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What Determines Adult Cognitive Skills? Impacts of Pre-Schooling, Schooling and Post-Schooling Experiences in Guatemala

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Abstract

Most investigations of the importance of and the determinants of adult cognitive skills assume that (a) they are produced primarily by schooling and (b) schooling is statistically predetermined. But these assumptions may lead to misleading inferences about impacts of schooling and of pre-schooling and post-schooling experiences on adult cognitive skills. This study uses an unusually rich longitudinal data set collected over 35 years in Guatemala to investigate production functions for adult (i) reading-comprehension and (ii) nonverbal cognitive skills as dependent on behaviorally-determined pre-schooling, schooling and post-schooling experiences. Major results are: (1) Schooling has significant and substantial impact on adult reading comprehension (but not on adult nonverbal cognitive skills)—but estimates of this impact are biased upwards substantially if there are no controls for behavioral determinants of schooling in the presence of persistent unobserved factors such as genetic endowments and/or if family background factors that appear to be correlated with genetic endowments are included among the first-stage instruments. (2) Both pre-schooling and post-schooling experiences have substantial significant impacts on one or both of the adult cognitive skill measures that tend to be underestimated if these pre- and post-schooling experiences are treated as statistically predetermined—in contrast to the upward bias for schooling, which suggests that the

underlying physical and job-related components of genetic endowments are negatively correlated with those for cognitive skills. (3) The failure in most studies to incorporate pre- and post-schooling experiences in the analysis of adult cognitive skills or outcomes affected by adult cognitive skills is likely to lead to misleading over-emphasis on schooling relative to these pre-and post-schooling experiences. (4) Gender differences in the coefficients of the adult cognitive skills production functions are not significant, suggesting that most of the fairly substantial differences in adult cognitive skills favoring males on average originate from gender differences in schooling attainment and in experience in skilled jobs favoring males. These four sets of findings are of substantial interest in themselves. But they also have important implications for broader literatures, reinforcing the importance of early life investments in disadvantaged children in determining adult skills and options, pointing to limitations in the cross-country growth literature of using schooling of adults to represent human capital, supporting hypotheses about the importance of childhood nutrition and work complexity in explaining the "Flynn effect" of substantial increases in measured cognitive skills over time, and questioning the interpretation of studies that report productivity impacts of cognitive skills without controlling for the endogeneity of such skills.

Keywords

Adolescence, Adult, Age, Child, Cognition, Developing countries, Early adulthood, Early childhood, Early childhood nutrition, Economic development, Economics, Education, Educational attainment, Educational outcomes, Experimental, Experimental health, Fieldwork, Gender, Grade, Guatemala, Human capital, Intergenerational transfer, Interviews, Life course, Longitudinal data, Migrants, Nutrition, Nutritional intervention, Nutritional status, Preschool, PROGRESA, Raven's Progressive Matrices, Reading, Schooling, Sex, Supplements, Surveys

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