

Emotion Regulation in the Context of Stress Management

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ABSTRACT:

Modern life cannot be lived without stress. Untreated stress can have a negative impact on a person's health, well-being, and socioeconomic status. The market for stress management applications for wearable smart devices is expanding. Biofeedback and wearable smart devices have received less attention for individual, real-world stress reduction interventions. We first identified stress levels by employing our unobtrusive automatic stress detection system for consumer-grade smart bands. Our system uses contextual information about physical activity to suggest the best relaxation technique when a high stress level is detected. Traditional methods may be useful in free contexts, where physical activity is lower and mobile relaxation methods may be more appropriate.

Keywords: Commercial smartwatch, Mental stress, Psychophysiological, Emotion regulation, Heart rate variability, Electrodermal activity

INTRODUCTION

Stress is a common occurrence in everyday life. However, its effects frequently vary from person to person, and despite similar circumstances, some individuals may not experience any strain while others may be severely impacted. These differences exist for a variety of reasons; including how people perceive reality and how they respond to the many stimuli they are exposed to. Perceived stress occurs when a person believes that their coping mechanisms are inadequate for a given situation. As a result, how people perceive stress varies from person to person based on how much value they place on a situation and how well they know how to deal with it.

Perceived stress has been the subject of research by numerous psychologists. Chronic stress is when an individual experiences a mismatch between perceived resources and contextual demands on a consistent basis rather than just at one time. Not only has it been demonstrated that chronic stress has a significant impact on people's well-being and quality of life, but it also plays a significant role in the onset and persistence of a number of mental and physical illnesses (Aldao, et al. 2012).

As a consequence of this, a growing body of research has concentrated on the strategies that people employ to lessen

the mental and physical strain caused by that perceived stress. Different terms like “coping styles,” “stress management techniques,” “emotion regulation techniques,” or “coping styles” describe how people use certain behavioral, cognitive, or emotional strategies to keep their allosteric load stable [15]. To put it another way, every living thing needs a mix of stability and plasticity to survive. Humans are not an exception to the rule, and the need to maintain a constant level of regulation and the intricate system that applies to each person allow them to pursue their goals.

YOGA AND MINDFULNESS: AS TOOLS FOR EMOTION REGULATION: The ancient Eastern practice of yoga dates back more than two thousand years. The earliest written description of yoga's philosophy—the “Yoga Sutra,” which focuses on growing spirituality and regulating emotions and thoughts—is uncertain about its creator and source. At first, the focus was on breathing awareness and “pranayama” breathing exercises to calm the mind and body and eventually reach a higher state of consciousness (Bali, et al. 2015).

As yoga developed, postures and yogic breathing, or “prana,” were incorporated with relaxation techniques and physical movement. The fundamental goal is to improve well-being by enhancing physical flexibility, reducing pain and unpleasant stimuli, and reducing negative thoughts and feelings. The benefits for mental and physical health conditions like anxiety, depression, cardiovascular disease, cancer, and respiratory symptoms are reported to be extensive in the healthcare literature. It is also said to improve physical symptoms and muscular-skeletal issues by making people more aware of their bodies (Dimsdale. 2008).

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Yoga has spread all over the world and is practiced in many different ways. In general, all types of yoga incorporate some relaxation techniques. Additionally, while some forms emphasize pranayama, others are more physical. Vinyasa flow is one such practice that uses the inhale and exhale breath patterns to move through a variety of yoga postures. The movement becomes meditative as a result of this. Standing postures and a movement called vinyasa, which is similar to a sun salutation, are often part of the practice. Vinyasa helps keep the body moving, improves flexibility, and maintains connection to the breath. A variety of seated positions, an inversion (such as a headstand or shoulder stand), and the final relaxation pose known as “savasana” are also common elements of the practice (Gjoreski, et al. 2017).

UNOBTRUSIVE STRESS DETECTION SYSTEM: Our stress detection system, which was developed in, makes it possible for users to monitor their stress levels throughout their day without causing any disruption or restriction. Wearing a smart band is all that is required to use this system. The Empatica E4 smart band was worn by participants in this study on their non-dominant hand. Blood Volume Pressure, ST, EDA, IBI (Interbeat Interval), and 3D Acceleration are provided by the smart band. The data are kept in the device’s memory. After that, the physiological signal artifacts were found and dealt with. The sensory signals’ features were taken from them and fed to the machine learning algorithm for prediction. Pre-trained machine learning models are needed to use this system. Feature vectors and collected class labels were used to train the models (Huston, et al. 2017).

CONCLUSION

With the help of Empatica-E4 smart-bands and our automatic stress detection system, we were able to identify stress levels and recommend appropriate relaxation techniques—traditional or mobile—for people who were experiencing high levels of stress in this study. Our relaxation method suggestion system makes its decisions based on the user’s physical activity-related context, and our stress detection framework is unobtrusive, comfortable, and suitable for daily use. We gathered eight days’ worth of data from 16 people who were attending a training event for an EU research project in order to test our system. Training and lectures (mild stress), yoga, mindfulness, and mobile mindfulness (PAUSE) (relax), and a moderated presentation (high stress) were all events that participants were required to participate in. There were participants from a variety of nations and cultures.

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