

Definitions of perception.

Meeting of sensations in mental images (perceiving)

Auditory perception.

LITERARY:

Knowledge, sensation, intuition.

Modularity of the mind is a theory of the philosopher Jerry Fodor, inspired by the work of Noam Chomsky and very influential in cognitive science.

According to this thesis, the human mind comprises a number of modules specialized in the performance of certain cognitive functions.

For Fodor these modules work automatically, unconsciously, quickly, parallel and independently of each other, opposing the central system conscious, controlled but also slow and sequential.

The operation of these modules is also innate, at most influenced by a few parameters but in no case resulting from learning.

An example of a module concerns language processing, within which there are sub-modules (semantics, syntax, morphology, etc.) that are independent of each other.

This encapsulation within the language module itself would explain why we are able to speak while doing something else.

This theory is the subject of intense controversy, particularly concerning the operational definition of such modules, the extent of their specialization or their independence.

These ideas have been generalized by evolutionary psychology which postulates the existence of specialized modules for each area of knowledge.

This development is disapproved of by Chomsky and denounced by Fodor in a recent book (Mind, that doesn't work like that)



tumblr.co/Z_2vpTa-wlZT8m00

Computationalism is a functionalist theory in the philosophy of mind which, for methodological reasons, conceives of the mind as an information processing system and compares thought to a calculation (in English, computation) and, more precisely, the application of a system of rules.

By computationalism, we mean the theory developed in particular by Hilary Putnam and Jerry Fodor, and not cognitivism in general.

Computationalism has been the target of various critiques, particularly from John Searle, Hubert Dreyfus, or Roger Penrose, which all revolved around the reduction of thinking and / or understanding to the mere application of a system of rules.

At the end of the 1980s, it faced competition from a new cognitive model, connectionism.

This aims to show that we can explain the language of thought without appealing to reasoning governed by a system of rules, as computationalism does.

The algorithm, transformation of the input into an output.

Functionalist theory thus comprises three types of specifications:

- Input specifications, specifications that state the kinds of things that cause mental states in people.
- Specifications of internal states that describe the causal interactions of mental states.
- The output specifications that say what kinds of actions or behaviors are caused by mental states.

We go from inputs to outputs through an algorithm.

It is the basic principle of a Turing machine or even of a machine with counters, abstract model of computability which is concretized.

Computability thus makes it possible to identify the class of computer functions that can be calculated using an algorithm.

These functions are sets of instructions performing a certain task: we also sometimes speak of routine.

Various criticisms have been leveled at computationalist theory, all of which revolve around the question of rules.

Indeed, computationalism postulates that thought can be assimilated to a system of application of rules, which in turn makes it possible to identify complex computer functions as being an equivalent of thought.

These critiques are not necessarily fatal to computationalism, but limit its extension to certain determined thought processes, which could be modified according to a system of rules.

In the late 1980s, the connectionist approach began to compete with computationalism, whose main title of legitimacy, according to Fodor, was that it was the only theory capable of accounting for the evolution of cognitive science and models. implicit used by them.

Donald Knuth suggests that the conscious is sequential in nature (we can only clearly analyze one thing at a time) and the unconscious parallel in nature.

He sees this as a reason for the great success of programming among nerds, who are uncomfortable with phenomena that do not fall under pure logic.

It is through, on the one hand, the mathematical formalism, developed at the end of the nineteenth century by Gauss, Peano, Frege and Hilbert, and on the other hand computability, that computationalism deals with this problem.

Indeed, the formalism succeeds, by developing an axiomatic, in excluding or codifying the semantic intuitions of the mathematician (for example the intuition at the source of the postulate on the parallel of Euclid)

Formalism thus considers, by enlarging the line, that mathematics exists outside all intention and all thought.

They work with the help of symbols that need to be handled according to formal rules.

The second decisive mathematical aspect in computationalist theory is the definition of calculable functions by Alan Turing in 1936.

By developing the abstract model of the Turing machine, it showed that any operation involving only syntactic schemes could be duplicated mechanically. We also speak of the Church-Turing thesis.

Computationalism could also rely on the cognitivist revolution brought about in linguistics by Chomsky.

Chomsky's generative linguistics thus asserts that from a limited system of rules, we can understand an infinity of statements: which in turn implies that we can conceive of an infinity of thoughts.

According to Jerry Fodor (1975), the linguistic competence theorized by Chomsky led to postulate a "mental" language of thought.

Gestalt and perception.

