Analysis of Electrodermal Activity to Quantify Stress Levels in Autism

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Individuals with autism experience heightened sensitivity to their environment, resulting in neutral stimuli being perceived as amplified and threatening. The sensory meltdown is the painful reaction that follows, as the person feels overwhelmed by stressors. The objective of this research is to develop methods by which changes in skin resistance levels (SRL) could serve as early warning signs of a sensory meltdown in autism. This research seeks to gain quantitative insight into stressor detection, allowing for timely intervention to prevent sensory meltdowns. Skin resistance readings were used to detect and monitor the onset of mounting frustration levels as volunteers engaged in various tasks. By corresponding environmental stimuli with SRL, connections were drawn between observed stress responses and the stimuli that caused them. Patterns detected in SRL were used to comprise “fingerprint” characteristics of different types of stress, allowing the type of stress a person is experiencing to be predicted based on SRL. Additionally, readings were found to reflect processes such as amygdala habituation and stressor-recovery, offering insight into the efficacy of employed recovery methods. The outcome of this research is aimed at enhancing Sensory Integration practice, allowing for individualized and more effective approaches to autism therapy. Future applications include the design of a wearable device and smartphone app for caregivers. By enabling real-time feedback on the impact of stressors, this tool will help empower individuals with autism with a stronger grasp of the causes and prevention of sensory meltdowns, and thus strengthened independence in day-to-day life.

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