DIGITAL SCREENING FOR AUTISM IN CHILDREN

KEYWORDS
- Autism
- Screening Technology
- Eye-Tracking
- 18-36 months old children

Collaboration type
License agreement
R&D collaboration

IP status
"Method for evaluating a risk of neurodevelopmental condition with a child"
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THE TECHNOLOGY IN A NUTSHELL

The DepistEye Technology is an autism screening tool based on eye-tracking technology and on measures of the child's linguistic development, to detect a risk of developing an autism condition from 18 months.
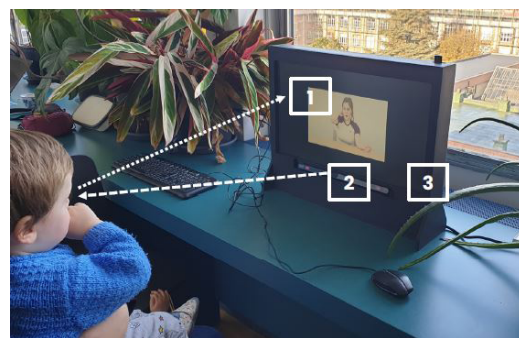
STATE OF THE ART

Autism is a neurobiological developmental condition whose prevalence is estimated at 1 in 68 children. The scientific community agrees on the importance of early intervention, when cerebral plasticity is still optimal, which increases the chances of a favorable prognosis and decreases the risks of comorbidities and the level of dependence of the person.
While the critical period for language starting intervention is before the age of three, the median age of diagnosis is still often higher than 4 years.
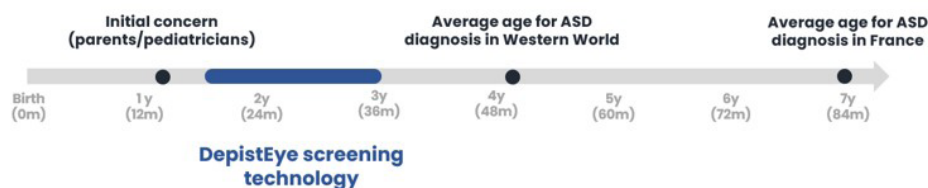
In Belgium, as in France and in other countries, the diagnosis must be delivered by a specialized team within an Autism Reference Center (CRA). These CRAs are now saturated and have waiting lists of 1 to 2 years, further delaying the age of diagnosis. These delays are in part due to a large number of false positives and a first line that does not feel sufficiently equipped to deal with the difficulty of spotting the early signs of autism.

THE INVENTION

1. **Visual stimuli**: proprietary video test protocol based on language development in children
2. **Eye movement** (fixation of gaze) of the child is tracked and recorded
3. **Eye-tracking data** are analyzed and the proprietary algorithm is used to score for the likelihood of ASD.

Trial session with 19-month-old baby with the DepistEye prototype device & software (Nov. 2021)

TECHNOLOGY READINESS LEVEL

1 2 3 4 5 **6** 7 8 9

- PoC Study completed
- Study performed at the ULB with 120 children aged 3 to 5 years (36-60 months)
- 60 children previously diagnosed with ASD and 60 typical development children
- All children were screened in 4 video sessions and eye-tracking data were collected
- Eye-tracking data were used to:
  - Determine differences at group level (ASD vs. TD), cf. publication
  - Develop predictive model (algorithm) to score for ASD
- PoC study results will be used as the basis for the pivotal study in children aged 18-36 months

KEY ADVANTAGES OF THE TECHNOLOGY

The DepistEye screening approach allows to:

1. Reduce the age of diagnosis and initiate intervention faster
2. Reduce burden on parents and families
3. Reduce number of undiagnosed children
4. Increase objectivity and reliability of screening methods
5. Reduce number unnecessary diagnostic evaluations
6. Prioritize children at higher likelihood
7. Reduce waiting times for clinical diagnosis

√ 18-36 months-old
√ medical framework
√ scalable and systemic
√ digital & use of algorithm
√ higher accuracy
√ higher accuracy
√ higher accuracy

THE INVENTORS

Prof. Mikhail Kissine is professor of linguistics and director of the Centre of Research in Linguistics (LaDisco) in the Université Libre de Bruxelles (ULB) Co-Principal Investigator of the research group on Autism ACTE (Autism in Context: Theory and Experiment).

Prof. Gaétane Deliens is professor of cognitive neuropsychology at the Faculty of Psychology and Education of the Université libre de Bruxelles (ULB) Co-Principal Investigator of the research group on Autism ACTE (Autism in Context: Theory and Experiment).

RELEVANT PUBLICATIONS

> Attention to intentional versus incidental pointing gestures in young autistic children: an eye-tracking study, Stercq F., Kissine M., Journal of Experimental Child Psychology, Volume 210, 105205. Published October 2021.

> Audio-visual integration in nonverbal or minimally verbal young autistic children, Kissine M., Bertels J., Deconinck N., Passeri G., Deliens G., Journal of Experimental Psychology: General. Published 2021.