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The effect of color on human perception

Color is the subjective perception by the human brain of visible light, differences in its spectral structure, perceived by the eye. In humans, the ability to distinguish colors is better developed than in other mammals. Light affects the photosensitive receptors of the eye retina, and then they produce a signal transmitted to the brain. It turns out that the perception of color is formed in a complex way in a chain: the eye is a visual image of the brain. Thus, color is an interpretation of the surrounding world in the human mind, resulting from the processing of signals coming from photosensitive eye cells - cones and rods. In this case, the first is responsible for the perception of color, and the second - for the sharpness of twilight vision [3].

The eye responds to three primary colors: blue, green, and red. And the brain perceives colors as a combination of these three basic colors. If the retina loses the ability to distinguish any color, then the person loses it. People with normal vision are able to distinguish up to a thousand shades. The perception of color by a person varies depending on the conditions of the surrounding world. The same tone looks different in the light of candles or in sunlight. But human vision quickly adapts to these changes and identifies the familiar color [2].

According to the three-color theory of vision, human eyes perceive color by stimulating three visual pigments in the retinal cones. One of these pigments is more sensitive to light with a length of about 630 nm (red), the other has a maximum sensitivity near 530 nm (green), and the third at a frequency of about 450 nm (blue). Comparing the intensity of light sources, we feel the color of light. This theory of vision is the basis for displaying color outputs on a monitor using three primary colors - red, green, and blue, which is called the RGB color model. The RGB color model — the additive color model describes the colors emitted and is formed on the basis of three primary colors: red, green, and blue; other colors are formed by mixing the three primary colors in different proportions (that is, with different brightness). When pairing the primary colors, secondary colors are formed: cyan, magenta, and yellow. Primary and secondary colors are primary colors. The basic colors are the colors with which you can get almost the entire spectrum of visible light. The RGB model is used in devices that work with light fluxes: cameras and camcorders, scanners, computer monitors, televisions, etc. It is hardware-dependent, since the values of primary colors, as well as the white point, are determined by the technological features of a particular equipment. For example, on different monitors the same image looks differently [4].

Numerous experiments of psychologists and physiologists confirm the ability of color to influence a person’s physical condition:

- red color has a warming effect. It stimulates brain activity, eliminates melancholy, but in large doses, annoying;
- yellow stimulates the brain, therefore, helps with mental deficiency;
- orange color has a stimulating effect and accelerates the pulse, without raising blood pressure. It improves mood, raises vitality, but over time can tire;
- green is hypnotic and painkiller. It has a positive effect on the nervous system, relieves irritability, fatigue and insomnia, and it also raises the tone and lowers blood pressure;
- blue color has an antiseptic effect. It is useful to look at it with suppurations and inflammations. Sensitive individual blue shade helps better than green. But the "overdose" of this color causes some depression and fatigue;
- purple color affects the lungs, blood vessels, heart and increases the endurance of body tissues;

It is obvious that people have a strong desire for beauty, expressed in the inner need to see the world in color, and not monochrome. Vision is a unique and fragile instrument, the study of which will take a lot of time. Learning about it as much as possible will be useful to everyone[1].

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