Household environment's association with math and reading test scores in Ghana

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BACKGROUND

The contribution of the household learning environment is often ignored in studies of student achievement in sub-Saharan Africa. Students spend significant time at home doing homework, preparing for class and studying for tests so their experience at home should be related to their performance in school. This paper offers a new case study of the association between the home environment and achievement of 9 to 15-year olds in Ghana. This is important as much of the literature on the home learning environment and achievement is taken from developed countries.

The relevance of the household environment in promoting learning and academic achievement in children is a research area that has not been fully explored. As Yair and Gazit (2006) discuss, the understanding of how much and how well children learn at home provides an important contribution to the existing education literature. Lockheed, Fuller and Nyirongo (1989) argue that while family background may be a useful proxy for financial resources, it also represents intangible characteristics such as parental ambition and motivation that may influence child achievement. Neglecting to understand the nonmaterial contribution of households to academic outcomes will underestimate the influence of family characteristics on achievement. Further, a closer look at the other pathways through which families may influence academic performance will provide insights into how to accurately measure household effects on achievement in developing countries.

HYPOTHESES

Household characteristics that provide a positive environment for learning should be associated with higher reading and math scores. The economic resources of the household should be correlated with expenditure on educational resources. Intangible resources such as motivation and assistance should also influence the learning environment. Family characteristics such as number and age of siblings at home will determine how much competition the child has for educational resources and how able they are to learn at home. The nature of the child's surroundings such as good lighting and available study spaces free from distractions determine whether the home would be conducive for learning. Socioeconomic resources should be positively associated with achievement as should family characteristics and physical settings that afford a positive learning environment.

DATA AND METHODS

The data comes from the 2003 Household and School Survey, a nationally representative household based survey that administered achievement tests to all household members aged 9 to 55 years. The age range starts from nine because children younger than nine were not tested. The maximum age is 15 because at that age, students should have completed primary school. The method will be a regression of learning environment indicators on children's reading and mathematics test scores. The focal independent variables will be measures of the physical and cognitive environment that are outlined below. Control variables included will be the child's demographic characteristics and district level measures of school quality.

CHARACTERIZING THE LEARNING ENVIRONMENT

Household Socioeconomic Resources

The first measure of the household's economic resources will be household income which represents the financial resources that the household can provide for the children and that should be positively associated with test scores. The second is access to educational materials, which represents the non-economic resources that contribute to learning at home. It will be measured using expenditure on books, notebooks and stationary as used by Guo and Harris (2000) to measure cognitive stimulation at home. The reading test score of the household head is included to represent household human capital. The presence of a literate adult in the house would likely provide assistance and motivation for children, which should be correlated with higher test scores. I use the household head because the prevalence of child fostering means that many children do not live with their parents (Lloyd and Blanc 1996).

Family Structure

For the sibling characteristics, I use information on all children in the house and not just that of siblings because with the presence of child fostering, using sibling information alone may not provide a complete picture of all the children living in the house. The variables used will be the average age of children in the household and whether the child on average is older than the other children in the household (per the Confluence Model). In addition to lowering the intellectual level in the household, younger children may present responsibilities that compete with study time or make the home a difficult place to learn whilst having older children would be helpful if they are there to motivate or assist with schoolwork. The final variable for family structure will be female headship. Although female headship is associated with better schooling outcomes (Lloyd and Blanc 1996), the relationship with achievement may be more complex. Since

female-headed households tend to have lower socioeconomic status (Lloyd and Blanc 1996), they may not be able to provide an adequate home learning environment.

Physical Environment

The variables available in this dataset to describe physical setting will be lighting and crowding as used by Yair and Gazit (2006). For lighting, there will a dummy variable indicate whether the household has electricity. The measure of crowding will be the number of rooms available per person in the house and the number of children under 15 in the household. There is also a variable for living in a multi-family housing unit because it would be presumably be harder to find quiet study spaces where there are more people around to provide distractions. I expect that children in households with electricity, more rooms per person, fewer children and living in single-family units will perform better on the tests.

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