



# DATA VISUALIZATION



# UNIT - II



# Contents

1

Clutter is your enemy

2

Focus your audience's attention

3

Lessons in Storytelling

# How you'll learn to tell stories with data



## STEP 1

### CONTEXT

Understand the Context



## STEP 2

### DISPLAY

Choose an appropriate visual display



## STEP 3

### CLUTTER

Eliminate Clutter



## STEP 4

### ATTENTION

Focus attention where you want it



## STEP 5

### THINKING

Think like a designer



## STEP 6

### TELL A STORY

Tell a story to audience





# Clutter is your enemy

- Picture a blank page or a blank screen: every single element you add to that page or screen takes up cognitive load on the part of your audience—in other words, takes their brain power to process.

## Cognitive load:

- Perhaps you were sitting in a conference room as the person leading the meeting was flipping through their projected slides and they paused on one that looked overwhelmingly busy and complicated.



# Clutter is your enemy

- Yikes, did you say “ugh” out loud, or was that just in your head?
- Maybe you were reading through a report or the newspaper, and a graph caught your eye just long enough for you to think, “ this looks interesting, but I have no idea what I’m meant to get out of it”

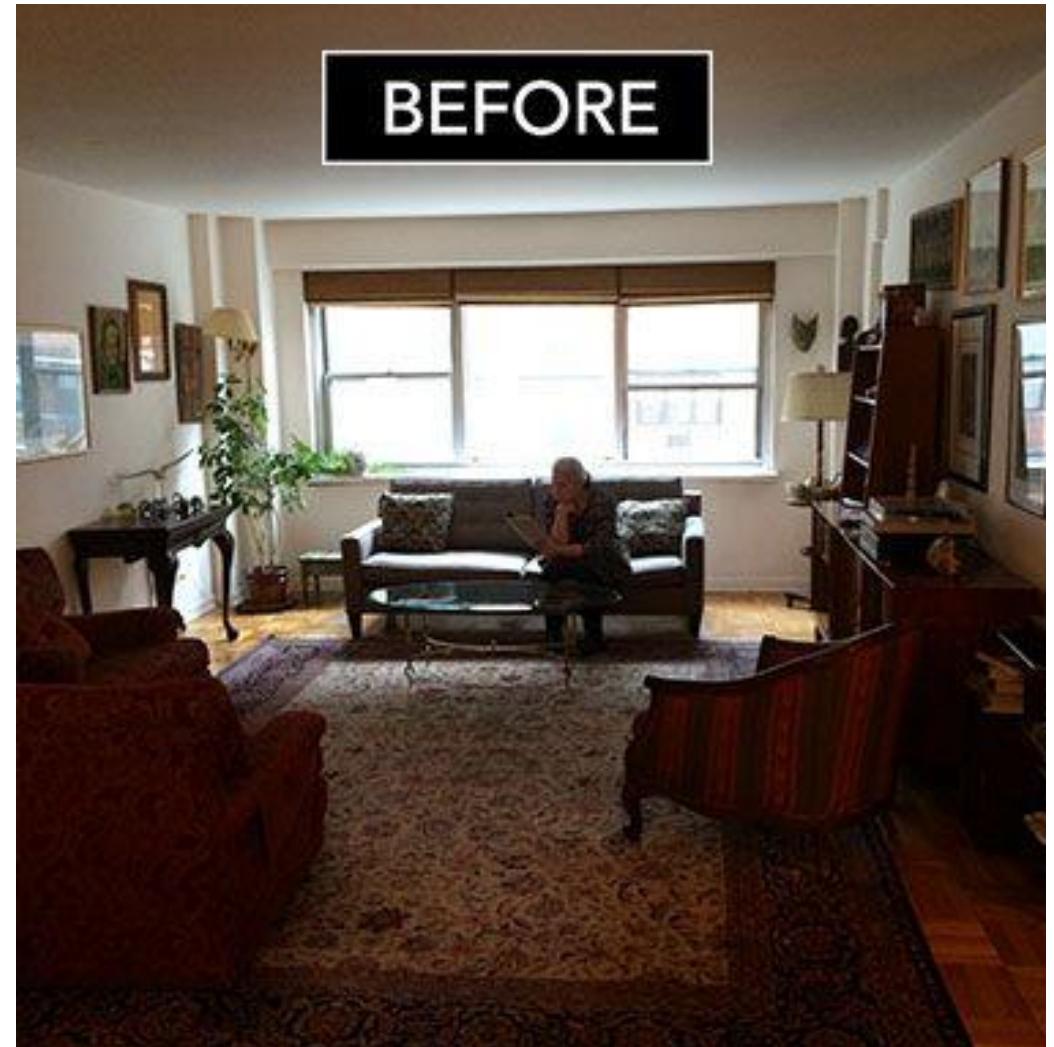




# Clutter is your enemy

## Clutter:

- One culprit that can contribute to excessive or extraneous cognitive load is something refer to simply as clutter.
- These are visual elements that take up space but don't increase understanding.





# Clutter is your enemy

## Clutter:

- There is a simple reason we should aim to reduce clutter: because it makes our visuals appear more complicated than necessary.

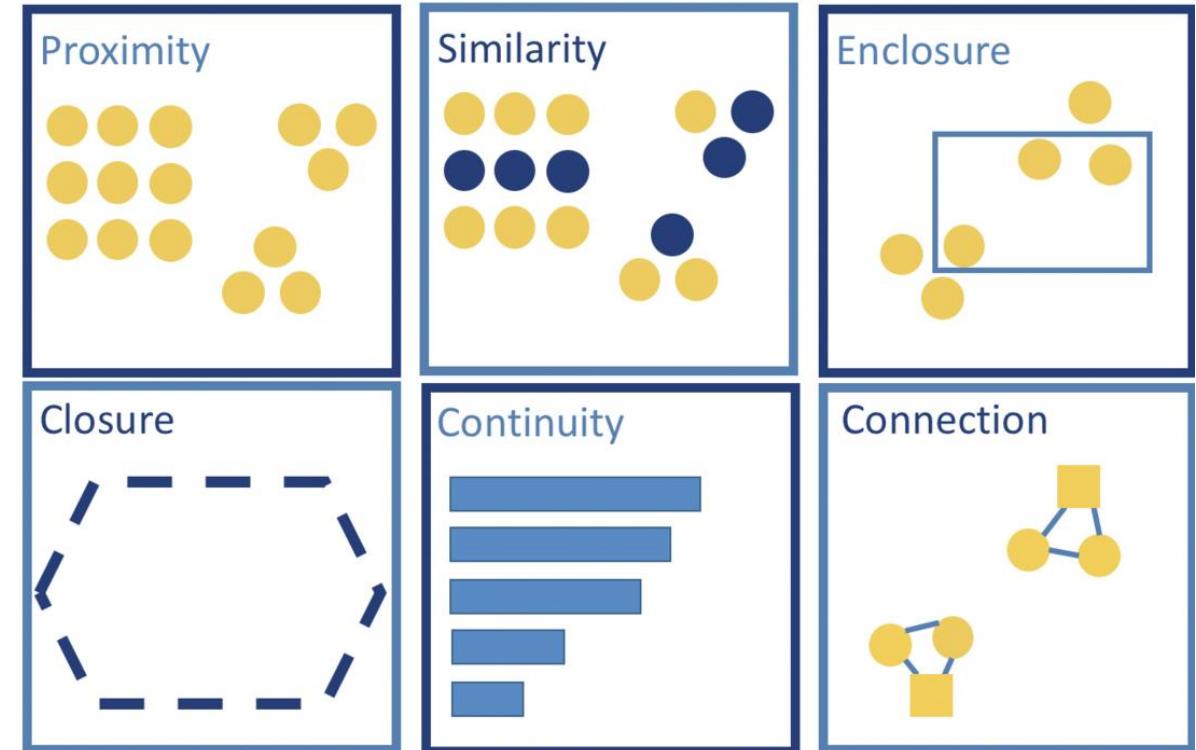




# Clutter is your enemy

## Gestalt principles of visual perception:

- The Gestalt School of Psychology set out in the early 1900s to understand how individuals perceive order in the world around them.
- **Six principles** : proximity, similarity, enclosure, closure, continuity, and connection.





Gestalt principles of visual perception:

- Proximity
- Similarity
- Enclosure
- Closure
- Continuity
- Connection

# Clutter is your enemy

- We tend to think of objects that are physically close together as belonging to part of a group.





# Clutter is your enemy

Gestalt principles of visual perception:

- Proximity
- Similarity
- Enclosure
- Closure
- Continuity
- Connection

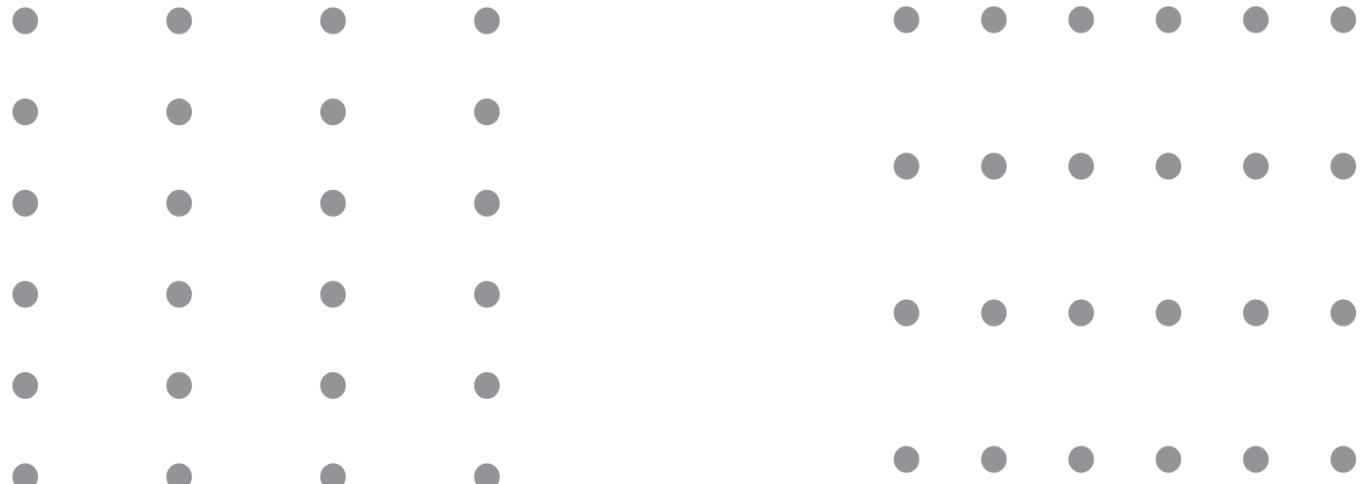
- We can leverage this way that people see in table design.
- In Figure simply by virtue of differentiating the spacing between the dots, your eyes are drawn either down the columns in the first case or across the rows in the second case.



# Clutter is your enemy

Gestalt principles of visual perception:

- Proximity
- Similarity
- Enclosure
- Closure
- Continuity
- Connection





# Clutter is your enemy

Gestalt principles of visual perception:

- Proximity
- **Similarity**
- Enclosure
- Closure
- Continuity
- Connection

- Objects that are of similar color, shape, size, or orientation are perceived as related or belonging to part of a group.
- In Figure you naturally associate the blue circles together on the left or the grey squares together on the right.



# Clutter is your enemy

Gestalt principles of visual perception:

- Proximity
- **Similarity**
- Enclosure
- Closure
- Continuity
- Connection



**FIGURE 3.3** Gestalt principle of similarity

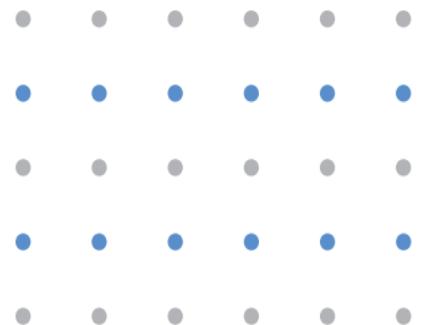


Gestalt principles of visual perception:

- Proximity
- **Similarity**
- Enclosure
- Closure
- Continuity
- Connection

# Clutter is your enemy

- In Figure 3.4, the similarity of color is a cue for our eyes to read across the rows.
- This eliminates the need for additional elements such as borders to help direct our attention



**FIGURE 3.4** You see rows due to similarity of color



# Clutter is your enemy

Gestalt principles of visual perception:

- Proximity
- Similarity
- Enclosure
- Closure
- Continuity
- Connection

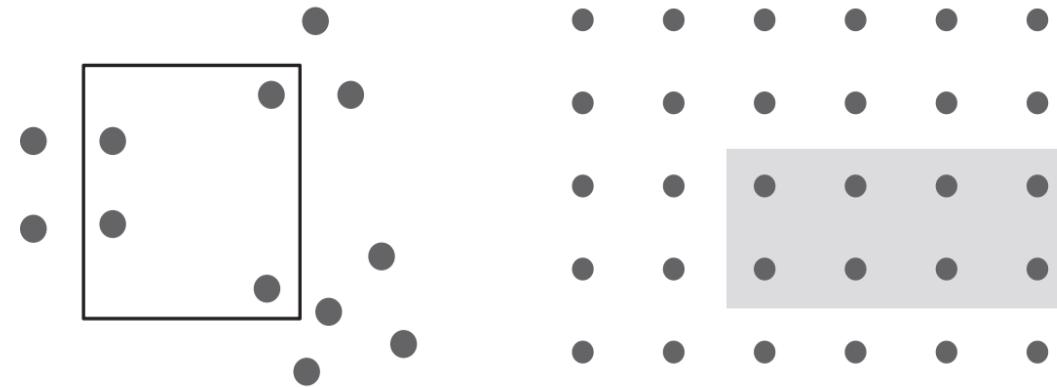
- We think of objects that are physically enclosed together as belonging to part of a group.
- It doesn't take a very strong enclosure to do this: light background shading is often enough, as demonstrated in Figure 3.5



