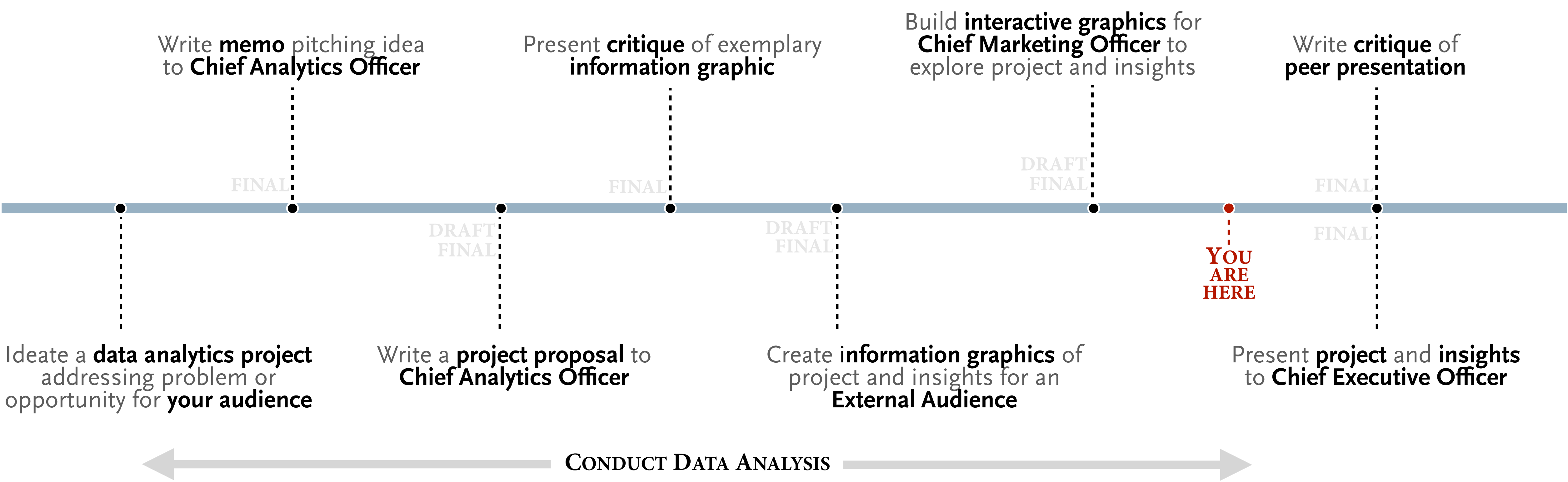


Storytelling with data

12 | Interactive documents and multimodal communication

course overview, main course deliverables

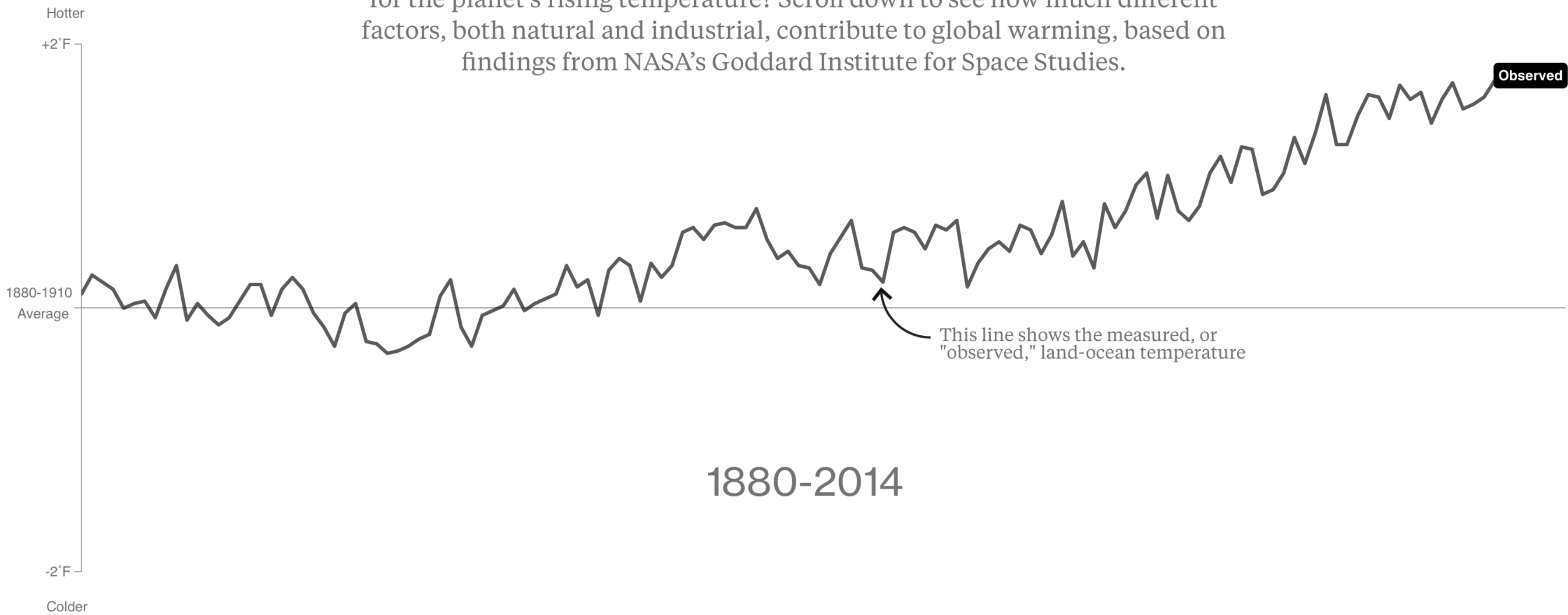


interactive communication, a “scrollytelling” layout

What's Really Warming the World?

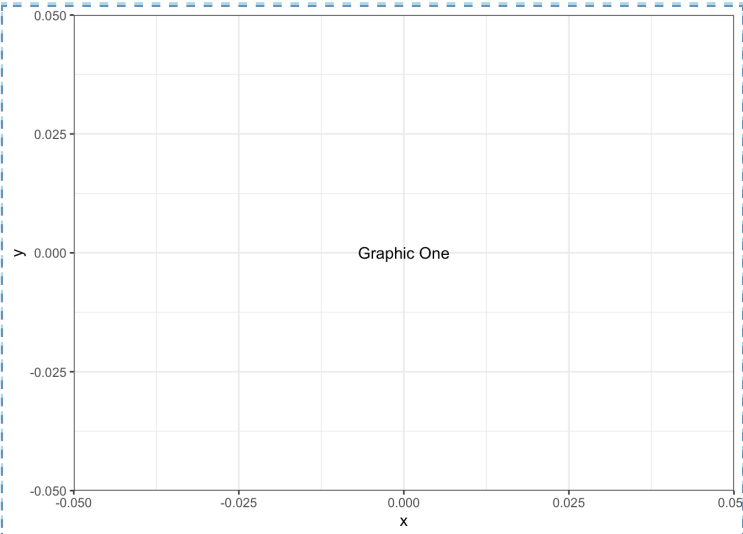
By Eric Roston  and Blacki Migliozi  | June 24, 2015

Skeptics of manmade climate change offer various natural causes to explain why the Earth has warmed 1.4 degrees Fahrenheit since 1880. But can these account for the planet's rising temperature? Scroll down to see how much different factors, both natural and industrial, contribute to global warming, based on findings from NASA's Goddard Institute for Space Studies.



Minimal Scrollytelling Example

This is a paragraph outside the scrollytelling sections. Lorem ipsum dolor sit amet, consectetur adipiscing elit. Donec interdum tellus felis, at lobortis orci sollicitudin ac. Donec lobortis sapien ac posuere faucibus. Mauris lectus neque, pretium non volutpat eget, vestibulum at magna. In sollicitudin augue nunc, non bibendum augue ornare quis.



This is a first article paragraph inside the first scrollytelling section. Lorem ipsum dolor sit amet, consectetur adipiscing elit. Donec interdum tellus felis, at lobortis orci sollicitudin ac. Donec lobortis sapien ac posuere faucibus. Mauris lectus neque, pretium non volutpat eget, vestibulum at magna. In sollicitudin augue nunc, non bibendum augue ornare quis.

This is a second article paragraph inside the first scrollytelling section. Integer accumsan interdum justo eu pretium. Aliquam maximus mi sit amet dapibus efficitur.

This is a third article paragraph inside the first scrollytelling section. Sed condimentum lacus sit amet turpis aliquam varius nec a lacus. In facilisis convallis ante sit amet consequat. Aenean a lorem mollis, bibendum nibh nec, maximus orci. Nulla facilisi.

html

```
<h1>...</h1>

<p>...</p>

<section>

  <figure>

    ```{r, echo=FALSE}
 # graphics go here
    ```

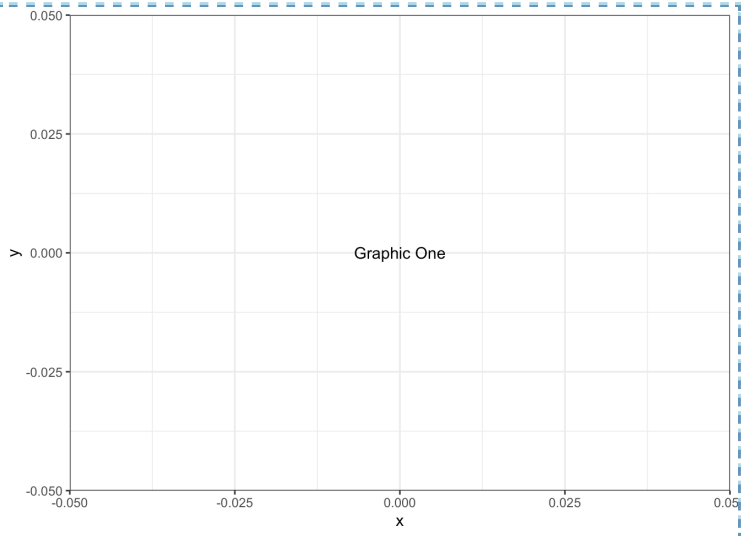
  </figure>

  <article>
    <p>...</p>
  </article>

</section>
```

Minimal Scrollytelling Example

This is a paragraph outside the scrollytelling sections. Lorem ipsum dolor sit amet, consectetur adipiscing elit. Donec interdum tellus felis, at lobortis orci sollicitudin ac. Donec lobortis sapien ac posuere faucibus. Mauris lectus neque, pretium non volutpat eget, vestibulum at magna. In sollicitudin augue nunc, non bibendum augue ornare quis.



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scrollytelling, minimal code in an r markdown to scroll explainers past stay-in-place data graphics

CSS

```
<style>

section {
  display: flex;
  flex-direction: row;
  margin-top: 1rem;
  margin-bottom: 5rem;
}

section > * {
  flex: 1;
}

article {
  padding: 0 1rem;
}

article p {
  font-size: 0.8rem;
  line-height: 1.4;
}

article p:not(:last-of-type) {
  min-height: 20vh;
}

article p:last-of-type {
  min-height: 50vh;
}

figure {
  display: flex;
  align-items: start;
  justify-content: center;
  height: 30rem;
  top: 5rem;
  position: sticky;
}

figure * {
  max-width: 100%;
  object-fit: contain;
}

</style>
```

html

```
<h1>...</h1>

<p>...</p>

<section>

  <figure>

    ```{r, echo=FALSE}
 # graphics go here

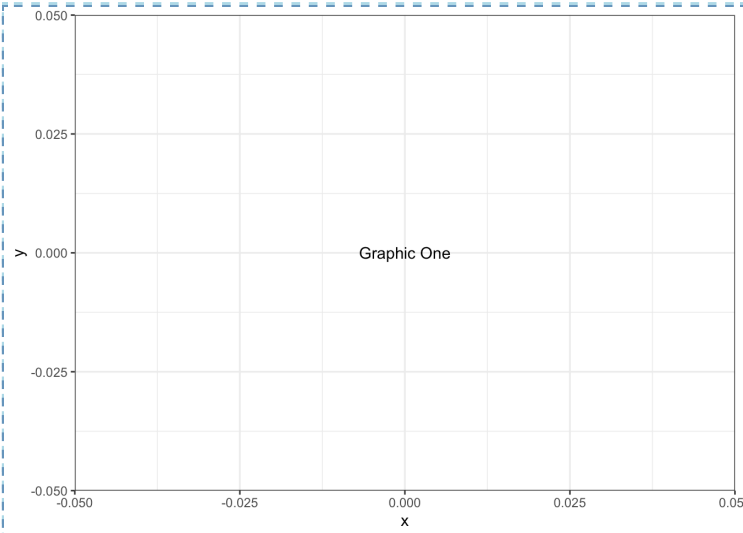
 </figure>

 <article>
 <p>...</p>
 </article>

</section>
```

Minimal Scrollytelling Example

This is a paragraph outside the scrollytelling sections. Lorem ipsum dolor sit amet, consectetur adipiscing elit. Donec interdum tellus felis, at lobortis orci sollicitudin ac. Donec lobortis sapien ac posuere faucibus. Mauris lectus neque, pretium non volutpat eget, vestibulum at magna. In sollicitudin augue nunc, non bibendum augue ornare quis.



