



# Aspirations, Education, and Extreme Poverty

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Aspirations shape important future-oriented behaviors, including educational investment. Higher family aspirations for children predict better educational outcomes in multiple developing countries. Unfortunately, aspirations sometimes outstrip people's ability to pursue them. We study the relationship between family aspirations for children and later child educational outcomes in an extremely poor context. We observe caregivers' educational and career aspirations for thousands of rural Gambian children about to begin schooling. While higher aspirations predict subsequent educational investment and, three years later, better child performance on reading/math tests, these gains are small in terms of skills learned, and high-aspirations children remain far from achieving literacy/numeracy. In contrast, a bundled supply-side intervention generated large literacy/numeracy gains in these areas. Since unobserved correlates of aspirations and educational outcomes likely bias our estimates upwards, the true aspirations-learning relationship may be even smaller. We conclude higher aspirations alone are insufficient to achieve literacy/numeracy in this, and perhaps similar contexts.

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# Aspirations, education, and extreme poverty

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## Abstract

Aspirations shape important future-oriented behaviors, including educational investment. Higher family aspirations for children predict better educational outcomes in multiple developing countries. Unfortunately, aspirations sometimes outstrip people's ability to pursue them. We study the relationship between family aspirations for children and later child educational outcomes in an extremely poor context. We observe caregivers' educational and career aspirations for thousands of rural Gambian children about to begin schooling. While higher aspirations predict subsequent educational investment and, three years later, better child performance on reading/math tests, these gains are small in terms of skills learned, and high-aspirations children remain far from achieving literacy/numeracy. In contrast, a bundled supply-side intervention generated large literacy/numeracy gains in these areas. Since unobserved correlates of aspirations and educational outcomes likely bias our estimates upwards, the true aspirations-learning relationship may be even smaller. We conclude higher aspirations alone are insufficient to achieve literacy/numeracy in this, and perhaps similar contexts.

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# 1 Introduction

Beliefs about the future shape decisions about how much to invest today. This relationship forms the core of canonical studies of educational investment (Becker, 1975; Foster and Rosenzweig, 1996; Jensen, 2010). More recently, a series of theoretical and empirical papers have shown how hopes for the future, also known as “aspirations,” shape future-oriented investment behavior and educational and career outcomes (Ray, 2006; Lybbert and Wydick, 2018; La Ferrara, 2019; Serneels and Dercon, 2020). This research focuses primarily on developing countries, often trying to understand the extent to which people’s aspirations for themselves and their children influence children’s educational outcomes. For example, multiple experimental studies have shown that raising children’s and their caregivers’ aspirations for the child’s future can increase educational investments and attainment (Beaman et al., 2012; Bernard et al., 2014; Macours and Vakis, 2014).

The relationship between aspirations, investment, and later outcomes is more complicated in contexts where aspirations potentially outstrip an individual’s or family’s ability to reach them. In cases of extreme poverty, the realization of aspirations for the future via greater educational investment may be constrained by income, political instability, or inadequate educational supply. Aspirations that are exceedingly difficult to realize can even discourage educational investments and lead to worse later life outcomes (Genicot and Ray, 2017; Janzen et al., 2017; Ross, 2019).

We study the following question: when income is very low, how strong is the relationship between aspirations, educational investment, and learning outcomes? To do so, we use data from a census of families in 169 rural Gambian villages. The data track families who, at the time of a baseline survey, intended to enroll at least one of their children in the first grade, for the first time, in the coming fall. This baseline survey collected families’ educational and career aspirations for these children. Families and children were then followed over three years, during which time data was collected on the child’s school enrollment and attendance, and the family’s educational expenditure on the child. At endline, these children were administered one-on-one tests of basic reading and math skills.<sup>1</sup>

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<sup>1</sup>These were Early Grade Reading and Math Assessments, also known as “EGRA” and “EGMA” tests, respectively.

We report three sets of analyses characterizing the relationship between aspirations, investment, and learning outcomes in this context. First, we describe aspirations levels and their correlation with wealth and education. Second, we show how different levels of caregiver aspirations at baseline map onto subsequent educational investments in the child and the child's later educational outcomes. Third, we show how these aspiration differentials condition the impact of a highly effective educational intervention that provides supplementary after school classes for these children, and how, in turn, receipt of this intervention affects aspirations at endline.<sup>2</sup>

We focus on caregivers' educational and career aspirations for the child, as in La Ferrara (2019). We operationalize this with two dummy variables: the aspiration to have the child go to college, and the aspiration for the child to work in an urban area, a rough proxy for higher income jobs given that income in the city is so much higher than that in the countryside. At baseline, roughly sixty percent of families wish to send their children to college, and a similar proportion aspire that their child will work in an urban area. These variables are positively correlated with each other and with caregiver education, though this correlation is low. There is little correlation between them and our measure of household wealth.

