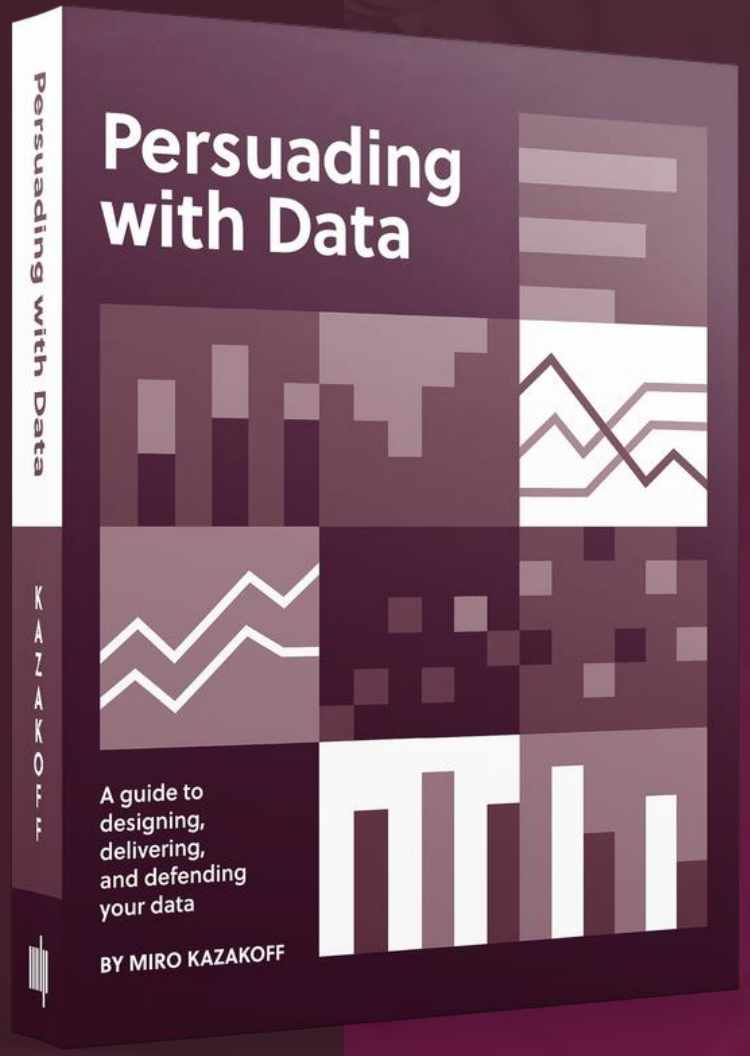

Why your expertise makes you worse at communicating data

and what you can do about it

By the end of this talk you will better understand

- How humans take in information
- Why experts are worse communicators than non-experts
- What you can do to be a more effective communicator

All communication is a form of encoding and decoding

Encoding:

Decoding:

All communication is a form of encoding and decoding

Encoding:

The process of choosing which information to communicate and how to represent that information

Decoding:

The process by which our brains convert visual input into information

II

2

二

10

All communication is a form of encoding and decoding

Encoding:

The process of choosing which information to communicate and how to represent that information

The author

Depends on

Choices the author makes.
Single intended meaning for each encoding.

Decoding:

The process by which our brains convert visual input into information

The audience

Depends on

- Context
- Prior experience
- Familiar patterns
- Familiarity with this encoding
- Culture
- Channel
- Communicator
- Biological factors (ie. Colorblind)

By the end of this talk you will better understand

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  → Every mind decodes differently
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17^2

$$17^2 = 289$$

By the end of this talk you will better understand

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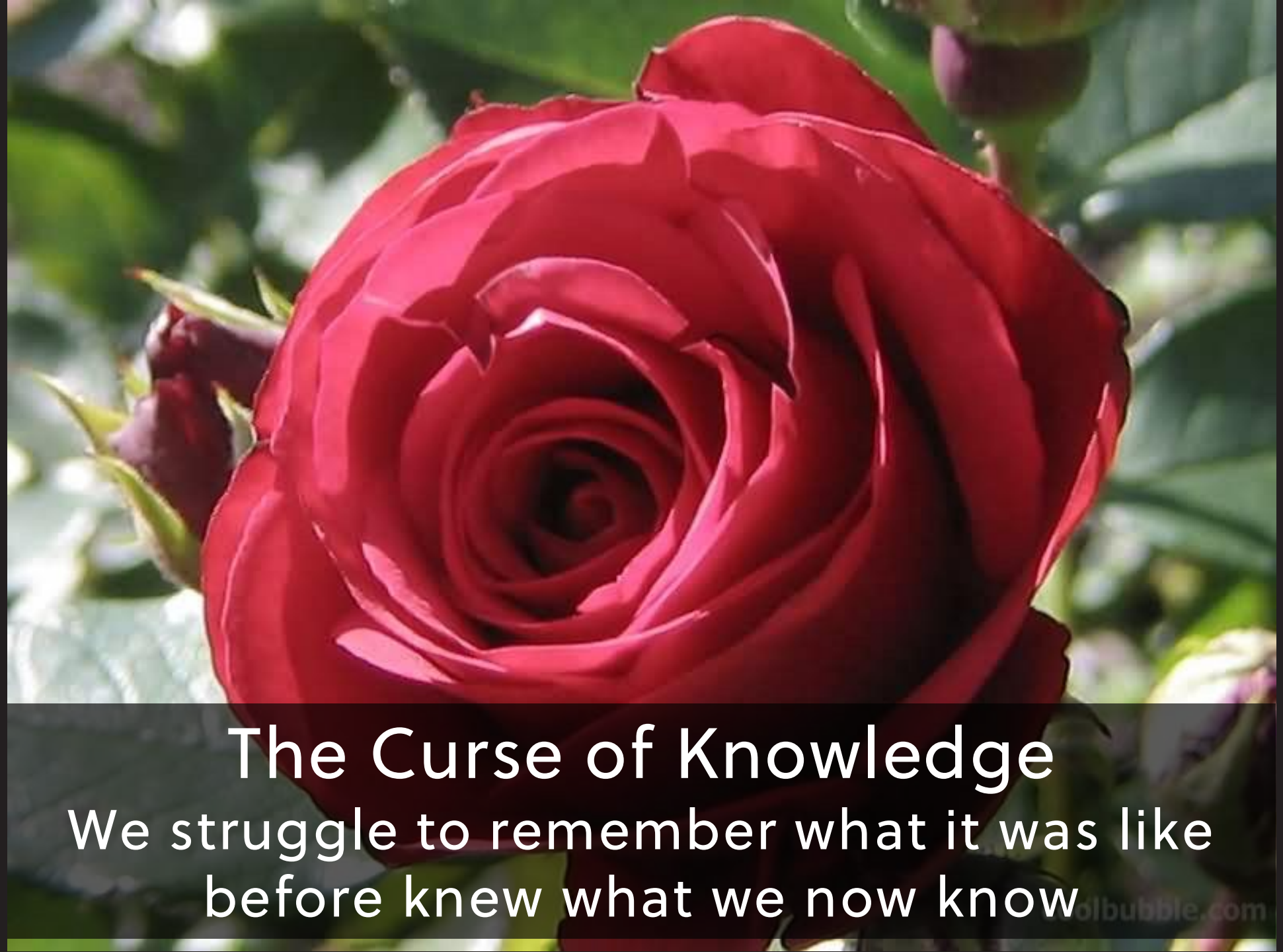