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# scrollytelling, minimal code in an r markdown to scroll explainers past stay-in-place data graphics

```
<style>
section {
 display: flex;
 flex-direction: row;
 margin-top: 1rem;
 margin-bottom: 5rem;
}

section > * {
 flex: 1;
}

article {
 padding: 0 1rem;
}

article p {
 font-size: 0.8rem;
 line-height: 1.4;
}

article p:not(:last-of-type) {
 min-height: 20vh;
}

article p:last-of-type {
 min-height: 50vh;
}

figure {
 display: flex;
 align-items: start;
 justify-content: center;
 height: 30rem;
 top: 5rem;
 position: sticky;
}

figure * {
 max-width: 100%;
 object-fit: contain;
}

</style>
```

Of note: Apply any text formatting you want to `<h1>`, `<p>`, and `<article><p>`

Place code chunks for **interactive graphics** here.

Write your **explainers** that scroll past the **figures** here.

Specify white space for *between* **article paragraphs**, and for *after* the last **article paragraph** here. **20vh** means 20 percent of the viewfinder height. Experiment.

When **scrolling**, the `<figure>` **element** stops — **sticks** — its **top** at **5rem** (near the top of the viewfinder, adjust where you like). It will stay there until pushed up or down by its outer scrolling `<section>` element. Unlike the **figure**, the **article paragraphs** keep scrolling.

```
<h1>...</h1>

<p>...</p>

<section>

 <figure>
    ```${r, echo=FALSE}
    # graphics go here
    </figure>

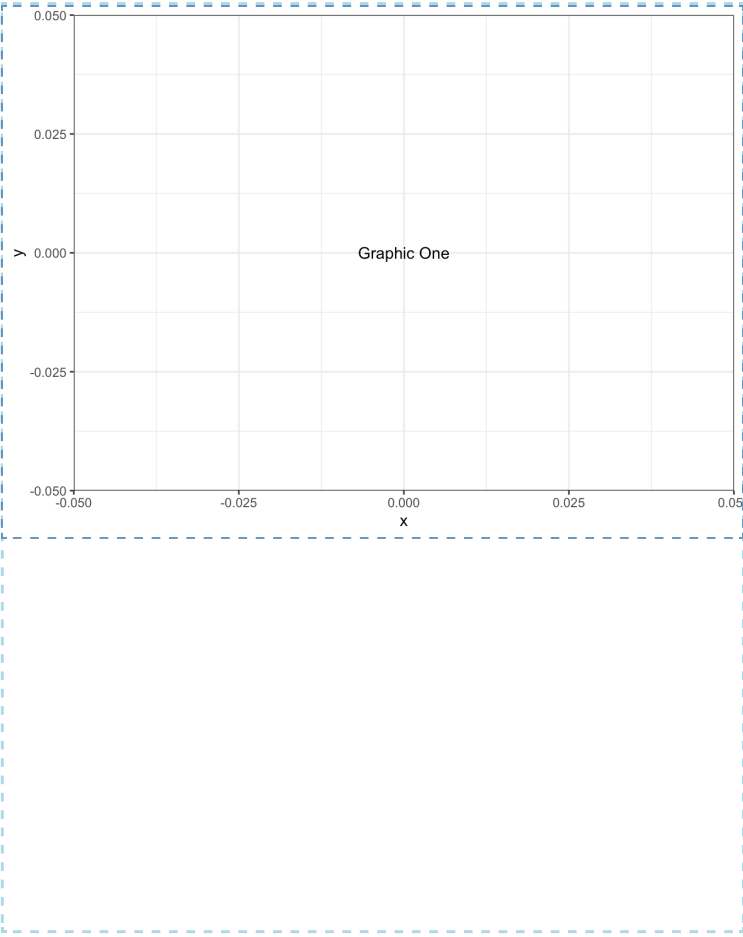
  <article>
    <p>...</p>
  </article>

</section>
```

Minimal Scrollytelling Example

This is a paragraph outside the scrollytelling sections. Lorem ipsum dolor sit amet, consectetur adipiscing elit. Donec interdum tellus felis, at lobortis orci sollicitudin ac. Donec lobortis sapien ac posuere faucibus. Mauris lectus neque, pretium non volutpat eget, vestibulum at magna. In sollicitudin augue nunc, non bibendum augue ornare quis.

Sticky location of `<figure>`



Empty space inside `<section>` allows `<figure>` to stay put until its bottom contacts scrolling `<section>` bottom.

The `<article>` vertically fills entire `<section>`, so it always scrolls with `<section>`.

This is a first article paragraph inside the first scrollytelling section. Lorem ipsum dolor sit amet, consectetur adipiscing elit. Donec interdum tellus felis, at lobortis orci sollicitudin ac. Donec lobortis sapien ac posuere faucibus. Mauris lectus neque, pretium non volutpat eget, vestibulum at magna. In sollicitudin augue nunc, non bibendum augue ornare quis.

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This is a third article paragraph inside the first scrollytelling section. Sed condimentum lacus sit amet turpis aliquam varius nec a lacus. In facilisis convallis ante sit amet consequat. Aenean a lorem mollis, bibendum nibh nec, maximus orci. Nulla facilisi.

verbal with the visual — *limitations and advantages*

verbal with the visual, limitations of presentations

PowerPoint, compared to other common presentation tools, **reduces the analytical quality** of serious presentations of evidence.

This is especially the case for the PowerPoint **ready-made templates**, which **corrupt statistical reasoning**, and often **weaken verbal and spatial thinking**.

— Tufte, 2006



verbal with the visual, limitations of presentations

Powerpoint can have low resolution and it

verbal with the visual, limitations of presentations

encourages

verbal with the visual, **limitations of presentations**



verbal with the visual, **limitations of presentations**

not

verbal with the visual, **limitations of presentations**

spatial
spatial spatial
spatial spatial

verbal with the visual, **limitations of presentations**

review.

Information separated. in. time. makes it difficult
to understand context and evaluate relationships.

verbal with the visual, addressing limitations

show comparisons
adjacent in space



verbal with the visual, addressing limitations

show comparisons
adjacent in space

increase data-ink on
slides too, within reason

verbal with the visual, addressing limitations

show comparisons
adjacent in space

one alternate approach,
document & discussion

increase data-ink on
slides too, within reason

verbal with the visual, advantages of presentations

show comparisons
adjacent in space

one alternate approach,
document & discussion

increase data-ink on
slides too, within reason

consider advantages of
sequential presentation

verbal with the visual, advantages of presentations

show comparisons
adjacent in space

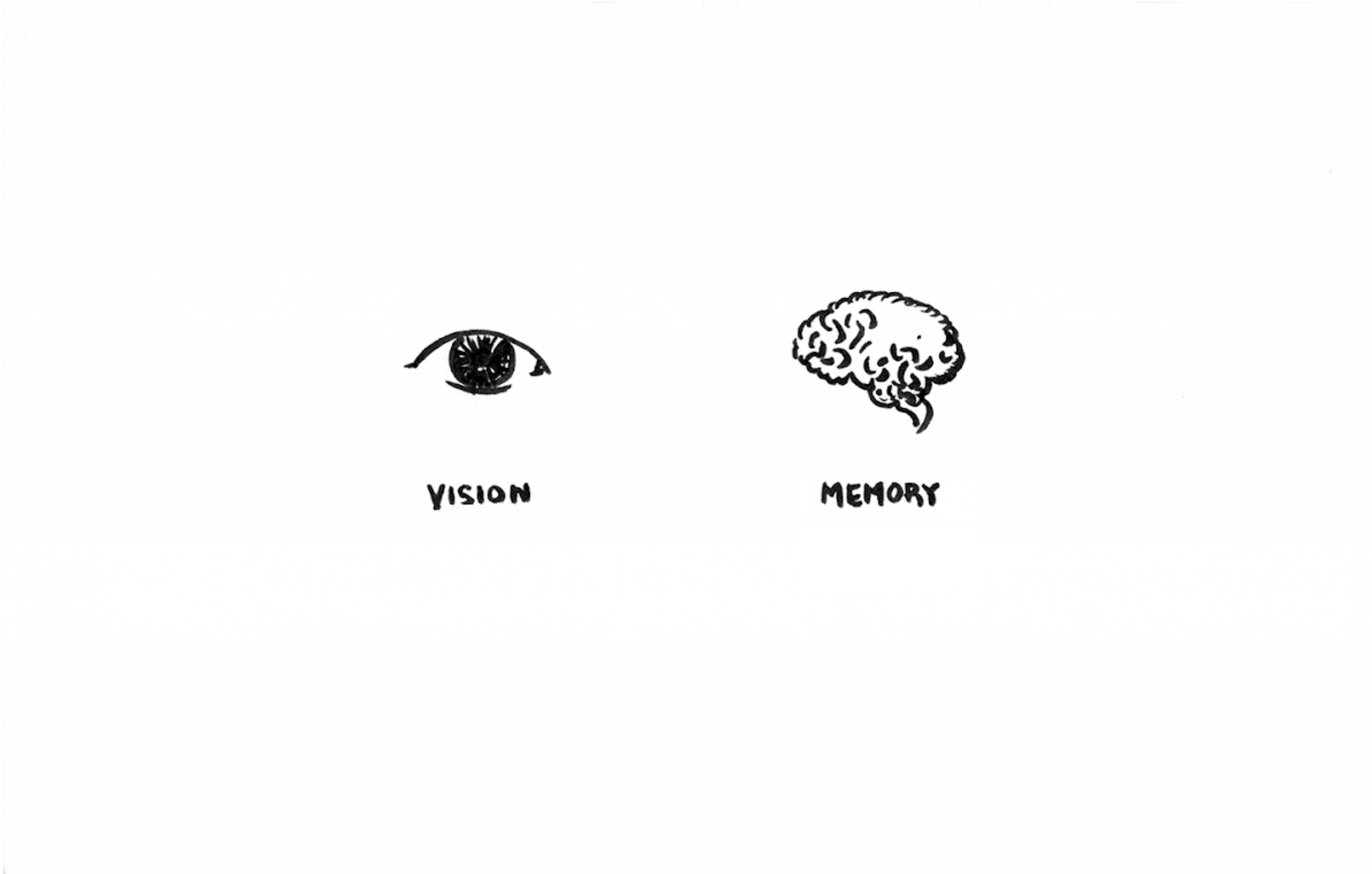
one alternate approach,
document & discussion

increase data-ink on
slides too, within reason

consider advantages of
sequential presentation

*We control **when** our audience receives information!*

verbal with the visual, advantages of presentations



GRAPHIC DESIGN
IS THE USE OF SPACE
TO CONTROL TIME

— Barbara de Wilde

data
verbal with the ✓ visual

verbal with the (data) visual

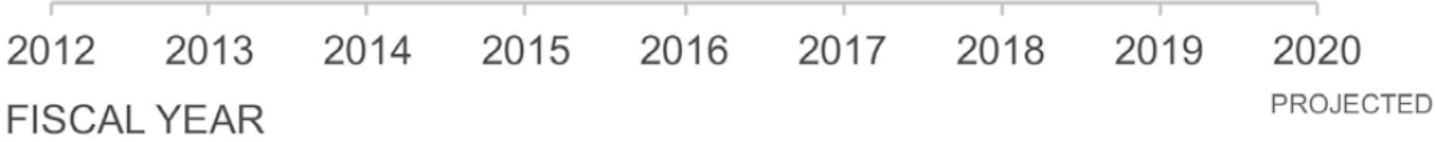
temporal layering of spatial comparisons

verbal with the (data) visual, temporal layering of spatial comparisons

example

verbal with the (data) visual, example — temporal layering of spatial comparisons