We find that baseline aspirations for the child's future predict substantial differences in educational investment. Late enrollment in school is a common problem in Sub-Saharan Africa (Glewwe and Jacoby, 1995; Bommier and Lambert, 2000), and enrollment of children in school at younger ages is a strong predictor of greater overall educational attainment (Nonoyama-Tarumi et al., 2010). We show that caregivers in our study population with greater educational and career aspirations for the child are between three and seven percentage points more likely to enroll their child in school in the first two years of the study, as compared to children of caregivers with lower aspirations. While we see no difference in attendance conditional on enrollment, we do observe a difference in financial outlays: caregivers who report greater baseline educational and career aspirations for the child also report spending roughly 15 percent more on expenses related to the child's education.

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See Platas et al. (2014) and Dubeck and Gove (2015) for details on their development, implementation, and limitations.

<sup>2</sup>This intervention and its impacts are described in Eble et al. (2021). Our logic for studying whether the intervention affected aspirations is that the large learning gains from the intervention might have stimulated caregivers' aspirations for their child's future.

Despite these differences in the timing of enrollment in school and educational expenditure, we find that differences in aspirations are associated with only moderate differences in learning levels. Children whose caregivers report higher aspirations at baseline score roughly five points better on endline tests of basic reading and math ability, administered three years after the initial aspirations data were collected.

The average child test score we observe is very low because learning levels are so low in these areas; this makes the correspondence between baseline aspirations levels and subsequent learning appear large in relative terms. For example, if we calculate this difference in terms of the commonly used metric of test standard deviations (SDs), the five point difference between low- and high-aspirations children comprises a 0.30-0.33 SD gain. This would make it relatively large seen through the lens of meta-analyses of the hundreds of impact evaluations of educational interventions in developing country contexts (c.f., Kremer and Holla 2009; McEwan 2014; Ganimian and Murnane 2016).

In absolute terms, however, these gains are far more modest. The 0.30 SD difference we measure is roughly equivalent to a fifty percent improvement in the mastery of one skill on either the reading or the math test. At the low levels of learning we see in this population, this would be equivalent to, for example, the child learning to differentiate which of two one- or two-digit numbers was larger, or which of three words started with a different sound. Unfortunately, the modal child, regardless of baseline aspirations, does not have mastery of other basic skills necessary for literacy and numeracy – and expected of grade 2 students – such as reading simple words or calculating basic sums. This also highlights a drawback of using standardized effect size when overall achievement is very low.

We argue that our estimates provide an *upper bound* on the relationship between these aspirations, educational investment, and learning outcomes. This is because potential unobservable confounders – for example, unobserved wealth, education, or tastes – are most likely to be positively correlated with both the aspirations we study (for the child’s educational attainment and career success) and educational outcomes (Bernard et al., 2014; Ross, 2019). To the extent that

such unobserved traits influence our estimates, the true relationship is likely even smaller than what we measure here. This further emphasizes our main point that higher aspirations alone are likely insufficient to reach higher learning levels in this, and perhaps similar contexts.

We also show that higher baseline aspirations do not increase the impact of a large, highly effective educational intervention, though the intervention does increase educational aspirations at endline. The subjects of our paper were also participants in the randomized controlled trial reported in Eble et al. (2021). That study finds that a multi-pronged para teacher intervention dramatically increased learning levels among children randomly assigned to receive it.<sup>3</sup> In this paper, we find no evidence that the para teacher intervention had a greater effect on children of caregivers with higher baseline aspirations for the child, relative to families with lower aspirations for the child. Looking at the impact of the intervention on aspirations, we find that the para teacher intervention raised the endline proportion of caregivers who aspire to have their child to go to university by about seven percentage points, relative to a control group endline mean of 70 percent.

We contribute to two key literatures. First, we advance understanding of the linkage between aspirations and educational outcomes, as studied in much recent work (c.f., Genicot and Ray, 2017; Lybbert and Wydick, 2018; La Ferrara, 2019). We characterize how aspirations, educational investment, and learning outcomes evolve over time in a highly resource-poor setting. We show that in such a setting, although early educational and career aspirations predict future educational investments, this generates only a modest gain in terms of realized learning outcomes.

We also contribute to the ongoing debate about how to achieve the large gains in educational attainment and learning outcomes in resource-poor areas necessary to prevent high levels of illiteracy and innumeracy in future generations of children (Kremer and Holla, 2009; Pritchett, 2013; McEwan, 2014; Glewwe and Muralidharan, 2016). The greater learning we see among those with higher baseline aspirations is small compared to the large learning gains realized from a highly-resourced intervention in the same area (Eble et al., 2021). Our findings suggest that it may be

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<sup>3</sup>This intervention hired and trained people not previously trained as teachers, and who hailed from the village or nearby, to conduct regular after-school classes for these children. These classes focused on building literacy and numeracy skills aligned with the national curriculum in grades 1-3.

difficult for demand-side factors, perhaps including demand-side interventions, to generate large learning gains in such contexts without complementary supply-side intervention.

The rest of the paper proceeds as follows. Section 2 describes the setting in which we work. Section 3 describes the data we collected and our research design. Section 4 presents our results and Section 5 concludes.