# Clutter is your enemy

Gestalt principles of visual perception:

- Proximity
- Similarity
- **Enclosure**
- Closure
- Continuity
- Connection



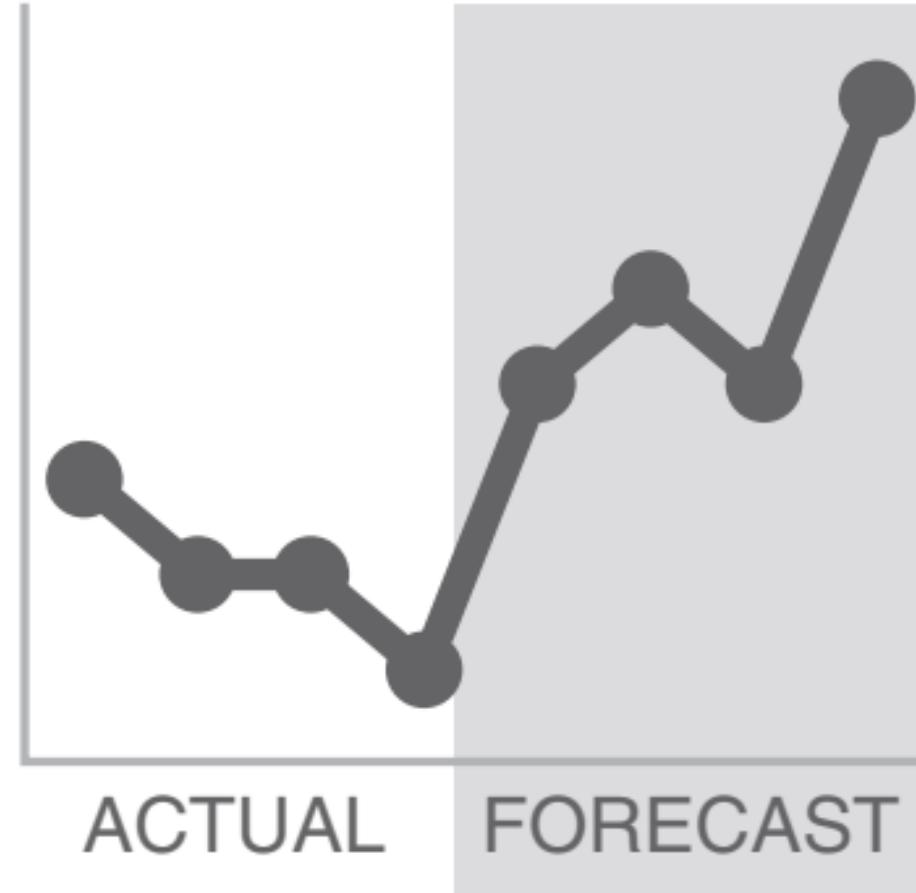
**FIGURE 3.5** Gestalt principle of enclosure



# Clutter is your enemy

Gestalt principles of visual perception:

- Proximity
- Similarity
- Enclosure
- Closure
- Continuity
- Connection





# Clutter is your enemy

Gestalt principles of visual perception:

- Proximity
- Similarity
- Enclosure
- Closure
- Continuity
- Connection

- The closure concept says that people like things to be simple and to fit in the constructs that are already in our heads.
- Because of this, people tend to perceive a set of individual elements as a single



Gestalt principles of visual perception:

- Proximity
- Similarity
- Enclosure
- Closure
- Continuity
- Connection

# Clutter is your enemy

- For example, the elements in Figure 3.7 will tend to be perceived as a circle first and only after that as individual elements.



FIGURE 3.7 Gestalt principle of closure



Gestalt principles of visual perception:

- Proximity
- Similarity
- Enclosure
- Closure
- Continuity
- Connection

# Clutter is your enemy

- It is common for graphing applications to have default settings that include elements like chart borders and background shading.



**FIGURE 3.8** The graph still appears complete without the border and background shading



# Clutter is your enemy

Gestalt principles of visual perception:

- Proximity
- Similarity
- Enclosure
- Closure
- Continuity
- Connection
- The principle of continuity is like closure: when looking at objects, our eyes seek the smoothest path and naturally create continuity in what we see even where it may not explicitly exist.



Gestalt principles of visual perception:

- Proximity
- Similarity
- Enclosure
- Closure
- Continuity
- Connection

# Clutter is your enemy

- Figure 3.9, if I take the objects (1) and pull them apart, most people will expect to see what is shown next (2), whereas it could as easily be what is shown after that (3).

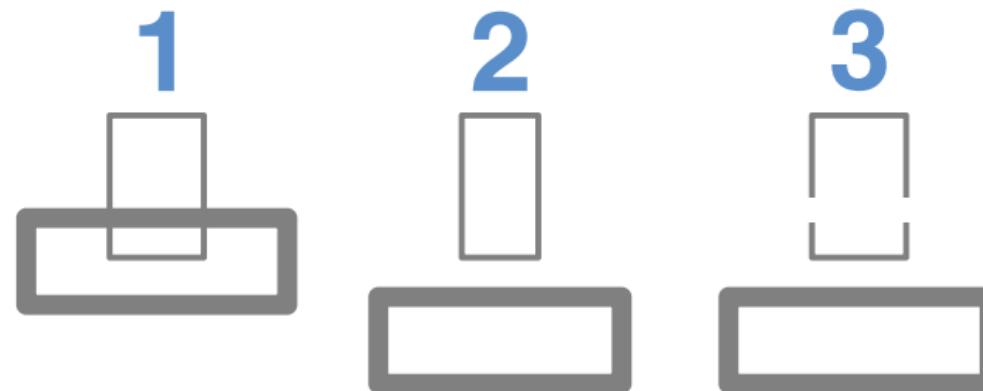


FIGURE 3.9 Gestalt principle of continuity

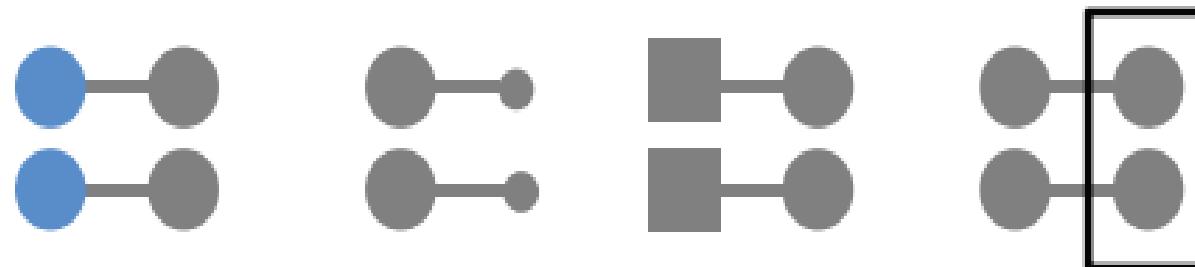


Gestalt principles of visual perception:

- Proximity
- Similarity
- Enclosure
- Closure
- Continuity
- Connection

# Clutter is your enemy

- We tend to think of objects that are physically connected as part of a group.
- The connective property typically has a stronger associative value than similar color, size, or shape.



**FIGURE 3.11** Gestalt principle of connection



# Clutter is your enemy

Gestalt principles of visual perception:

- Proximity
- Similarity
- Enclosure
- Closure
- Continuity
- Connection

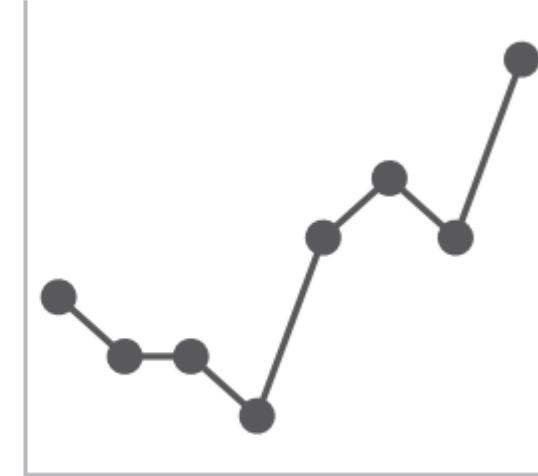
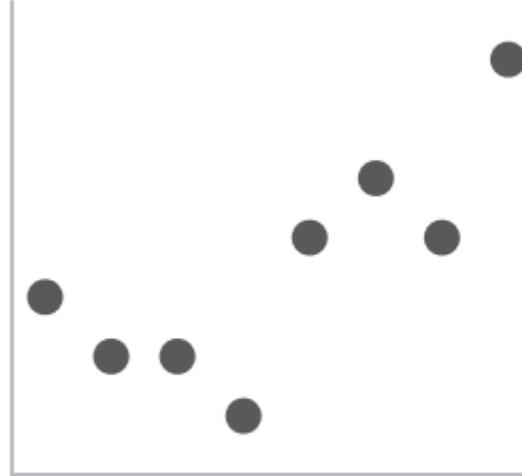


FIGURE 3.12 Lines connect the dots



# Clutter is your enemy

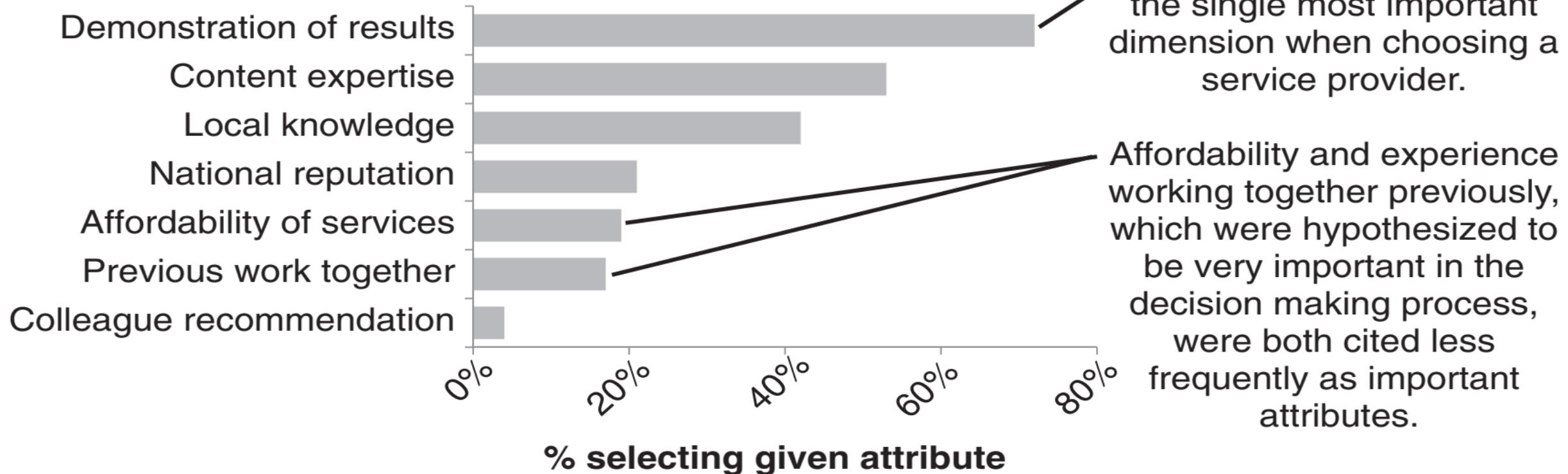
let's shift our focus to a couple of other types of visual clutter.

- Lack of visual order
- Non-strategic use of contrast

- When design is thoughtful, it fades into the background so that your audience doesn't even notice it.
- Let's look at an example to understand the impact visual order—and lack thereof—can have on our visual communications.

## Demonstrating effectiveness is most important consideration when selecting a provider

In general, what attributes are the most important to you in selecting a service provider?  
*(Choose up to 3)*



Survey shows that demonstration of results is the single most important dimension when choosing a service provider.

Affordability and experience working together previously, which were hypothesized to be very important in the decision making process, were both cited less frequently as important attributes.

Data source: xyz; includes N number of survey respondents. Note that respondents were able to choose up to 3 options.

**FIGURE 3.13** Summary of survey feedback



# Clutter is your enemy

let's shift our focus to a couple of other types of visual clutter.

- Lack of visual order
- Non-strategic use of contrast

- Take a moment to study Figure 3.13, which summarizes survey feedback about factors considered by nonprofits in vendor selection.

## Demonstrating effectiveness is most important consideration when selecting a provider

In general, **what attributes are the most important** to you in selecting a service provider?

(Choose up to 3)



Demonstration of results

Survey shows that **demonstration of results** is the single most important dimension when choosing a service provider.

Content expertise

Local knowledge

National reputation

Affordability of services

Previous work together

Colleague recommendation

**Affordability** and **experience working together previously**, which were hypothesized to be very important in the decision making process, were both cited less frequently as important attributes.

Data source: xyz; includes N number of survey respondents.  
Note that respondents were able to choose up to 3 options.

**FIGURE 3.14** Revamped summary of survey feedback



# Clutter is your enemy

let's shift our focus to a couple of other types of visual clutter.

- Lack of visual order
- Non-strategic use of contrast

- We can improve this visual markedly by making some relatively minor changes.
- Look at Figure 3.14. The content is the same; only the placement and formatting of elements have been modified.



# Clutter is your enemy

let's shift our focus to a couple of other types of visual clutter.

- Lack of visual order
- Non-strategic use of contrast

- The lack of clear contrast, on the other hand, can be a form of visual clutter.
- Ex: Imagine you work for a U.S. retailer and want to understand how your customers feel about various dimensions of their shopping experience in your store compared to your competitors.



# Clutter is your enemy

let's shift our focus to a couple of other types of visual clutter.