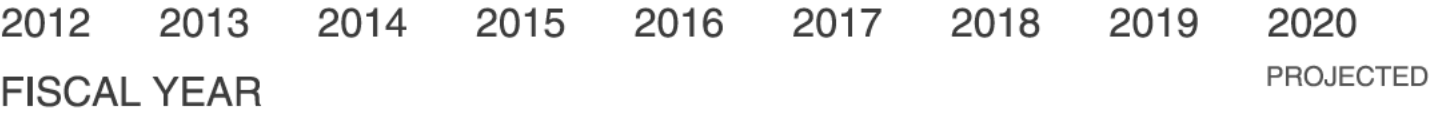
Total units sold



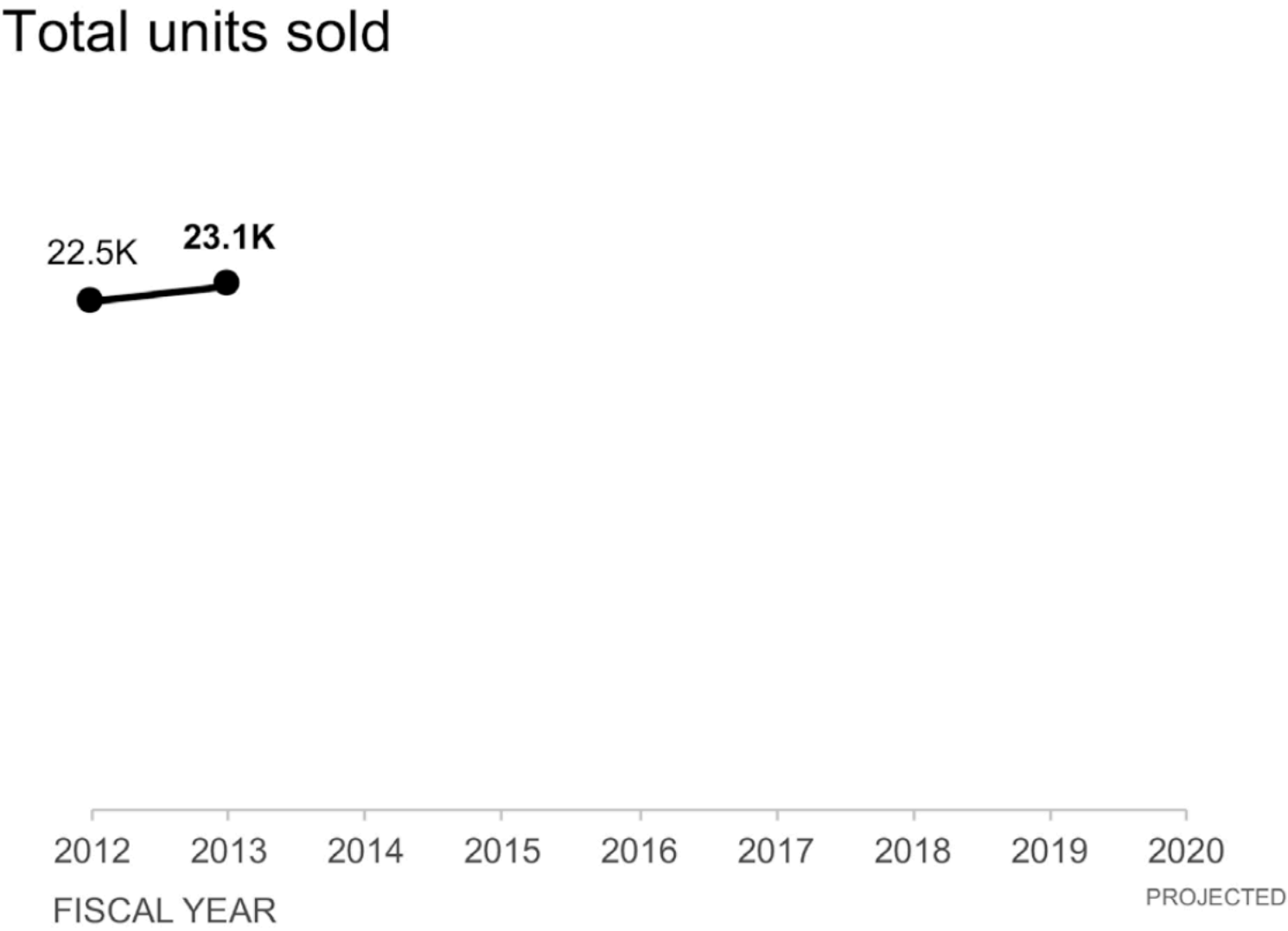
verbal with the (data) visual, example — temporal layering of spatial comparisons

Total units sold

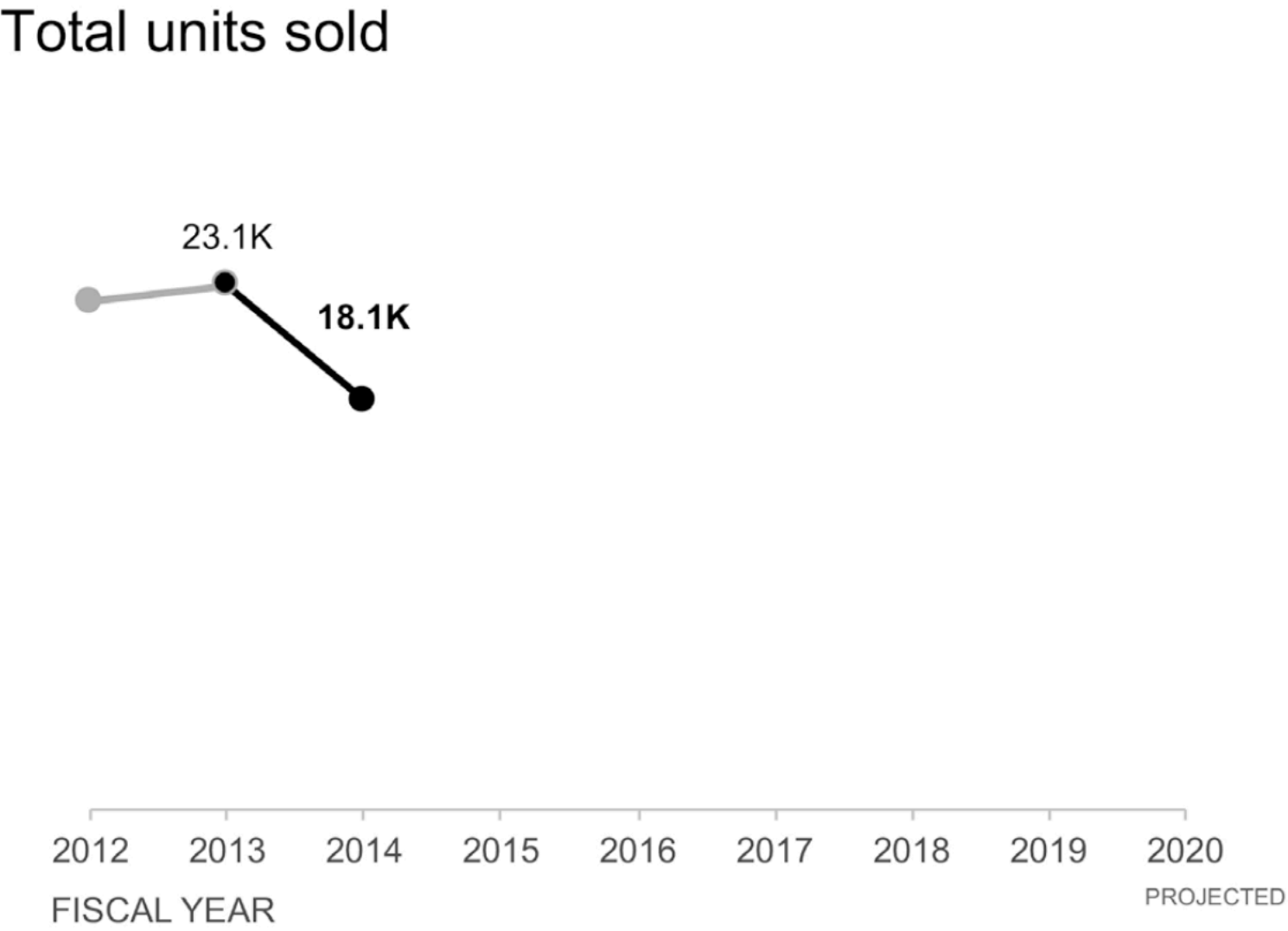
22.5K



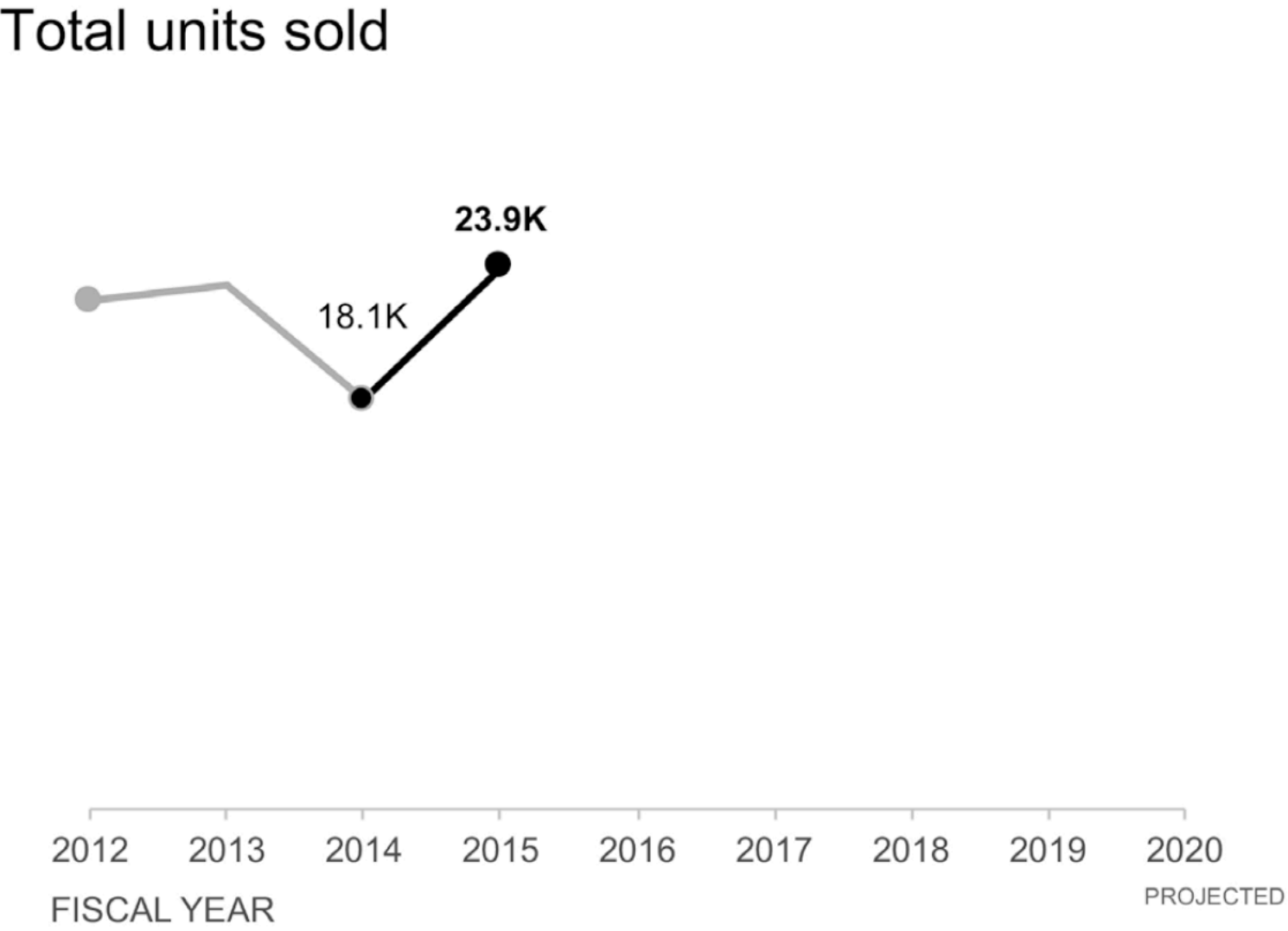
verbal with the (data) visual, example — temporal layering of spatial comparisons