## 2 Setting

Our study takes place in small, rural settlements in the North Bank and Lower River regions of The Gambia. The Gambia is located in West Africa, with Senegal on its border to the north, east, and south, and the Atlantic Ocean to its west. It is a former British colony and served as a major hub for the trans-Atlantic slave trade. Its population is roughly two million people, and its geographic area covers roughly 11,300 square kilometers (CIA, 2019). It is also very income poor: per-capita GDP in 2018 is estimated to be \$716. The country's main sources of economic activity are agriculture, tourism, remittances, and foreign aid.

In addition to income poverty, the country's education levels are also very low. In 2013, the Demographic and Health Surveys estimated that only 26.7 percent of adults living in rural areas were literate, and roughly half of adults in these areas had never been to school (The Gambia Bureau of Statistics and ICF International, 2014). Other national assessments of children's reading and math abilities have shown that even among children, learning levels are dramatically lower than in other countries in the region (Sprenger-Charolles, 2008).

Our study focuses on the population of children and families enrolled in the randomized controlled trial reported in Eble et al. (2021). The research took place in 169 villages in the two central regions of the Gambia, beginning with the universe of villages in these two regions who had between 10 and 300 households according to the 2013 national census. Ultimately, the study enrolled 169 of these villages which met the predetermined eligibility criterion of having at least 10 eligible children.<sup>4</sup> Children were eligible if, at the time of enumeration in early 2015, i) they were between

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<sup>4</sup>There were 323 total villages to begin with. Of these, 113 had too few children to be eligible. The study excluded a

the ages of 6 and 8, ii) they had not yet entered the first grade, and iii) their primary caregiver intended to enroll them in the first grade in the coming academic year. There were 4,518 children enumerated at baseline, 3,825 for whom we have endline test scores. For the sake of brevity, we focus on these 3,825 students in our analysis.<sup>5</sup> In the next section, we describe the characteristics of these children and their families.

### **3 Data and research design**

In this section, we describe our data and research design. In Section 3.1, we describe our data sources and provide summary statistics for our study population. In Section 3.2, we describe the research design we use to answer our two main research questions.

#### **3.1 Data**

We use data from eligible children, as described at the end of Section 2, and their caregivers. These data were collected between January 2015 and May 2018. The original study enrolled children in early 2015. Randomization occurred in late 2015. In villages randomly assigned to receive the intervention, an aggressive after school para teacher education program began in 2016 and continued until early May 2018.<sup>6</sup>

In mid-to-late May and June of 2018, early grade reading and math assessments – EGRA and EGMA tests, respectively (Platas et al., 2014; Dubeck and Gove, 2015) – were administered to all study children. These tests measured the primary outcome of Eble et al. (2021): whether the intervention increased reading and math ability among children who were randomly assigned receive it, relative to those who were randomly assigned not to. We refer to these as the “endline” tests, and calculate the average of these two scores to generate one composite endline test score.

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further 41 of the remaining villages to create buffer zones between villages in order to ensure no potential for spillover between villages, i.e., caregivers of control children instructing their children to walk into an intervention village and avail themselves of the intervention there.

<sup>5</sup>Baseline aspirations do not predict attrition at the endline test.

<sup>6</sup>This intervention is described briefly in Footnote 3, and in greater depth in Eble et al. (2021).



Our other main outcome data focus on educational investment. These consist of data on child enrollment in school and attendance at school, collected at the end of each academic year, and caregiver expenditure on the child’s education in the third (and final) year of the study.

In Table 1, we present a few key demographic characteristics of the children in our sample overall and, separately, by the arm of the trial into which they were randomized. At baseline, more than three quarters of these children were being cared for by adults (“caregivers”) who had never been to school.<sup>7</sup> This is lower than overall data for the Gambia (The Gambia Bureau of Statistics and ICF International, 2014), consistent with the fact that the areas in which the study took place are poorer, more remote, and less well-served by the government than many others in the country. We observe a simple proxy for wealth: whether the floor, walls, and roof of the home are made of synthetic materials, also used in Eble et al. (2021), with roughly one quarter of households living in homes constructed entirely out of synthetic materials.

We observe caregiver aspirations for the child at two points in time: at the beginning of the study, before the child had entered school, and again at the end of the study, after three years had passed. We will refer to these as “baseline” and “endline” levels of aspirations, respectively.<sup>8</sup> As in La Ferrara (2019), we focus on two types of aspiration. The first is the caregiver’s aspirations for their child’s highest level of educational attainment. The second is the caregiver’s aspirations for their child’s career in adulthood. To capture educational aspirations, at the beginning of the trial, we asked the child’s main caregiver: “ideally, what is the highest level of education you would like [child name] to attain?” To capture career aspirations, we asked the caregiver: “when [child name] is 20 years old, what job do you hope [she/he] will be doing?” These questions were again asked at the end of the study period, with the age specified in the career question changed to 25 to reflect the advancement of time and to stick with a “round” number.

