The first 1000 days of life are a period of unique sensitivity and plasticity during which critical cognitive abilities are formed. Routine developmental screening tools aim to identify infants who would benefit from early intervention. While these tools have been validated for detecting children with more severe neurodevelopmental disorders, their ability to identify the larger proportion with below average cognitive function has not been sufficiently explored. The aim of this study was to examine the validity of the Ages and Stages Questionnaire (ASQ), for identifying children with later below average cognitive function.

The study population (n=8260) is formed from two national cohort studies, the Growing Up in Ireland (GUI) Infant cohort (n=7,444) and the Cork BASELINE cohort (n=816). The ASQ was completed at 8 months and 24-27 months respectively. Cognitive assessments were performed at age 5. Those scoring <1 standard deviation (SD) below the mean were categorised as below average cognitive function. Applying the currently used onward referral criterion (one fail in any domain) the sensitivity, specificity, positive and negative predictive values of the 8- and 24-27- month ASQ for detecting children with later below average cognitive function were calculated.

In the GUI cohort n=905 participants (12.5%) had scores <1SD below the mean on the Picture Similarities Scale. In the BASELINE cohort n=101 participants (13.4%) had an IQ <1SD below the cohort mean. Applying the currently used onward referral criterion (failing in any one domain in the ASQ), the sensitivity of the 8-month ASQ for detecting children scoring <1SD below the mean on the Picture Similarities Scale at age 5 was 16.4% (95% CI 14.0-19.0). The specificity was 92.0% (95% CI 91.3-92.6), with a positive predictive value (PPV) of 22.6% (95% CI 19.5-26.0) and a negative predictive value (NPV) of 88.5% (95% CI 87.7%-89.2%).

In the BASELINE cohort n=468 participants completed the 24-month ASQ and n=316 the 27-month ASQ. Applying the same onward referral criterion to the 24- and 27- month ASQ combined, the sensitivity for detecting those with an IQ <1SD below the cohort mean was 20.8% (95% CI 13.6-30.2) and the specificity was 91.1% (95% CI 88.6-93.2).

The ASQ has a low sensitivity for identifying children with below average cognitive function at age 5. The findings of this study suggest that if we are to intervene early in the developmental trajectory for children with below average cognitive function alternative methods of identifying high risk infants are needed.

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EMOTIONAL BEHAVIOURAL DEVELOPMENT IN CHILDREN WITH BELOW AVERAGE COGNITIVE FUNCTION

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Children with below average cognitive function represent a substantial yet under-researched population for whom academic and social demands, which increase in complexity year by year, pose significant challenge. Effects on emotional-behavioural development (EBD) are not well understood. The aim of this study was to compare trajectories of EBD for children with and without below average cognitive function.

The underlying hypothesis was that trajectories of EBD would differ between groups, with divergence occurring as children are subject to increasingly complex cognitive demands.

Participants consist of 7,000 children and caregivers who completed the Growing Up in Ireland survey at age 3,5 and 9 years. Cognitive function was measured at age 3 using the Picture Similarities Scale. A t-score 1-2 standard deviations below the mean was categorised as below average cognitive function (n=767), and scores above this categorised as average cognitive function (n=6418). EBD was measured using the Strengths and Difficulties Questionnaire (SDQ) at age 3,5 and 9. Repeated measures ANOVA was used to examine the difference between the overall group means across the repeated measures of SDQ, the SDQ change over time, and the interaction between cognitive group and change over time. Further analysis of trajectories was performed using latent growth curve analysis.

Compared to those with average cognitive function, a significantly higher proportion of children with below average function were male (61.8% v 38.2%, χ^2 (1, N=7134) = 42.07 p<0.001), born to a single parent family (22.4% v 14.7%, χ^2 (1, N=7134) = 23.15 p<0.001), and had a parent who smoked (35.6% v 25.8%, χ^2 (1, N=7134) = 33.23 p<0.001). Children with below average cognitive function had significantly higher mean total SDQ scores at all ages. Repeated measures ANOVA demonstrated a significant group-by-time interaction effect (F(2,7182)=4.649, p=0.010). The mean difference (MD) in SDQ between cognitive groups increased over time (MD Age 3:0.87, 95% confidence interval (CI) 0.53-1.21, Age 9 MD:1.49,95% CI 1.08-1.91). For those with average or above cognitive function the overall SDQ decreased between age 3-9 (MD: -0.49 95% CI -0.65—0.33). This decrease was not seen for those with below average function, who had a non-statistically significant increase in SDQ between age 3-9.

Children with below average cognitive function experience higher and worsening mean SDQ scores throughout childhood. A scalable method of early identification of children at risk for below average cognitive function should be a research priority for public health, enabling early intervention for cognitive and adaptive outcomes.

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ASSISTED REPRODUCTIVE TECHNOLOGY TECHNIQUES AND RISK FOR NEURODEVELOPMENTAL DISORDERS

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Assisted reproductive technology (ART) techniques are becoming more common nowadays, due to the growing incidence of infertility. Such pregnancies are more often multiple, which carries the risk of premature birth and lower birth weight and, accordingly, a higher risk of occurrence of neurodevelopmental disorders. Aside from the before mentioned, other known risk factors for neurodevelopmental disorders include chorioamnionitis, gestational diabetes, and respiratory distress. The aim of the study was to compare the prevalence of risk factors for neurodevelopmental disorders between two groups of children born preterm, those conceived through ART and those conceived naturally.