Form psychology, Gestalt theory from German, Gestaltpsychology, is a psychological and philosophical theory proposed in the early twentieth century according to which the processes of perception and mental representation treat phenomena as global forms rather than like the addition or juxtaposition of simple elements.

- It is based on three postulates:

Psychic activities take place in a complex and open system, in which each partial system is determined by its relation to its meta-systems.

A system is defined as a dynamic unit from the relationships between its psychological elements.

A system tends towards a harmony between all its qualities to allow a concise and clear perception or design, the right form.

Gestaltism is considered to be an early form and one of the main sources, along with Saussurian linguistics, of the structuralist intellectual current which became widespread in the middle of the twentieth century.

They essentially share the same methodological principles: holism, interest in the relations between elementary units, non-conscious character of the theoretical model.

If the German word Gestalt translates to "form" (thus Gestalttheorie means theory of form), it is actually something much more complex, which no word translates exactly in any language.

Also, we have kept this term Gestalt as well in French where it is entered in the dictionary, as in English, Russian or Japanese.

The verb gestalten can be translated as formatting, giving a meaningful structure.

The result, the "gestalt", is therefore a structured, complete and meaningful form for us.

For example, when we look at the stars, each of them is a visual stimulus, yet we can easily organize them into constellations, into a set of stimuli.

So, the mental image that we have in mind is a form, and can be evaluated by our mind as such, for example by naming it.

We can see that the whole is different from the sum of its parts, one of the key principles of gestalt theory.

To understand a behavior or a situation, it is therefore important not only to analyze them, but above all, to have a synthetic view of them, to perceive them in the larger whole of the global context, to have a look that is not more focused but broader: the context is often more meaningful than the text.

To understand is to take together.

- Gestalt base.

It is a paradigm which is globally opposed to individualism (bottom-up) by reversing this perspective towards a top-down approach.

A bottom-up or top-down approach characterizes the general operating principle of a procedural approach.

At first glance, the distinction can designate the meaning of an intellectual process:

it can be a synthesis (ascending) where one starts from the detail, from the bottom, that is to say the finest level, to gradually consolidate and operate a synthesis.

it can be a question of a (top-down) analysis where, starting from the whole, one breaks down into ever more detailed elements, to lead to a "flattening", a "total dissection", an inventory of the situation. object studied.

By extension, the distinction can designate the mode of animation and management of an approach:

It can be a participatory (bottom-up) piloting where the guiding thread of the animation starts from perceptions and initiatives of the lowest level (in the hierarchical sense) or the most "field" (in the operational sense) for be reflected, declined and taken into account by the upper echelons.

It can also be a directional (top-down) piloting where, on the contrary, the guiding thread of the animation is actuated by the hierarchy.

The "subordinate" levels whose function is to shape, execute, deduce and improve the prescribed instructions.

In computer science we use top-down methods in the field of development, because in principle we already master the concepts within the framework of a theory that we implement, and on the contrary the bottom-up method within the framework of research, where we try to make them emerge from practice.

An important indictment against the top-down approach was made by Richard Feynman in his report on the Space Shuttle Challenger crash of 1986.

According to him, the top-down approach forces premature design decisions and makes design corrections much more difficult than the bottom-up approach where you always start from what is well known and firmly mastered.

In physics, the global perception of a form precedes the details; in psychology, the society, the group, the culture, the nation are superior entities which take precedence over the individual.

- Hence the following Gestalt postulate:
- The world, the perceptual process and the neurophysiological processes are isomorphic: that is, structured in the same way, they resemble each other in their structures and in their principles (in a certain way)
- There is no isolated perception, perception is initially structured.
- Perception consists of a distinction of the figure on the background.
- The whole is perceived before the parts forming it: The Whole is different from the sum of the parts or The Whole takes precedence over the elements that compose it.
- The structuring of forms is not done at random, but according to certain so-called natural laws which are imposed on the subject when he perceives.

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The law of good form: main law from which the others derive a set of shapeless parts (like random groupings of points) tends to be perceived first (automatically) as a form, this form is intended to be simple, symmetrical, stable, in short, a good shape.

The law of continuity: close dots tend to represent shapes when they are perceived, we first perceive them in a continuity, as extensions one in relation to the other.

The law of proximity: we first group the points closest to each other.

The law of similarity: if the distance does not allow the points to be grouped together, we will then endeavor to identify the most similar to each other in order to perceive a shape.

The law of common destiny: moving parts having the same trajectory are perceived as being part of the same shape.