In Table 2, we summarize caregivers’ responses to these questions. We first show the pro-

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<sup>7</sup>We focus on caregivers, as opposed to parents, because early fieldwork suggested that the most important person for the child’s development is the primary person from whom the child receives their day-to-day care. This is often, but not always, the parent. In our data, roughly 75% of caregivers are mothers, 11% are grandmothers, and the rest are various other members of the household in which the child lives.

<sup>8</sup>Note that, over these three years, the children randomized to the intervention group received an after school para teacher intervention aimed at raising basic reading and mathematics skills, as described in Footnote 3.

Table 1: Demographic characteristics

	(1)	(2)	(3)
	All	Control	Treatment
Child is female	0.50	0.51	0.48
<i>Caregiver education</i>			
Never been to formal schooling	0.76	0.77	0.76
At least some primary education	0.16	0.15	0.16
At least some junior secondary education	0.06	0.06	0.06
At least some senior education, or more	0.02	0.02	0.02
<i>Household wealth</i>			
House is made of all natural materials	0.06	0.05	0.08
House is made of partially synthetic materials	0.68	0.68	0.68
House is made of all synthetic materials	0.26	0.28	0.24
Observations	3,825	2,045	1,780
F-statistic (p-value)		0.572 (p= 0.684)	

Table 1 note: this table presents select demographic characteristics for children in our sample, both overall (column 1) and then separately by the treatment status to which they were randomized (columns 2 and 3, respectively). The joint F-statistic is a test of the null that these variables together are not jointly predictive of the child’s randomization status to the treatment or control group, clustering by trial-assigned clusters of contiguous villages. All variables in this table, except for the number of observations, are binary, with 0 = No and 1 = Yes.

portion of children whose caregiver aspires for the child to go to university. Roughly 60 percent of caregivers report this aspiration, similar to levels recently recorded in rural Ethiopia (Bernard et al., 2014). The rest of the table describes the caregiver's aspirations for their child's career. This question allowed the respondent to answer freely; responses that did not clearly fall into one of 14 listed categories were recorded as given and later coded. Given economic conditions in The Gambia and our initial analysis of this response data, we considered the following two broad categories of employment: working for the government and working in an urban area. Since over 80 percent of respondents chose some type of work for the government, leaving little variation to study, we instead focus on aspirations to work in an urban area. This captures most jobs which require literacy and numeracy skills. As mentioned earlier, this construction also incorporates the fact that income in the city is much higher than in the countryside.<sup>9</sup>

The correlation between aspirations for the child to attend university and for the child to work in an urban area is 0.187, indicating substantial independent variation between the two. These two variables are also positively and significantly correlated with the likelihood of the caregiver having any formal schooling, as opposed to none, though the correlations are low (0.114 for the aspiration to have the child attend university, and 0.104 for them to work in an urban area). There is no evidence of correlation between our rough proxy of wealth and either aspirations measure, nor is there correlation between wealth and caregiver education. This is in line with the notion that, in rural Gambia, higher levels of wealth are not necessarily predictive of greater education, particularly given the importance of farming and animal husbandry.

Next, we describe correlations between baseline aspirations and other baseline characteristics. We examine this for three binary baseline characteristics - whether the child's caregiver has received any formal schooling, whether the family knows someone outside of The Gambia, and whether the home is made of synthetic materials. These characteristics are predetermined relative to our measurement of aspirations, and are meant to proxy for the family's educational background, the family's economic network, and the family's wealth, respectively. The child's caregiver is

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<sup>9</sup>This includes jobs such as doctor, nurse, judge, legal clerk, or politician, but not jobs like Imam, farmer, or farm laborer.

Table 2: Aspirations at baseline

	(1) All	(2) Control	(3) Treatment	(4) P-value
Highest level of education: university	0.61	0.61	0.61	0.89
<i>Broad work categories</i>				
Job in urban area	0.65	0.65	0.65	0.93
Government job	0.87	0.86	0.87	0.70
<i>Top jobs aspired to</i>				
Teacher	0.26	0.26	0.27	0.89
Wishes child will work for government (no further detail)	0.22	0.23	0.21	0.55
Nurse	0.15	0.15	0.15	0.94
Observations	3,825	2,045	1,780	—

Table 2 note: this table presents baseline aspirations data for children in the trial, both overall (column 1) and separately by treatment assignment (columns 2 and 3). Column 4 presents the p-value of a t-test for the null that the aspirations levels are equal at baseline for children in control villages and children in villages assigned to receive the para teacher intervention. These p-values were derived from a regression of the variable on intervention assignment, clustering standard errors by trial-assigned clusters of contiguous villages. These results are robust to adding controls for caregiver education and household wealth.

roughly ten percentage points more likely to express either of these aspirations for the child if the caregiver has previously been to school. There does not appear to be meaningful correlation between aspirations and either our measure of household wealth or whether the family knows anyone outside of Gambia.<sup>10</sup> These calculations are presented in tabular form in Appendix Table A.1.

