

# Appraisal of stressful or threatening situations by the brain

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Researchers at the Research Center Translational Neurosciences of Johannes Gutenberg University Mainz (JGU) in Germany have advanced a generalized concept as the basis for future studies of mental resilience. Their new approach is based on a mechanistic theory which takes as its starting point the appraisals made by the brain in response to exposure to stressful or threatening situations. Previously social, psychological, and genetic factors were in the foreground of resilience research. The Mainz-based team has published its conclusions in the renowned journal *Behavioral and Brain Sciences*.

Stress, traumatic events, and difficult life situations play a significant role in the development of many [mental illnesses](#), such as depression, anxiety, addiction. However, not everyone exposed to such circumstances develops a [psychological disorder](#) as a result. Every person has a greater or lesser mental stabilizing capacity and this inherent potential is called '[resilience](#)' by psychologists. Resilience helps to effectively master challenges, stress, and difficult situations, thus maintaining mental health. The fact that some individuals either develop only short-term problems or do not become ill at all on experiencing major psychological or physical pressures suggests that there are certain protective mechanisms – in other words, defensive, self-healing processes – which can prevent the development of stress-related illnesses.

The core concern of the Mainz team of researchers is to identify these mechanisms. By means of a thorough review and analysis of the results

of previous studies of and investigations into the subject of resilience, they were able to identify a common principle that can be used as a general basis for future studies of resilience. In order to achieve this, the researchers combined various parameters and research concepts – from psychological and social approaches to the results of genetic and even neurobiological investigations. "To date, research into resilience has tended to take into account a very extensive range of social, psychological, and even [genetic factors](#) that positively influence mental flexibility, such as social support, certain personality traits, and typical behavior patterns," explained Professor Raffael Kalisch, one of the authors of the current publication and the director of the Neuroimaging Center, a central research platform of the Mainz University Medical Center and the Research Center on Translational Neurosciences.

"We wondered whether there might be a common denominator behind all of these individual approaches and so we systematically examined various examples. As a result, the focus is less on the already well-known social, psychological, or genetic factors and much more on cognitive processes happening in the brain. We thus consider that the appropriate way forward is to determine how the brain assesses each situation or stimulus. It is quite possibly the positive evaluation of potentially aversive stimuli that is the central mechanism which ultimately determines an individual's level of resilience. The many already identified factors only impact on resilience indirectly by influencing the way the brain assesses a certain situation." Assuming this theory is correct and it is the mental processes of evaluation that are of central relevance, this would mean that it is not necessarily the threatening situations or stimuli that decide whether stress develops but rather the manner in which the individual appraises the situation. A person who tends to more positively evaluate such factors would be protected against stress-related illnesses over the long term because the frequency and degree of stress reactions in that person would be reduced. The Mainz-based researchers call their new mechanistic hypothesis 'Positive

Appraisal Style Theory of Resilience' (PASTOR).

The aim of future research activities will thus be to investigate the neurobiological processes that occur in the brain and that lead it to see a specific situation or potential threat in a more positive light. "We want to understand which mental processes enable people to protect themselves against the harmful effects of stress and unpleasant events, and how these protective mechanisms can be specifically promoted and reinforced," added Kalisch.

One example of an actual research project inspired by the PASTOR theory is the recently initiated Mainz Resilience Project (MARP). Being recruited for the study are young, healthy participants who are in the specific and frequently difficult phase of life that involves the transition from adolescence and school and family life to adulthood and work life. The researchers will be monitoring the study subjects over a period of several years in order to document their [mental health](#) and the stress factors to which they are exposed over time. The researchers hope that this will enable them to identify key protective mechanisms in the brain as well as the mental characteristics that contribute to [psychological resilience](#). The long-term goal is the development of effective preventative measures that would not only alleviate the distress suffered by individuals but also reduce the related financial and social outlay.

**More information:** R. Kalisch, M. B. Müller, O. Tüscher, "A conceptual framework for the neurobiological study of resilience," *Behavioral and Brain Sciences*, 27 August 2014, [DOI: 10.1017/S0140525X1400082X](#)

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