



New Trends  
in Psychology

## Neuronal Circuits Involved in Emotion Activation

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**Abstract:** Modern science supports the classical perspective on emotion, namely that in our brain there are several circuits of emotion and each produces a specific set of changes. Emotions are the result of a combination of the physical properties of our body, a flexible brain that is connected to the environment in which it develops, the environment being created by our culture and education. Emotions are considered reflexes in conflict with our own judgment: the primitive part of the brain pushes us out of pragmatics but the rational part forces us to refrain. This inner confrontation between emotion and reason, defines us as human beings. An overview of emotion processing is provided by the Scherer model, which involves five basic, coordinated and synchronized components. The mechanism of primary emotions is followed by mechanisms of secondary emotions, which occur after the correlation between experienced feelings, categories of objects and situations, and primary emotions.

**Keywords:** emotion; brain; environment; culture; human beings; feelings

### 1. Introduction

Over the course of over two thousand years of existence, mankind has understood emotions as part of our genetic heritage, describing them as distinct and recognized phenomena that exist in each of us. When something happens in the world, whether it's something catastrophic or just seductive looks, emotions come quickly and automatically, as if someone were pressing a button. Emotions are transmitted to our

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face through smiles, frowns, frowns, or other characteristic reactions that are easy to identify. Voice is also another indicator of emotions through laughter, shouts, and crying. Every gesture outlined.

Modern science supports the classical perspective on emotion, namely that in our brain there are several circuits of emotion and each produces a specific set of changes, such as: an aggressive factor can trigger “anger neurons” when blood pressure rises, we frown, we scream, we feel the anger grow; an alarming information will trigger the “neurons of fear”, then our heart will beat, we will be terrified and we will feel chills.

The classical thesis supports the idea that emotions are the result of evolution: in the past emotions helped us to survive and now they have become a permanent component of our biological structure. Emotions are universal phenomena felt “almost” identically by people regardless of age, culture, geographical or temporary affiliation. We express that emotions are felt “almost” the same way because the faces, bodies and brain activity of each of us do not look “exactly” the same when we experience emotions. Heart rate, blood flow does not change in the same way, we can frown or relax more or less depending on the situation, event or cultural tradition. Emotions are considered reflexes in conflict with our own judgment: the primitive part of the brain pushes us out of pragmatics, but the rational part forces us to refrain. This inner confrontation between emotion and reason defines us as human beings.

The classical view of emotions, proven by a multitude of experiments, is refuted by many other experiments that do not consider classical assertions, but only analyze them, outlining different explanations of emotions. They are innate but are built of several basic components; they are not universal, but vary from culture to culture; they are not triggered by anything, we create them. So, emotions are the result of a combination of the physical properties of our body, a flexible brain that is connected to the environment in which it develops, the environment being created by our culture and education.

An overview of emotion processing is provided by the Scherer model, which involves five basic, coordinated and synchronized components:

- *cognitive evaluation of events and objects;*
- *body, physiological symptoms;*
- *trends of action, motivational;*

*- facial and vocal expressions - feelings (subjective experience of emotional state).*

This process of generating emotions is described by Tripathy (2018) as follows: the emotional center of the brain gives rise to feelings and emotions, at the same time the neocortex is responsible for thinking and reasoning. It is a visual signal that goes from the retina to the thalamus and is translated into the language of the brain. Messages reach the visual cortex, where they are analyzed and evaluated for meaning and appropriate response. The response obtained, if emotional, emits a signal to the amygdala to activate the emotional centers. At the same time a smaller “portion” of the initial signal goes directly from the thalamus to the amygdala, through a faster transmission, favoring a faster response, so the amygdala can trigger an emotional response before the cortical centers fully understand what is happening.

Analyzing the emotional process, A. Damasio argues that the beginning of the emotional process is the awareness of the object in the form of mental images. Mental images correspond to a neural substrate (topographic representations) influenced by mood representations.

At the unconscious level, networks in the prefrontal cortex respond automatically and involuntarily to signals obtained from the processing of mental images under the influence of dispositional representations, resulting, in particular, from personal rather than innate experiences. Feedback from the prefrontal cortex is received by the amygdala and anterior cingulate, activating the nuclei of the autonomic nervous system and giving signals to the body through the peripheral nerves; sending signals to the engine system; activation of the endocrine and peptide systems and by activation with particular patterns, of non-specific neurotransmitter nuclei in the brain stem and basal brain. The first three ways of responding cause an “emotional state of the body” and are received to the limbic and somatosensory systems. The last type of response is not found in the body itself but in a group of brain stem structures that influence the style and efficiency of cognitive processes and are a parallel pathway for emotional response.

Analyzing theories about the origin of emotions, we distinguish a common point of view: the existence of primary, innate emotions that occur naturally when certain characteristics of internal stimuli are perceived or certain factors such as size, movement, sounds, body conditions, etc. These characteristics are processed and noticed by a component of the limbic system of the brain, the amygdala, which determines a characteristic body condition and modifies the cognitive processing in a suitable way.

The emotional response can be interpreted by bodily changes, continuing with the onset of emotion towards the stimulus and the connection between the exciter and the emotional state of the body. The mechanism of primary emotions is followed by mechanisms of secondary emotions, which occur after the correlation between experienced feelings, categories of objects and situations, and primary emotions. The process of secondary emotions is carried out by an extensive network that includes the prefrontal cortex and somatosensory agents.

We conclude that emotion is the combination of mental evaluation and the answers given to evaluation, at the same time not all emotions give rise to feelings and not all feelings spring from emotions, accompanies that event.

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