## 3.2 Research design

Our first research question is how aspirations at baseline map onto later investment in education (enrollment, attendance, and money spent) and endline learning levels. To answer this research question, we conduct a simple test of the equality of each variable across baseline aspiration level, operationalized with an OLS regression of the outcome on the baseline aspiration, clustering standard errors by trial-assigned clusters of contiguous villages. For brevity, we report only the p-value of this test. This and all of our other regression results are robust to adding controls for baseline household wealth and caregiver education.

In these analyses, presented in Table 3, we use only data from the control group. This is because, as shown in Eble et al. (2021), the intervention group’s subsequent investment and endline aspirations and learning levels are also affected by receipt of the intervention, confounding our ability to measure the mapping from baseline aspirations to subsequent outcomes among these children.

Our second research question asks whether there is heterogeneity in the effect of the para teacher intervention studied in Eble et al. (2021) across different baseline aspirations. In these analyses, presented in Panel A of Table 4, we look at all children in the study, regardless of intervention status. For this, we use simple ordinary least squares, regressing the endline test score on a constant, the treatment variable (which was randomly assigned), baseline aspirations, and their interaction:

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<sup>10</sup>The Gambia has frequent outmigration, and we use this as a proxy for access to resources and knowledge about outside opportunities.

$$y_i = \beta_0 + \beta_1 T_i + \beta_2 A_{0i} + \beta_3 T_i * A_{0i} + \varepsilon_i \quad (1)$$

Here  $T_i$  is child  $i$ 's treatment status, and  $A_{0i}$  is the relevant measure of aspirations for the child reported by their caregiver at baseline. Here too we cluster our standard errors by the trial-assigned cluster of contiguous villages in which the child was enumerated. The coefficient  $\beta_3$  captures our test of whether the effect of the intervention varies with baseline aspirations.

Finally, we study whether there is a greater baseline-endline difference in aspirations among caregivers of children in intervention villages than among caregivers of children in control villages. Here again we look at all children in the study, and present results in Panel B of Table 4. We implement this analysis by estimating a version of Equation 1, using endline aspirations as the outcome variable. In this estimation, we drop the term  $\beta_3 T_i * A_{0i}$  from the right hand side of the equation because it is not relevant to answering this specific research question and, as shown in Table 2, baseline aspirations are orthogonal to treatment status; here too, our results are robust to including it in the specification. Because our paper reports exploratory analysis of existing data, we did not register a pre-analysis plan (Olken, 2015; Lin and Green, 2016).

## 4 Results

In this section, we present our empirical results. In Section 4.1, we show how baseline aspirations map onto subsequent educational investments (enrollment, attendance, and education expenditures) and endline learning levels. In Section 4.2, we show how baseline aspirations condition the effect of the intervention and how the intervention, in turn, affects endline aspirations relative to those measured at baseline.

## **4.1 Baseline aspirations, subsequent educational investment, and endline learning levels**

First, we show the mapping from baseline aspirations to subsequent educational investments and, separately, learning outcomes at the end of the trial. The “investments” we consider are time and money. Time is measured by time spent in school, captured both on the extensive (enrollment) and intensive (attendance) margins. Our measure of monetary investment is the caregiver’s educational expenditure on the child’s education in the third (and final) year of the study. Learning levels are measured by the child’s performance on the endline test. We show results in Table 3, tabulating our outcome variables by baseline caregiver aspirations for the child’s education and career.

We find that higher baseline caregiver aspirations predict earlier child enrollment in school. In years 1 and 2 of the study, children whose caregivers aspire that the child will go to university or, separately, work in an urban area, are three to seven percentage points more likely to be enrolled in school, from a low-aspiration group mean of roughly 80 percent enrollment in year one. This pattern disappears in year three of the study, at which point almost all children are enrolled in school. Nonetheless, this early difference is important: delayed enrollment in school is a strong predictor of lower overall educational attainment (Nonoyama-Tarumi et al., 2010). On the intensive margin of attendance, we see little difference between low and high aspirations children for either educational or career aspirations. For educational expenditure, we see that children whose caregivers hold higher educational or career aspirations for the child spend between 10 and 15 percent more per year on costs related to the child’s education.<sup>11</sup>

We next characterize the relationship between baseline aspirations and endline learning levels, as measured by the composite endline test score. Children whose caregivers have high baseline aspirations for the child perform better than children whose caregivers do not, with a raw test score difference of roughly five points. Using the common practice of scaling this raw difference by the standard deviation (SD) of the variable among the comparison group, this comprises a difference

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<sup>11</sup>Expenditures are shown in 2020 US dollars; this difference is between 75 and 90 Gambian Dalasis, converted at a rate of 51.71 dalasis per dollar.

of 0.30-0.33 SD.

While this SD difference is large compared to other studies<sup>12</sup>, in terms of actual learning it is much less remarkable. This is because baseline learning levels are so low in this context that even a one SD difference only comprises a small difference in learning. This, in turn, highlights a drawback of using standardized effect size when overall achievement is very low.

