POINTS OF VIEW

Layout

Layout is the act of arranging text and images on the page according to an overall aesthetic scheme and for the purpose of clarifying a presentation. In graphic arts, it is the elephant in the room; layout underlies everything we do when we communicate visually. Well-structured content can guide readers through complex information, but when the material we present lacks order, it can confuse or, worse yet, agitate readers trying to make sense of the material.

Many artists and architects achieve balanced outcomes by proportioning their work to approximate the golden section. The golden section is a special mathematical relationship that comes from dividing a line into two segments where the ratio of the total length ($x + y$) to the length of the longer segment (x) is the same as that of the length of the longer segment (x) to the length of the shorter segment (y) (**Fig. 1a**), or 13:8. Many celebrated paintings since at least the Renaissance exhibit these proportions (**Fig. 1b**).

Compositional aesthetics may serve a fundamentally different purpose from designs aimed to communicate. However, the Fibonacci numbers, which are also linked to the golden ratio, heavily influence graphic design. This sequence of numbers starts with 0 and 1 and each subsequent integer is the sum of the previous two (that is, 0, 1, 1, 2, 3, 5, 8, 13 and so on). The quotient of successive pairs of numbers, with the exception of the first few, is approximately 1.6180 (or 13:8). The harmonious relationships of the Fibonacci integers are often used as measurements for font sizes and determining page layouts in books.

A practical application of the golden section is to incorporate their congruous proportions into slides and posters we create, and not just for artistic reasons: the placement of objects on a page can carry meaning. A simplified version of the golden section is the 'rule of thirds', which suggests dividing a page into nine equal parts (**Fig. 1c**). Elements placed along the lines and especially where the lines intersect (the so-called power points) become more visually prominent. Eye-tracking studies have shown that our gaze lingers in the regions marked by the lines when we scan an image.

Using a grid to aid layout (**Fig. 2a**) can dramatically streamline the design process by taking the guesswork out of sizing and placing content. Try creating a set of strategically placed guides in Microsoft PowerPoint or Adobe Illustrator before you work. Grids help to anchor content and create stability within a design. They also build consistency between slides that allows the audience to anticipate where content will appear.

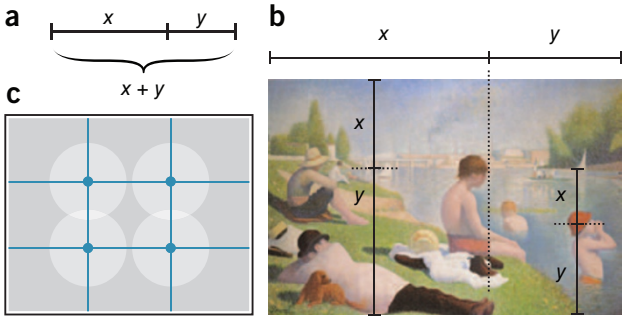

Figure 1 | Infallible proportions. (**a**) The golden section is a line segment divided by the golden ratio 13:8 such that ($x + y$) is to x as x is to y. (**b**) In *Bathers at Asnières,* Georges-Pierre Seurat used the golden section to position the horizon and subjects in the composition (http://en.wikipedia.org/wiki/File:Seurat_bathers.png). (**c**) The 'rule of thirds' is a simplified version of the golden section used to form interesting compositions.

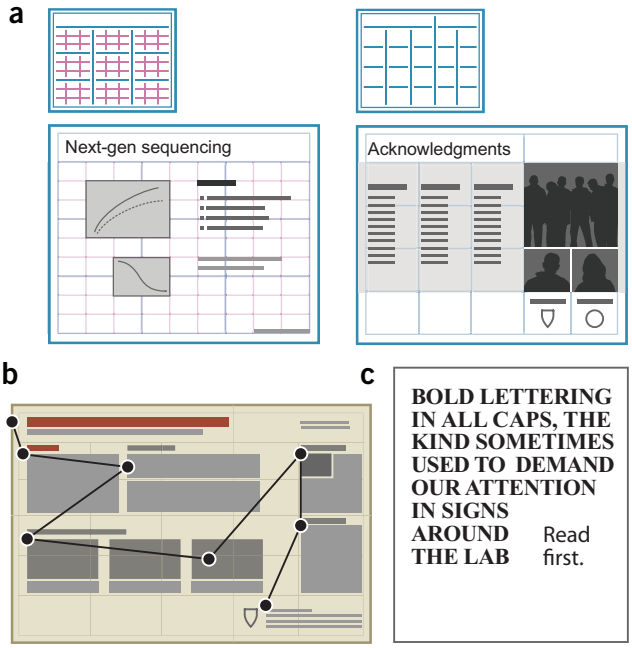

Figure 2 | Gridlines help to structure layouts. (**a**) Examples of gridline systems for presentation slides. (**b**) Arrange elements according to the order in which they should be read. (**c**) Surrounding an element in ample white space helps it get noticed first.

Layout is more than adhering to lines of a grid system: it is the process of planning out exactly the journey we want the eyes to travel across the arrangements (**Fig. 2b**). The goal is to reveal the hierarchical relationship in the information and make clear what is to be read first, second and so on. This can be done by developing dominance with some elements and practicing restraint with others. Two ways to draw a reader's attention to a compositional element is to make it visually different from its surroundings[1] or to frame the object in ample white space[2] (**Fig. 2c**). The Gestalt principles[3,4] also offer useful operational guidance to describe relationships between objects based on certain graphical cues.

We all have seen slides and posters packed full of content where the presenters have assigned equal visual weight to all the material. In these situations, it is difficult to know where to begin reading. The legendary American graphic designer Paul Rand said, "Without contrast, you're dead." Layout is the foundation of graphic design, and it should not be overlooked. How we arrange elements on the page can help or hinder whether the information is understood.

Next month, I will focus on the importance of aligning 'salience' and 'relevance'.

Bang Wong

1. Wong, B. Salience. *Nat. Methods* **7**, 773 (2010).
2. Wong, B. Negative space. *Nat. Methods* **8**, 5 (2011).
3. Wong, B. Points of View: Gestalt principles (part 1). *Nat. Methods* **7**, 863 (2010).
4. Wong, B. Points of View: Gestalt principles (part 2). *Nat. Methods* **7**, 941 (2010).

Bang Wong is the creative director of the Broad Institute of the Massachusetts Institute of Technology & Harvard and an adjunct assistant professor in the Department of Art as Applied to Medicine at The Johns Hopkins University School of Medicine.