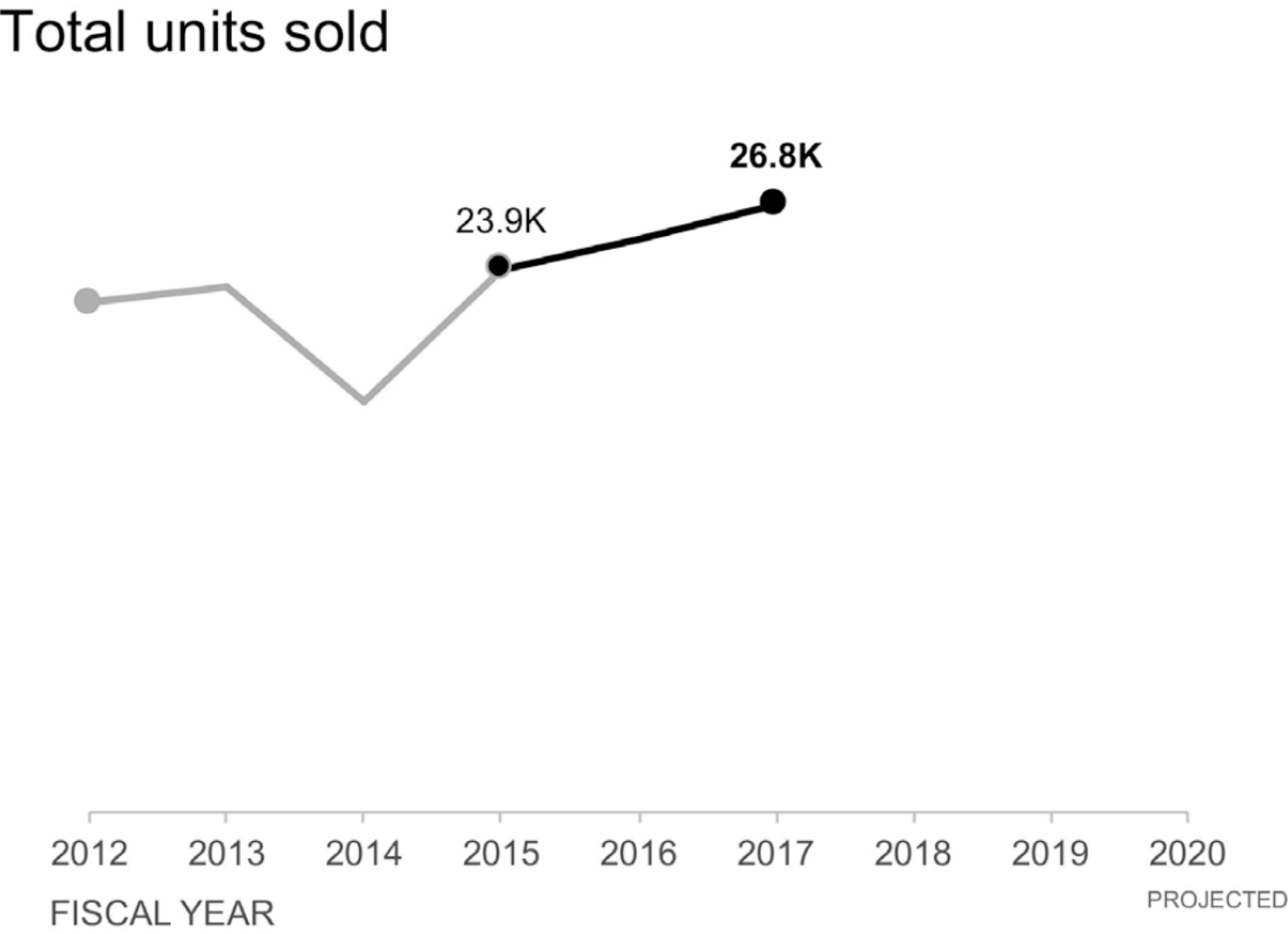
verbal with the (data) visual, example — temporal layering of spatial comparisons



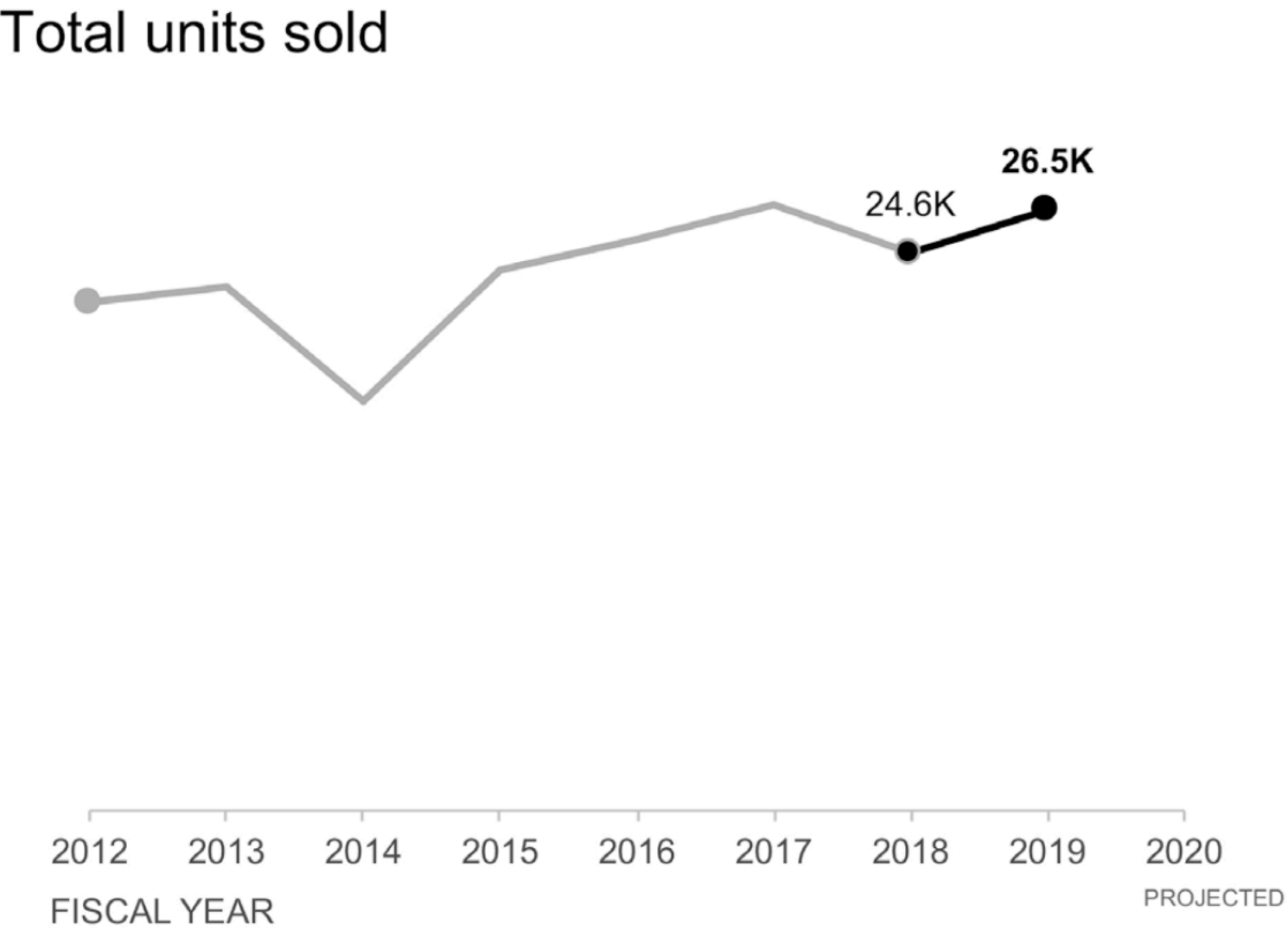
verbal with the (data) visual, example — temporal layering of spatial comparisons



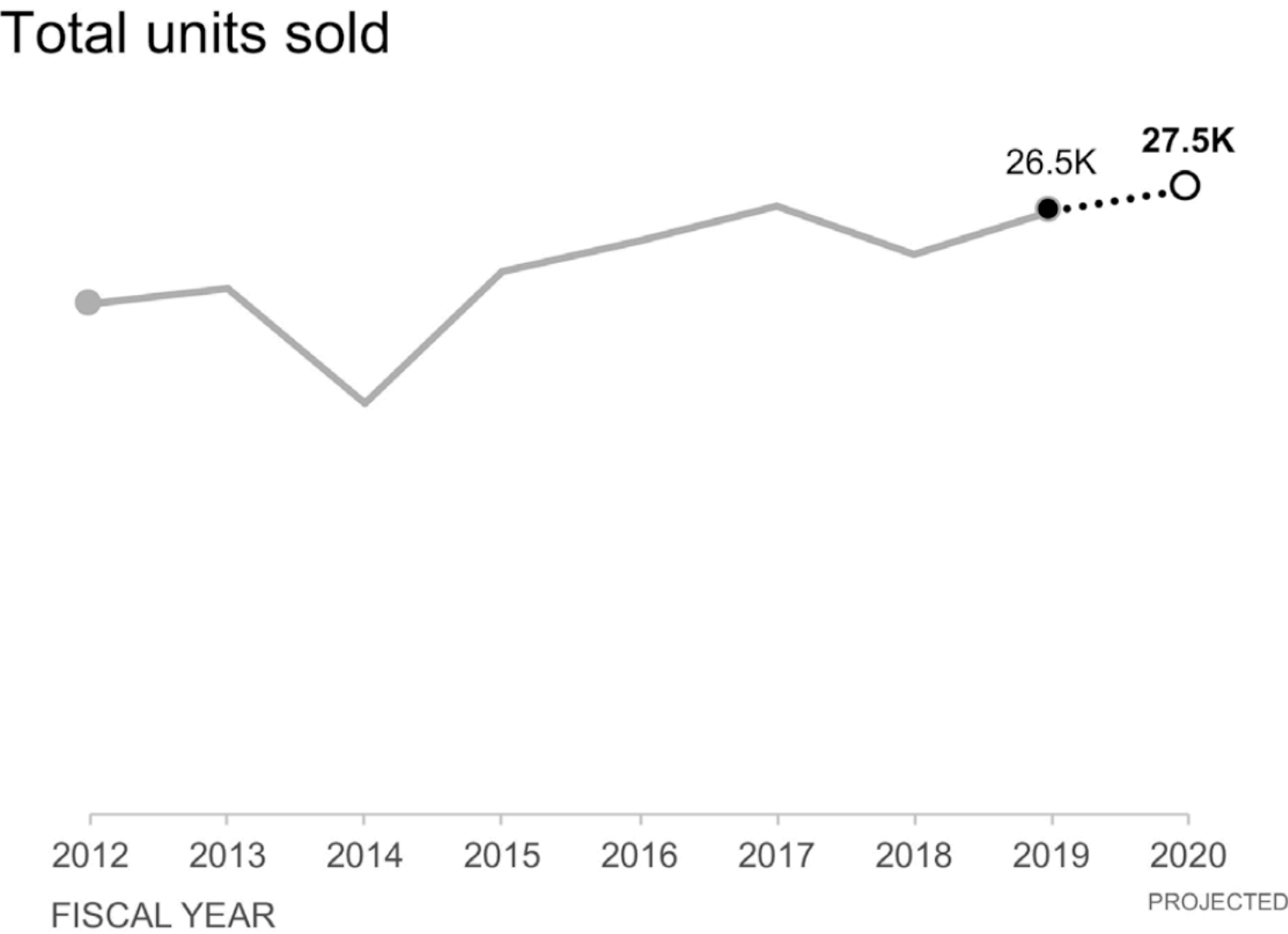
verbal with the (data) visual, example — temporal layering of spatial comparisons