The Curse of Knowledge

We struggle to remember what it was like before knew what we now know

By the end of this talk you will better understand

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  → We all suffer from the Curse of Knowledge

- What you can do to be a more effective communicator
  → Aim for one idea at a time

0 7 1 1 8 1 1 8 6 4 6 2 5 6 8 7 0 2 5 6 1 6 8
4 6 8 5 8 4 7 4 5 0 1 2 3 7 8 6 6 8 6 2 8 5 8
7 8 7 6 5 1 3 1 2 2 3 1 7 7 6 5 8 5 0 4 7 2 6
8 4 4 1 8 3 4 1 5 8 1 1 6 5 8 0 4 4 6 6 4 5 8
6 3 5 0 4 0 3 7 7 6 3 7 7 3 1 0 2 0 0 7 5 7 1
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7 8 3 7 0 3 3 3 7 5 6 4 1 4 2 3 8 7 5 2 3 7 2
3 2 7 4 1 1 3 8 2 1 3 8 7 8 7 8 4 1 3 3 7 2 7
5 3 8 7 2 8 6 1 4 1 1 7 5 0 7 3 2 2 2 2 8 4 7
6 7 4 2 7 4 4 2 4 7 1 3 1 3 1 7 7 8 6 0 4 4 1
3 6 0 4 4 7 2 5 0 0 7 3 6 8 2 1 6 6 5 7 0 0 2
4 6 6 6 6 6 3 2 4 7 5 3 3 2 0 7 6 5 0 7 6 4 0
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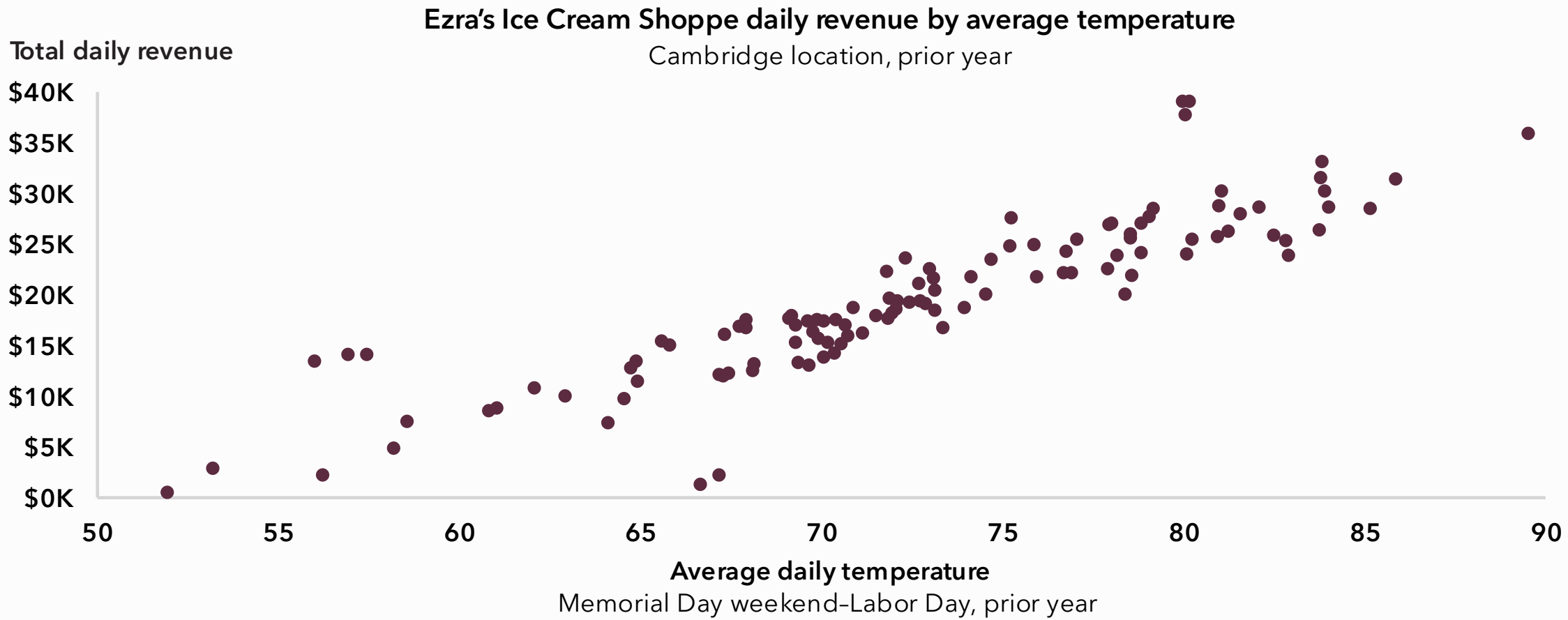
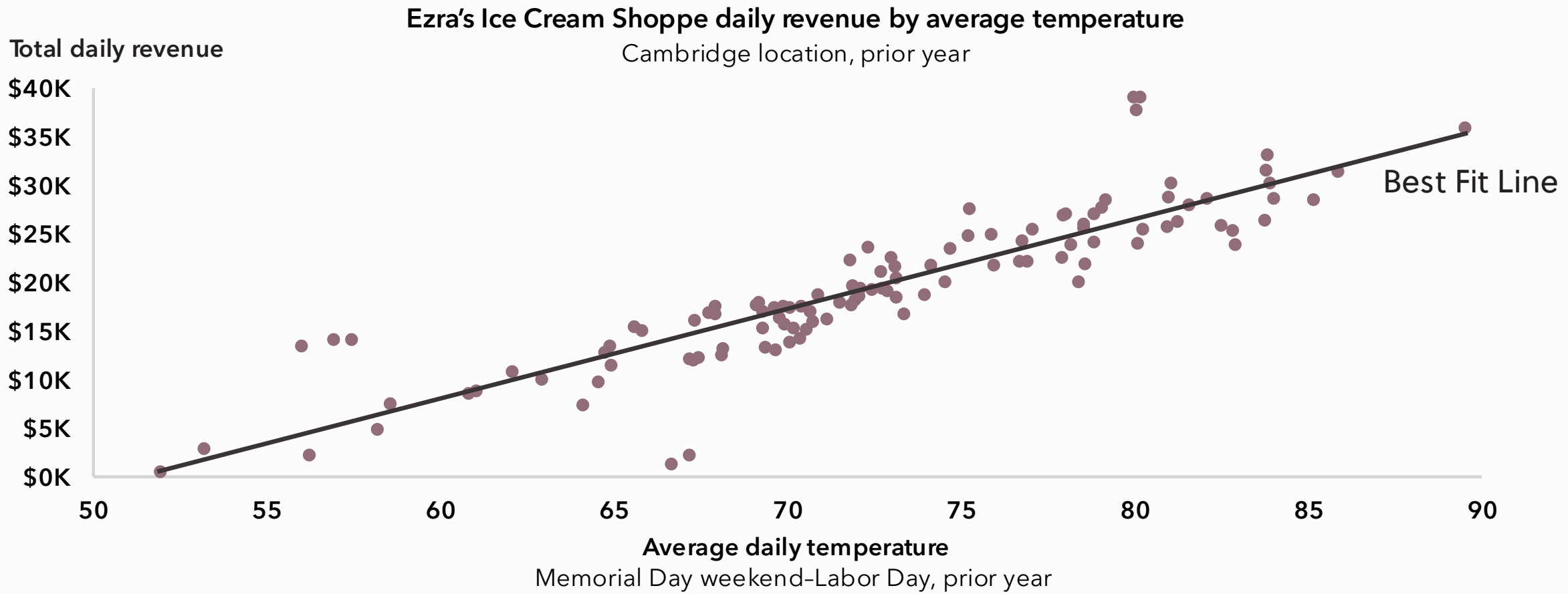
2 3 1 3 4 5 2 7 3 0 8 8 6 8 7 1 6 7 4 2 1 3 7
0 2 5 8 0 3 2 6 7 5 0 2 4 2 0 6 8 3 4 4 5 7 0

