Sensing and Perception, what is the difference?

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1 Introduction

The understanding of perception has been a topic for discussion a long time. From the ancient Greeks and through modern times until today. The Greeks introduced the three perspectives on perception. Something reaching out to sense the world, something radiating from the world and contacts the sensing organs, and the thought that the world and the sensing organs are connected through a medium.

In modern days we have split the act of perceiving into two aspects. The sensory system, what happens in the body, and the cognitive aspects, what happens in the mind. The sensory system is the complex biological combination of sensors, nerve system, and brain. "Perception is the organization, identification, and interpretation of sensory information in order to represent and understand the environment" [2].

Both the sensory system and perception is affected by external influences. Perception is affected by several factors such as learning, memory, expectations, and attention. These factors shapes our perception of experiences. The sensory system can be affected by disabilities, or more often drugs.

Psychophysics describe relations between perception and sensory input from physical qualities. An application of psychophysics is lossy-compression of media content, where concepts of psychophysics have enlightened how humans perceive sound and vision. Psychophysics is also referred to as a set of methods that can be used for studying perceptual systems. [4]

Other significant developments of perception are events like the cognitive revolution. Where anthropology, psychology, and linguistics were combined with the new developments and ideas from computer science, neuroscience, and artificial intelligence. [5]

The body as the sensory system, and the mind as perception is presented next. Both as different aspects of the perceiving system, where sensing and

perception are different things. A discussion of the core question, what is the difference between sensing and perception, will conclude the essay.

2 Body

The five common senses that create the sensory system touch, smell, taste, hearing and sight. The vestibular system, responsible for balance, are also part of the sensory system. The information from the sensory system is transmitted to the brain, where it is interpreted, and transformed into the foundation for our perception or view of the world around us.

Stimulus is the central task of the sensory system. It reacts based on the stimulus that is exerted on the body. The stronger the stimulus, the stronger the sensory signal, and the stronger the reception in the brain. Along with intensity duration and location is important in relation to stimulus.

The sensory system consists of three main parts: the neural pathways that transmits signals, the sensory receptors, like hands, eyes, and the nose, and parts of the brain that interprets the electrical signals that represent the different observations of the sensory inputs.

Essential concepts of the sensory system are receptors, cortex, modality.

There are five types of receptors in the body: chemo-, photo-, mechano-, thermoreceptors, and nociceptors. The chemoreceptors detect chemical stimuli. Tasting buds are an example of chemoreceptors. The photoreceptors detect light, eyes are photoreceptors. There are four categories of mechaoreceptors that react to mechanical stimuli of different intensities. Thermoreceptors are affected by temperature, warm and cold. Nociceptors are internal sensors that react to potential damage to internal organs.

Accompanying the senses we have cortices in the brain. Somatosensory cortex for touch, auditory cortex for processing sound, gaustatory cortex for processing taste, primal olfactory cortex to interpret smell, and the visual cortex to handle the optical information from the eyes.

Modality is the physical phenomenon that is sensed by the sensory organs, taste, smell, pressure, and temperature.

The information from the different censors, the cortices in the brain, and the sensory modality of the world creates, in combination, a foundation of information for perception.

3 Mind

Perception can roughly be described in two perspectives, bottoms-up and top-down. The top-down approach starts at the highest level of abstraction, and works its way down. It uses attention, concepts, and knowledge to comprehend the sensory input. The bottoms-up way is to take the smallest building blocks first and gradually build a bigger picture. Here low-level information is processed to become higher-level information. An example of this is that rough shapes can be interpreted as objects. [2] Attention, learning, memories, and expectations are part of perception. These four aspects are what represents the experience part of perception.

In Gestalt psychology perception focusses on the whole picture. "Perception of the whole is prior to that of its parts" - Wertheimer. And "The whole is more than the sum of its parts" - Aristotle. The world is apparently chaotic in Gestalt psychology. This has its effect on the ability to maintain and acquire meaningful perceptions. An understanding of laws in this context is what the Gestalt psychologist try to find. The notion that the mind creates a self-organizing global whole in this chaotic world is a central principle. [3]

Direct vs indirect perception. A popular discussion in psychology is direct vs indirect perception. The two thoughts that we on one side perceives the world directly, and the other, that we interpret the sensory input along the way. Here we have two distinct thoughts of how mind and body works on perception. In direct perception the body more or less places the finished though in the mind, while indirect perception provides the mind with information to be processed. Direct perception leaves experience and memory to be spice for the idea, while indirect perception uses memory and experiences as a filter for the sensory image. [6]

Perception-in-action is the theory where action and perception is closely connected. Action is not possible without perception, and perception serves no purpose without action. Continual adjustment of perception and action to external input is regarded in constructivism as what constitutes the 'entity'.

Evolutionary psychology if associated with perception in some forms. Some evolutionary psychologists thinks that the purpose of perception is not knowledge, and that a primary use of perception is to guide movement. It is as an example suggested that eyesight is used to direct action, collision avoidance, and not for knowledge.

Perception is by some thought of to be the whole process of comprehending the environment around us. While others believe that perception is only the part where previous experience and sensory input is combined to a new abstract impression.

4 Discussion

The basis for a discussion around perception and sensing has been presented with the sensory system and theories about perception. Where the sensory system provides the physical aspect of perception and the theories provide the different ideas of how perception really works in our mind.

The two polarised ideas are that perception is the whole process of perceiving the environment we inhabit, and that perception is only the interpreting aspect of combining sensory information and experiences.

For the first idea, perception as a whole, reduces the difference of sensing and perception to more or less the same action/event. This is described by Gibson in his theory of direct-perception. We can also see this in evolutionary psychology where it is believed that perception is used to guide action.

On the other hand, with the second idea, perception is used in many cases to gain knowledge. People can also use reflection and think of new ideas that change perception, or change how we perceive the environment we currently occupy.

The two ideas have two different complexity levels. The first idea is much more complex than the second. It is easier to understand a modular system where the sensing happens in the sensory system, and perception is the product of different sources of information(sensory input, and previously experienced knowledge).

References

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