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## Cannon-Bard Theory of Emotion

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In the late 1920s, Walter Cannon and Philip Bard proposed their own theory in refutation of the James-Lange Theory of Emotion. According to the Cannon-Bard Theory of emotion, emotions and bodily changes do not share a cause-and-effect relationship. Rather, they occur simultaneously, following a stimulating event.

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## Origin of the Theory

During the time of Cannon, the James-Lange theory <sup>[1]</sup> was one of the most prominent theories of emotion. To test the theory, Cannon experimented on cats by severing the afferent nerves of the ANS' sympathetic branch. He believed that doing this would test whether emotion expression could emerge without a visceral afferent feedback (through the afferent nerves), as what the James-Lange theory implied. The results of his experiments in 1915 challenged the James-Lange theory by proposing that arousal and emotions emerge at the same time after the perception of a stimulating occurrence.

## The Theory

**Event ==> Simultaneous Arousal and Emotion**

The above sequence summarizes the Cannon-Bard Theory of Emotion. In essence, the theory is backed up by neurobiological science. In a stimulating event, sensory signals are

transmitted to the brain's relay center, the thalamus. Once the thalamus receives the signal, it relays the information to two structures: the amygdala and the brain cortex. The amygdala is responsible for the instantaneous response in the form of emotions, whereas the brain cortex is for the slower response. At the same time, the autonomic nervous system or ANS sends signals to muscles and other parts of the body, causing them to tense, increase in rate, change in rhythm, and more. Therefore, this theory views stimulation/arousal and emotion [2] as a combined response to a stimulating event.

For instance, when a person sees a venomous snake, he feels afraid and his muscles get tensed at the same time, preparing to run away from the dangerous animal. One can observe the person's emotion based on the physiological signals that his body displays.

## Criticisms of James-lange Theory

As mentioned, the theory by Cannon and Bard emerged from their refutation of the concepts under the James-Lange Theory. Based on their experiments, the theorists came up with seven concepts that negate the James-Lange Theory. These include:

1. No alteration on emotional behaviour occurs when the viscera is totally separated from the central nervous system or CNS. This was proven by the cats being alive after the viscera have been removed.
2. Various emotional and non-emotional (purely physiologic) states emerge as a result of similar visceral changes. For instance, increased heart rate may not only indicate fear, but may also be a sign of high fever.
3. The components of the viscera are found to be reasonably insensitive parts of the body.
4. Emotions and feelings may not result from visceral changes simply because visceral changes occur too slowly.
5. Strong emotions that are typically attributed to specific visceral changes may not be produced if the same visceral changes are triggered through artificial means.
6. The action of the subcortical centers of the brain leads to emotional expression.
7. Affective experience results from thalamic responses.

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### Links

[1] <https://explorable.com/james-lange-theory-of-emotion>

[2] <https://explorable.com/nature-of-emotions>