Perceptual Principles for Non-realistic Images

Non-realistic symbolic images (such as icons, cartoons, comics) are pervasive in popular culture and media, so it is important to understand the cognitive processes that give these representations their ubiquity. Different examples of images will be discussed in terms of their perceptual properties and how they facilitate communication and learning in various disciplines.

Some of the most recognizable icons are emoticons (emojis). As a great deal of our communication depends on text-based forms of interaction (emails, messages), emoticons have been developed to ease communications, where facial expression is absent. Consider the emoticon design, they depict faces. Faces occupy a special place in human perception. More than any to other object, humans are drawn to recognize facial features and expressions. Emoticons are designed with a high level of abstraction, employing eyebrows, eyes and mouths as the main features to signal a wide variety of emotions. Despite the high level of abstraction, they can set an emotional tone that is often lost without face-to-face interaction. In fact, the more abstract, simple and contrasting the emoticon is, the easier it is for the viewer to identify the emotional information (Kendall, Raffaelli, Kingstone & Todd, 2016). Neuroimaging findings reveal that brain sites involving both verbal and nonverbal data are activated when emoticons appear with sentences, more so than with plain text (Yuasa, Saito & Mukawa 2011).

The role of icons extends beyond interpersonal communication. Pictorial icons can effectively transmit information to a large number of people, especially if the icons are well recognized across cultures. Such icons may guide people to their destinations, warn them of danger, caution them against certain actions, encourage other types of actions. Figure 1 shows a set of icons used in the medical domain. The viewer's attention is easily captured by such icons as they are constructed with a high level of abstraction and contrast between the figure and background. The recognition of these icons is assured because they are represented from a "canonical view" (in other words from an angle most easily identified). Since the brain stores a limited number of key views for each object, the icon view is readily recognized because it matches the stored viewpoint-specific exemplar (Ware 2012). Take, for example, the pictorial icon of an ambulance: it is most often depicted in profile. It would be difficult to make sense of an icon that depicted the ambulance from above or even the front.

Comics is another means using juxtaposed pictorial images in sequence to convey ideas, often (but not necessarily) combined with text or other visual data. Because of its appeal, comics increase the level of an individual's interest and enjoyment. Comics can also serve an educational purpose. Figure 2 illustrates how utilizing comics can facilitate learning processes. The varied appearance of the comics motivates the young learner to focus on the page and read the scientific content in a coherent manner, enhancing attention and memory performance for the presented material (Hosler & Boomer, 2011; Keogh& Naylor, 1999). Different effects are immediately evident in this figure, for example, speech balloons isolating the text from the other visual elements helps the viewer to organize the visual information. Moreover, some characters in the figure are represented as solid shapes with a singular color against a white background in a silhouetted design, making the items easily distinguishable (Ware, 2012).

Non-realistic representations are so effective in communication that they surpass realistic imagery. The prevalence of such representations suggests that they enhance cognitive processing. Their power lies in their ability to reach communicative goals while minimizing the cognitive effort (and time) needed to achieve those goals.

References:

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Figure 1

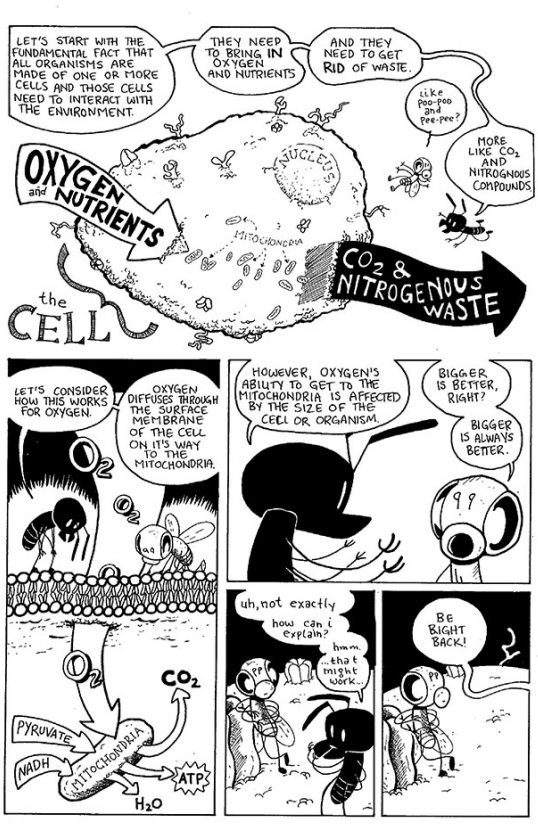

Figure 2