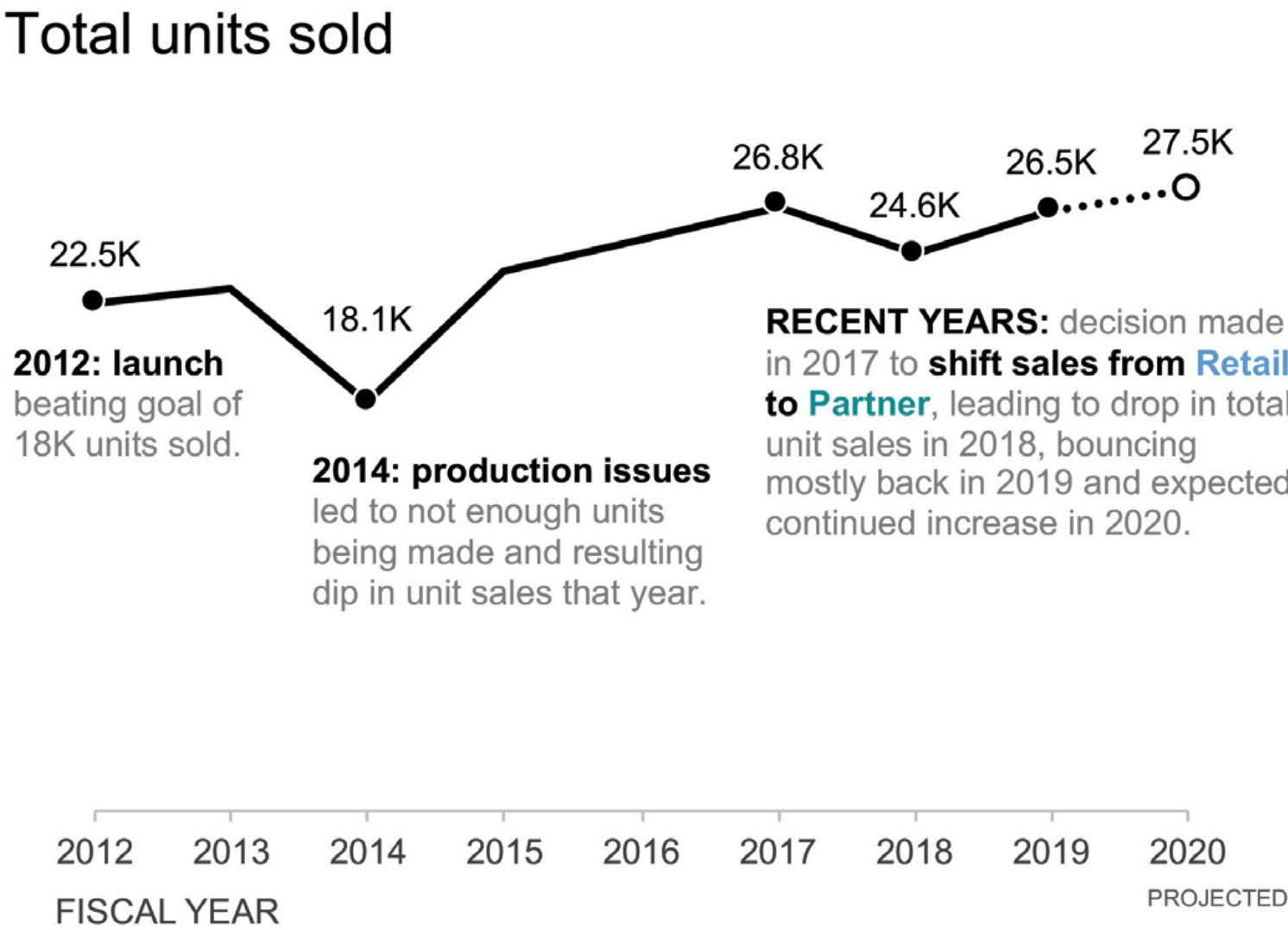
verbal with the (data) visual, example — temporal layering of spatial comparisons



verbal with the (data) visual, example — temporal layering of spatial comparisons



verbal with the (data) visual, example — possible stand-alone version



verbal with the (data) visual, recall, comparisons convey meaning

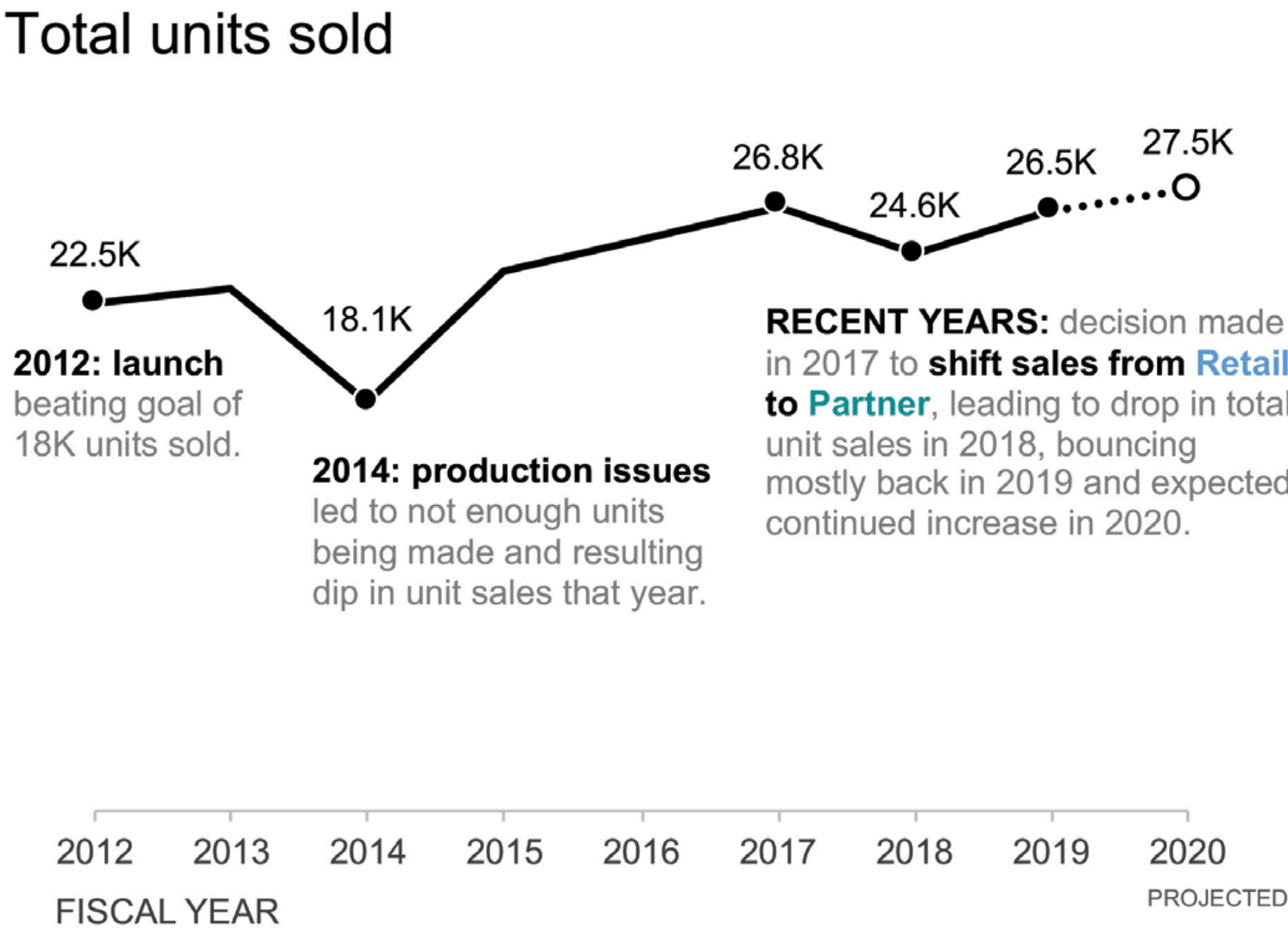
The idea of comparison is crucial. To make a point that is at all meaningful, statistical presentations must refer to differences between observation and expectation, or differences among observations.

— Abelson, Robert, *Statistician, Professor*

The fundamental analytical act in statistical reasoning is to answer the question ‘Compared with what?’

— Tufte, Edward, *Statistician, Professor, Data Visualization Expert*

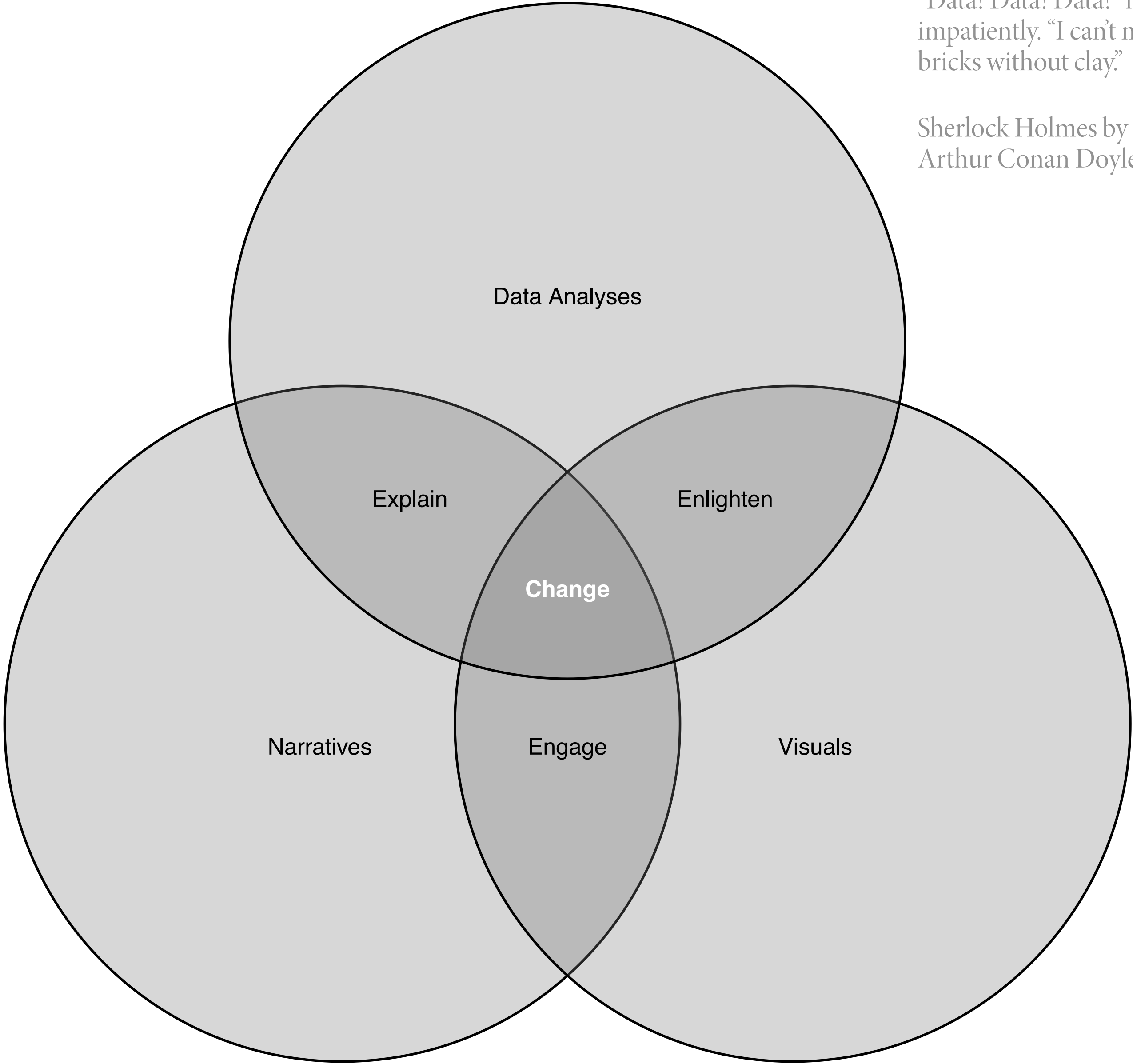
verbal with the (data) visual, time is just one example of layering into a data graphic comparisons between things



storytelling with data, from where we began

“Data! Data! Data!” he cried impatiently. “I can’t make bricks without clay.”