We can also measure these test score gains in terms of the skills the tests evaluate. Our estimates suggest that children whose caregivers hold high career or educational aspirations for the child would be more likely to master one more basic math or reading skill than children whose caregivers do not. In math, for example, this would mean these children would be able to differentiate which of two numbers was larger. In reading, it would mean that these children would be able to differentiate which of three words started with a different sound. Unfortunately, all control children display very low skill levels at endline<sup>13</sup>, meaning that there is ultimately a small absolute difference in endline reading and math skills between children with low and high caregiver aspirations at baseline. As a result, in this context higher aspirations are unlikely to lead to a greater likelihood of literacy or numeracy for most children.

We further argue that our estimates are likely to provide an upper bound for the true relationship between educational and career aspirations, educational investment, and learning outcomes in this setting. Aspirations for education and employment are often positively correlated with other hard-to-measure or unobservable traits – such as caregiver wealth, education, or other tastes and preferences – that are also positively correlated with child educational investment and outcomes (Bernard et al., 2014; Ross, 2019). Any confounding from such sources would cause our estimates to be exaggerated, relative to the true relationship (Wooldridge, 2016). Therefore, unless there exists some other important, unobserved trait which is negatively correlated with these specific aspirations and positively correlated with educational investment and learning outcomes (or vice

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<sup>12</sup>See the many recent meta-analyses of RCTs evaluating educational interventions in such contexts, including Kremer and Holla (2009), McEwan (2014), Glewwe and Muralidharan (2016), and Evans and Yuan (2020) for details on these studies and their effect sizes.

<sup>13</sup>Figure 3 in Eble et al. (2021) shows that control children can answer fewer than 10 percent of most higher-level math and reading skills, such as single-digit subtraction or the ability to read simple, familiar words such as “and” and “but.”



Table 3: Baseline aspirations, educational investment, and endline test scores in the control group

	(1)	(2)	(3)	(4)	(5)	(6)
	All control children	<i>Aspires child will attend university</i>		<i>Aspires child will work in urban area</i>		Number of obser- vations
		Yes	No	Yes	No	
Annual expenditure on education (in 2020 USD)	12.98	13.71	11.82	13.53	11.94	1,929
		(p= 0.002)		(p= 0.009)		
<i>Enrollment in school</i>						
Year 1	0.85	0.86	0.83	0.87	0.82	2,008
		(p= 0.122)		(p= 0.079)		
Year 2	0.84	0.87	0.80	0.87	0.80	1,976
		(p= 0.021)		(p= 0.003)		
Year 3	0.98	0.98	0.97	0.98	0.97	1,976
		(p= 0.256)		(p= 0.455)		
<i>Days of school missed in prior two weeks</i>						
Year 1	0.70	0.72	0.67	0.71	0.67	1,703
		(p= 0.696)		(p= 0.726)		
Year 2	0.49	0.46	0.53	0.44	0.59	1,665
		(p= 0.565)		(p= 0.134)		
Year 3	0.54	0.54	0.54	0.55	0.52	1,777
		(p= 0.959)		(p= 0.685)		
Endline test score	17.44	19.00	14.96	18.94	14.60	2,045
		(p= 0.000)		(p= 0.000)		

Table 3 notes: in this table, we tabulate the endline test score, annual educational expenditure in the third (and final) year of the study, and child enrollment and attendance data from each year of the study. We show this for five groups: all control children (column 1), and control children whose caregivers do or do not express the aspiration given in the italicized column heading (columns 2-5). In parentheses below the relevant means, we present the p-value of a test of the null that the outcome listed in the row title is equivalent between the two groups (yes or no to the baseline aspiration), estimated by simple OLS adjusted for clustering by trial-assigned clusters of contiguous villages. In column 6, we show the number of observations for each set of comparisons; differences arise from differences in response rates across the various surveys in which these data were collected. We do not show these outcomes for intervention children because, as shown in Eble et al. (2021), being assigned to receive the para teacher intervention affects these outcomes, and so confounds our measurement of the mapping from baseline aspirations to subsequent outcomes. Expenditure data is in terms of 2020 US dollars, using the exchange rate 51.71 Gambian Dalasis to one USD. Enrollment in school is a 0/1 indicator variable, days of school missed in the last two weeks are on a scale from 0 to 10, and the endline test score is on a scale of percent of questions answered correctly, with a range of 0 to 100.

versa), then our estimates are probably larger than the true relationship. This further emphasizes our main point that higher educational and career aspirations alone are likely insufficient to reach higher learning levels in this, and perhaps similar contexts.

## 4.2 Baseline aspirations and an external education intervention

In this section, we study two related questions: one, whether the impacts of a highly effective education intervention vary by the level of baseline aspirations the caregiver expresses for the child, and two, the extent to which receiving this intervention shapes caregiver aspirations at endline. We find that the low caregiver aspiration/high caregiver aspiration difference in child learning levels is an order of magnitude smaller than the impact of receiving the intervention on the child’s learning. We also estimate that the intervention raises educational aspirations somewhat.

