POINTS OF VIEW

Gestalt principles (Part 2)

Our visual system attempts to structure what we see into patterns to make sense of information. The Gestalt principles describe different ways we organize visual data. Last month, we looked at four principles that incline us to group objects when they are made to look alike, are placed near one another, are connected by lines or are enclosed in a common space[1]. This month, we will examine the principles of visual completion and continuity. These principles are useful in page layout work and when we compose figures and slides.

Visual interpolation creates interesting illusions in which we see contours that do not actually exist. The Kanizsa triangle[2] we looked at last month is a famous example of illusory or subjective contours (**Fig. 1a**). The 'Pac-Man' shapes align to form what appears to be well-defined edges of a triangle.

Another example of visual completion is shown in **Figure 1b**. We automatically and spontaneously perceive a full circle behind the square. In reality, several shapes are possible in the occluded area. This disparity between the actual visual stimulus and what we think (or know) we should be seeing points to the psychology involved in seeing. It is likely that we complete the object behind the square as a circle because it produces a simple and familiar shape.

Because we have a strong tendency to see shapes as continuous to the greatest degree possible, we fill in voids with visual cues found elsewhere on the page. This means every element on a page affects how we perceive every other element. Visual completion enables us to forgo the extraneous lines, boxes, bullets and other graphical elements that tend to clutter our presentations.

Graphics and text can be considered shapes with vertices and edges. To construct unified compositions, align these constituent parts to
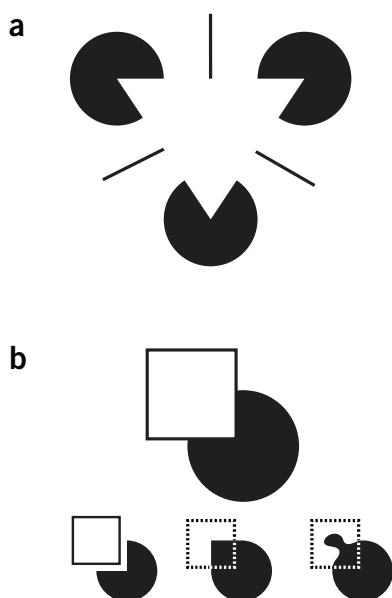

Figure 1 | Visual completion. (**a**) The Kanizsa triangle and illusory contour. (**b**) Spontaneous and automatic completion of occluded surfaces as a simple and familiar circle.
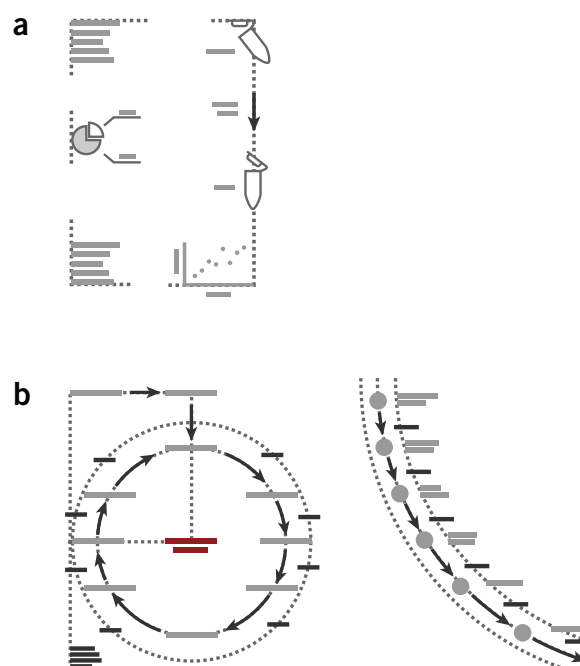

Figure 2 | Alignment. (**a**) Graphics and text used as vertices and edges of geometric shapes. (**b**) Geometric and curvilinear shapes used as flexible guides to align content.

form meaningful blocks of information (**Fig. 2a**). Simple geometric shapes provide a base structure on which to organize and build content (**Fig. 2b**). It is helpful to actually draw these background shapes and use them as alignment guides. I have shown examples of guides as dotted lines in **Figure 2**, which would not exist in the final figure. Placing components on the guide's path anchors the information and helps the audience identify patterns. Curvilinear guides are useful in sequencing information because they create a clear path through the material. Such alignment produces invisible lines that connect content.

Our eyes are acutely aware of small misalignments; compositions that use guides tend to look clean and professional. We can create different alignment guides for different information. For example, labels that describe an action can be distinguished from those for names. Moreover, we can combine alignment with the Gestalt principles of similarity, proximity, connection and enclosure to group information and structure the content. The action labels can be distinguished from the name labels with color or typographical treatment.

Our goal is to lay out information in a way that enhances its message. In structuring the components of a slide or figure, we inevitably affect the surrounding white space. White space is a vital part of design; it frames the content and gives our eyes a place to rest. Next month, we will look at 'negative space' to complete our exploration of composition.

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1. Wong, B. *Nat. Methods* **7**, 863 (2010).
2. Kanizsa, G. *Organization in Vision: Essays on Gestalt Perception* (Praeger Publishers, New York, 1979).

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