Sherlock Holmes by Sir Arthur Conan Doyle, *author*



No one ever made a decision because of a number. They need a story.

Daniel Kahneman, *psychologist, behavioral economist, and author*

The greatest value of a picture is when it forces us to notice what we never expected to see.

John W Tukey, *mathematician*

resources

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supplemental

verbal with the (data) visual, temporal layering of spatial comparisons

example two

Back-to-school shopping survey results

STORE OFFERS...	% FAVORABLE	
	Our store	All stores
The store is well-organized.	40%	38%
Fast and easy checkout.	33%	34%
Friendly and helpful employees.	45%	50%
Good promotions.	45%	65%
I can find what I'm looking for.	46%	55%
I can find the size I need.	39%	49%
A nice atmosphere.	80%	70%
Latest technology for easy shopping.	35%	34%
Lowest sales prices.	40%	60%
A wide selection.	49%	47%
Items I can't find elsewhere.	74%	54%
The latest styles.	65%	55%

Let's **invest** in employee training to
improve the in-store customer experience

Back-to-school shopping accounts for

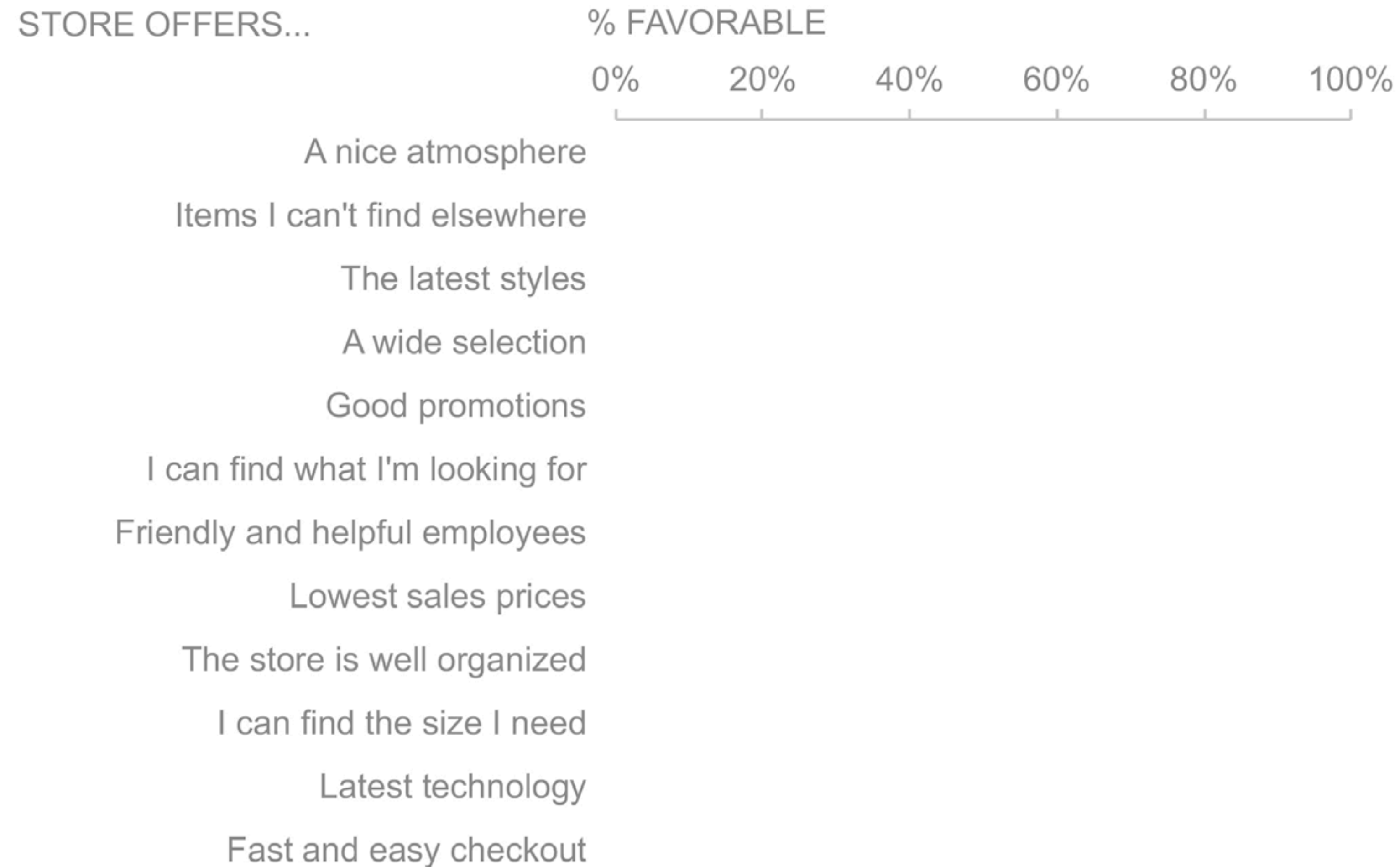
30%

of our annual revenue. Because of this, it is a huge driver of our overall annual success.

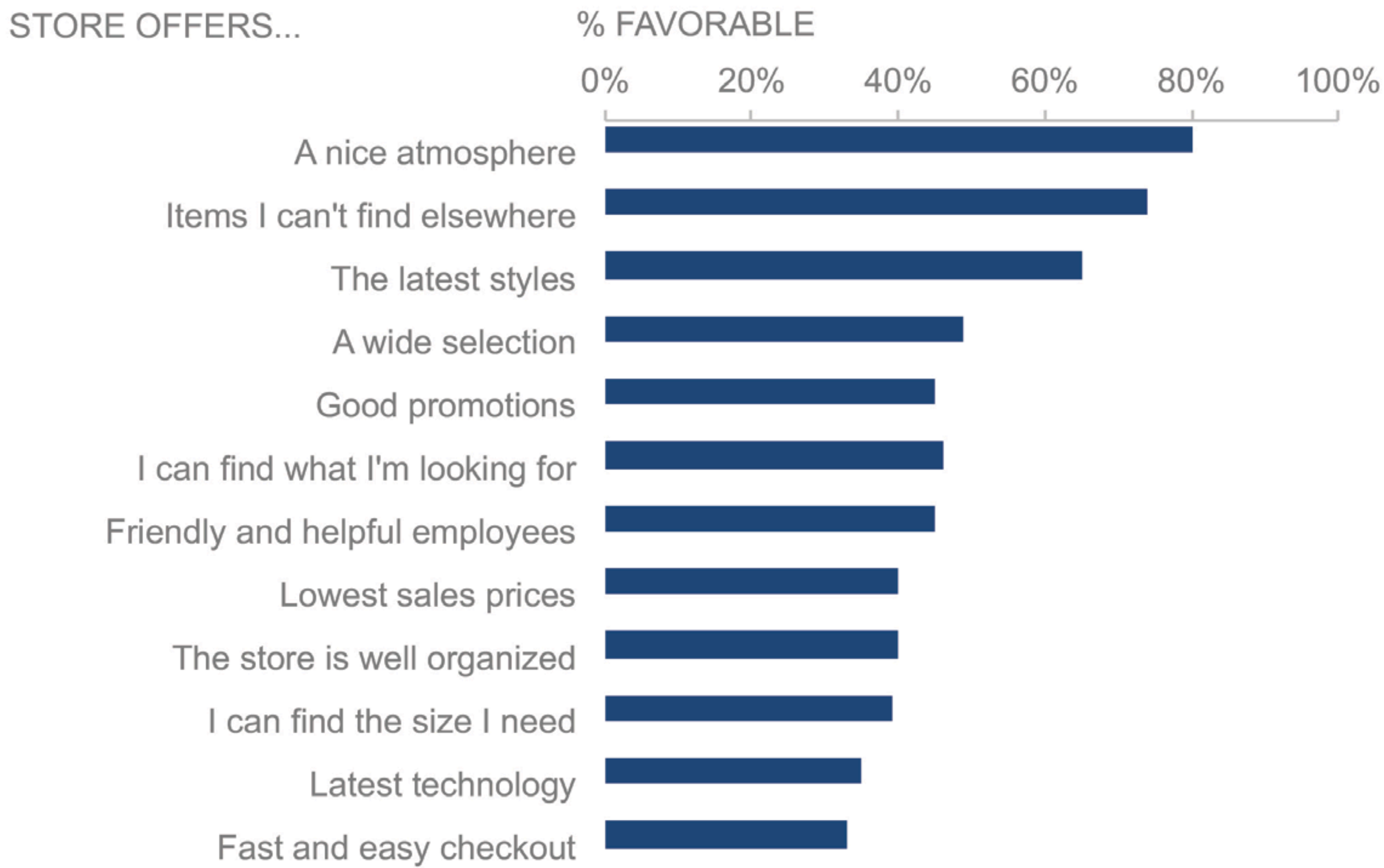
What we'll cover today

- 1 Discuss what we've learned**
from our survey analysis¹ and
- 2 Suggest specific recommendations**
on changes to make for the upcoming back-to-school shopping season to improve customer satisfaction and increase sales.

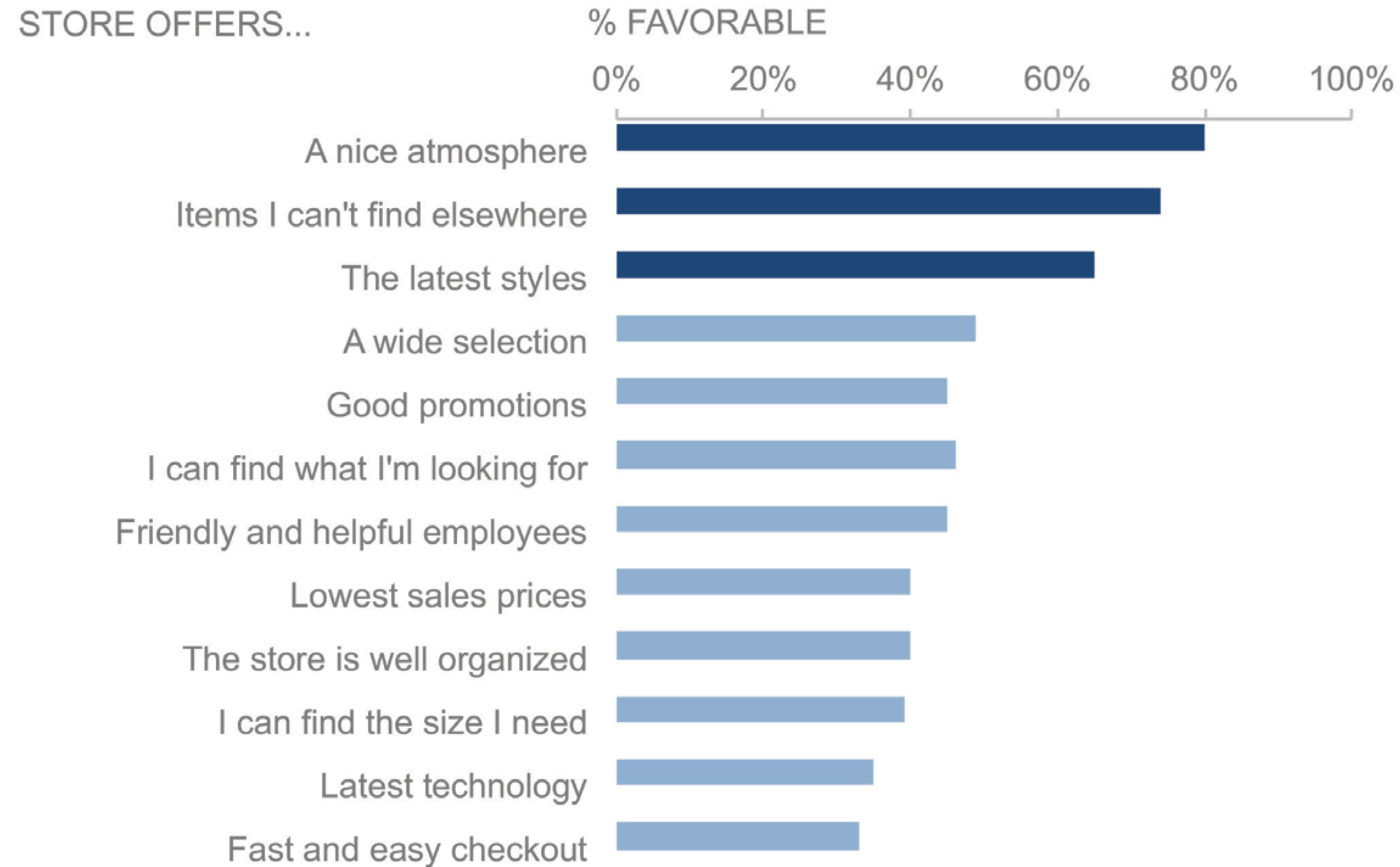
Back-to-school shopping: **consumer sentiment**



