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The color "variable"
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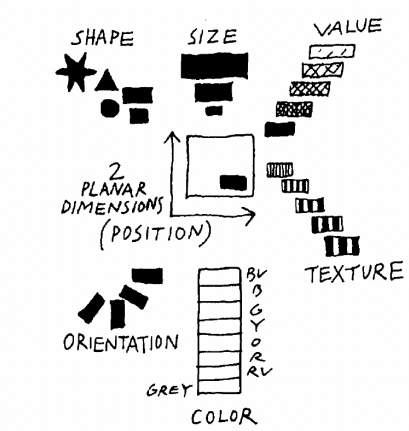
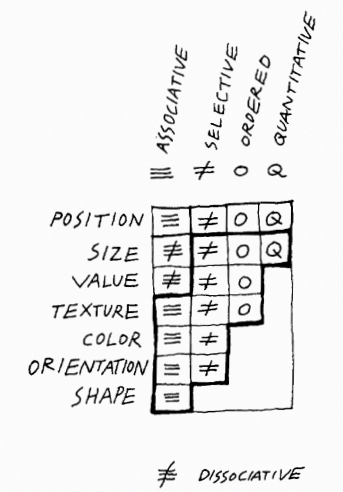
The color variable

by Narciso Silvestrini
1981



"COLOR is one of the variables of the system of signs and symbols with which information can be codified and communicated. Combined with the other variables, color contributes to differentiate the visual field, thus making it perceptually significant. POSITION, DIMENSION, SHAPE, VALUE, COLOR, TEXTURE, and DIRECTION: these are the seven possible components of an image, be it in relation to the plane, or in space.

Each one of these variables is in reality a sub-set of the SPACE set, which is in turn intersected by the TIME set. Time has four visual sub-sets: movement, fluctuation, intermittency, and scintillation. Therefore, time is not the eighth variable, but a "variable apart", capable of setting in motion, emphasize, amplify or weaken each and every spatial variable.



The laws of cinematic expression are different from those of drawing and photography. In the same way, time as we experience it, shows an elastic and flexible, rather than a quantitative nature; time can be thought of as the nervous system of space. Every variable has its own longitude, or capacity to withstand the progressive degrees of fragmentation of information; its own latitude, or peculiar area of application; its own valence, or ability to organize itself with the other variables, towards the codification and transmission of information with maximum competence and minimum noise.

The level of the valence is established by the perceptual properties of the given variable. It can be of four types: ASSOCIATIVE, SELECTIVE, ORDERED, and QUANTITATIVE. (J. Bertin)

From this point of view, and towards its use as a code, color is not 'ordered' or 'quantitative'. This means that colors do not have an intrinsic order of succession or sequence, as it happens for instance with value. In this variable, the different grays are always ordered according to their progressive degrees of brightness. Nor is color 'quantitative', as is the case in the dimension variable, where one thing is differentiated from the other by virtue of its size: bigger or smaller. Color includes instead the 'associative' and 'selective properties. In the first property (association,) various signals are associated

together through similitude - or likeness - of color. In the second property (selection), various signals are perceived as different through difference in color.

The variation of color allows a high and immediate selectivity (or selection) of the components of the visual field. Though, it cannot be properly used, at least by itself, when a precise ordering criteria is required. And the treatment of information is often a problem of order.

It is in relation to this area of competence that all the advantages and disadvantages of color, its role and necessity, must be considered and evaluated, towards design and communication.

Color is a property of light which, in turn, is an aspect of a defined segment of the electromagnetic spectrum of radiating energy. Therefore, color belongs to one of the four fundamental interactions: the electromagnetic interaction. (The other three are: weak interaction, strong interaction, gravitational interaction.) The radius of action of the electromagnetic interaction, like that of gravity, is infinite. Therefore it can inform us -- visually in part -- about places and bodies of the distant universe. Within the theory of models, color is useful in looking at what is considered to be the most elementary stuff of matter: quarks or pre-quarks. Maybe that is the reason why color has such an evocative power, it is present in all areas of communication: non-biological, biological, animal, and social communication. The issue then, is not about "color" and "non-color", but in asking why our vision is "in color", and why color always presents itself as a double.

In communication theory, it must be as COHERENT as possible - colored, monochromatic - as in the laser, in order to avoid interference with the information which is being carried through it. On the contrary, in information theory, light must be as INCOHERENT as possible - non-colored, white - thus interfering as much as possible with the bodies, in order to disclose their structural and formal characteristics. In a sense, LIGHT is about INFORMATION, force, and COLOR is about COMMUNICATION, form. Saturation, being the relationship between color and light, between color and non-color, expresses the levels of interaction between information and communication.

When we examine the role of color in safety regulations, identification codes, or scientific information, we speak of "intentional meaning" of color.

Definitions such as "symbolism of color", "meaning of color", or "semiotic code" (Sahlins,1966) are arguable, when we consider that the "number of colors identified by man as perceptual categories is very limited, especially if compared to the infinite variety of colored things" (Tornay, 1976.)

Colors do not, in themselves, constitute a code. 11They may be used as elements of a code, but this is a marginal aspect if we compare it to the cognitive and operative value of its perception, and also in relation to the symbolic function of the mind. [The complexity of color is apparent in the variety of structural and] ... cultural associations which take place between colors and perception, colors and concepts, colors and objects, etc." (Tornay, 1978.)

In examining various codes and regulations, the distinction between "intentional meaning" and "actual meaning" may sometimes become blurred. We consider the former as being formulated by the source, where the latter is elaborated by the receiver.

The meaning of bands of color on a pipe, to identify the liquid running inside, is intentional. The meaning of the spectral lines emitted in the identification of a chemical element, is more actual than intentional.

The distinction between code and regulation also relates to the intentional aspect. We speak of regulation when the signification of color, its physical and measurable characteristics, and the definitions of its uses, are prescribed by law, or by a consistent usage which has evolved into an accepted rule.

We speak of code when the reference color-meaning is either freely agreed upon, or simply recurrent in the observed phenomena.

In looking at examples from the industrial and the scientific fields, one notices a progression towards safety, identification, description, transcription ... a tendency of color to move from the "state of things" towards the "statute of things!' in which signals can be assigned marks (signs) and these marks (writing) can amount to a language.

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