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Executive Summary

EarliPoint HEALTH

Development and Replication of Objective Measurements of Social Visual Engagement to Aid in Early Diagnosis and Assessment of Autism

What Was Studied

Whether an objective eye-tracking test of toddlers' attention to social scenes can aid autism diagnosis before age 3 and quantify abilities (social, verbal, nonverbal).

Why It Matters

- Many parents notice concerns by age 2, but diagnosis often comes at 4–5 years, delaying support.
- Gold-standard tools are accurate but time-intensive and require specialists; waitlists are long.
- An objective biomarker could expand access and speed services.

Who and How

- Design: Two prospective, double-blind studies (clinicians blinded to eye-tracking; eye-tracking blinded to clinical results).
- Participants: 1,089 children:
  - Discovery: 719 kids, 16–30 months (mean 22.4).
  - Replication: 370 kids, 16–45 months (mean 25.4).
  - Roughly half with autism, half without (per expert diagnosis).
- Eyetracking test: Toddlers watched videos while an eye-tracker recorded where they looked; algorithms summarized "social visual engagement," (how children look at and learn from their surroundings)
- Clinical comparison: Gold-standard expert autism diagnosis using validated assessments (e.g., ADOS-2, Mullen).

Diagnostic Performance

- Discovery: AUC 0.90; Sensitivity 81.9%; Specificity 89.9%.
- Replication: AUC 0.89; Sensitivity 80.6%; Specificity 82.3%.
- Plain take: High accuracy, replicated in an independent sample.

How Well Did It Track Abilities? (Convergent validity, replication study)

- Accurately measured social disability (explained 68.6% of variance in ADOS-2 scores).
- Accurately measured verbal ability (explained 63.4% of variance in Mullen verbal).
- Accurately measured nonverbal learning (explained 49.0% of variance in Mullen nonverbal).
- Plain take: Beyond "autism vs not," results meaningfully reflect each child's individual support needs.

Practical Notes

- Safe, effective, can be run by technicians.
- Automated processing; results generated quickly after testing.
- Objective eye-tracking measures successfully proxy results of gold standard, multi-hour
- assessments.
- Results designed to aid expert clinicians (not replace).

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Limitations

- Conducted with expert teams and a prototype device
- Broader multisite clinical trial needed to support FDA clearance.

Bottom Line

A promising, objective biomarker: eye-tracking of social visual engagement can aid earlier, more efficient autism assessment and can quantify individual strengths and vulnerabilities.