

# Gestalt Psychology: Why Our Brain Sees the Impossible

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The investigations developed at the beginning of the 20th century, based on traditional scientific methodology, divided the object of study into a set of elements that could be analyzed separately with the objective of reducing the complexity of this object. Contrary to this methodology, the school of Gestalt practiced a series of theoretical and methodological principles that attempted to redefine the approach to psychological research.

## The Theory

Gestalt psychology is based on the observation that we often experience things that are not a part of our simple sensations. The original observation was Wertheimer's, when he noted that we perceive motion where there is nothing more than a rapid sequence of individual sensory events. This is what he saw in the toy stroboscope he bought at the Frankfurt train station, and what he saw in his laboratory when he experimented with lights flashing in rapid succession (like the Christmas lights that appear to course around the tree, or the fancy neon signs in Las Vegas that seem to move). The effect is called apparent motion, and it is actually the basic principle of motion pictures.

If we see what is not there, what is it that we are seeing? You could call it an illusion, but it's not an hallucination. Wertheimer explained that you are seeing an effect of the whole event, not contained in the sum of the parts. We see a coursing string of lights, even though only one light lights at a time, because the whole event contains relationships among the individual lights that we experience as well.

Furthermore, say the Gestalt psychologists, we are built to experience the structured whole as well as the individual sensations. And not only do we have the ability to do so, we have a strong tendency to do so. We even add structure to events which do not have gestalt structural qualities.

The theoretical principles are the following:

Principle of Totality - The conscious experience must be considered globally (by taking into account all the physical and mental aspects of the individual simultaneously) because the nature of the mind demands that each component be considered as part of a system of dynamic relationships.

Principle of Psychophysical Isomorphism - A correlation exists between conscious experience and cerebral activity.

Based on the principles above the following methodological principles are defined:

Phenomenon Experimental Analysis - In relation to the Totality Principle any psychological research should take as a starting point phenomena and not be solely focused on sensory qualities.

Biotic Experiment - The School of Gestalt established a need to conduct real experiments which

sharply contrasted with and opposed classic laboratory experiments. This signified experimenting in natural situations, developed in real conditions, in which it would be possible to reproduce, with higher fidelity, what would be habitual for a subject.

### **Support from Cybernetics and Neurology**

In the 1940s and 1950s, laboratory research in neurology and what became known as cybernetics on the mechanism of frogs' eyes indicate that perception of 'gestalts' (in particular gestalts in motion) is perhaps more primitive and fundamental than 'seeing' as such:

A Frog hunts on land by vision... He has no fovea, or region of greatest acuity in vision, upon which he must center a part of the image... The frog does not seem to see or, at any rate, is not concerned with the detail of stationary parts of the world around him. He will starve to death surrounded by food if it is not moving. His choice of food is determined only by size and movement. He will leap to capture any object the size of an insect or worm, providing it moves like one. He can be fooled easily not only by a piece of dangled meat but by any moving small object... He does remember a moving thing provided it stays within his field of vision and he is not distracted.

Cyberneticist Valentin Turchin points out that the gestalts observed in what we usually imagine to be 'still images' are in fact exactly the kind of 'moving objects' which cause the frog retina to respond:

The lowest-level concepts related to visual perception for a human being probably differ little from the concepts of a frog. In any case, the structure of the retina in mammals and in human beings is the same as in amphibians. The phenomenon of distortion of perception of an image stabilized on the retina gives some idea of the concepts of the subsequent levels of the hierarchy. This is a very interesting phenomenon. When a person looks at an immobile object, "fixes" it with his eyes, the eyeballs do not remain absolutely immobile; they make small involuntary movements. As a result the image of the object on the retina is constantly in motion, slowly drifting and jumping back to the point of maximum sensitivity. The image "marks time" in the vicinity of this point.