Gestalt principles of visual perception

When it comes to identifying which elements in our visuals are signal (the information we want to communicate) and which might be noise (clutter), consider the **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. What they came away with are the principles of visual perception still accepted today that define how people interact with and create order out of visual stimuli.

We'll discuss six principles here: proximity, similarity, enclosure, closure, continuity, and connection. For each, I'll show an example of the principle applied to a table or graph.

Proximity

We tend to think of objects that are physically close together as belonging to part of a group. The proximity principle is demonstrated in Figure 3.1: you naturally see the dots as three distinct groups because of their relative proximity to each other.

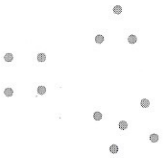

FIGURE 3.1 Gestalt principle of proximity

We can leverage this way that people see in table design. In Figure 3.2, 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.

FIGURE 3.2 You see columns and rows, simply due to dot spacing

Similarity

Objects that are of similar color, shape, size, or orientation are perceived as related or belonging to part of a group. In Figure 3.3, you naturally associate the blue circles together on the left or the grey squares together on the right.

FIGURE 3.3 Gestalt principle of similarity

This can be leveraged in tables to help draw our audience's eyes in the direction we want them to focus. In Figure 3.4, the similarity of color is a cue for our eyes to read across the rows (rather than down the columns). 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

Enclosure

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.

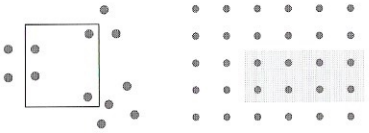

FIGURE 3.5 Gestalt principle of enclosure

One way we can leverage the enclosure principle is to draw a visual distinction within our data, as is done in the graph in Figure 3.6.

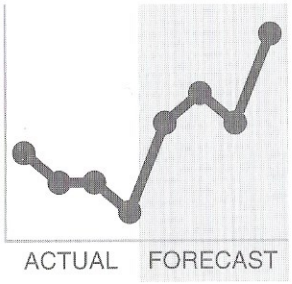

FIGURE 3.6 The shaded area separates the forecast from actual data

Closure

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, recognizable shape when they can—when parts of a whole are missing, our eyes fill in the gap. For example, the elements in Figure 3.7 will tend to be perceived as a circle first and only after that as individual elements.

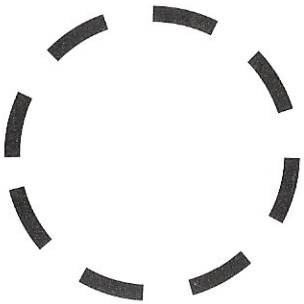

FIGURE 3.7 Gestalt principle of closure

It is common for graphing applications (for example, Excel) to have default settings that include elements like chart borders and background shading. The closure principle tells us that these are unnecessary—we can remove them and our graph still appears as a cohesive entity. Bonus: when we take away those unnecessary elements, our data stands out more, as shown in Figure 3.8.

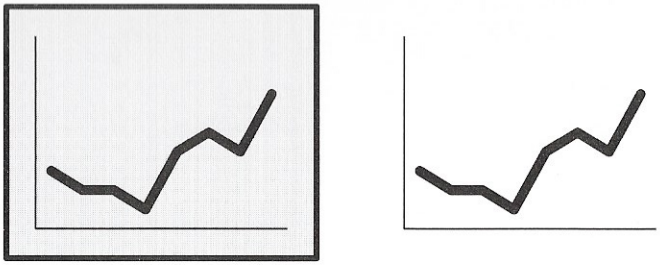

FIGURE 3.8 The graph still appears complete without the border and background shading

Continuity

The principle of continuity is similar to 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. By way of example, in 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).

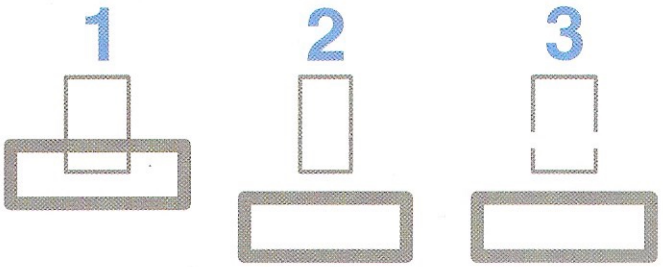

FIGURE 3.9 Gestalt principle of continuity

In the application of this principle, I've removed the vertical *y*-axis line from the graph in Figure 3.10 altogether. Your eyes actually still see that the bars are lined up at the same point because of the consistent white space (the smoothest path) between the labels on the left and the data on the right. As we saw with the closure principle in application, stripping away unnecessary elements allows our data to stand out more.

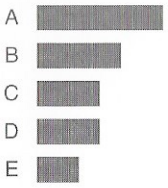

FIGURE 3.10 Graph with *y*-axis line removed

Connection

The final Gestalt principle we'll focus on is connection. 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. Note when looking at Figure 3.11, your eyes probably pair the shapes connected by lines (rather than similar color, size, or shape): that's the connection principle in action. The connective property *isn't* typically stronger than enclosure, but you can impact this relationship through thickness and darkness of lines to create the desired visual hierarchy (we'll talk more about visual hierarchy when we discuss preattentive attributes in Chapter 4).

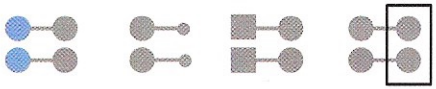

FIGURE 3.11 Gestalt principle of connection

One way that we frequently leverage the connection principle is in line graphs, to help our eyes see order in the data, as shown in Figure 3.12.

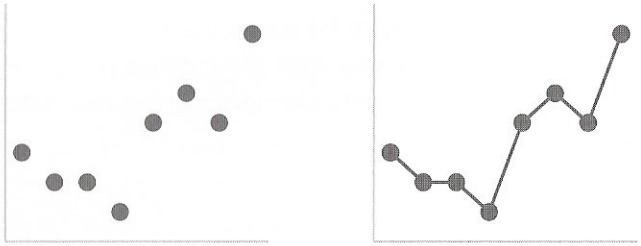

FIGURE 3.12 Lines connect the dots

As you have learned from this brief overview, the Gestalt principles help us understand how people see, which we can use to identify unnecessary elements and ease the processing of our visual communications. We aren't done with them yet. At the end of this chapter, we'll discuss how we can apply some of these principles to a real-world example.