Kanizsa figures in lightness and brightness context

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Figures such as Kanizsa's triangle are compelling visual phenomena in which presence of the figure is indisputable, though it is only partially outlined. Most vision research focused on the presence of the contour and phenomena such as illusory contrast created by modal completion. However, this figure also appears to have a color different from the background, suggesting that there is a modal texture filling the area outlined by that contour. If there were such a texture, would its color be treated like a real texture color, i.e. would it be susceptible to various visual effects? We reasoned that the visual phenomena typical for texture color should be applicable to modal figures. Simultaneous contrast (SC) is a visual illusion in which black and white backgrounds modulate the surface color of targets. Hence, illusions like SC should work equally well with modal targets.

In a series of experiments, we replaced typical SC black and white backgrounds with differently shaped inducers (circles, rectangles, lines) that created illusory targets (gray squares). We used six types of inducers, each with three gray levels of targets (see Figure 1) running both lightness and brightness conditions. Participants made matches using a Munsell scale (real scale in the case of lightness and the scale on the screen in the case of brightness).

Estimated lightness of illusory targets was similar to regular SC gray targets in many relevant aspects. There was not only a difference between regular and modal objects ($F(2,26)= 6.75$, $p< 0.004$) but it was independent of the amount of outlined contour ($F(2,26)= 2.04$; $p> 0.05$). The texture of modal object exhibited all the qualities typical for regular targets, the effect was just as strong with illusory targets, the targets with dark inducers were perceived as lighter, the illusion became stronger when darker targets were used, and the effect increased with articulation. A significant difference between brightness and lightness conditions was also observed ($F(2,27)= 95.09$, $p< 0.000$).

These findings suggest that illusory figures do have an illusory texture, which is treated as a real texture, susceptible to visual phenomena characteristic for texture colors. Consequently, modal object are not just made of contour but they also have an area.

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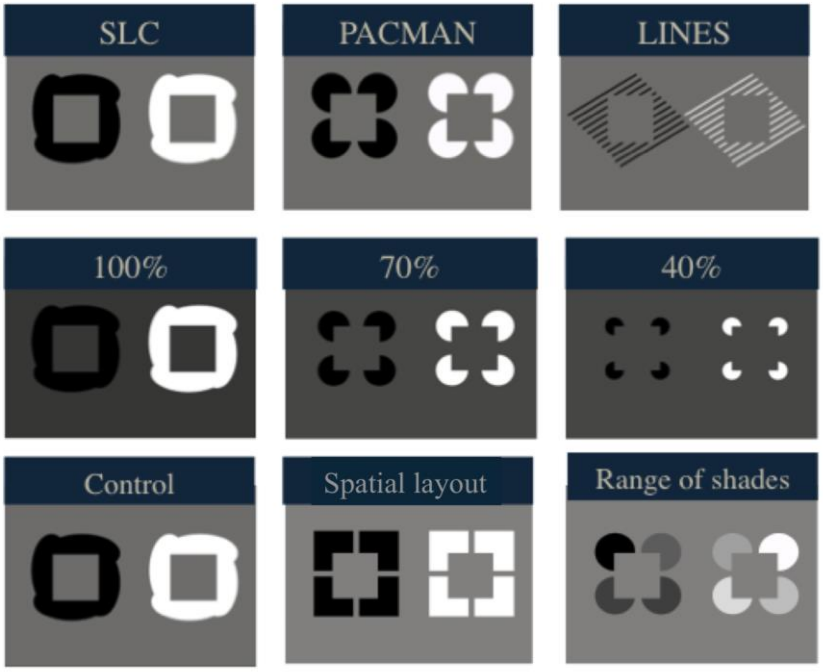

Figure 1. Stimuli used in Experiment 1 (first row), Experiment 2 (second row) and Experiment 3 (third row). All three different background gray shades were used in each experiment.