TOOLBOX

Pattern recognition

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101117-accelerometer-blog

There are many theories to explain why people with autism are prone to body rocking, hand flapping and other **repetitive motor movements, or stereotypies**. But no one really knows why people with autism engage in these behaviors, nor how to help them stop.

To learn more about these movements, researchers in the Massachusetts Institute of Technology's Media Laboratory are evaluating a tool called a 'wireless accelerometer,' a type of sensor that measures motion. Combined with special software that records and analyzes patterns in movement, **the instrument measures sterotypies** with greater precision than the usual observational methods, the researchers report in the September *Journal of Autism and Developmental Disorders*.

In a preliminary study, researchers attached the accelerometer's three sensors to the wrists and chests of six young men with autism, aged 13 to 20, who are prone to regular repetitive motions. The sensors were small and allowed the participants to move freely in a laboratory and a classroom setting, where they ate lunch and worked on tasks with a teacher.

Each session lasted 15 to 30 minutes, and researchers recorded each participant at least two times in both settings. They found that the new automated detection method is far more accurate than real-time note-taking, and more efficient than taking notes on video.

The devices send motion data from the sensors to a computer where they are synchronized with images from video recordings of the session. Together, these create an 'acceleration stream' that gauges how often and how long each individual engages in various behaviors. The end result is a graph that shows a particular pattern of movement for each individual.

The data should help researchers learn whether an individual's behavior varies over time and in specific situations — for example, when the person is stressed by new experiences.

If an individual shows the same level of movement at all times, regardless of circumstance, that suggests a biological cause and a pharmacological cure. But if, instead, he or she varies repetitive movements depending on specific conditions, the cause is more likely to be psychological, and behavioral interventions might be more effective.

People with autism seem to find repetitive motion comforting, and so any attempt to mediate these behaviors would have to take into consideration their wishes. That's something that no machine, however, sophisticated, can gauge.