The law of familiarity: we perceive the most familiar and the most significant forms.

These laws work at the same time and are sometimes contradictory.

The examples cited belong to the visual domain: it is that which printed communication makes it possible to reproduce.

The three founders Max Wertheimer, Wolfgang Köhler and Kurt Koffka were the pioneers of the Berlin group on psychology of form in the 1920s.

Kurt Lewin, Founder of Group Dynamics.

Fritz Perls (1893-1970), founder of Gestalt therapy, and Paul Goodman.

Wolfgang Metzger, Edwin Rausch and Kurt Gottschaldt are the pupils who remained in Germany after the forced emigration of Wertheimer and Köhler.

Karl Duncker, a pupil of Wertheimer and Köhler, emigrated to the United States.

Mary Henle and Solomon Asch are two American representatives of the second generation of Gestalt psychologists.

Paul Guillaume and Maurice Merleau-Ponty made Gestaltpsychology known in France.

Color vision is the ability of an animal or machine to distinguish objects that differ only in the spectrum of light they reflect.

Humans consider color as an attribute of the object, interpreting the radiation he receives from this object in relation to what surrounds him.

This characteristic implies that the visual system is able to evaluate the light it receives from the object with reference to that which it receives from its environment.

Animals are also endowed with photoreceptors using several categories of pigment proteins, opsins, which detect changes in the intensity and frequency of light. According to the number of these photoreceptors, biologists distinguish animals monochromates, dichromates, trichromates, tetrachromates.

The concept of color is often generalized in scientific and technical applications, which do not always aim to produce color images for use by humans, but, more generally, to distinguish bodies which differ mainly in the spectral distribution of the color. light that they return.

To distinguish chemical elements by their emission or absorption spectrum, several dozen bands are needed. These bands do not necessarily coincide with those of human vision.

Humans have three types of light-sensitive cells in the retina.

These cells called cones contain pigments that exposure to a specific part of the light spectrum breaks down, creating a nerve impulse before they are reconstituted by the body.

Human daytime vision is therefore trichromatic.

Night vision uses a unique type of receptor that is more sensitive than cones called a rod, and cannot distinguish colors.

A complex process produces the perception of color.

Color vision is a process of interacting with the environment, not a measure of visible radiation.

Humans associate a stable color with objects, compensating for differences in lighting compared to those around them.

According to an ecological approach to visual perception, these peculiarities, which to some extent diverge color vision from spectral analysis of radiation, have triumphed because they favor those who are endowed with them in their interaction with their environment, both animate and inanimate.

The stability of color perception, in a wide variety of light environments, allows them to spot interesting objects in all cases.

Using video to understand waves :) with 3D glasses in step 1: why?

In my logic, I found it useful to present step 1 using the 3D glasses because they carry filters that only allow the light contained in a single plane of polarization to pass.

1 vertically can only pass vertically polarized waves and 2 horizontally will only let light pass horizontally.

Edwin Land, with his model "Retinex", a portmanteau word built on retina and cortex, has opened up a field of research which aims to predict the human interpretation of color, from the entire visual field, and not more simply of a small sector in the middle of a reference field as in colorimetry.

This model necessarily involves the study of image segmentation.

Image segmentation is an image processing operation which aims to bring pixels together according to predefined criteria.

The pixels are thus grouped into regions, which constitute a tessellation or a partition of the image.

It can be for example to separate the objects from the background (last processing carried out Pdf 111 but it would be necessary to look at the timeline + to be followed by the work in progress)

If the number of classes is equal to two, it is also called binarization.

If man naturally knows how to separate objects in an image, it is thanks to high-level knowledge (understanding of objects and the scene)

Developing high-level segmentation algorithms (each region is a semantic object) is still one of the most common research themes in image processing.

Segmentation is an essential step in image processing.

If, in fact, human vision constitutes an appreciation of the spectral reflectance of an object, it is necessary to separate this object from the context, and to calculate, from this context, a probable illumination.

It quickly became apparent, in criticism of the original Retinex model, that nearby elements, contrasting with the object, have a more important role in this evaluation.

The same visual elements determine the boundary of the object.

A vision model that accounts for color consistency incorporates edge detection.

The outline is often not closed by a high contrast line in the two-dimensional image, one must look for sudden variations in the color gradient and changes in tint (Thompson 1995)

To be continued.

- Part of victimology research:

Implicit representations of the concept: the religious and sacrificial dimension.

- Step 2 Categories: based on principles of physics, Optical illusion.

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