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Psychophysics

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Stimulus and sensation are two interdependent factors that affect perception. The analysis of the relationship between stimulus and sensation is called psychophysics.

Psychophysics serves as a fusion of psychology and physics in which the physical stimuli and its properties relate to one's sensory processes. Because of this, psychophysics may also refer to a category of classical methods that are used to analyze an organism's perception.

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Quiz: Psychology 101 Part 2

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History

The term "psychophysics" was coined by Gustav Theodor Fechner, a physicist and philosopher, when he published "Elemente der Psychophysik" in 1860. He stated that the term was made to connect physical stimuli to the different components of consciousness, particularly sensation. Fechner's goal was to create a method that would be able to link the private impression or experience of a person to that of the public or external impression.

From his studies, Fechner developed a logarithmic scale that is commonly used today and is called the Fechner scale. The works of Fechner became crucial in forming the foundations of psychology as a field of science. Charles S. Pierce and his student Joseph Jastrow further developed the work of Fechner by means of experimental psychology. Their experiments proved most, but not all, findings of Fechner relating to psychophysics.

Areas of Investigation

The experiments of psychophysicists concentrate on employing physical stimuli and relating them to sensation. These stimuli must be objectively measured; an example of this is the variation of lights in terms of luminance. Vision, hearing, taste, smell, touch and time have been constantly studied by psychophysicists.

The areas of investigation involved in their experiments include thresholds (absolute or discrimination) and scaling. A threshold refers to the intensity point where the subject is able to detect a stimulus, whether the presence of such or the difference between stimuli. Another term used for threshold is "limen", and stimuli that have below-threshold intensities and hence cannot be detected are called "sub-liminal".

The two types of threshold – absolute and discrimination – are considered as two different areas of investigation in psychophysics. Absolute threshold or detection threshold is an intensity level of the stimulus wherein a person can detect the presence of the stimulus in relation to some proportion of time (p).

On the other hand, discrimination or difference threshold is the intensity of the smallest difference between stimuli that possess different intensities as detected by the participant at some proportion of time (p).

To do this, the researcher may use several methods. The most often used method is asking the subject to perform adjustment/s to one of the stimuli until he perceives that it is at the same intensity level as the other stimulus.

Scaling is a branch of measurement in which quantitative metric units are used to express qualitative constructs by means of creating a research instrument. Examples of scales used in psychophysics include Likert scale, Guttman scale, and Thurston scale.

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