- Lack of visual order
- Non-strategic use of contrast

- Figure 3.15 shows the weighted performance index across categories for your company and five competitors.



FIGURE 3.15 Original graph

## Weighted Performance Index

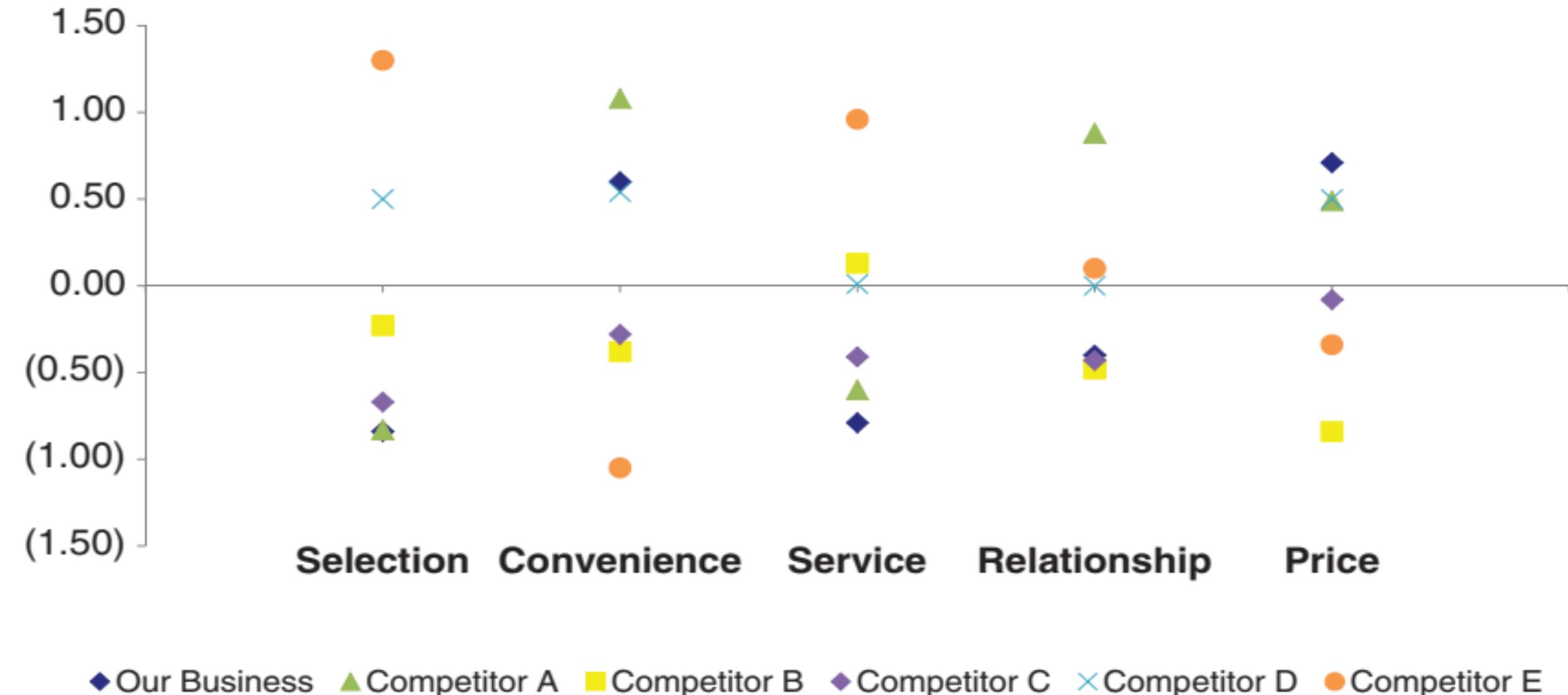


FIGURE 3.15 Original graph



# Clutter is your enemy

let's shift our focus to a couple of other types of visual clutter.

- Lack of visual order
- Non-strategic use of contrast

- Figure 3.15 shows the weighted performance index across categories for your company and five competitors.



FIGURE 3.15 Original graph

# Performance overview

## ■ Our business

- Competitor A
- Competitor B
- Competitor C
- Competitor D
- Competitor E



FIGURE 3.16 Revamped graph, using contrast strategically



# Clutter is your enemy

## Decluttering: step-by-step:

- Ex: Imagine that you manage an information technology (IT) team. Your team receives tickets, or technical issues, from employees.
- In the past year, you've had a couple of people leave and decided at the time not to replace them.

- You have heard a rumbling of complaints from the remaining employees about having to “pick up the slack.”
- You’ve just been asked about your hiring needs for the coming year and are wondering if you should hire a couple more people.



# Clutter is your enemy

## Decluttering: step-by-step:

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- In the past year, you've had a couple of people leave and decided at the time not to replace them.

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# Clutter is your enemy

## Decluttering: step-by-step:

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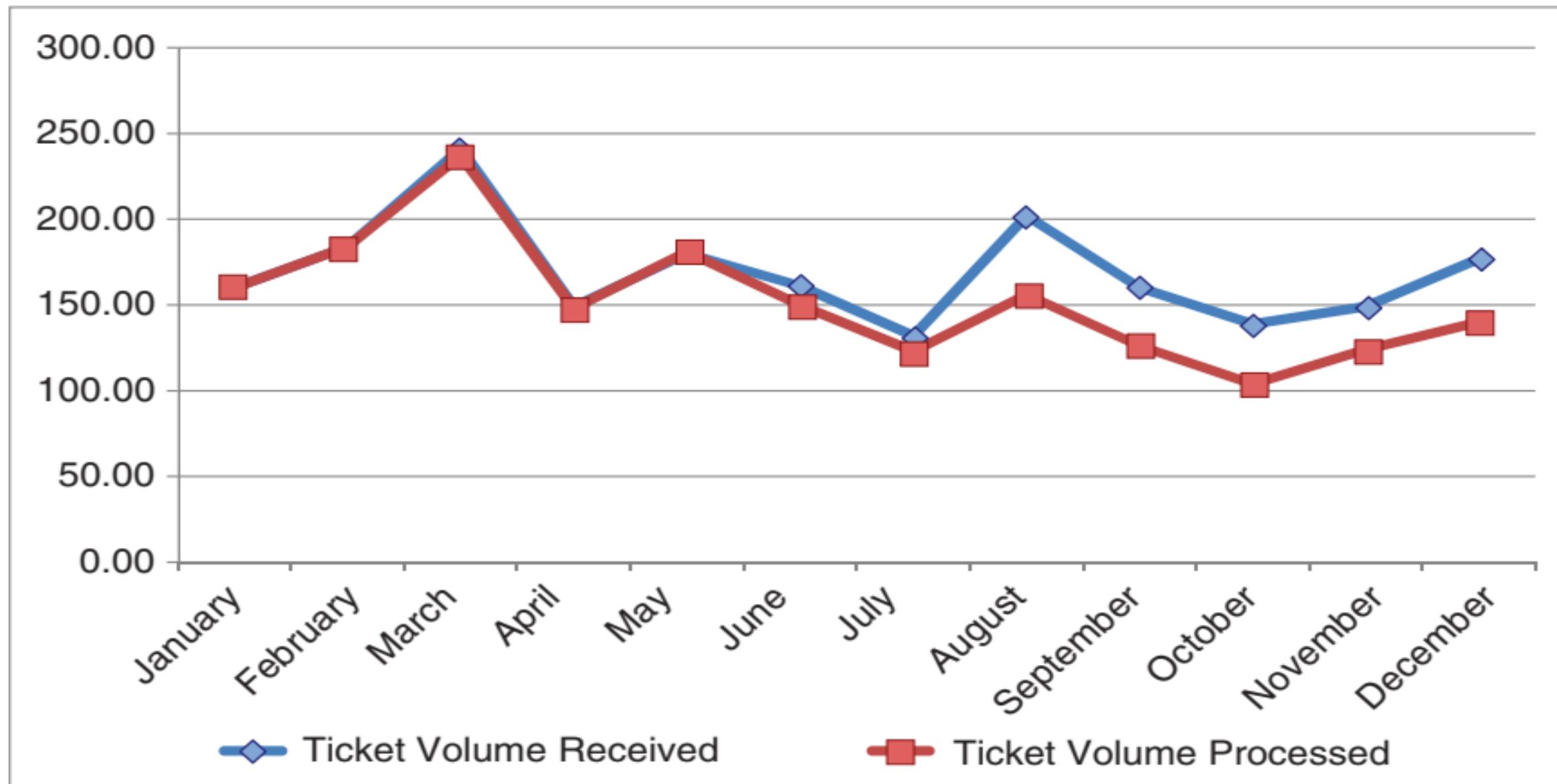


FIGURE 3.17 Original graph



# Clutter is your enemy

Decluttering: step-by-step:

1. Remove chart border
2. Remove gridlines
3. Remove data markers
4. Clean up axis labels
5. Label data directly
6. Leverage consistent color

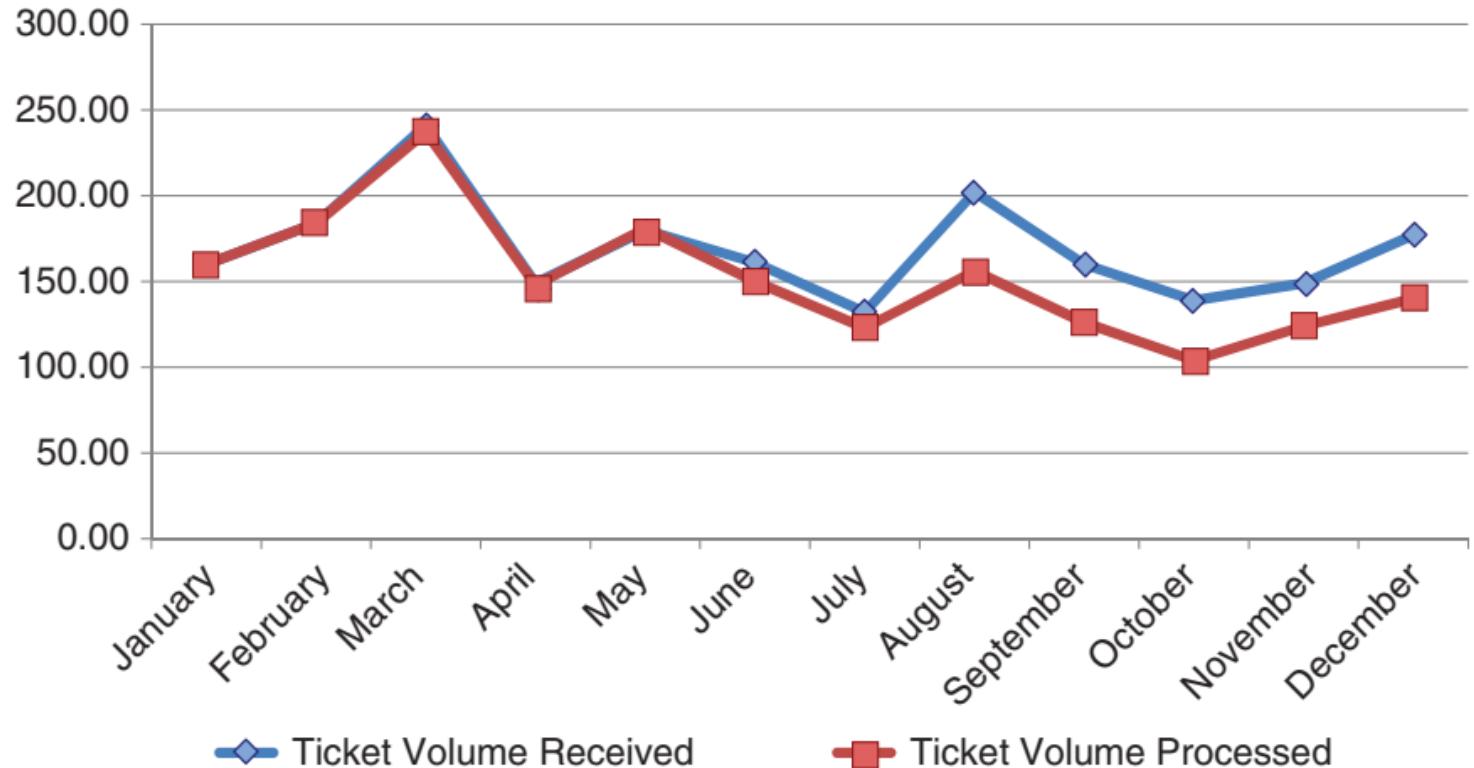


FIGURE 3.18 Remove chart border



# Clutter is your enemy

## Decluttering: step-by-step:

1. Remove chart border
2. Remove gridlines
3. Remove data markers
4. Clean up axis labels
5. Label data directly
6. Leverage consistent color