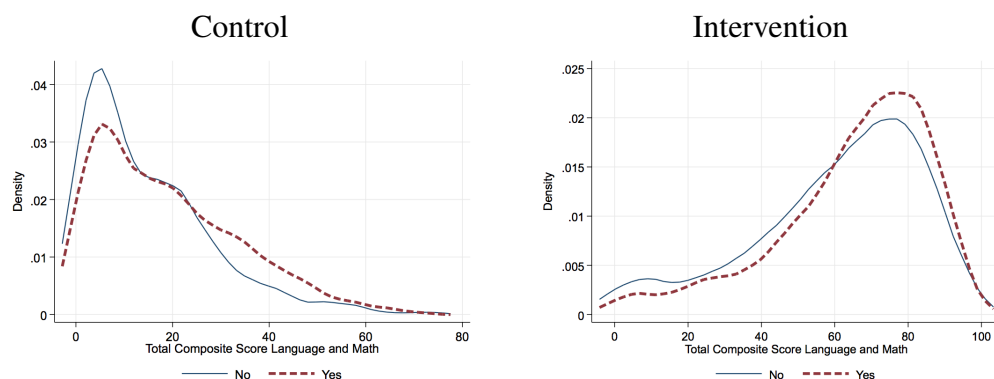
We show these results in both figure and table format. In Figure 1, we generate a series of kernel density plots showing the distribution of endline test scores by baseline aspiration. In the left column, we show this for children in control villages, and in the right column we show this for children in intervention villages. In Panel A (the top row), we show this for educational aspirations at baseline. In Panel B (the bottom row), we show this for career aspirations at baseline.

We see that in all four plots, higher baseline aspirations map onto higher endline test scores. Kolmogorov-Smirnov tests reject the equality of the test score distributions for those with low and high baseline aspirations, respectively, with  $p < 0.001$  for every comparison except for the intervention group in Panel B. These differences, however, are minuscule in comparison with the differences in test scores between the intervention and control group, as can be seen visually comparing the distributions across the left and right columns.

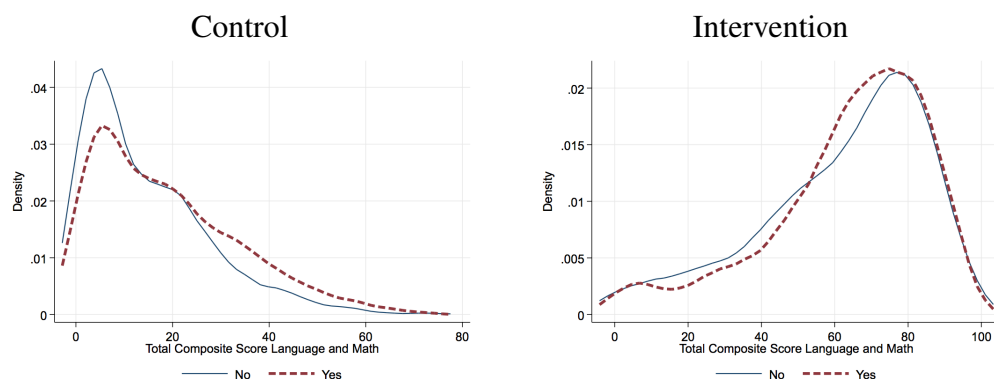
We formalize this comparison by estimating whether baseline aspirations generate heterogeneity in the effect of the intervention. First, to estimate heterogeneity in the effect of the intervention by baseline aspirations, we estimate Equation 1, reporting the coefficients on the aspirations variable, the intervention, and their interaction. We report these results in Panel A of Table 4.

This analysis shows no evidence that baseline educational aspirations generate any measurable

Figure 1: Endline test scores, by aspirations



*Panel A: Baseline aspiration to have the child attend university*



*Panel B: Baseline aspiration to have the child work in an urban area as an adult*

Figure 1 notes: this figure shows four kernel density plots of endline test scores. In Panel A, we show this for children whose caregivers did (red dashed line) and did not (solid blue line) express the aspiration that their child go to university at the time of the baseline survey. In Panel B, we show this for children whose caregivers did (red dashed line) and did not (solid blue line) express, at baseline, the aspiration that their child work in an urban area in adulthood. Scores for children in control villages are shown in the plots in the left column, and scores for children in villages which received the intervention reported in Eble et al. (2021) are shown in the plots in the right column. Kolmogorov-Smirnov tests reject the equality of the two distributions with  $p \leq 0.001$ , except for the intervention group in panel B, where  $p = 0.109$ . As in Tables 1 and 2, there are 2,045 observations in the control group and 1,780 in the intervention group.

heterogeneity in the size of the effect of the intervention. Baseline career aspirations are associated with a 2.4 point lower effect of the intervention on test scores. While statistically significant, it is not economically meaningful, comprising only a 5 percent difference in the overall effect of the intervention.

