

The goal of the present research project is to investigate how slow breathing influences our mood and emotions as well as how our brain reacts to emotional stimuli. Planned experiments will allow to check if the effects of breathing on the cardiovascular system are responsible for this influence.

How we feel at any given moment is related with the state of our body. When we feel negative emotions, our heart begins to beat faster, our breathing speeds up and begins to shallow. When we feel safe, our breathing slows down, and most of the time we don't feel our heartbeats. Those changes in the body are sent back to the brain and perceived through a sense called interoception. They contribute to how we feel. The question about the role of these changes in the body for our emotions has been the subject of a number of studies and discussions since William James and Oscar Lange proposed their peripheral theories of emotions. Despite the fact that in contrast to other physiological processes breathing can be easily consciously controlled, up to now only a handful of studies have investigated its influence on emotions.

In the present research project we will investigate how slowing down breathing influences our emotions. Breathing exerts a strong influence on the functioning of the heart. Because of that we will also investigate if the influence of breathing on the heart is one of the physiological mechanisms responsible for the effects of breathing on emotions. We will be particularly interested in the changes in heart rate and the impact of breathing on the mechanism that monitors and regulates blood pressure (baroreflex). Because the activation of baroreceptors decreases the arousal of the central nervous system, we hypothesize that breathing influences how we feel through this system. In addition, we will be interested in the changes in the cortical response to emotional stimuli. For this purpose we will use electroencephalography, which allows us to measure the brain's electrical activity.

In planned experiments, participants will breathe at different speeds. We will investigate how those different breathing frequencies influence how they feel, the functioning of their hearts and brains. We expect that slower breathing will be related to a lower experienced level of arousal and to an increase in the parasympathetic control of the heart as well as to a decrease in the sympathetic control of the heart.

Breathing can be controlled voluntarily; because of that, in the future, the present project can serve as a basis for the development of techniques that will use breathing control to influence how we feel.