

## The Role of Low Learning in Driving Dropout: A Longitudinal Mixed Methods Study in Four Countries

Michelle Kaffenberger, Danielle Sobol, and Deborah Spindelman

### Abstract

Using unique longitudinal quantitative and qualitative data, we examine the role that low learning plays in driving dropout in Ethiopia, India, Peru, and Vietnam. Regression analysis using IRT-linked test scores and data on schooling attainment and dropout shows a strong, significant association with one standard deviation higher test scores associated with 50 percent lower odds of dropping out between the ages of 8 and 12, and a similar association between the ages of 12 and 15. Qualitative analysis indicates a direct relationship between low learning and dropout, with children and parents choosing to discontinue school when they realize how little is being learned. Qualitative findings also show that low learning interacts with and exacerbates more proximate causes of dropout, with low learning often contributing to choices of early marriage (for girls) and of leaving school to work (for both genders), with families making practical decisions about which options will best provide for children in the long run. Finally, learning, work, and poverty often interact, as the need to work to help provide for the household reduces the opportunities to learn, and low learning tilts the opportunity cost of time in favor of working. These findings suggest that low learning may play a larger role in dropout decisions, by underlying and interacting with other causes, than has been typically recognized.

## **The Role of Low Learning in Driving Dropout: A Longitudinal Mixed Methods Study in Four Countries**

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## I. Introduction

Most children, including in low-income countries, now start primary school. Far fewer reach primary school completion or higher levels. Understanding why children drop out is therefore critical for reaching national and international schooling and learning goals, including those articulated in Sustainable Development Goal 4.

While many causes of dropout are well known in the literature, only limited attention has been given to the role of learning, or specifically to low learning, as a potential driver of dropout. Commonly cited reasons for dropping out include a child needing to work to support the household, or a girl becoming pregnant or getting married (Spaull, 2015; Branson, Hofmeyr, & Lam, 2014; Gustafsson, 2011; Oruko, et al., 2015). But the decision to drop out is often the end of a cumulative process resulting in dropout. As Branson, Hofmeyr, and Lam (2014) state about South Africa, “The reason given for dropout may only reflect the event or constraint that prompted the decision as opposed to the root cause of a longer-term problem.” The reason children or parents give for a child dropping out may only represent the proximate cause – or the cause most directly and immediately related to the dropout decision – not accounting for the underlying causes that put the child on the trajectory towards dropout.

That learning in many low- and middle-income countries is in crisis is widely acknowledged (World Bank, 2018). According to the World Bank’s new learning poverty measure, 90 percent of ten-year-olds in low-income countries cannot read and understand a simple story (World Bank, 2019). Analysis of learning profiles across more than 50 countries found that on average only half of young women who had completed primary school (and no higher) could read a simple sentence (Pritchett & Sandefur, 2020).

In this study, we examine the role that low learning plays in children dropping out of school. We hypothesize that low learning could drive dropout through (at least) two mechanisms. First, low learning could directly contribute to decisions for children to drop out of school. Children who are not learning (or their parents) may determine that schooling is not a worthwhile use of time and resources and choose to drop out. As one parent poignantly put it, “My children will not go to the government school because they say there is no education” (Economist, 2018).

A second way low learning could contribute to dropout is indirectly, by interacting with and exacerbating other, more proximate causes of dropout. For example, working and earning income is one of the most well-established proximate causes of children dropping out of school. However, low learning could underlie the pull to enter the labor force. When learning is high, the expected returns to schooling may be high, leading households to determine that forgoing current earnings is worthwhile (Bedi & Marshal, 2002). When learning is low, on the other hand, the opportunity cost in terms of time and school fees may be too high to rationalize continued schooling.