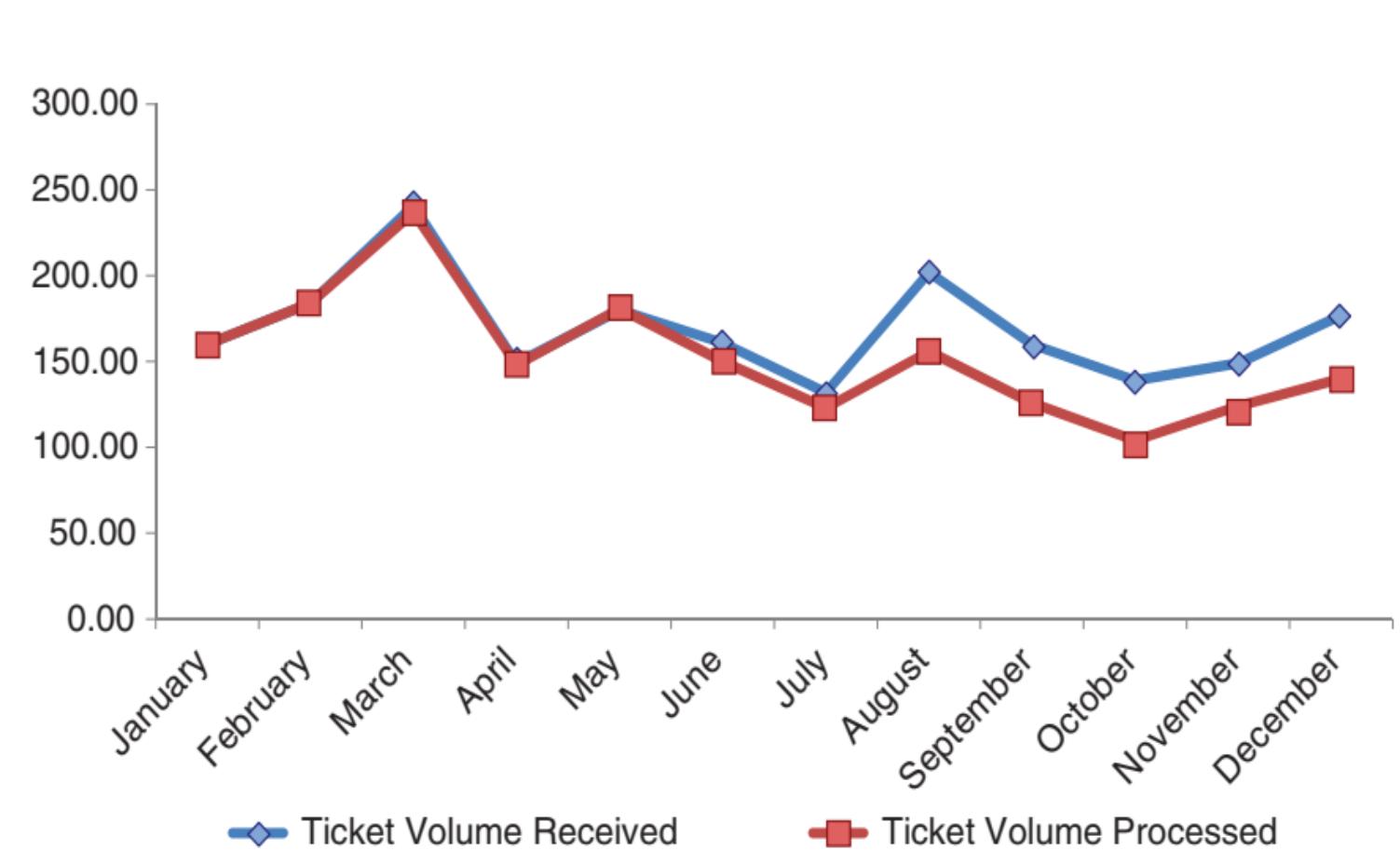


FIGURE 3.19 Remove gridlines



# Clutter is your enemy

## Decluttering: step-by-step:

1. Remove chart border
2. Remove gridlines
3. Remove data markers
4. Clean up axis labels
5. Label data directly
6. Leverage consistent color

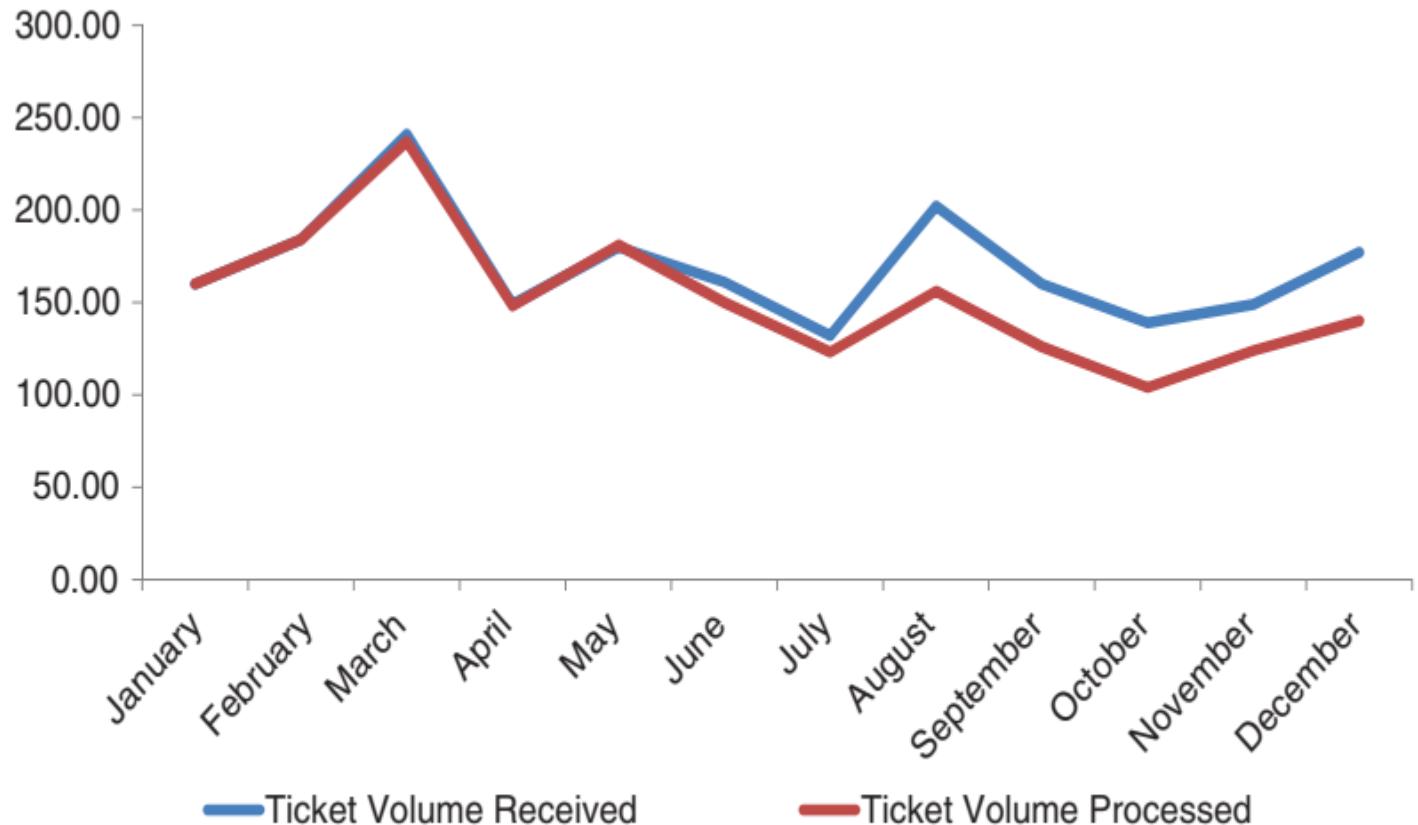


FIGURE 3.20 Remove data markers



# Clutter is your enemy

## Decluttering: step-by-step:

1. Remove chart border
2. Remove gridlines
3. Remove data markers
4. **Clean up axis labels**
5. Label data directly
6. Leverage consistent color

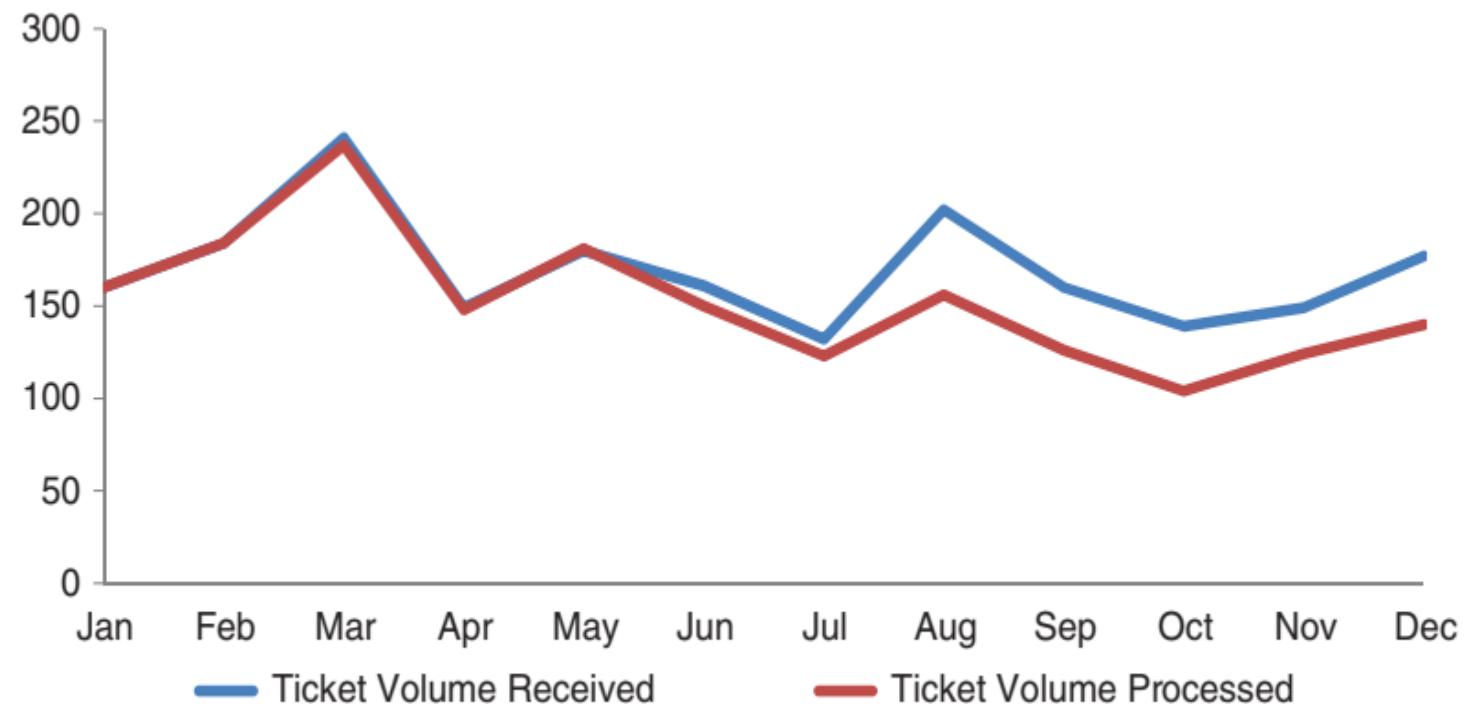


FIGURE 3.21 Clean up axis labels



# Clutter is your enemy

## Decluttering: step-by-step:

1. Remove chart border
2. Remove gridlines
3. Remove data markers
4. Clean up axis labels
5. Label data directly
6. Leverage consistent color

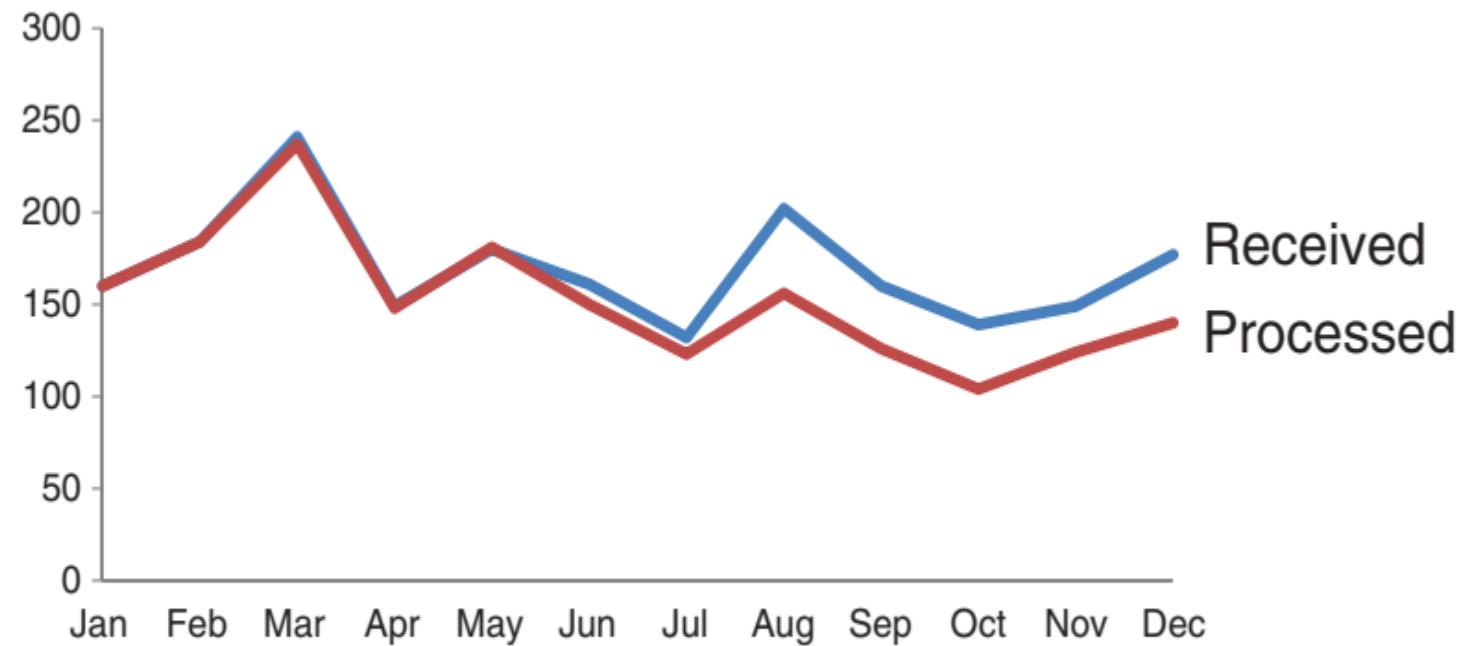


FIGURE 3.22 Label data directly



# Clutter is your enemy

## Decluttering: step-by-step:

1. Remove chart border
2. Remove gridlines
3. Remove data markers
4. Clean up axis labels
5. Label data directly
6. Leverage consistent color

