

Home videos could be powerful tool for diagnosing autism, researcher says

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Dennis Wall and his colleagues found that brief training enabled people to accurately detect autistic-type behaviors in children who appeared in short videos posted online. Credit: Steve Fisch

Short home videos, such as those posted on YouTube, may become a powerful tool for diagnosing autism, according to a study whose senior author is a scientist at the Stanford University School of Medicine.

No biochemical or physical tests for autism have been established, so the developmental disorder is diagnosed by observing a child for such telltale signs as repetitive behaviors, poor language skills and lack of eye contact. On average, [children](#) with autism are diagnosed at age 4, though their parents often suspect for years before diagnosis that something is wrong. Delayed diagnosis is a missed opportunity; prior research has

shown that behavioral autism treatments work best when started early, at age 2 or 3.

Yet with only brief training, research assistants were able to accurately score autistic-type behaviors in home videos of children in natural settings, the study found. "Our new paper supports the hypothesis that we can detect autism quickly in very short home videos with high accuracy," said Dennis Wall, PhD, associate professor of pediatrics in systems medicine and the senior author of the paper, published April 16 in *PLOS ONE*. Vincent Fusaro, PhD, a research associate at Harvard, is the lead author. The finding has the potential to improve the speed and availability of [autism diagnosis](#).

Turning to the Web

Since short videos can be shared over the Internet and evaluated quickly, using them to aid diagnosis could reduce families' need to travel long distances or wait—in many cases for over a year—for a medical evaluation. "These findings give us a great deal of hope that we will be able to make diagnosis and follow-up much more widely available, not only in the U.S. but across the globe, so that children get recognized as early as possible," Wall said.

For the study, Wall's team found 100 videos on YouTube, each 10 minutes or less, that showed kids from 1 to 15 years old at play. Forty-five of the videos had been tagged by their creators with "autism," "ASD," "Asperger's" or "hand-flapping/stimming;" these were classified by the researchers as showing children with autism. The remaining 55 videos did not have such tags and were classified as not depicting [autism spectrum disorder](#).

Then, a group of undergraduate students was trained to score the behavior of the children in the videos. The rating scale they used was

based on the Autism Diagnostic Observation Schedule, which is widely considered the gold standard for diagnosing autism. The raters used only questions from the scoring system that could be applied to pre-recorded videos, such as whether children showed [eye contact](#) and picked up on social cues from others in the [video](#), whether they played with toys appropriately, and whether they engaged in [repetitive behaviors](#).

Using this system, the students accurately classified children in the videos 97 percent of the time, the researchers found.

Supplementing current methods

The finding raises several interesting possibilities for future clinical applications, Wall said. Although video-based evaluations are unlikely to completely replace standard diagnostic methods, in which a trained clinician spends several hours evaluating a child, they could augment standard approaches.

"For instance, we could use this system for clinical triage, as a way to channel traffic so that children can get the kind of attention they need as early as possible," Wall said. Children who clearly have autism might be diagnosed primarily with videos and quickly started on therapy, freeing clinicians to spend more time evaluating children whose diagnosis is less clear-cut.

"I'm really fascinated by this work; it raises a lot of questions we need to flesh out," said Kari Berquist, PhD, a pediatric psychologist who treats children with autism at Lucile Packard Children's Hospital Stanford. Berquist was not involved in Wall's research.

"I don't think this technique should necessarily replace traditional diagnostic approaches, but it could be a good way to get people in and start to get them the help they need," she added. "Hopefully, it will also

prevent the 'watch and wait' approach for parents who are really concerned and feel like they are not being heard."

Watchful waiting

Video evaluations could be used to track a child's development and improve the watchful-waiting process, Wall said. Autism cannot usually be diagnosed prior to 2 years of age; some children who will never develop autism have early oddities in their social and [language skills](#) that resolve by age 2. However, if parents suspect that their 18-month-old has [autism](#), a video evaluation at that age could provide a baseline for "informed watchful waiting" and later assessments at 24 or 36 months. Similarly, scored home videos could provide a simple way to track progress after children begin receiving behavioral therapy; no tools now exist to measure such progress.

Another potential advantage of using video for diagnosis is that young children often behave differently in a doctor's office than at home.

"Clinical settings are often stark, artificial and can elicit behaviors that are abnormal," Wall said. "The odds are stacked against the diagnostic professional because the child is in an unknown environment with strangers."

Wall and his fellow researchers hope to conduct future research on the use of videos for diagnosing children with other learning disabilities, including attention deficit hyperactivity disorder, as well adults with late-onset neurologic conditions such as Alzheimer's disease, Parkinson's disease and amyotrophic lateral sclerosis.

"Our goal is to bridge the gap between families in need and the services they require," Wall said.

Provided by Stanford University Medical Center

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