Without a single point, it's unclear what the point is



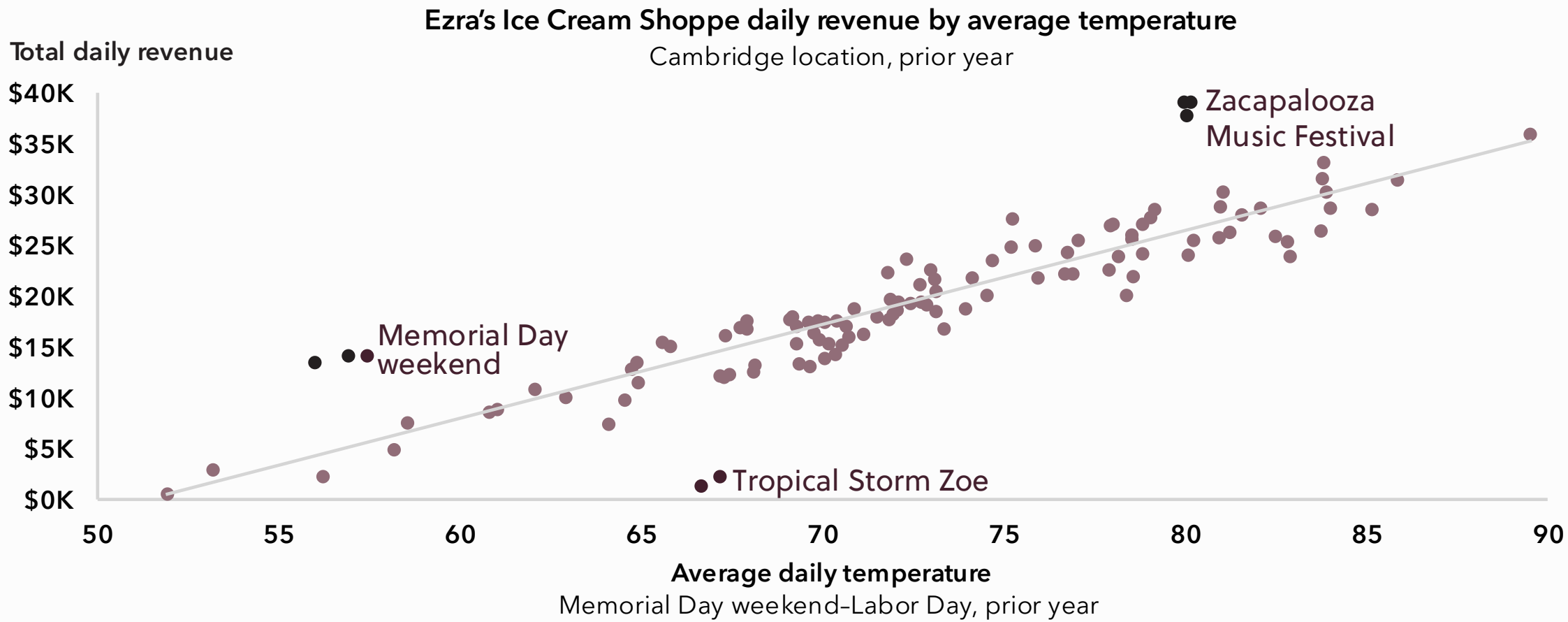
Note: Sales prediction based on ordinary least squares linear regression. Sales formula components are rounded to the nearest $1K for clarity. R2 = 0.83
Source: Company Financial Reports; NOAA Climate Data Online