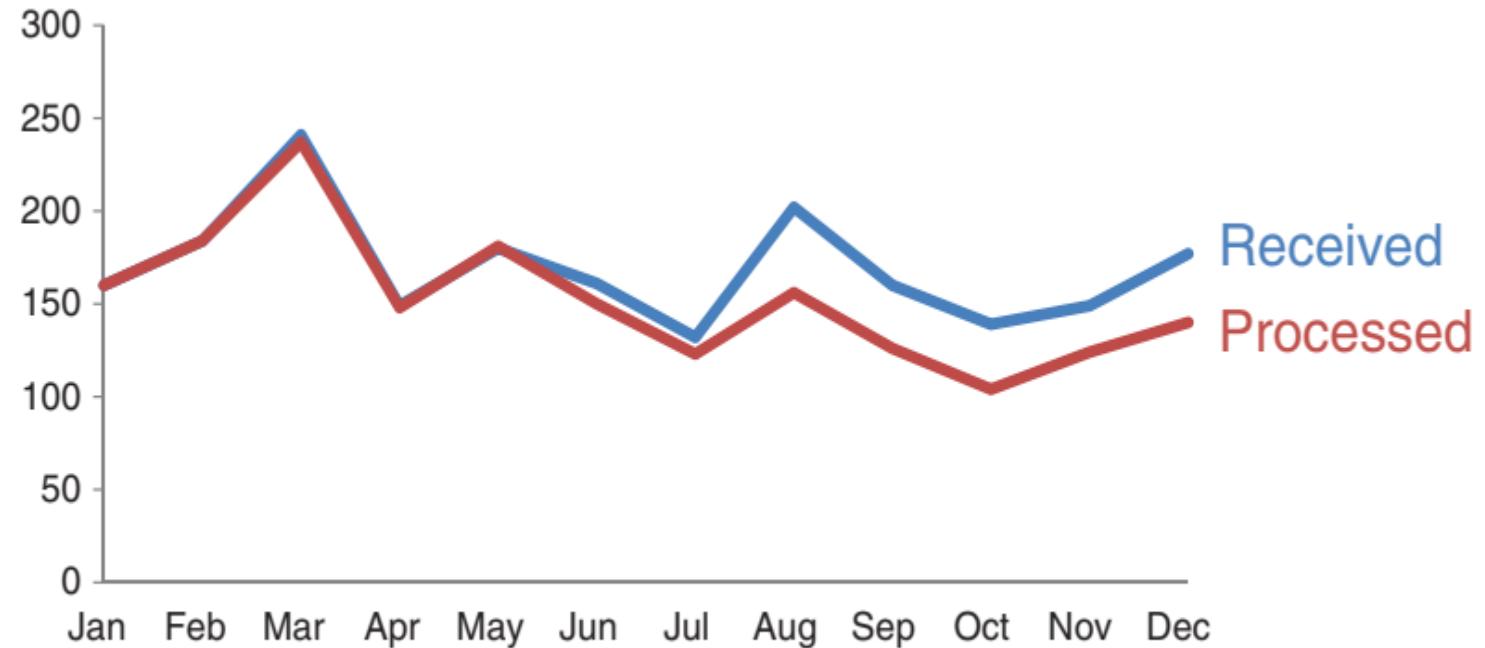


FIGURE 3.23 Leverage consistent color



# Contents

1

**Clutter is your enemy**

2

**Focus your audience's attention**

3

**Lessons in Storytelling**



# DATA VISUALIZATION



# UNIT - II



# Contents

1

**Clutter is your enemy**

2

**Focus your audience's attention**

3

**Lessons in Storytelling**

# How you'll learn to tell stories with data



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## STEP 2

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Choose an appropriate visual display



## STEP 3

### CLUTTER

Eliminate Clutter



## STEP 4

### ATTENTION

Focus attention where you want it



## STEP 5

### THINKING

Think like a designer



## STEP 6

### TELL A STORY

Tell a story to audience





# Focus your audience's attention

- How people see and how you can use that to your advantage when crafting visuals.
- We will talk briefly about sight and memory to highlight the importance of some specific, powerful tools: preattentive attributes.





# Focus your audience's attention

## You see with your brain:

- Light reflects from a stimulus. This gets captured by our eyes.
- We don't fully see with our eyes; there is some processing that happens there, but mostly it is what happens in our brain that we think of as visual perception.

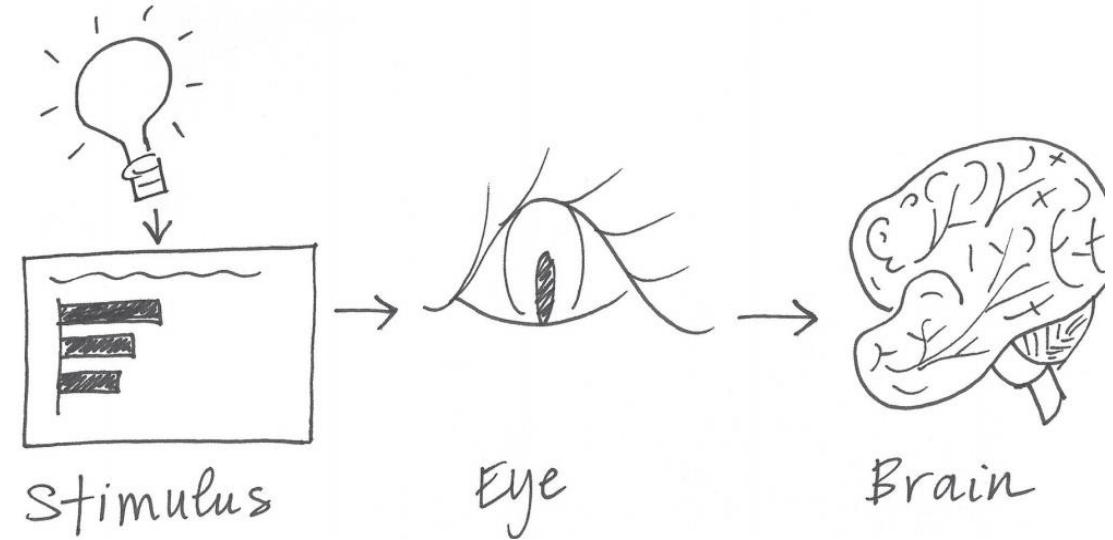


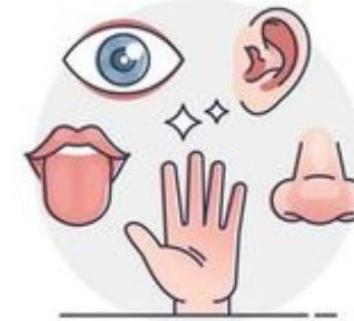
FIGURE 4.1 A simplified picture of how you see



# Focus your audience's attention

## A brief lesson on memory:

- There are three types of memory that are important to understand as we design visual communications:
  1. Iconic memory
  2. Short-term memory
  3. Long-term memory



**ICONIC  
MEMORY**



**LONG-TERM  
MEMORY**



**SHORT-TERM  
MEMORY**



# Focus your audience's attention

## A brief lesson on memory:

- There are three types of memory that are important to understand as we design visual communications:
  1. Iconic memory
  2. Short-term memory
  3. Long-term memory

- Iconic memory is super fast.
- It happens without you consciously realizing it.
- For example, when you see a car passing by on the highway, and for a moment you can picture the car after it is gone.
- Information stays in your iconic memory for a fraction of a second before it gets forwarded on to your short-term memory.



# Focus your audience's attention

## A brief lesson on memory:

- There are three types of memory that are important to understand as we design visual communications:
  1. Iconic memory
  2. Short-term memory
  3. Long-term memory





# Focus your audience's attention

## A brief lesson on memory:

- There are three types of memory that are important to understand as we design visual communications:
  1. Iconic memory
  2. Short-term memory
  3. Long-term memory

- Short-term memory has limitations.
- Specifically, people can keep about four chunks of visual information in their short-term memory at a given time.



# Focus your audience's attention

## A brief lesson on memory:

- There are three types of memory that are important to understand as we design visual communications:
  1. Iconic memory
  2. Short-term memory
  3. Long-term memory

- Remembering a phone number
- Remembering details from a book you read a few days ago
- Following directions
- Listening to a lecture



# Focus your audience's attention

## A brief lesson on memory:

- There are three types of memory that are important to understand as we design visual communications:
  1. Iconic memory
  2. Short-term memory
  3. Long-term memory

- When something leaves short-term memory, it either goes into oblivion and is likely lost forever or is passed into long-term memory.
- Long-term memory is built up over a lifetime and is vitally important for pattern recognition and general cognitive processing.



# Focus your audience's attention

## A brief lesson on memory:

- There are three types of memory that are important to understand as we design visual communications:
  1. Iconic memory
  2. Short-term memory
  3. Long-term memory

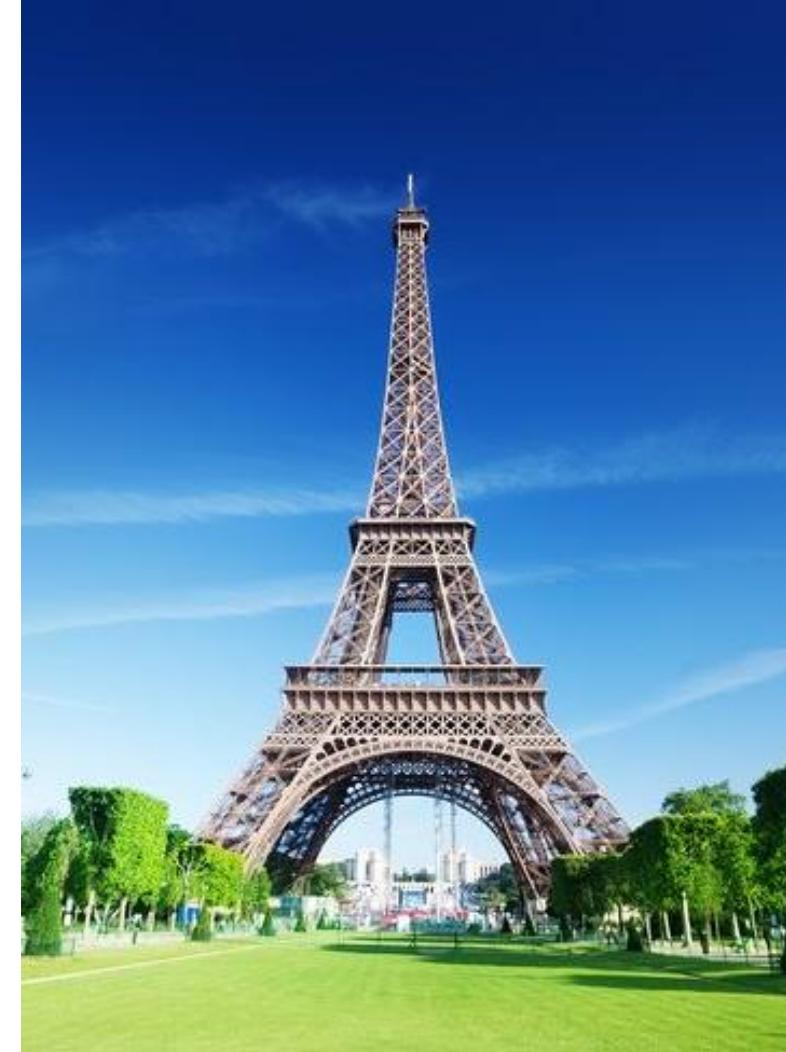
- Remembering important days, such as birthdays or holidays
- Knowing how to ride a bicycle
- Remembering the words to a song
- Knowing how to type
- Recollecting work skills learned in your first job



# Focus your audience's attention

## A brief lesson on memory:

- There are three types of memory that are important to understand as we design visual communications:
  1. Iconic memory
  2. Short-term memory
  3. Long-term memory





# Focus your audience's attention

## A brief lesson on memory:

- There are three types of memory that are important to understand as we design visual communications:
  1. Iconic memory
  2. Short-term memory
  3. Long-term memory











# Focus your audience's attention

Preattentive attributes signal where to look:

- Figure 4.2 shows a block of numbers. Taking note of how you process the information and how long it takes, quickly count the number of 3s that appear in the sequence.

756395068473  
658663037576  
860372658602  
846589107830

FIGURE 4.2 Count the 3s example



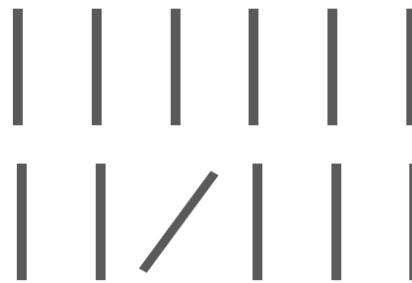
# Focus your audience's attention

Preattentive attributes signal where to look:

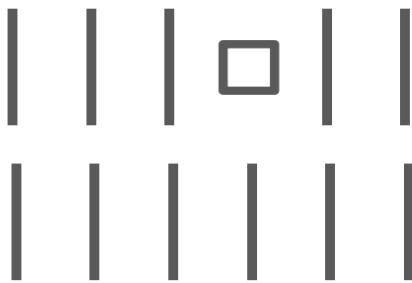
- Use preattentive attributes strategically, they can help us enable our audience to see what we want them to see before they even know they're seeing it!