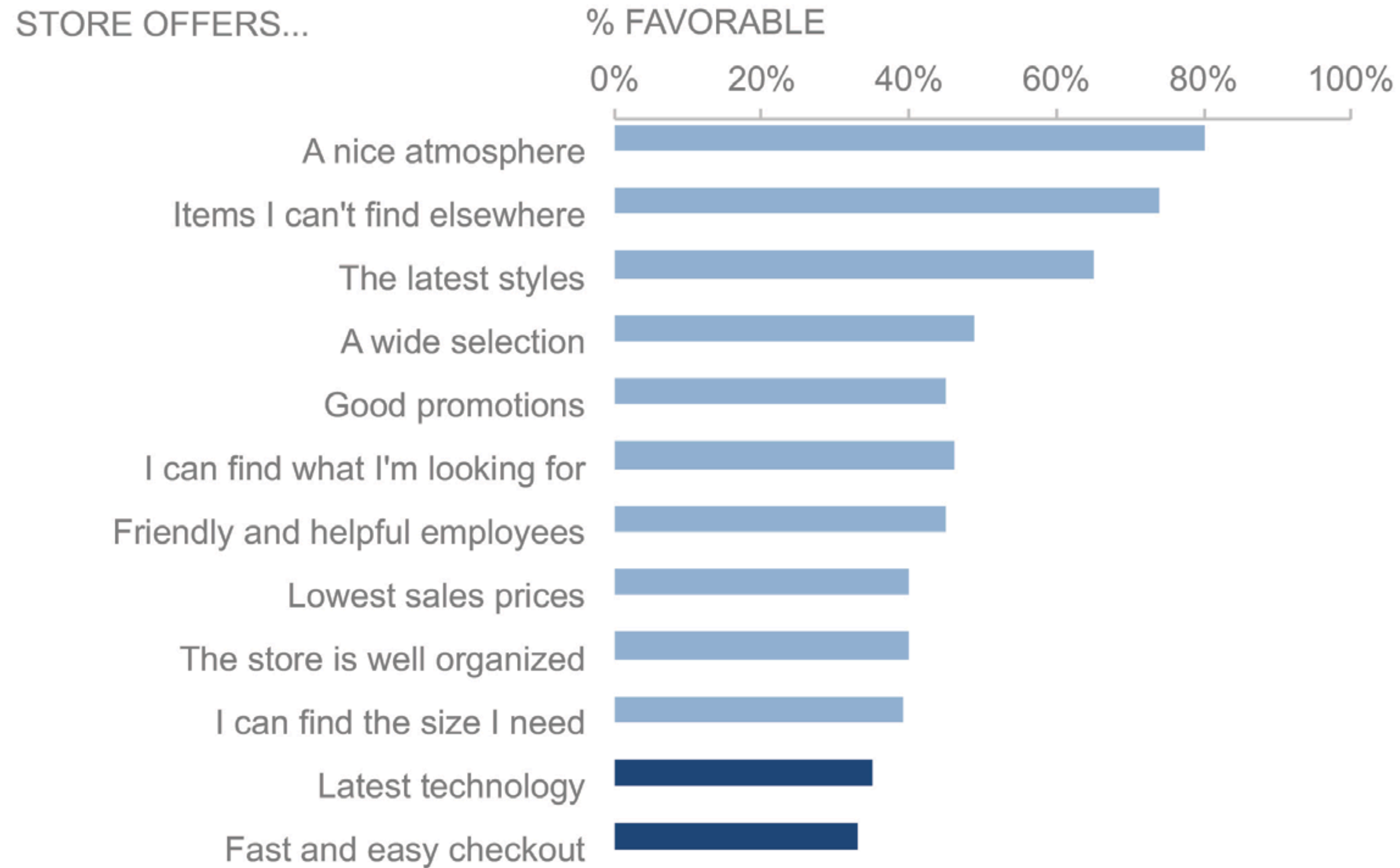
Back-to-school shopping: **consumer sentiment**



Back-to-school shopping: **consumer sentiment**



Back-to-school shopping: **consumer sentiment**



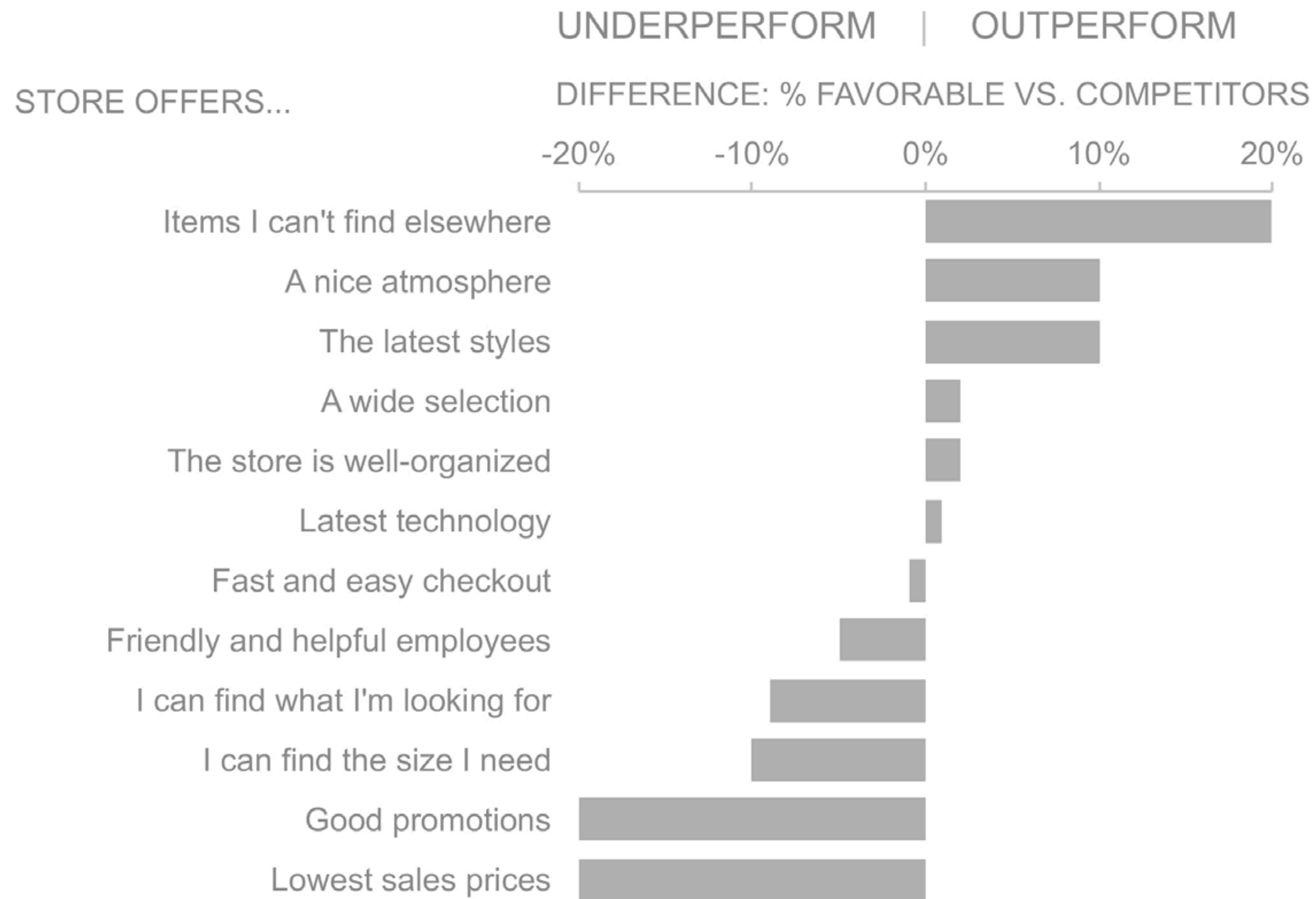
Back-to-school shopping: **consumer sentiment**



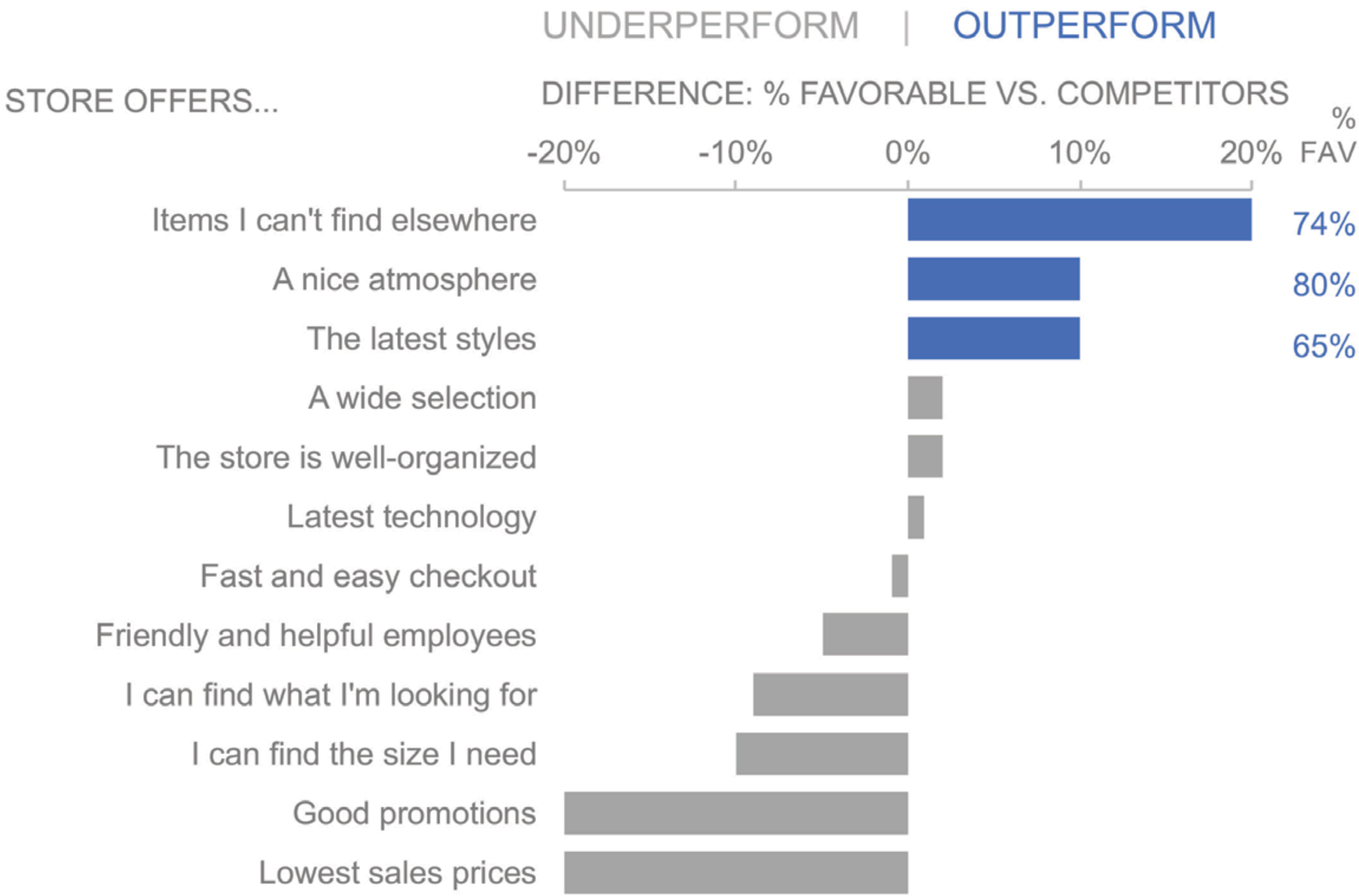
Back-to-school shopping: **consumer sentiment**