Ice cream sales are correlated with temperature



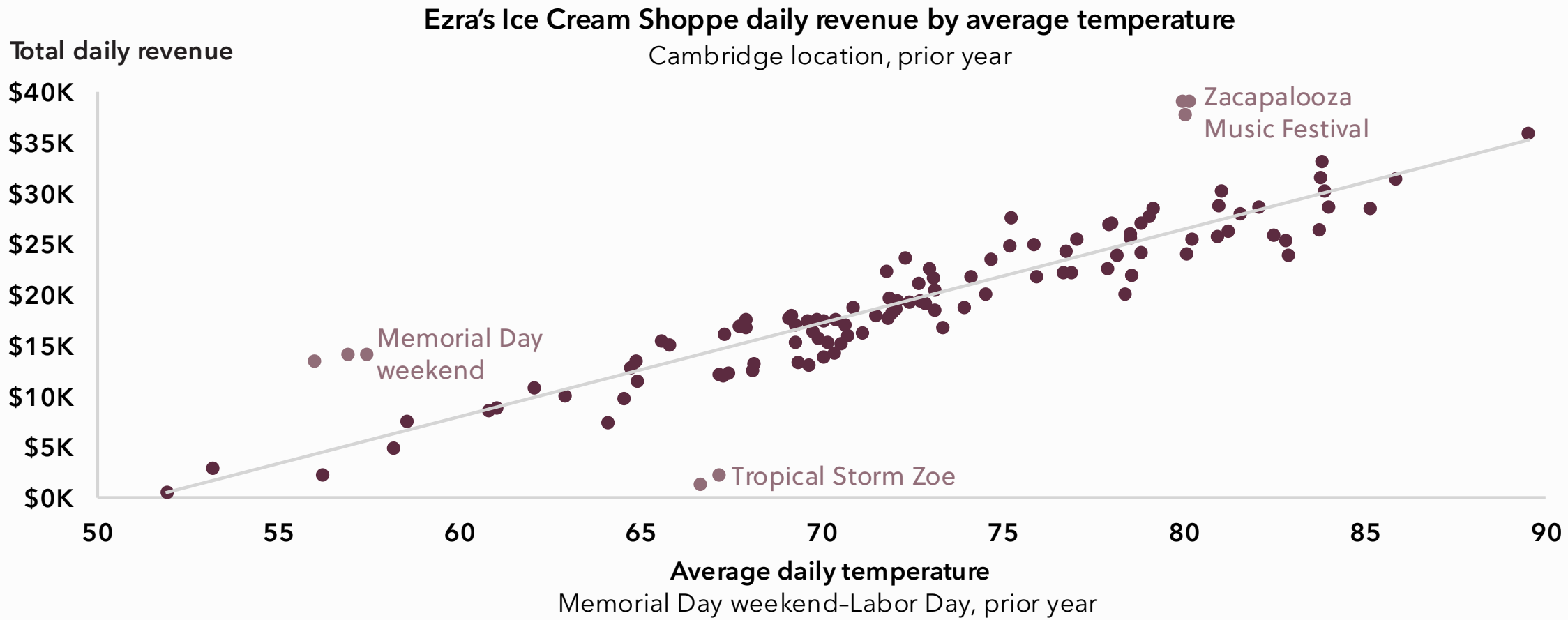
Note: Sales prediction based on ordinary least squares linear regression. Sales formula components are rounded to the nearest $1K for clarity. R2 = 0.83
Source: Company Financial Reports; NOAA Climate Data Online

Specific events explain outliers



