. (2005). **Blink: The power of thinking without thinking**. Little, Brown and Co.

> Hegarty, M. (2011). **The cognitive science of visual displays: Implications for design**. *Topics in Cognitive Science*, 3, 446-474.

> Kosslyn, S. M. (1994). **Elements of Graph Design**. New York: W.H. Freeman and Company.



### Data Storytelling Videos

> **Turning Bad Charts into Compelling Data Stories** (2019) TEDxYouth Talk by Dominic Bohan

<https://www.youtube.com/watch?v=edAf1jx1wh8>

> **The Power in Effective Data Storytelling** (2018) TEDx Talk by Malavica Sridhar

<https://www.youtube.com/watch?v=0e52QfQngrM>

> **Making Data Mean More Through Storytelling** (2015) TEDx Talk by Ben Wellington

<https://www.youtube.com/watch?v=6xsvGYIxJok>

> **Telling Stories with Data in 3 Steps** (2019) Harvard Business Review video by Scott Berinato

[https://www.youtube.com/watch?v=r5\\_34YnCcMY](https://www.youtube.com/watch?v=r5_34YnCcMY)

> **The Evidence-Based Storytelling Toolkit: Using Assessment Data to Write Your Learning Narrative** (2020) webinar from the National Institute for Learning Outcomes Assessment

<https://www.youtube.com/watch?v=TutW9VCam8A>

### Image Sources

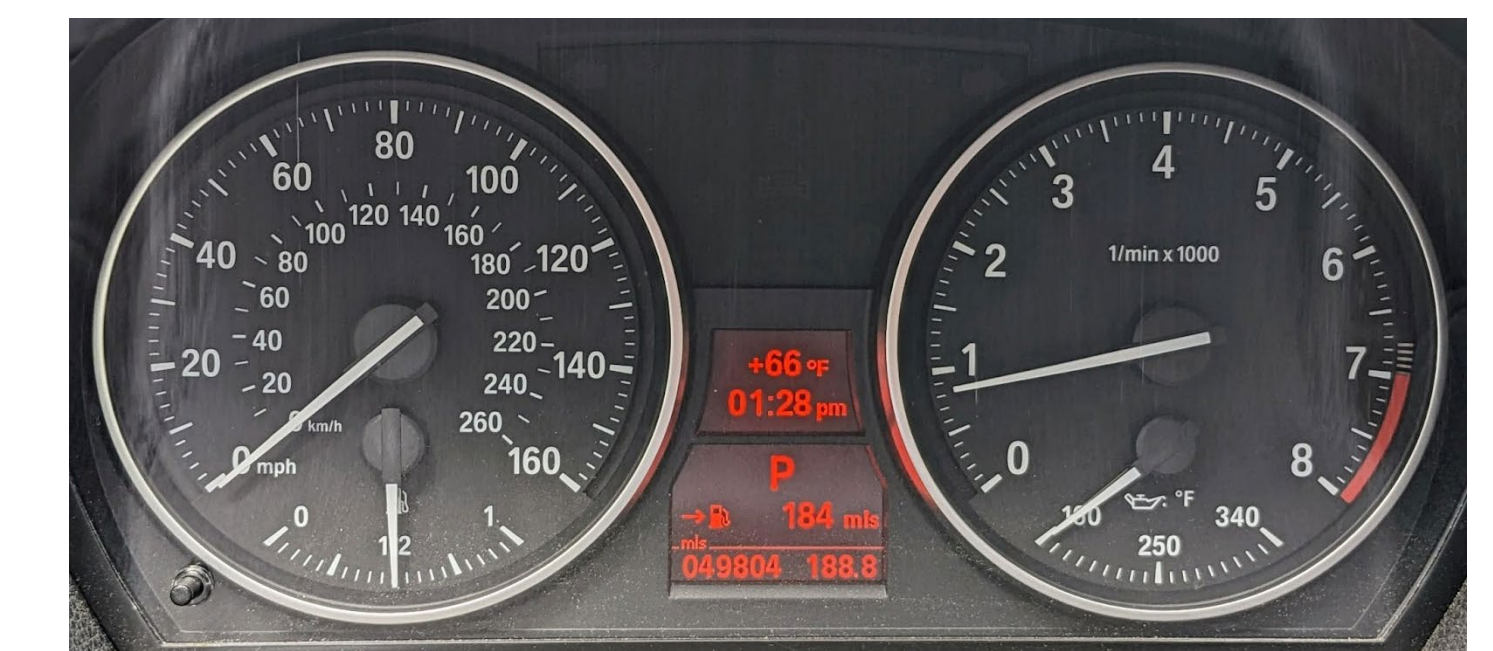
- 1 Data Collection
- 2 Data Preparation
- 3 Data Visualization



- 4 Data Analysis
- 5 Data Storytelling



> Lego Data Storytelling image graciously provided by Brent Dykes of <https://www.effectiveastorytelling.com/>



> Car dashboard picture taken by Jillian Morn

- Human-friendly chart type
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> Data Storytelling guidelines taken from Dominic Bohan's TEDxYouth Talk referenced to the left