756395068473  
658663037576  
860372658602  
846589107830

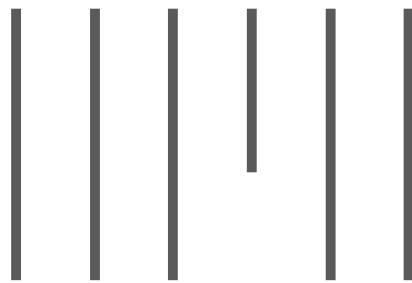
FIGURE 4.3 Count the 3s example with preattentive attributes



Orientation



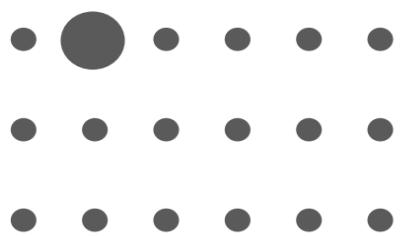
Shape



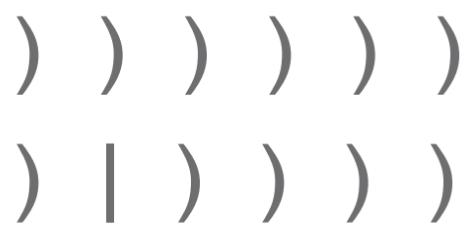
Line length



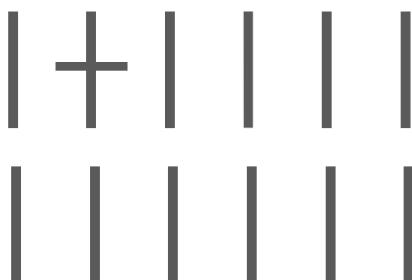
Line width



Size



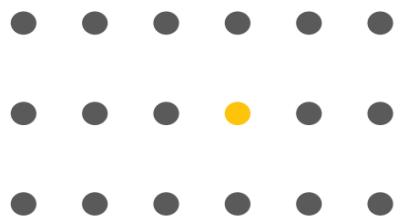
Curvature



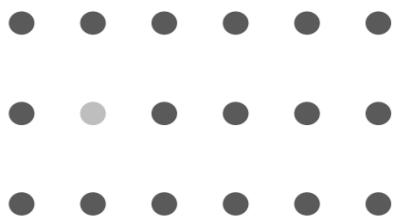
Added marks



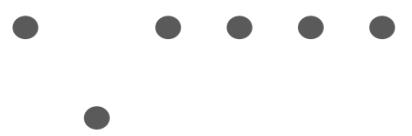
Enclosure



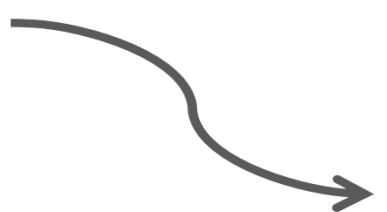
Hue



Intensity



Spatial position



Motion

**FIGURE 4.4** Preattentive attributes



# Focus your audience's attention

## Preattentive attributes in text:

- The subsequent blocks of text employ a single preattentive attribute each.
- Note how, within each, the preattentive attribute grabs your attention, and how some attributes draw your eyes with greater or weaker force than others.

## No preattentive attributes

What are we doing well? Great Products. These products are clearly the best in their class. Replacement parts are shipped when needed. You sent me gaskets without me having to ask. Problems are resolved promptly. Bev in the billing office was quick to resolve a billing issue I had. General customer service exceeds expectations. The account manager even called to check in after normal business hours.

You have a great company – keep up the good work!

# No preattentive attributes

What are we doing well? Great Products. These products are clearly the best in their class. Replacement parts are shipped when needed. You sent me gaskets without me having to ask. Problems are resolved promptly. Bev in the billing office was quick to resolve a billing issue I had. General customer service exceeds expectations. The account manager even called to check in after normal business hours.

You have a great company – keep up the good work!

# Bold

**What are we doing well?** Great Products. These products are clearly the best in their class. Replacement parts are shipped when needed. You sent me gaskets without me having to ask. Problems are resolved promptly. Bev in the billing office was quick to resolve a billing issue I had. General customer service exceeds expectations. The account manager even called to check in after normal business hours.

You have a great company – keep up the good work!

# Color

What are we doing well? Great Products. These products are clearly the best in their class.

Replacement parts are shipped when needed. You sent me gaskets without me having to ask. Problems are resolved promptly. Bev in the billing office was quick to resolve a billing issue I had. General customer service exceeds expectations. The account manager even called to check in after normal business hours.

You have a great company – keep up the good work!

# Italics

What are we doing well? Great Products. These products are clearly the best in their class.

*Replacement parts are shipped when needed.* You sent me gaskets without me having to ask. Problems are resolved promptly. Bev in the billing office was quick to resolve a billing issue I had. General customer service exceeds expectations. The account manager even called to check in after normal business hours.

You have a great company – keep up the good work!

# Size

What are we doing well? Great Products. These products are the best in their class. Replacement parts are shipped when needed. You sent gaskets

**without me having to ask.** Problems are resolved promptly. Bev in the billing office was quick to resolve a billing issue I had. General customer service exceeds expectations. The account manager even called to check in after normal business hours. You have a

# Separate spatially

What are we doing well? Great Products. These products are clearly the best in their class.

Replacement parts are shipped when needed. You sent me gaskets without me having to ask.

Problems are resolved promptly.

Bev in the billing office was quick to resolve a billing issue I had. General customer service exceeds expectations. The account manager even called to check in after normal business hours. You have a

# Outline (enclosure)

What are we doing well? Great Products. These products are clearly the best in their class.

Replacement parts are shipped when needed. You sent me gaskets without me having to ask. Problems are resolved promptly. Bev in the billing office was quick to resolve a billing issue I had. General customer service exceeds expectations. The account manager even called to check in after normal business hours.

You have a great company – keep up the good work!

# Underline (added marks)

What are we doing well? Great Products. These products are clearly the best in their class.

Replacement parts are shipped when needed. You sent me gaskets without me having to ask. Problems are resolved promptly. Bev in the billing office was quick to resolve a billing issue I had. General customer service exceeds expectations. The account manager even called to check in after normal business hours.

You have a great company – keep up the good work!

# What are we doing well?

Themes & example comments

- **Great products:** "These products are clearly the best in class."
- **Replacement parts are shipped when needed:**  
"You sent me gaskets without me having to ask, and I really needed them, too!"
- **Problems are resolved promptly:** "Bev in the billing office was quick to resolve a billing issue I had."
- **General customer service exceeds expectations:**  
"The account manager even called after normal business hours.  
*You have a great company - keep up the good work!*"

**FIGURE 4.6** Preattentive attributes can help create a visual hierarchy of information



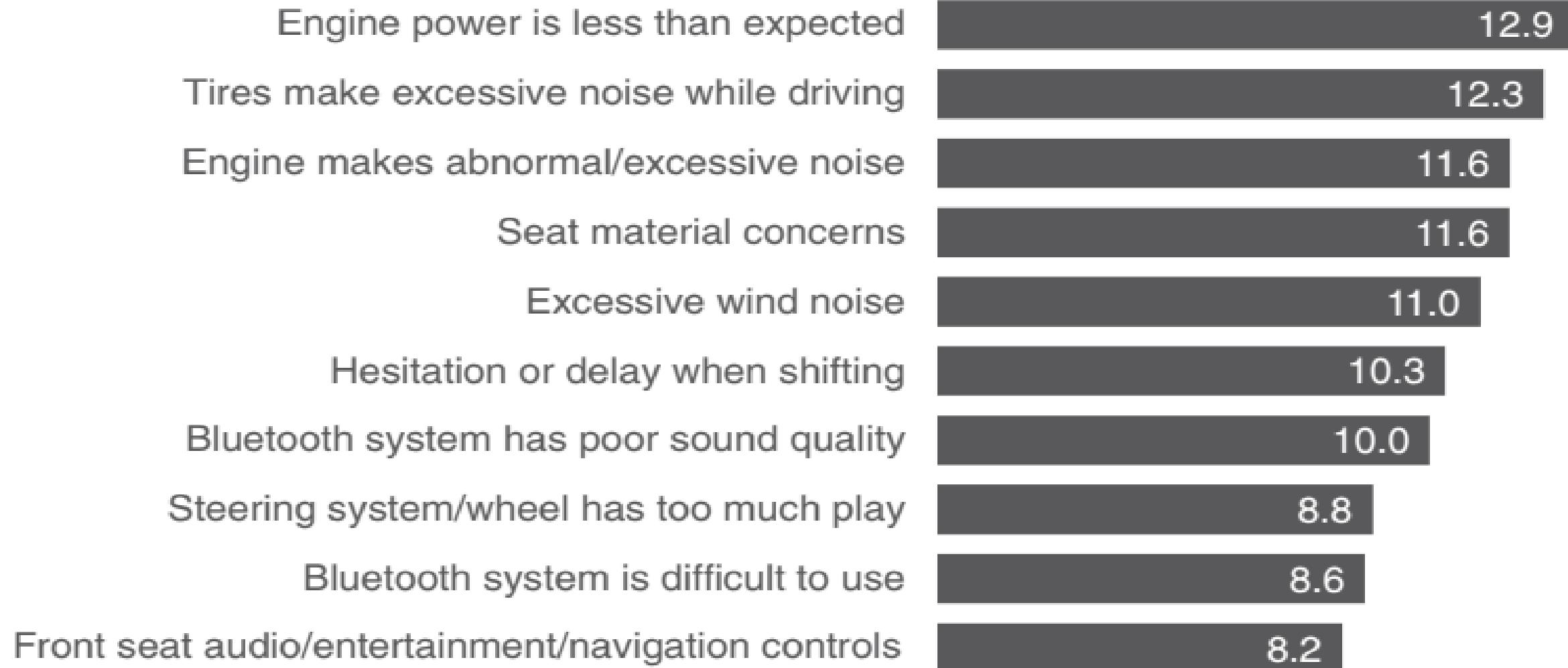
# Focus your audience's attention

## Preattentive attributes in graphs:

- Imagine you work for a car manufacturer.
- You are interested in understanding and sharing insight about the top design concerns from customers for a particular vehicle make and model.
- Measured as the number of concerns per 1,000 concerns from customers for a particular vehicle.
- Your initial visual might look something like Figure 4.7

## Top 10 design concerns

concerns per 1,000

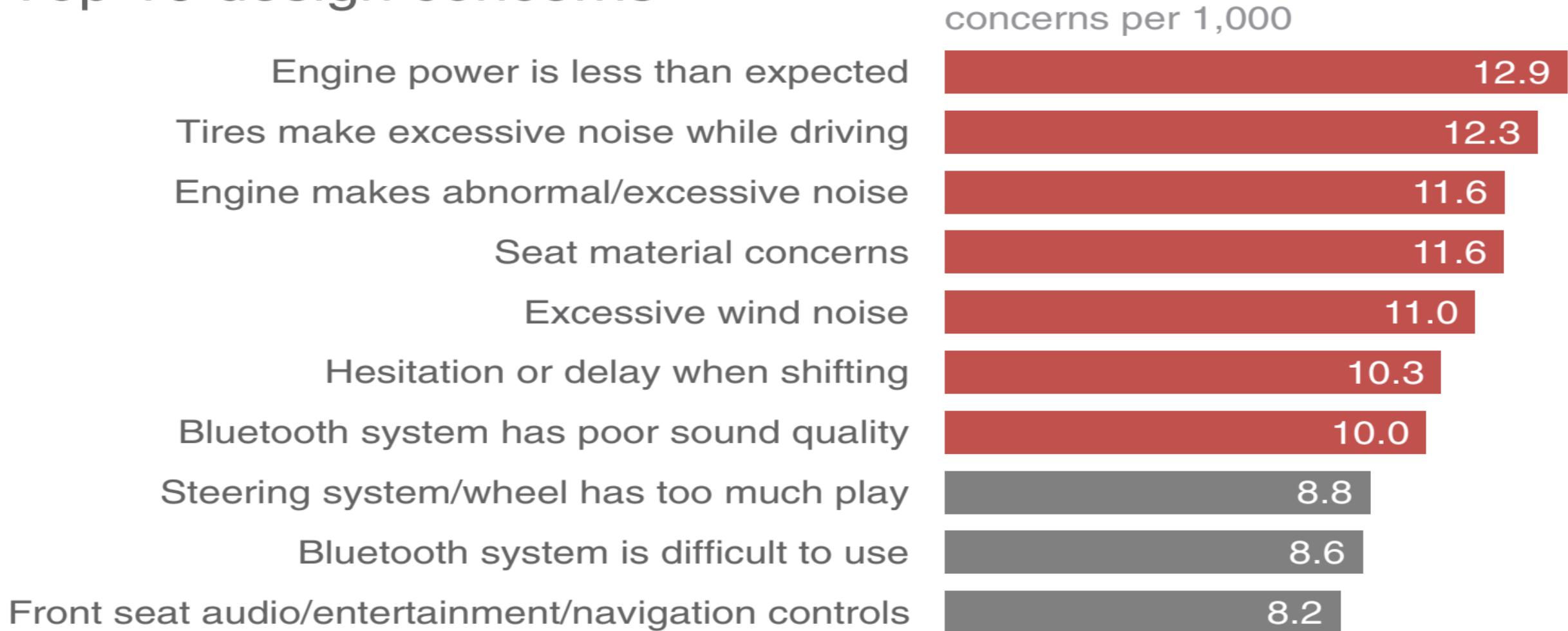


**FIGURE 4.7** Original graph, no preattentive attributes

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

Discussion: is this an acceptable default rate?

