Autism & Beyond: Lessons from the Development of a ResearchKit App for Autism Screening

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The Friday Center
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Bringing early childhood mental health, information science, computer engineering, big data, and global health together
18 Months
Age at which autism can be detected

700
Synapse/Sec
Rate of brain growth in the first few years of life

5.3 Years
Mean age of autism diagnosis in the U.S.
Lack of child psychiatrists locally and globally

There are 50-60 child psychiatrists in sub-Saharan Africa. There are nearly 400 million children.
Early Identification Improves outcomes
Current Approaches DON’T SCALE
Access to knowledge empowers parents, teachers and clinicians to get children the help they need.

Information science and mobile technology are key to transformative change.
Can we make digital tools that use computer vision to automatically code a child’s behaviors and emotions?
The PRIDE Study

Developing an iPad tool to improve autism screening in pediatric clinics
Child watches video designed to elicit social-emotional responses while camera records the child’s behavior.
Responding to a story: typical child
Responding to a story: child with autism
Software detects toddler’s emotional expressions in real time.
Computer and human raters agree
Toddler orients to name
Children with autism less likely to respond when name called or respond more slowly

Median in Control is .98 sec
Median in Autism is 1.58 sec
Autism & Beyond
an Apple ResearchKit app for parents
Autism & Beyond
A Study of Young Children's Mental Health

Read Consent Document
Email Consent Document

About the Study

This study looks at young children’s emotions and behaviors to better understand and identify risks for developmental and mental health disorders like autism.

You’ll be asked to answer surveys about your family and your child will watch several videos.

How it Works

While your child watches a video on your iPhone, we will record your child’s face to measure emotion.

You can choose to share the video or only the facial expressions.
Welcome to Autism & Beyond

We will explain the research study and its activities and allow you to provide your consent to participate in the study.

Get Started
Activities

- Family Background Survey
  14 Questions, one time only
- Parental Concern Survey
  28 Questions
- Temper Tantrum Survey
  8 Questions
- Bubbles Video
  20 Seconds, with your child
- Bunny Video
  35 Seconds, with your child
- Mirror Video
  30 Seconds, with your child
- Toys and Songs Video
  30 Seconds, with your child

Video Samples

The videos your child watches are designed to make them smile, laugh and be surprised.

Join Study

Already Participating?
Feedback

M-CHAT Autism Survey
Completed 30 Nov 2015

Your child’s score on the M-CHAT-R/F indicates that your child may be at high risk for an autism spectrum disorder. We recommend that children with these scores receive a developmental evaluation. Your child may also be eligible for early intervention services.

Does this score mean my child has autism?

No.

Six out of 10 children with this score have autism spectrum disorder. 4 out of 10 children with this score have another developmental delay.
“Earlier this week ... I stared into the front-facing camera of [an iPhone] and contorted my face into a deep frown and, with the twinkle of a few green dots, caught a glimpse of the future of handheld healthcare.”

- Charlie Warzel, BuzzFeed
Aim 1. Will parents upload videos? Will the video quality be good enough for analysis?

80% of parents upload full videos

The child’s face is detected in 90% of the frames
Featured in the March 2016 Apple Keynote

“We’ve gone as far as we can with traditional research. Now we have technology in our pockets that lets us go even further.”

Dr. Helen Link Egger,
Duke University Medical Center

ResearchKit and CareKit
Empowering medical researchers, doctors, and now you.

Doctors around the world are using iPhone to transform the way we think about health. Apps created with ResearchKit are already producing medical insights and discoveries at a pace and scale never seen before. That success has inspired us to widen the scope from medical research to personal care with the introduction of CareKit — a framework for developers to build apps that let you manage your own

The Autism & Beyond app lets schools screen for autism as easily as they do for hearing and vision issues. Early detection of autism is a crucial factor in providing effective treatment.
• SOUTH AFRICA
• ARGENTINA
• TURKEY
• INDIA