Gestalt Psychology

General

Gestalt psychology was first introduced in 1912 by Max Wertheimer[1], a German psychologist, when he published a paper on optical illusion called *apparent motion*. In the paper he analyzed the illusion occurring when a series of static images is perceived as movement, just like films. The assumption that **whole is more than just sum of its parts** is the basic principle of gestalt psychology.
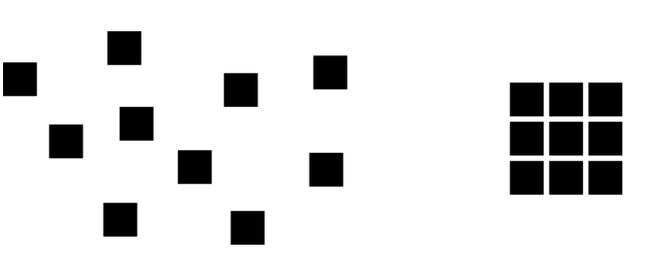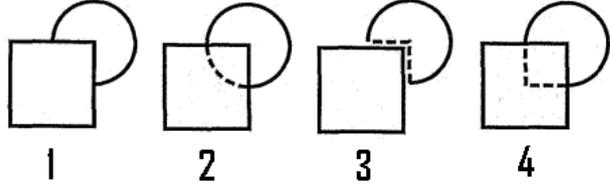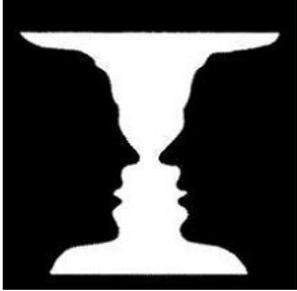
What is gestalt psychology?

Gestalt theory was introduced as a **contrast to** at the time dominant **structuralism**, which claimed that complex perceptions could be understood through breaking them into smaller elementary parts of experience, like splitting graphical forms into sets of dots or melody into sequence of sounds. Gestaltists **attacked this theory**: same melody can be recognized if transposed into another key and perception of a rectangle can be achieved through other forms than four lines. The idea of Wertheimer was that the ability to **perceive objects** was an **ability of the nervous system**, which tends to **group together objects** that are **nearby**, similar, form **smooth lines**, form most of the **shape we can recognize**. These are the four Wertheimer's *laws of grouping*:

- **Similarity** - objects with **similar properties** (like shape or color) are grouped together
- **Proximity** - objects **nearby** are grouped together
- **Continuation** - objects that define **smooth lines** or **curves** are grouped together
- **Closure** - if **enough of the shape** is presented, the whole is perceived by filling in the missing information

Danish psychologist Edgar Rubin in 1921 introduced another important gestalt aspect of organization (although he wasn't a gestaltist himself), the **figure-ground** perception. Rubin suggested that a group of connected objects can mentally be interpreted as an **object** (figure) or **surface behind** it (ground) and formulated conditions describing when would which of that be the case.

The final Gestalt concept is the principle of *Prägnanz*, which claims that when visual stimulus can be interpreted in more ways (for example a partly hidden figure), people tend to **organize** it as **simple**, **regular** and **symmetric** as much as the conditions (information retrieved by the retina in the eye) allow. Gestaltists explained this through an idea of brains electric fields which reached an minimal energy state, but this theory is today mostly rejected.

1. **Similarity**[2] - similar objects are formed together to form the sun around eagles head	2. **Proximity**[3] - when close, nine rectangles are grouped as one object, when not, they are perceived as different objects	3. **Continuation**[4] - a smooth line is perceived as continuous

4. **Closure**[5] - enough of the shape is present to mentally complete the image of a panda	**Prägnanz**[6] - an ambiguous pattern (1) is recognized as as few simple shapes as possible (circle and rectangle over-leaping in 2) and not complex shapes (3,4)	**Figure-ground perception**: The Rubin goblet[7] - if black region is recognized as foreground then two faces are recognized, if white region is recognized as foreground then a goblet is recognized, but the two can never be recognized simultaneously

Gestaltist views on learning and problem-solving were opposed to at the time dominant pre-behaviorist and behaviorist views. Wertheimer emphasized importance of seeing the **whole structure of the problem**. Köhler performed experiments with animals learning through trial and error sessions. In his most famous example of insight learning in animals he gave a chimp named Sultan sticks that could be assembled together to form a longer one and placed a banana outside his cage out of his reach. Sultan, after considering the situation, suddenly jumped, assembled the sticks, and reached the banana. Discovery of correct solution to the problem was followed by insight occurrence. This presents ***insightful learning***, which has following properties[8]:

- Transition from pre-solution to solution is sudden and complete.
- When problem solution is found, performance is smooth and without errors.
- Insightful learning results in longer retention.
- The principle learned by insight can easily be applied to other problems.

What is the practical meaning of gestalt psychology?

Wertheimer suggested usage of gestalt principles in education. He contrasted **productive thinking** from **rote learning**, which occurs **without understanding**. Humans, unlike animals, can learn not only through conditioning or trial and error but also through **explanations** through **changing** their **cognitive structure** to achieve cognitive structure of the explainer, yet this should not be turned into rote learning. Problem-solving presents learning with understanding using gestalt principles. This learning is remembered for a long time, and can be applied to other situations. Gestaltism therefore suggests that learners should be **encouraged to discover** whole nature or relationships between elements of a problem, but also to **exclude implicit assumptions** that might be incorrect. Since human mind functions in accordance with the mentioned principles, **instructional design** should be **based on proximity**, **closure**, **similarity** and **simplicity**.

Application of gestalt laws has been suggested for **concept and knowledge maps** design (considering colors, shapes and groupings), where it has provided **positive results**[9].

Criticisms

Gestalt theory was mostly criticized for:

- being too **descriptive instead of offering explanations** and models for described phenomena,
- **investigating subjective experiences** like perception,
- **lack of precision in descriptions** and just qualitative description,
- **denying** the basic scientific approach of understanding a **whole as a set of its parts**.

Gestalt theory has inspired psychologist like Kurt Lewin or Kurt Goldstein, who introduced it in other aspects of psychology. Gestalt views also inspired later cognitivist theories.

Keywords and most important names

- **Gestalt**, **figure/ground**, **prägnanz**, **proximity**, **closure**, **similarity**, **simplicity**
- Max Wertheimer, Wolfgang Köhler, Kurt Koffka

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[1]
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[2], [3], [4], [5]
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