Note: Sales prediction based on ordinary least squares linear regression. Sales formula components are rounded to the nearest $1K for clarity. R2 = 0.83
Source: Company Financial Reports; NOAA Climate Data Online

After seeing each point separately, it is easier to see multiple points at once



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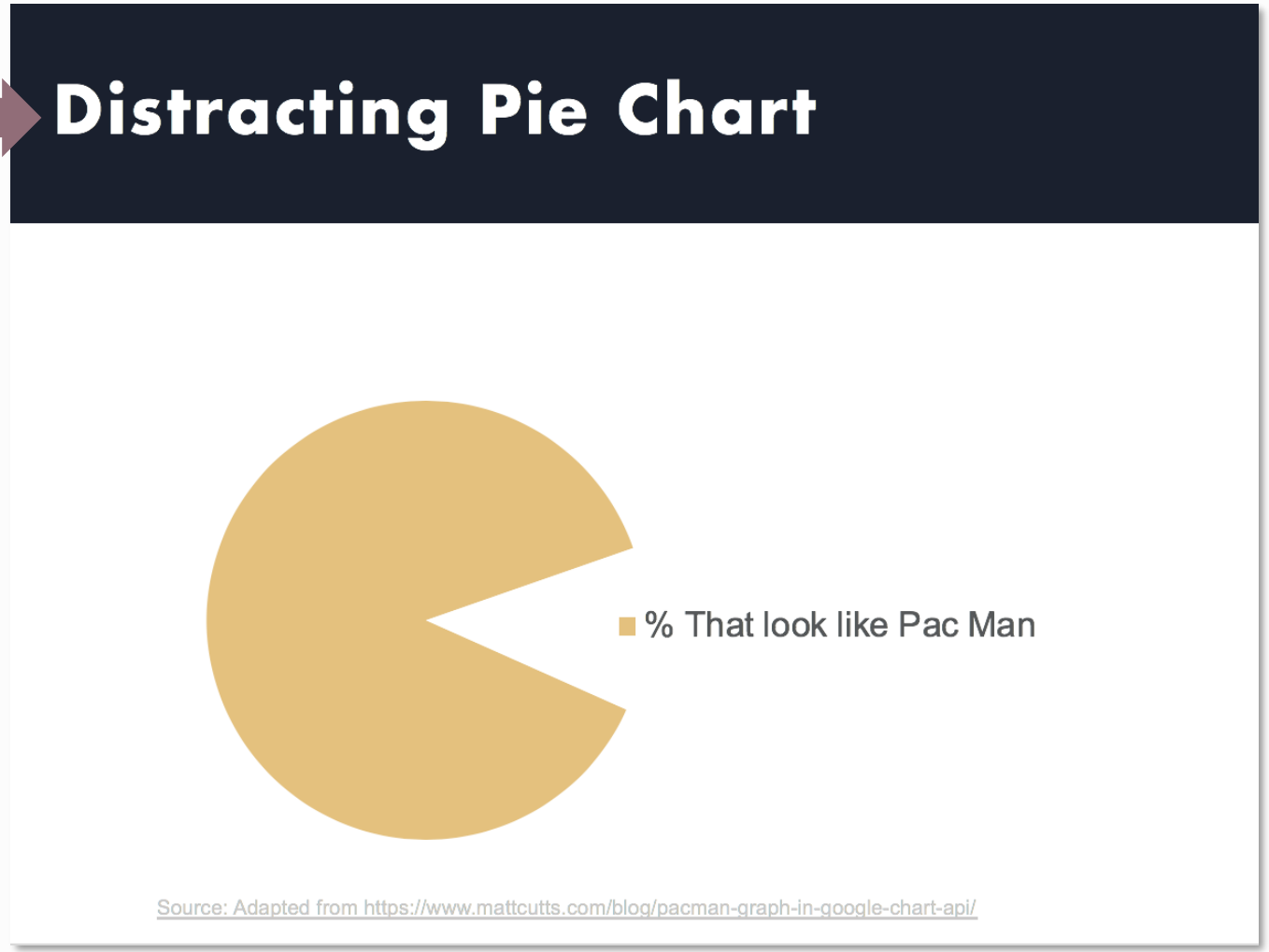
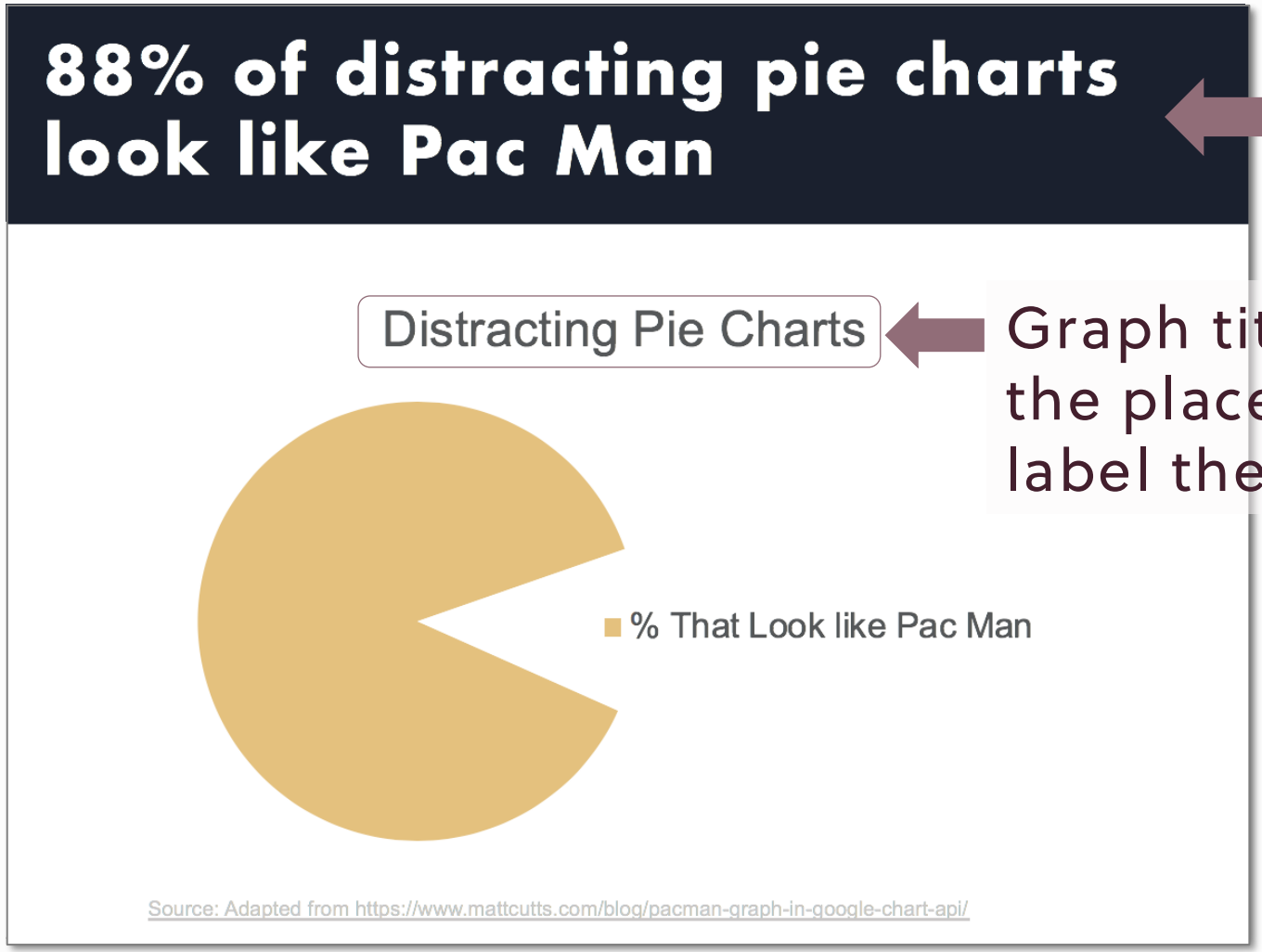
Don’t just label your slides