We compare these estimates to our estimates of the mapping from baseline aspirations to endline test scores in Table 3. The estimates in Table 3 show that children with higher baseline caregiver aspirations score better on the endline test by about five points, relative to children with lower baseline caregiver aspirations. The estimates in Table 4 show that receiving the intervention results in a gain in endline test scores – 47 points – that is roughly an order of magnitude larger than the difference in scores between children whose caregivers express either of the two aspirations for the child and those whose caregivers do not.<sup>14</sup>

Next, we show how receipt of the intervention impacts aspirations over the course of the trial. We find that caregivers whose children receive the intervention are 6.2 percentage points more likely to aspire to send their child to university at endline than those who do not. Because the endline level of aspirations for sending a child to university in the controls is 60 percent, this comprises a roughly ten percent difference. In contrast, we find no evidence that receiving the intervention leads to a change in caregiver aspirations for the child’s career.

## 5 Discussion

In this paper, we have shown the mapping between aspirations, educational investment, and learning outcomes for early-grade students in a highly resource-poor setting. We show that the aspirations of children’s caregivers for the child’s education and career, expressed prior to when the child enters school, predict statistically significant differences in educational expenditure, school enrollment, and learning. While significant and positive, however, these differences are economically more difficult to interpret. The highly-resourced para teacher program which occurred in interven-

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<sup>14</sup>This is slightly different than the result in Eble et al. (2021), 46.2 points, because we control for baseline aspirations in Equation 1 and they do not.

Table 4: How baseline aspirations interact with and are affected by the para teacher intervention

	<i>Aspiration:</i>	
	(1)	(2)
	Child attend university	Work in urban area
<i>Panel A: do baseline aspirations amplify the effect of the intervention on learning?</i>		
<i>Outcome variable: endline test score (range 0-100)</i>		
Baseline aspirations x intervention	-0.07 (1.56)	-2.63* (1.39)
Aspirations	4.15*** (0.95)	4.27*** (0.73)
Intervention	45.83*** (1.70)	47.49*** (1.72)
Comparison group mean	15.13	14.75
Number of observations	3,720	3,720
<i>Panel B: does the intervention affect educational or career aspirations?</i>		
<i>Outcome variable: endline aspiration listed in column heading (binary 0/1)</i>		
Effect of intervention on endline aspirations	0.062 (0.024)	0.006 (0.021)
Comparison group mean	0.60	0.53
Number of observations	3,720	3,720

Table 4 notes: This table reports tests for heterogeneity by baseline caregiver aspirations in the estimated effect of the para teacher intervention studied in Eble et al. (2021). The estimation sample is all enrolled children (as opposed to the sample of only control group children used in Table 3). We use Equation 1 to estimate the results in Panel A and an altered version of it, dropping the interaction term between baseline aspirations and receipt of the intervention, to estimate the results in Panel B. Coefficient estimates are reported according to the row title, with the relevant standard errors below them in parentheses, clustering by trial-assigned clusters of contiguous villages. Each panel x column “cell” corresponds to a separate regression. There are slightly fewer observations in this table (3,720) than in the previous figure and tables (3,850) because there are 130 children for whom we are missing endline aspirations data. Comparison group means are calculated for those in the control group whose caregiver did not express the aspiration given in the column title at baseline. \* $p < 0.10$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$

tion villages yielded learning gains that are nearly ten times the magnitude of the low aspiration / high aspiration difference in endline learning levels.

In many parts of the developing world, despite high levels of school enrollment and attendance, many children are growing up functionally illiterate and innumerate. Because literacy and numeracy skills gained in childhood are a crucial determinant of economic productivity and wellbeing in adulthood, and because levels of literacy and numeracy in the population are an important determinant of a country's economic prospects, addressing this "schooling without learning" is one of the central development problems of our time. We find that, in rural Gambia, greater educational and career aspirations predict greater investment in education and modest learning gains. Nonetheless, our findings suggest that aspiration-driven differences in educational investment and learning are unlikely to yield the large learning gains so crucial to this and similar contexts.

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## Appendix

Table A.1: Correlates of aspirations

	(1)	(2)	(3)
	Aspires that child will go to university	Aspires that child will find work w/ high returns to ed	Aspires that child will find work in urban area
<i>Mother has been to school</i>			
Mean if no	0.59	0.64	0.62
Mean if yes	0.69	0.66	0.71
P-value of difference	( 0.00)	( 0.32)	( 0.00)
<i>Knows someone outside Gambia</i>			
Mean if no	0.63	0.64	0.66
Mean if yes	0.59	0.66	0.63
P-value of difference	( 0.10)	( 0.37)	( 0.13)
<i>Home made of synthetic materials</i>			
Mean if no	0.61	0.64	0.63
Mean if yes	0.62	0.66	0.67
P-value of difference	( 0.70)	( 0.39)	( 0.10)

Table A.1 notes: This table shows the conditional means of aspirations across three predictive baseline characteristics: mother's education, connections to people who live outside of Gambia (meant to proxy for awareness of opportunities outside of one's home region), and a rough household wealth index. We break these baseline characteristics into binary variables, showing the conditional mean of the aspiration for both values of the characteristic, and the p-value for a t-test of the null that the aspiration in question is equal for those with each value of the baseline characteristic.