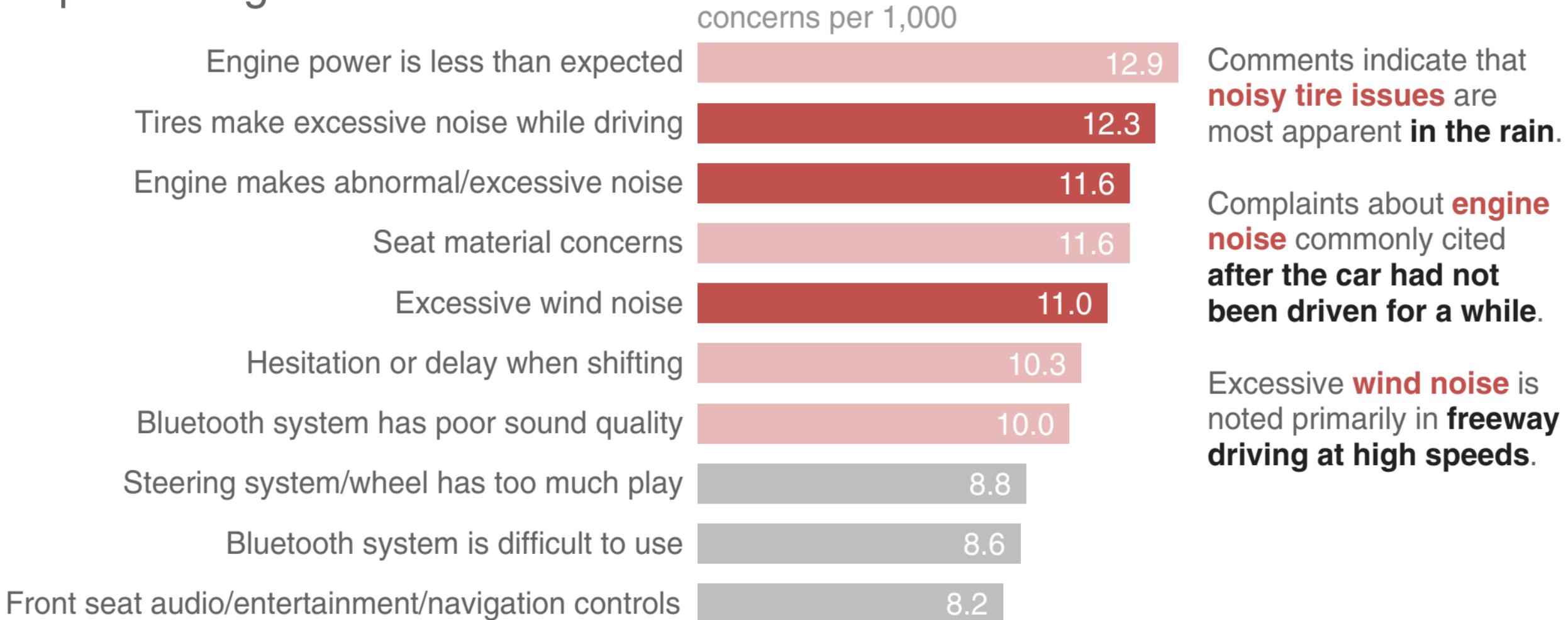
## Top 10 design concerns



**FIGURE 4.8** Leverage color to draw attention

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

### Top 10 design concerns



**FIGURE 4.9** Create a visual hierarchy of information



# Focus your audience's attention

## Preattentive attributes in graphs:

- There are a few preattentive attributes that are so important from a strategic standpoint when it comes to focusing your audience's attention that they warrant their own specific discussions:

**size, color, and position on page.**



# Focus your audience's attention

- **Size**
- Color
- Position

- If you're showing multiple things that are of roughly equal importance, size them similarly.
- Alternatively, if there is one important thing, leverage size to indicate that: make it BIG!



# Focus your audience's attention

- Size
- **Color**
- Position

- When used sparingly, color is one of the most powerful tools you have for drawing your audience's attention.
- Resist the need to use color for the sake of being colorful; instead, leverage color selectively as a strategic tool to highlight the important parts of your visual.



# Focus your audience's attention

- Size
- **Color**
- Position

When it comes to the use of color, there are several specific lessons to know:

- Use it sparingly
- Use it consistently
- Design with the colorblind in mind
- Be thoughtful of the tone color conveys
- Brand colors.



# Focus your audience's attention

- Size
- Color
- Position

When it comes to the use of color, there are several specific lessons to know:

- Use it sparingly
- Use it consistently
- Design with the colorblind in mind
- Be thoughtful of the tone color conveys
- Brand colors.



# Focus your audience's attention

- Size
- Color
- Position

- A table that showed market rank for a handful of pharmaceutical drugs across a few different countries.
- Each rank (1, 2, 3, and so on) was assigned its own color along a rainbow spectrum: 1 = red, 2 = orange 3 = yellow, 4 = light green, 5 = green, 6 = teal, 7 = blue, 8 = dark blue, 9 = light purple, 10+ = purple.



# Focus your audience's attention

- Size
- Color
- Position

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



# Focus your audience's attention

- Size
- Color
- Position

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



# Focus your audience's attention

- Size
- Color
- Position

When it comes to the use of color, there are several specific lessons to know:

- Use it sparingly
- Use it consistently
- Design with the colorblind in mind
- Be thoughtful of the tone color conveys
- Brand colors.



# Focus your audience's attention

- Size
- **Color**
- Position

- There are some cases where use of color must be consistent.
- Your audience will typically take time to familiarize themselves with what colors mean once and then will assume the same details apply throughout the rest of the communication.



# Focus your audience's attention

- Size
- **Color**
- Position

When it comes to the use of color, there are several specific lessons to know:

- Use it sparingly
- Use it consistently
- Design with the colorblind in mind
- Be thoughtful of the tone color conveys
- Brand colors.



# Focus your audience's attention

- Size
  - Color
  - Position
- 
- This most frequently manifests itself as difficulty in distinguishing between shades of red and shades of green.
  - When designing a visual and selecting colors to highlight both positive and negative aspects, frequently use blue to signal positive and orange for negative.



# Focus your audience's attention

- Size
- **Color**
- Position

When it comes to the use of color, there are several specific lessons to know:

- Use it sparingly
- Use it consistently
- Design with the colorblind in mind
- Be thoughtful of the tone color conveys
- Brand colors.



# Focus your audience's attention

- Size
- Color
- Position

- I had created these visuals in my typical color palette: shades of grey with a medium blue used sparingly to draw attention.



# Focus your audience's attention

- Size
- Color
- Position

When it comes to the use of color, there are several specific lessons to know:

- Use it sparingly
- Use it consistently
- Design with the colorblind in mind
- Be thoughtful of the tone color conveys
- Brand colors.



# Focus your audience's attention

- Size
- **Color**
- Position

- I was once working with a client whose brand color was a light shade of green. I originally wanted to leverage this green as the standout color, but it simply wasn't attention grabbing enough.
- There wasn't sufficient contrast, so the visuals I created had a washed-out feel.



# Focus your audience's attention

- Size
- Color
- Position

Leverage **brand color**

Category 1 7

Category 2 5

Category 3 4

Category 4 4

Category 5 3

*ClientLogo*

Draw attention with **black**

Category 1 7

Category 2 5

Category 3 4

Category 4 4

Category 5 3

*ClientLogo*

Use **complementary color**

Category 1 7

Category 2 5

Category 3 4

Category 4 4

Category 5 3

*ClientLogo*

FIGURE 4.16 Color options with brand color



# Focus your audience's attention

- Size
- Color
- Position

- Most members of your audience will start at the top left of your visual or slide and scan with their eyes in zigzag motions across the screen or page.

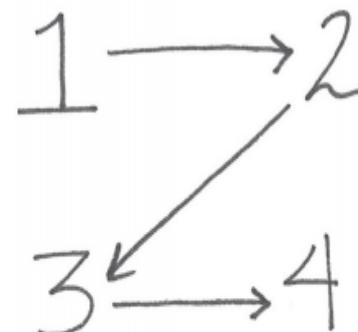


FIGURE 4.17 The zigzag "z" of taking in information on a screen or page



# Contents

1

**Clutter is your enemy**

2

**Focus your audience's attention**

3

**Lessons in Storytelling**



# DATA VISUALIZATION



# UNIT - II



# Contents

1

**Clutter is your enemy**

2

**Focus your audience's attention**

3

**Lessons in Storytelling**

# How you'll learn to tell stories with data



## STEP 1

### CONTEXT

Understand the Context



## STEP 2

### DISPLAY

Choose an appropriate visual display



## STEP 3

### CLUTTER

Eliminate Clutter



## STEP 4

### ATTENTION

Focus attention where you want it



## STEP 5

### THINKING

Think like a designer



## STEP 6

### TELL A STORY

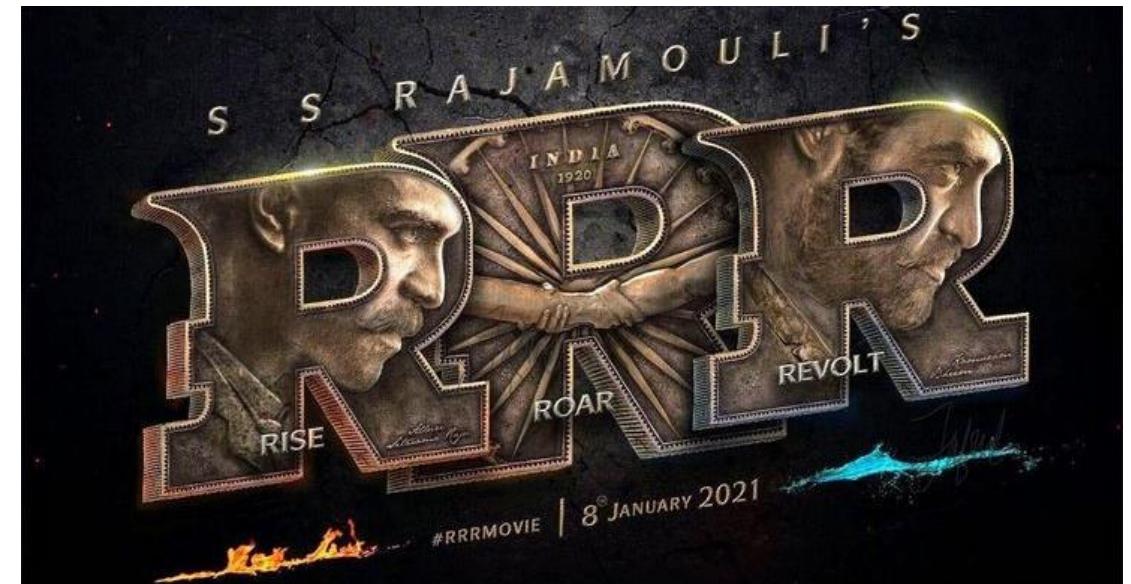
Tell a story to audience





# Lessons in Storytelling

- The lesson on storytelling often begins with a thought exercise.
- Close their eyes and recall the story of “RRR”





# Lessons in Storytelling

- The lesson on storytelling often begins with a thought exercise.
- Close their eyes and recall the story of “EVARU”





# Lessons in Storytelling

- The lesson on storytelling often begins with a thought exercise.
- Close their eyes and recall the story of “THE MUMMY”





# Lessons in Storytelling

## The magic of story:

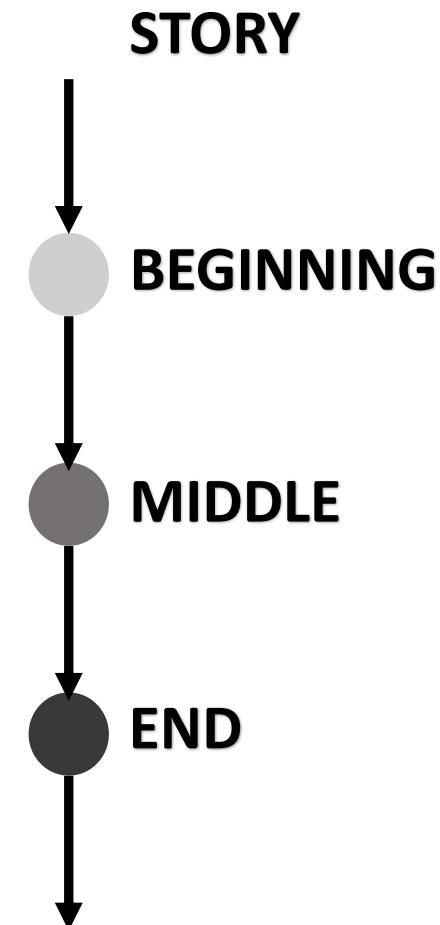
- When you see a great play, watch a captivating movie, or read a fantastic book, you've experienced the magic of story.
- A good story grabs your attention and takes you on a journey, evoking an emotional response.
- In the middle of it, you find yourself not wanting to turn away or put it down.
- After finishing it—a day, a week, or even a month later—you could easily describe it to a friend



# Lessons in Storytelling

## Storytelling in plays or Cinema:

- Aristotle introduced a basic but profound idea: that story has a clear beginning, middle, and end.
- He proposed a three-act structure for plays.





# Lessons in Storytelling

## Storytelling in plays or Cinema:

The first act sets up the story (The Beginning).

- The first thing to do is introduce the plot, building the context for your audience.
- In this section, we set up the essential elements of story—the setting, main character, unresolved situation, and desired outcome getting everyone on common ground so the story can proceed.





# Lessons in Storytelling

## Storytelling in plays or Cinema:

We should involve our audience

- Why should audience pay attention?
- What is in it for audience?





# Lessons in Storytelling

## Storytelling in plays or Cinema:

- It introduces the main character, or hero, their relationships, and the world in which they live.
  1. **The setting:** When and where does the story take place?
  2. **The main character:** Who is driving the action? (This should be framed in terms of your audience!)
  3. **The imbalance:** Why is it necessary, what has changed?
  4. **The balance:** What do you want to see happen?
  5. **The solution:** How will you bring about the changes?





# Lessons in Storytelling

## Storytelling in plays or Cinema:

The second act makes up the bulk of the story (The middle).

- Once you've set the stage, so to speak, the bulk of your communication further develops "what could be," with the goal of convincing your audience of the need for action. You retain your audience's attention through this part of the story by addressing how they can solve the problem you introduced.