Labels the data, but doesn’t explain it



Decide on a point and make it the headline of the slide



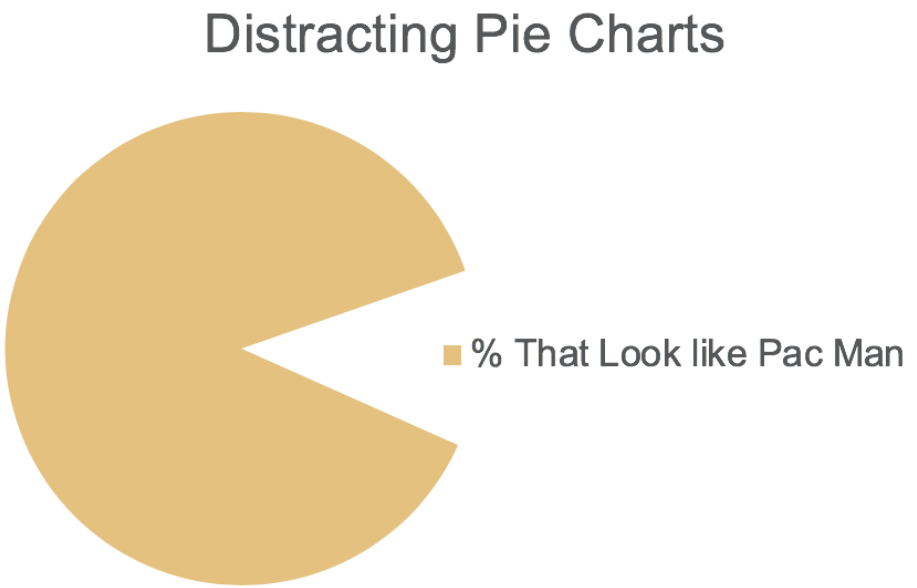
Use headlines to explain the point

Graph titles are the place to label the data

Headlines pass the verb test

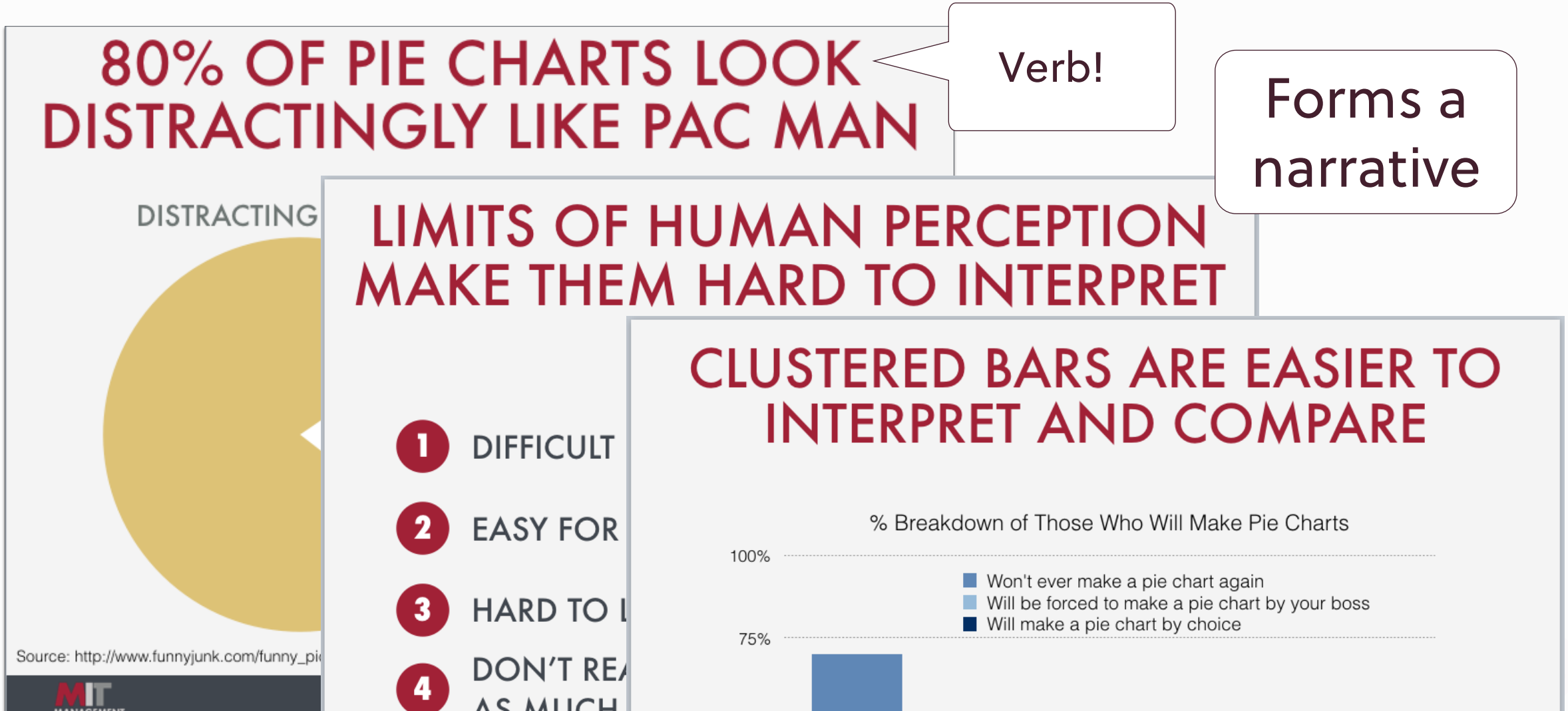
Verb!

88% of distracting pie charts look like Pac Man



Source: Adapted from https://www.mattcutts.com/blog/pacman-graph-in-google-chart-api/

A presentation with headlines passes the narrative test



Verb!

Forms a narrative

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  - → Maximize the data-ink ratio

