

Machine learning used to successfully measure attachment in children

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For the first time, researchers have used machine learning to successfully measure attachment in children—the vital human bond that humans first develop as infants to their caregivers.

In new multi-disciplinary research, led by the University of Glasgow and published in *PLOS ONE*, the study team present a quick and easy way to measure attachment through a [computer game](#), that has the potential to be used in largescale public health monitoring.

Attachment is a term used to describe the lasting emotional bond and feeling of connectedness between human beings. The attachment between a [young child](#) and their primary caregiver is known to be vitally important for emotional development—disruption to or loss of this bond can affect a child emotionally and psychologically into adulthood, impacting future relationships.

Insecure attachment in [children](#) is not necessarily abnormal, and is often an emotional adaptation to less than optimal environmental circumstances. However, insecure attachment is associated with increased risk of psychopathology of various types. As a result, there may be potential for SAM, in the future, to form part of an early school-based screening program to identify children at risk of psychopathology.

Assessing attachment can be time consuming and complex, as attachment behaviors can, at present, only be observed and assessed by trained professionals when a child feels they are in a stressful situation.

Now, a research collaboration team of child mental health and computing science experts has developed and validated the School Attachment Monitor (SAM) – a computer program that uses [machine learning](#) and smart sensors to accurately assess attachment in children. SAM is delivered by novel software which interacts with child participants, starting with warm-up activities to familiarize them with the task. Children are invited to play with 'smart dolls' while interacting with a story on the computer, and data on their attachment patterns are captured through video recording and movement sensors in the smart dolls.

Researchers found that the SAM technology was able to accurately measure a child's attachment, when compared with the ratings of trained professionals looking at the same child's data.

Professor Helen Minnis, professor of child and [adolescent psychiatry](#) at the University of Glasgow and lead author of the study, said: "Our study shows that using modern sensors and machine learning technology, it has been possible to develop the School Attachment Monitor (SAM) that works well with young children, and most importantly, gives an accurate classification of attachment security versus insecurity compared to manual ratings.

"The aim of our research program, from its inception over a decade ago, was to develop a quick and easy measure of attachment that can be used in large-scale public health monitoring or epidemiology. SAM has the potential to achieve that aim, although further research will be needed to examine its performance in a range of populations."

SAM offers automatic presentation, on computer, of story-stems based on the Manchester Child Attachment Story Task (MCAST). The study recruited 130 5-9 year old children from mainstream primary schools to participate.

The study, "The School Attachment Monitor—a novel computational tool for assessment of attachment in middle childhood," is published in *PLOS ONE*.

More information: Maki Rooksby et al, The School Attachment Monitor—A novel computational tool for assessment of attachment in middle childhood, *PLOS ONE* (2021). [DOI: 10.1371/journal.pone.0240277](https://doi.org/10.1371/journal.pone.0240277)

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