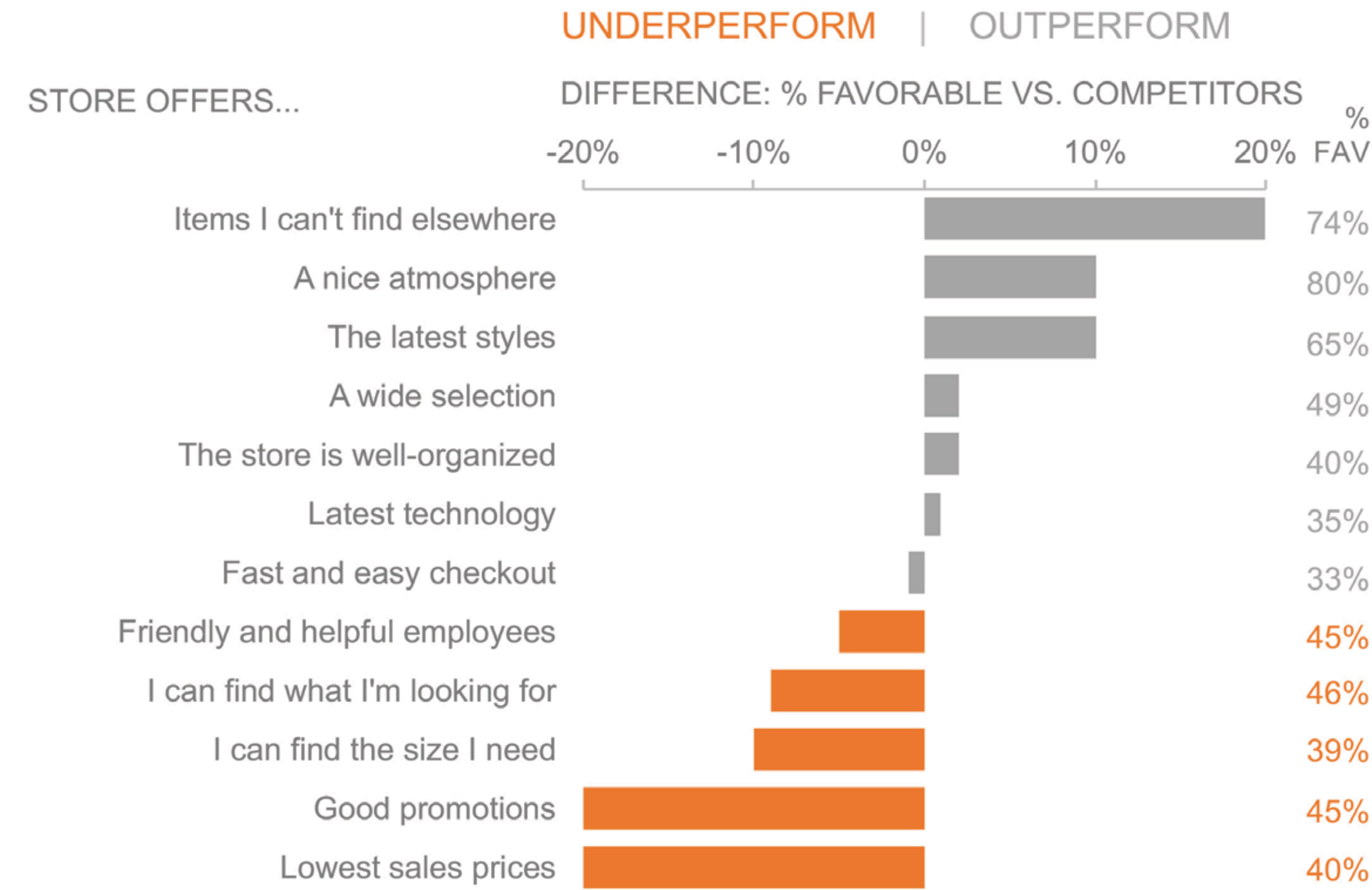
Back-to-school shopping: **consumer sentiment**



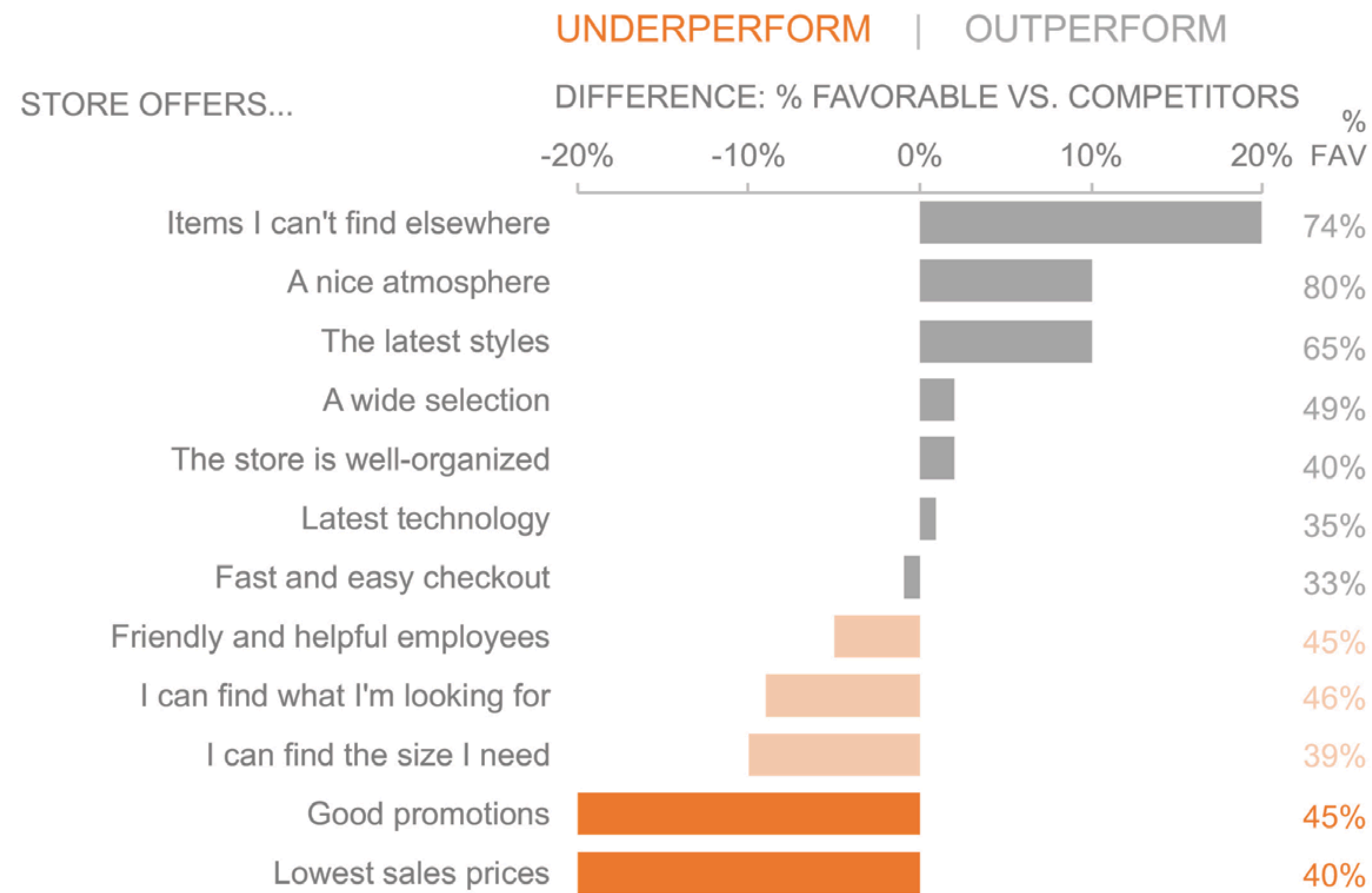
Back-to-school shopping: **consumer sentiment**



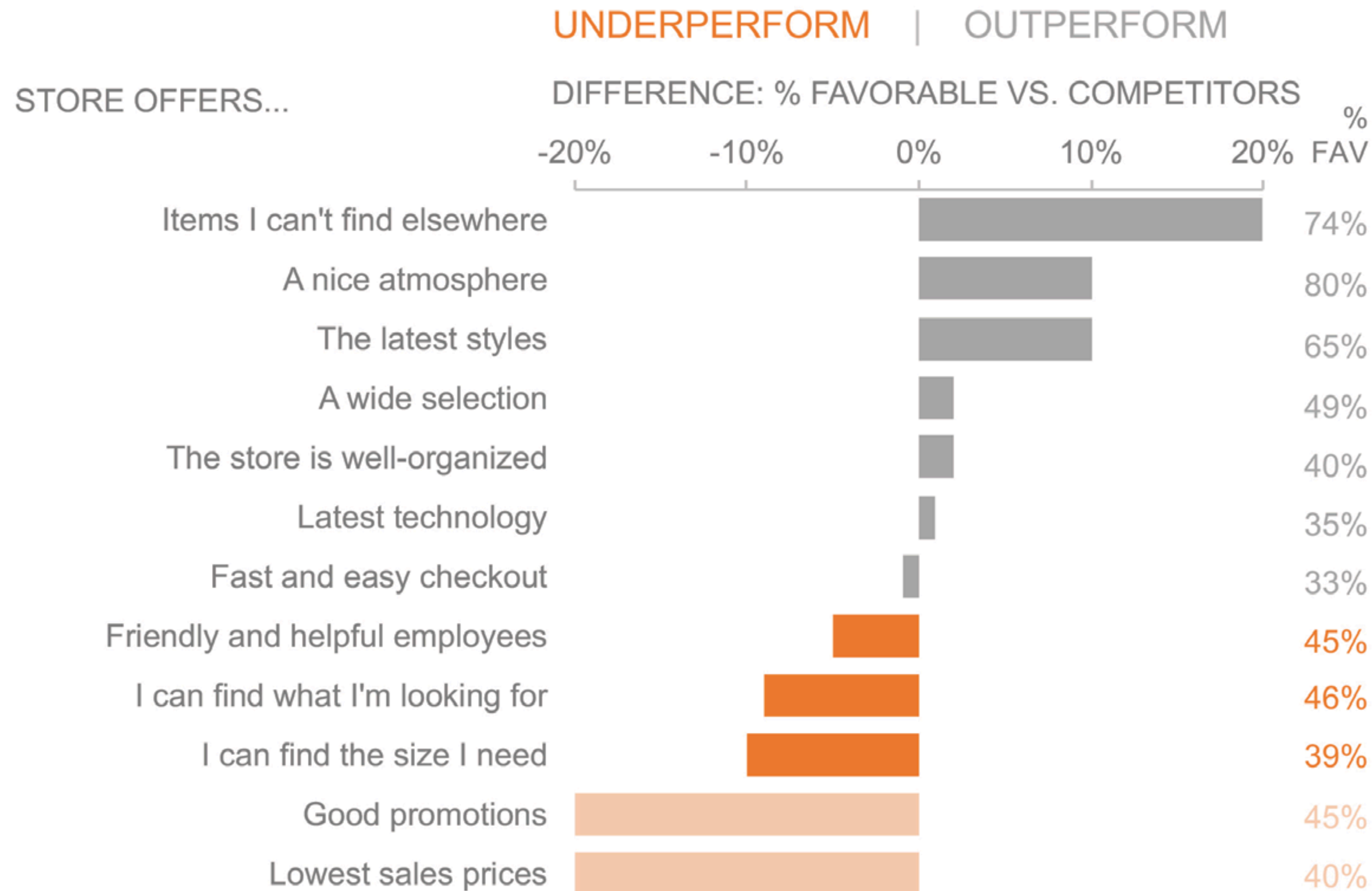
Back-to-school shopping: **consumer sentiment**



Back-to-school shopping: consumer sentiment



Back-to-school shopping: **consumer sentiment**



Let's **invest** in employee training to
improve the in-store customer experience