

Bridging the Early-Intervention Gap in Autism Using a Home-Based Social Robot: Interim Developmental Findings from a Single-Arm Feasibility Study

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Background. Demand for early autism support frequently exceeds available services, motivating scalable, home-deliverable models. QTRobot is a parent-mediated intervention combining a social robot, tablet-based activities, and a caregiver interface to deliver structured, play-based sessions targeting communication, cognitive, and social-emotional skills. This is its first evaluation in this population.

Methods. In a single-arm, repeated-measures feasibility study, autistic children aged 2.5–4.5 years were recruited in the West Midlands, England, with families committing to ≥12 sessions/month over 10 months. The Mullen Scales of Early Learning (MSEL) and Vineland Adaptive Behaviour Scales (VABS) were assessed at baseline, month 5, and month 10. We report the pre-specified interim analysis (69 families enrolled; n=51 with paired baseline and month-5 assessments), using mean change with 95% confidence intervals.

Results. All four MSEL domains showed significant raw-score gains at month 5: Receptive Language +4.5 (95% CI 3.3–5.7), Expressive Language +3.5 (2.4–4.6), Visual Reception +2.8 (1.9–3.7), and Fine Motor +2.6 (1.5–3.7). VABS standard scores rose in Communication (+3.3), Daily Living Skills (+3.5), and the Adaptive Behaviour Composite (+2.5), with Socialization not significant.

Conclusions. Interim data are consistent with early gains in language and adaptive functioning during a home-based, parent-mediated robot intervention. As an uncontrolled design, these findings cannot separate intervention effect from maturation or repeated testing; endpoint and mixed-methods feasibility data will follow.

References

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Biosketch

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CURRENT AND PAST POSITIONS

2024–present: Team Leader, Biostatistics, Luxembourg Institute of Health (CCMS / DMI), Luxembourg. Leads the Biostatistics group, directing statistical strategy, quality assurance, resource allocation, and reporting.

2020–2024: Biostatistician, Neuroscience, Luxembourg Institute of Health, Luxembourg.

2013–2018: Postdoctoral Data Analyst, Neuroscience, University Medical Center, Johannes Gutenberg University Mainz, Germany.

2008–2013: Doctoral Scientist, Max Planck Institute for Brain Research & Goethe University Frankfurt, Germany.

EDUCATION

Dr. rer. nat. (PhD) in Natural Sciences, Max Planck Institute for Brain Research & Goethe University Frankfurt.

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AWARDS AND HONORS

2013–2015: Postdoctoral Fellowship, awarded by Focus Network in Translational Neuroscience, Johannes Gutenberg University Mainz.

2013: Fellowship for re-invitation to Summer Institute in Cognitive Neuroscience, awarded by UC Santa Barbara – UC Davis.

2011: Fellowship for Summer Institute in Cognitive Neuroscience, awarded by UC Santa Barbara – UC Davis.

2008: Scholarship for Doctoral Studies, awarded by CONICYT corporation, Education Ministry, Chilean Government.

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OTHER RELEVANT PROFESSIONAL ACTIVITIES AND ACCOMPLISHMENTS

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