Maximize the Data-Ink Ratio

Optimize
Data Ink

Any mark that conveys information

$$\frac{\text{Data Ink}}{\text{Total Ink}}$$

Eliminate
Non Data Ink

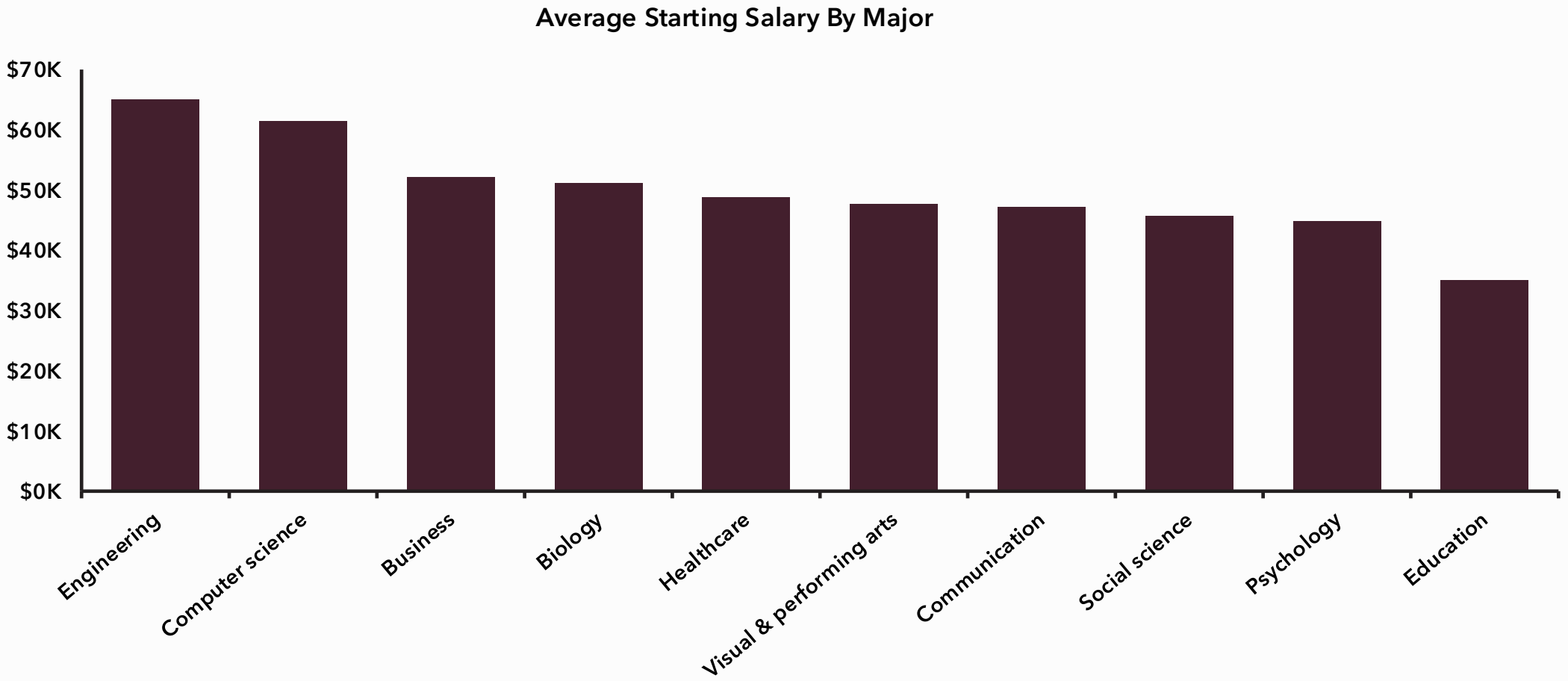
Marks that convey no information

Backgrounds ✓ Meaningless icons ✓

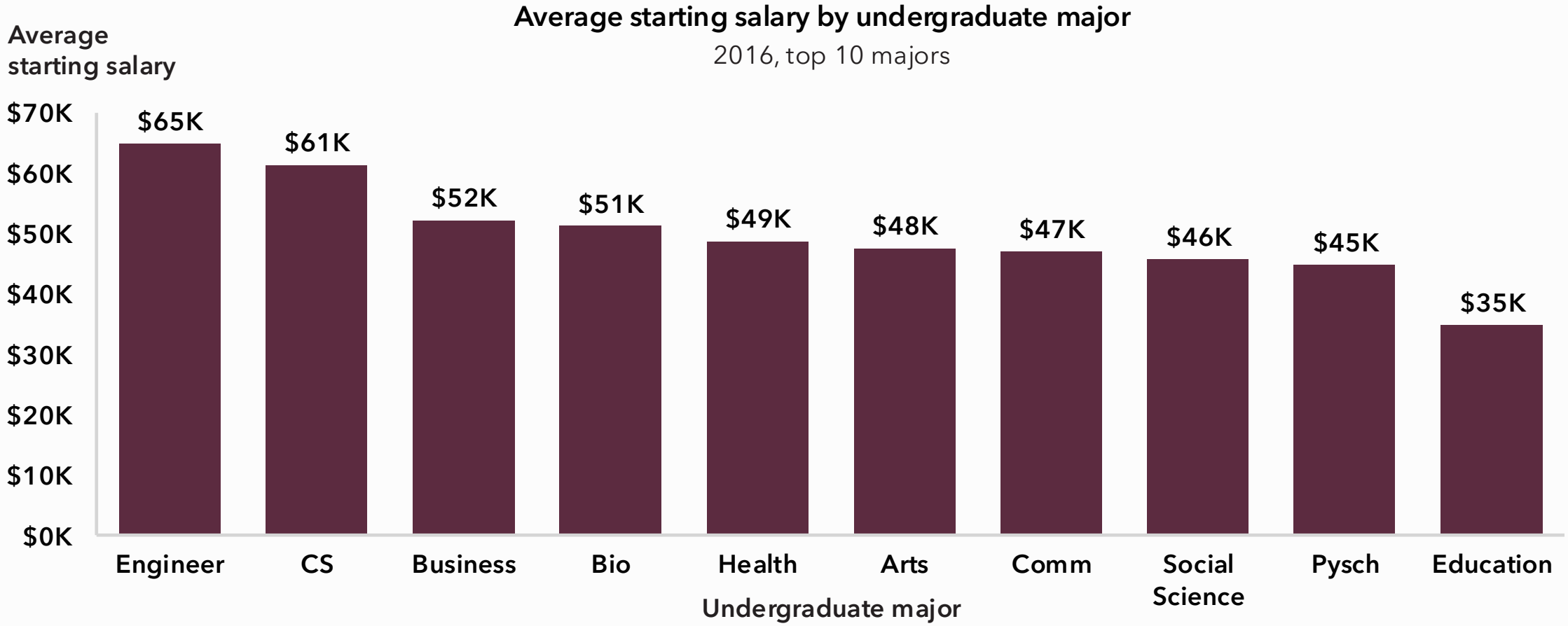
Excess Color ~~Grid lines~~

Shadows 3D Boxes

Eliminate non-data ink



Eliminate non-data ink to focus the audience on the data



Source: Sallie Mae, from Statista.com

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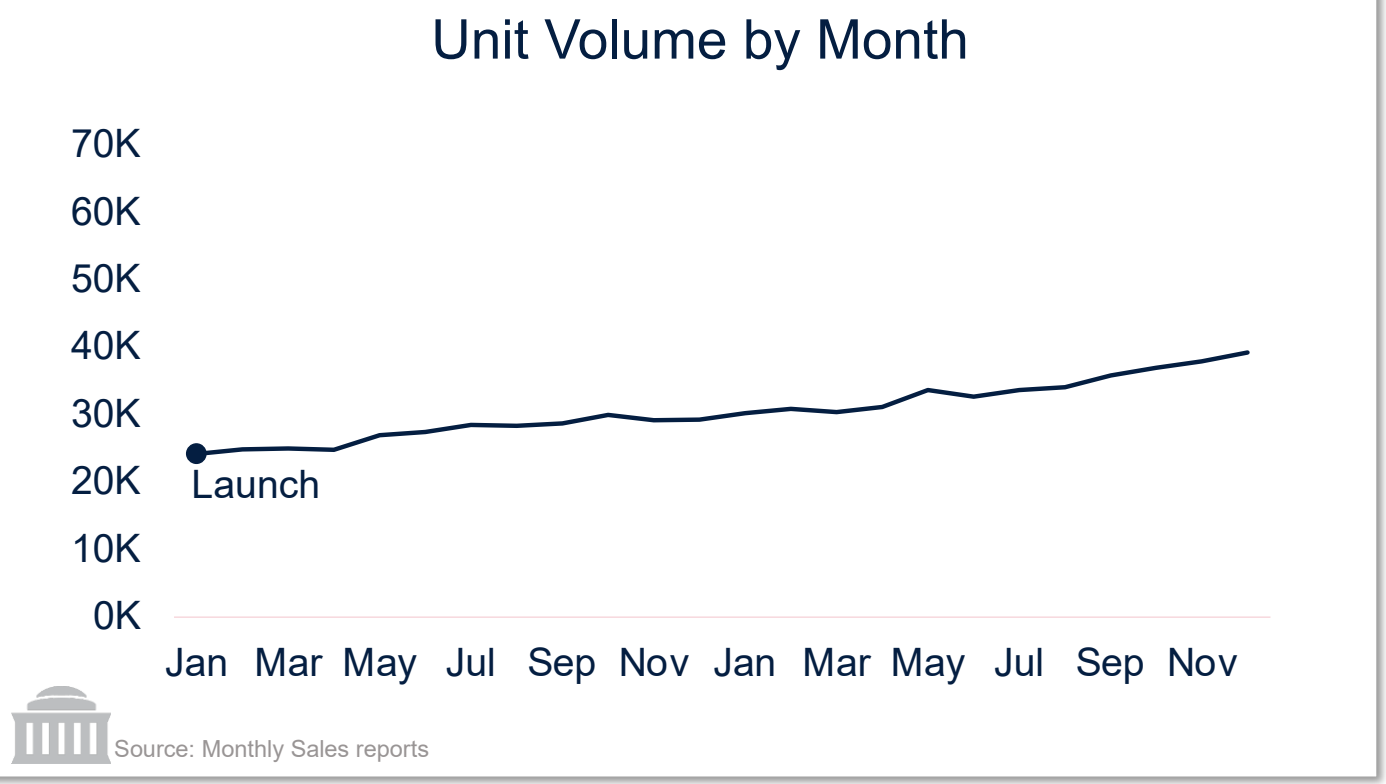
  - → Visualize all comparisons explicitly