# Lessons in Storytelling

## Storytelling in plays or Cinema:

- The main character lacks the skills to deal with the problem he faces, and, as a result, finds himself encountering increasingly worsening situations.
- He may have to learn new skills or reach a higher sense of awareness of who he is and what he is capable of to deal with his situation.





# Lessons in Storytelling

## Storytelling in plays or Cinema:

The third act resolves the story and its subplots (The End).

- Finally, the story must have an end. End with a call to action: make it totally clear to your audience what you want them.
- It includes a climax, where the tensions of the story reach the highest point of intensity.





# Lessons in Storytelling

## The narrative structure:

- To be successful, a narrative must be central to the communication.
- These are words—written, spoken, or a combination of the two—that tell the story in an order that makes sense and convinces the audience why it's important or interesting and attention to it should be paid.

## Considerations:

- Let's discuss some specific considerations when it comes to both the order of the story and the spoken and written narrative.



# Lessons in Storytelling

## Narrative flow: the order of your story:

- Your story must have an order to it.
- A collection of numbers and words on a given topic without structure to organize them and give them meaning is useless.

- One way to order the story—the one that typically comes most naturally—is **chronologically**.
- Another strategy is to **lead with the ending**.



# Lessons in Storytelling

## The spoken and written narrative:

- With a live presentation, you have the benefit of words on the screen or page being reinforced by the words you are saying.
- In this manner, your audience could both read and hear what they need to know, strengthening the information.
- Another challenge is that your audience can act unpredictably.
- They can ask questions that are off topic, jump to a point later in the presentation, or do other things to push you off track.



# Lessons in Storytelling

## The spoken and written narrative:

- In a written report you don't have the benefit of the voiceover to make the sections or slides relevant rather, they must do this on their own.
- Think about what words need to be present.

- Getting feedback from someone not as familiar with the topic can be especially useful in this situation.
- Doing so will help you uncover issues with clarity and flow, or questions your audience may have, so you can address those proactively.



# Lessons in Storytelling

## The power of repetition:

- Thinking back to “RRR”, one of the reasons we remember the story is due to repetition.
- The more the information is repeated or used, the more likely it is to eventually end up in long-term memory, or to be retained.

- Let’s explore a concept called **Bing, Bang, Bongo.**
- The idea is that you should first tell your audience what you’re going to tell them (“Bing,” the introduction paragraph in your essay).
- Then you tell it to them (“Bang,” the actual essay content).
- Then you summarize what you just told them (“Bongo,” the conclusion).



# Lessons in Storytelling

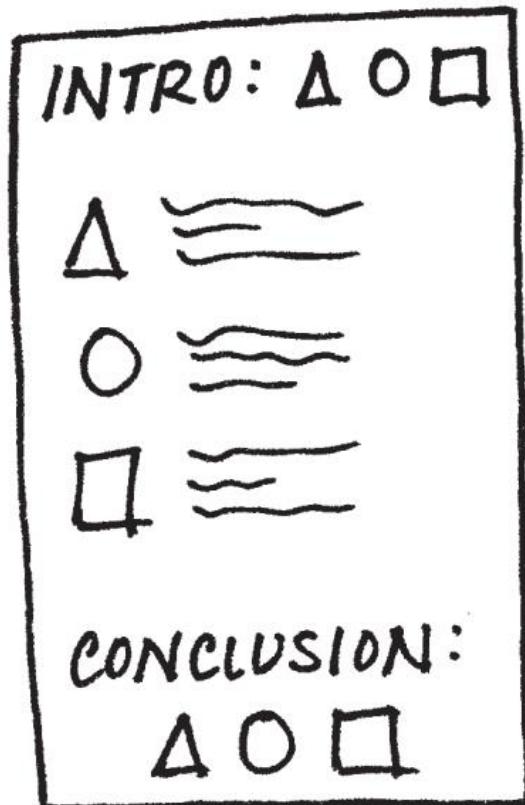


FIGURE 7.1 Bing, bang, bongo

- Let's explore a concept called **Bing, Bang, Bongo**.
- The idea is that you should first tell your audience what you're going to tell them ("Bing," the introduction paragraph in your essay).
- Then you tell it to them ("Bang," the actual essay content).
- Then you summarize what you just told them ("Bongo," the conclusion).



# Lessons in Storytelling

Tactics to help ensure that your story is clear:

Four Tactics:

1. Horizontal logic
2. Vertical logic
3. Reverse storyboarding
4. Fresh perspective

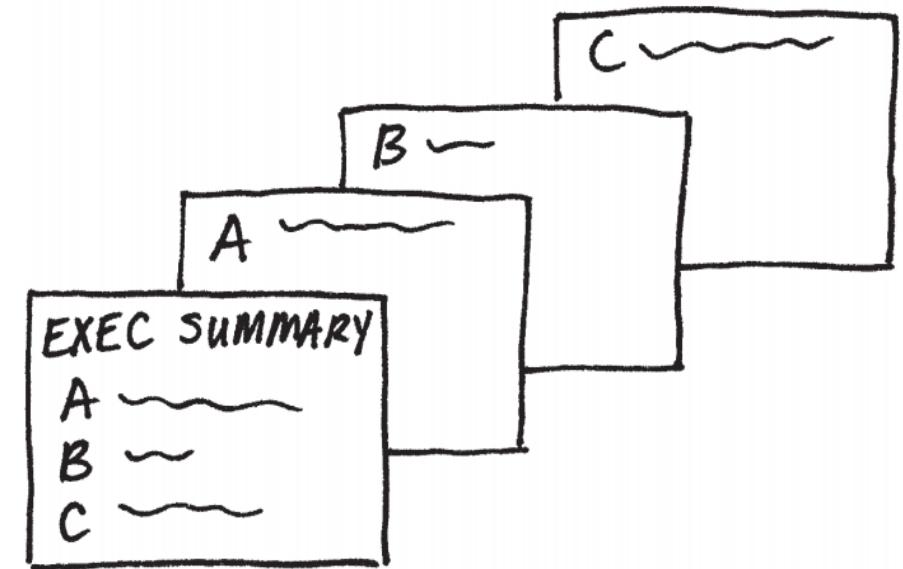


FIGURE 7.2 Horizontal logic



# Lessons in Storytelling

Tactics to help ensure that your story is clear:

Four Tactics:

1. Horizontal logic
2. Vertical logic
3. Reverse storyboarding
4. Fresh perspective

- One strategy is to have an executive summary slide up front, with each bullet corresponding to a subsequent slide title in the same order (Figure 7.2).



# Lessons in Storytelling

Tactics to help ensure that your story is clear:

Four Tactics:

1. Horizontal logic
2. **Vertical logic**
3. Reverse storyboarding
4. Fresh perspective

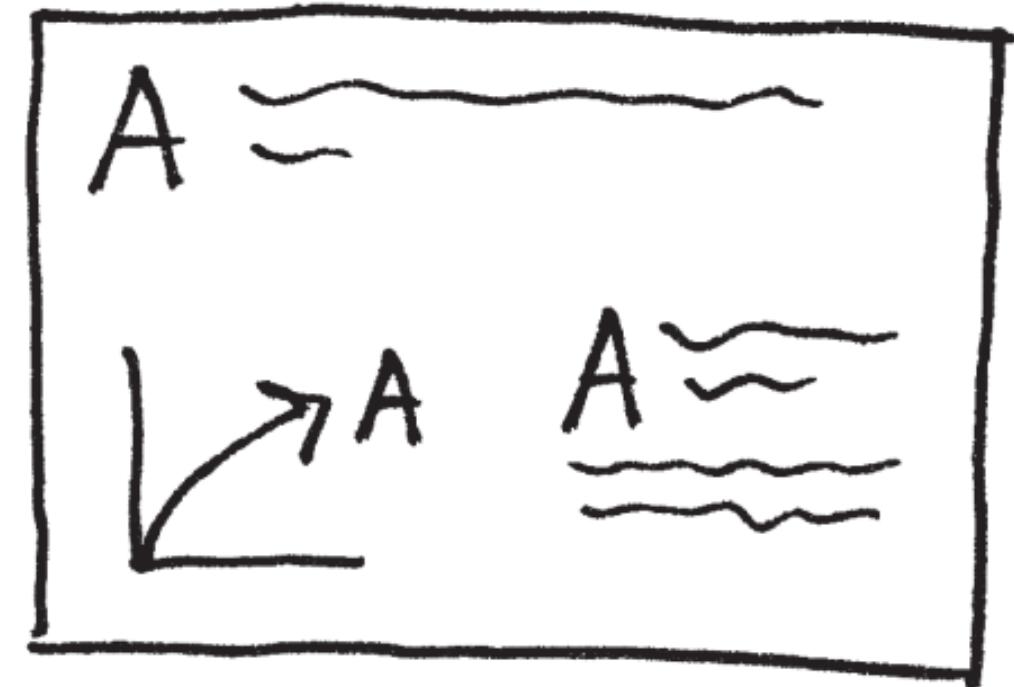


FIGURE 7.3 Vertical logic



# Lessons in Storytelling

Tactics to help ensure that your story is clear:

Four Tactics:

1. Horizontal logic
2. Vertical logic
3. Reverse storyboarding
4. Fresh perspective

- Vertical logic means that all information on a given slide is self-reinforcing. The content reinforces the title and vice versa. The words reinforce the visual and vice versa (Figure 7.3).
- There isn't any extraneous or unrelated information.



# Lessons in Storytelling

Tactics to help ensure that your story is clear:

Four Tactics:

1. Horizontal logic
2. Vertical logic
3. Reverse storyboarding
4. Fresh perspective

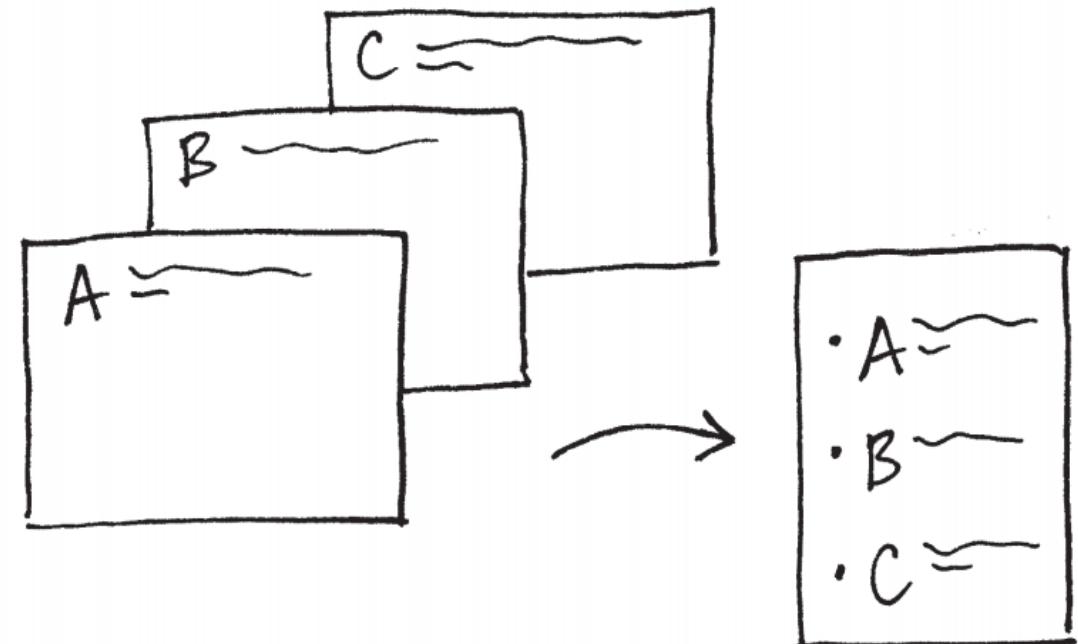


FIGURE 7.4 Reverse storyboarding



# Lessons in Storytelling

Tactics to help ensure that your story is clear:

Four Tactics:

1. Horizontal logic
2. Vertical logic
3. Reverse storyboarding
4. Fresh perspective

- You take the final communication, flip through it, and write down the main point from each page.
- Resulting list should look like the storyboard or outline for the story you want to tell (Figure 7.4).



# Lessons in Storytelling

Tactics to help ensure that your story is clear:

Four Tactics:

1. Horizontal logic
2. Vertical logic
3. Reverse storyboarding
4. Fresh perspective

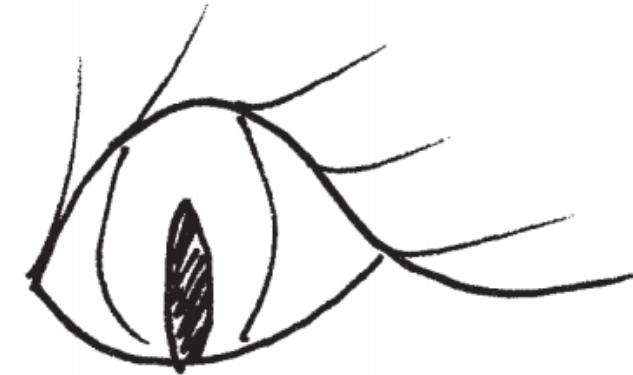


FIGURE 7.5 A fresh perspective



# Lessons in Storytelling

Tactics to help ensure that your story is clear:

Four Tactics:

1. Horizontal logic
2. Vertical logic
3. Reverse storyboarding
4. Fresh perspective

- Once you've crafted your communication, give it to a friend or colleague. It can be someone without any context.



# Lessons in Storytelling

Tactics to help ensure that your story is clear:

Four Tactics:

1. Horizontal logic
2. Vertical logic
3. Reverse storyboarding
4. Fresh perspective

- Ask them to tell you what they pay attention to, what they think is important, and where they have questions.
- This will help you understand whether the communication you've crafted is telling the story you mean to tell .



# Contents

1

**Clutter is your enemy**

2

**Focus your audience's attention**

3

**Lessons in Storytelling**