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Gameplay patterns on iPad could help identify children with autism

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Autism could be diagnosed by allowing children to play games on smart phones and tablets, a study involving the University of Strathclyde has found.

Dr Jonathan Delafield-Butt, of Strathclyde's Faculty of Humanities and Social Sciences, and colleagues at start-up company Harimata, used fun iPad games to track players' hand movements - gathering information that can help identify autism.

In the study, published in the Nature group journal Scientific Reports, the research team outlined how the technology could offer an accessible and less intrusive way to diagnose the developmental disorder.

Dr Delafield-Butt, a Senior Lecturer in Child Development, said: "We have shown that children with autism can be identified by their gameplay patterns on an iPad.

"This is potentially a major breakthrough for early identification of autism, because no stressful and expensive tests by clinicians are needed. Early detection is important as this can allow parents and children to gain access to a range of services support.

"This new 'serious game' assessment offers a cheaper, faster, fun way of testing for autism. But more work is needed to confirm this finding, and to test for its limitations.

"This study is the first step toward a validated instrument. Interestingly, our study goes further in elucidating the origins of autism, because it turns out that movement is the most important differentiator in the gameplay data.

"In other words, it is not social, emotional, or cognitive aspects of the gameplay that identify autism. Rather, the key difference is in the way children with autism move their hands as they touch, swipe, and gesture with the iPad during the game.

"This unexpected finding adds new impetus to a growing scientific understanding that movement is fundamentally disrupted in autism, and may underpin the disorder."

Anna Anzulewicz, Director of Research at Harimata, a company that develops mobile technology for improving early assessment of developmental disorders, said: "Early assessment of autism allows timely therapeutic intervention, but professional diagnosis of the disorder is difficult and time-consuming.

"Our aim was to develop a test that would be intuitive, fast, fun and engaging for the children. iPad-based games seemed to be perfect, and they are embedded with powerful sensors, which allow for the precise measurement of the children's play dynamics."

In the study, researchers examined movement data gathered from 37 children with autism, aged three to six years. The children were asked to play games on smart tablet computers with touch-sensitive screens and embedded movement sensors.

The report found: "Analysis revealed these patterns consisted of greater forces at contact and with a different distribution of forces within a gesture, and gesture kinematics were faster and larger, with more distal use of space.

"These data support the notion disruption to movement is a core feature of autism, and demonstrate autism can be computationally assessed by fun, smart device gameplay."

Source:
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