Visualize the comparison explicitly

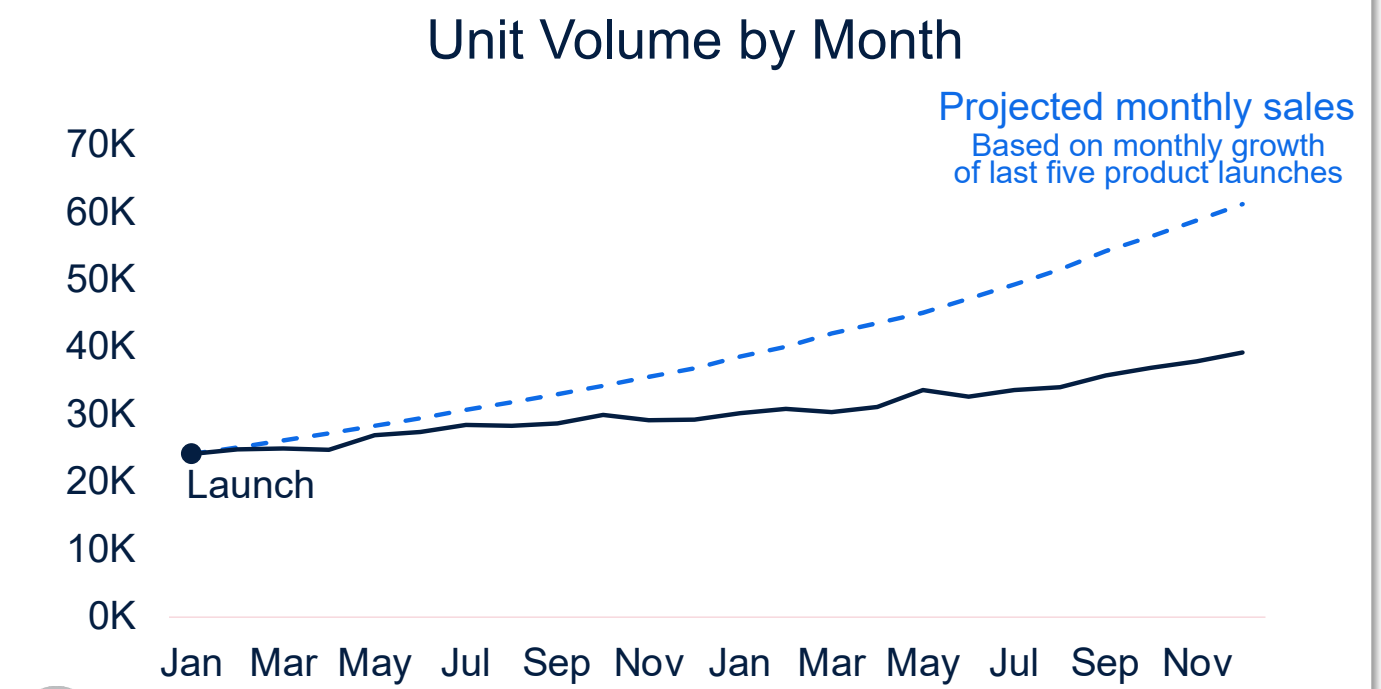
New product sales have been weak



Compares sales to itself at an earlier date

Visualize the comparison explicitly

New product sales have been weak



Source: Monthly Sales reports

Visualize

- Goals
- Targets
- Projections
- Averages
- Thresholds
- Tolerances

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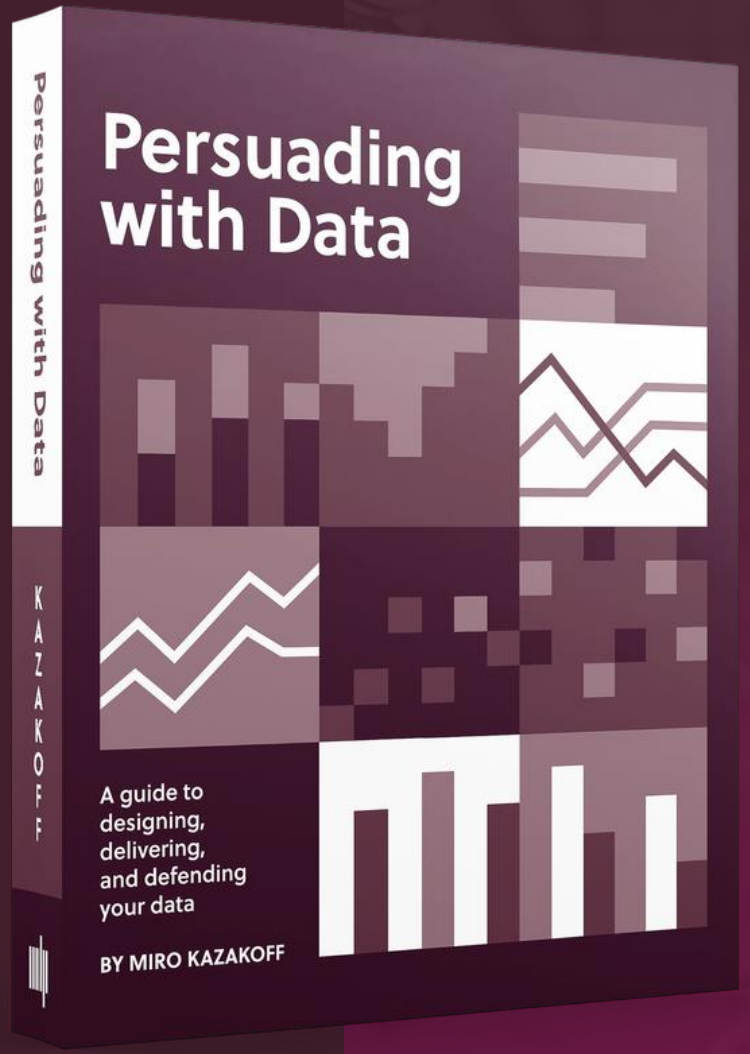

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Mirok@mit.edu if you want to bring these skills into your organization

- Choose the right graph
- Maximize the data-ink ratio
- Create self-sufficient slides
- Build clear, logical arguments
- Tell compelling data stories
- Deliver slides with confidence
- Handle challenging questions