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TITLE: Early manifestations of intellectual ability: Evidence that genetic effects on achievement are mediated through early childhood literacy

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ABSTRACT: Intellectual ability is one of the strongest predictors of lifelong success, health and longevity. Achievement in middle childhood is reliably linked to intellectual ability in adulthood and there is convincing evidence that genetic mechanisms underly this association. However, earlier indicators of intellectual ability are less well understood. While executive function (EF) and literacy are promising early markers, it remains unclear whether these abilities in infancy and early childhood have shared pathways with the development of later achievement or simply predict these outcomes. We used the powerful adoption design to examine the role of genetic factors, early EF and literacy in the development of later achievement, in 561 linked sets of adopted

children and their birth and adoptive parents. Latent measures of birth parent intellectual ability were used as indicators of genetic influence on children's intellectual outcomes, and multiple observational measures and tests were used to index child EF, literacy, and achievement. We hypothesized that birth parent intellectual ability would predict child EF, literacy and achievement, and that early childhood EF and literacy would mediate the association between birth parent intellectual ability and child achievement at 7 years. The results suggested that genetic factors underlying birth parent intellectual ability may influence EF at 27 months but not later in childhood, literacy from 4.5 years, and achievement at 7 years. There was no evidence that genetic effects on achievement were mediated through EF at 27 months. However, literacy at 4.5 years mediated the effects of genetic influences on achievement at 7 years.

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