Another well-established cause of dropout is early pregnancy or marriage among girls, and evidence has suggested that this too may be driven in part by the learning achieved in school. Grant and Hallman (2006) find that in South Africa, school performance is a predictor of pregnancy. A study in Kenya interviewed children who had dropped out of school, including girls who had dropped out due to pregnancy, about their trajectories from student to dropout. All of the children interviewed began their

description not with pregnancy or economic causes, but with a variation of “I wasn’t doing well in school” (Zuilkowski, Jukes, & Dubeck, 2016).

To investigate the role of low learning in driving dropout, we use unique, longitudinal quantitative and qualitative data from four countries, Ethiopia, India, Peru, and Vietnam, collected as part of the Young Lives surveys. Most data on learning and schooling is cross sectional data, gathered at a single point in time, making it impossible to examine the relationship between learning in one time period and schooling decisions in subsequent time periods. The longitudinal data we use allows us to examine the direct association between test scores and dropout across three time periods. To investigate the indirect association between low learning and dropout through interactions with other causes, we take advantage of the longitudinal qualitative data, collected in the same countries and over a similar time period as the quantitative surveys.

Our analysis has three key findings. First, the quantitative analysis shows that learning indeed has a strong and significant association with subsequent dropout. A one standard deviation increase in math test scores in one time period is associated with a 50% reduction in the odds of dropping out in the subsequent time period, three to four years later. Said another way, a child with a one standard deviation lower test score has 50% higher odds of dropping out in the next four years than his higher scoring peer. A similar relationship holds for both age ranges analyzed.

Second, the qualitative analysis indicates a strong direct link between children’s performance in school and their perceptions of their learning gains and decisions related to dropping out of school. In some cases, children exercise agency in choosing to drop out when they perceive they are not learning enough to justify staying in school. A child in Vietnam explained, “At this time I want to work, I am fed up with going to school. I cannot learn anything in lessons” (Duc & Tam, 2013, p. 18). In other cases, parents choose to discontinue schooling, sometimes against their children’s wishes, when they realize their children are learning little.

Third, qualitative findings indicate that low learning interacts with and exacerbates more proximate causes of dropout. The Young Lives qualitative analysis finds early marriage for girls is far more likely to occur after girls drop out of school due to low learning, rather than being married off while progressing satisfactorily in school. Girls or parents report choosing marriage to provide for the girl when it is determined that education quality is too poor to provide adequate opportunities. Furthermore, leaving school to work is linked to low learning, as children report choosing work over school when they realize school is not providing needed skills. Learning, work, and poverty also interact, as the need to work to help provide for the household reduces the opportunities to learn, and low learning tilts the opportunity cost of time in favor of working.

Every education system has goals for both schooling attainment and learning achievement for children. If low learning plays a more substantial role in driving dropout, through both direct and indirect means, than typically recognized, improving learning could provide a win-win in helping to achieve both sets of goals.

The paper proceeds as follows. Section II reviews the literature on determinants of dropout. This also provides the backdrop for the later analysis of the role of low learning in driving well-established causes

of dropout. Section III discusses the data and methodology. Section IV gives the quantitative results, and Section V the qualitative results. Section VI concludes.

## **II. Commonly cited reasons for dropout**

To investigate the role that low learning has in driving dropout both directly and through interacting with other causes of dropout, we first provide a detailed literature review of established causes of dropout.

### *a. What does the literature say about the reasons students drop out of school?*

Many commonly cited causes of dropout relate to an event or experience that closely preceded a child dropping out of school. These types of causes are proximate causes, or those most directly (whether temporally or logically) associated with the dropout decision. Many of the causes most commonly cited by children and households are proximate causes, including budget constraints, the child working or looking for work, marriage or pregnancy (for female students), and failing grades (Spaull, 2015; Branson, Hofmeyr, & Lam, 2014; Gustafsson, 2011; Oruko, et al., 2015).

Budget constraints often include an inability to afford school fees, books, uniforms, shoes and bags for school, sanitary napkins for girls, the costs of transportation to school, or boarding costs (e.g. for residential secondary schools) (Abuya, Oketch, & Musyoka, 2013; Gustafsson, 2011). Work drives missed school and dropout in many ways, including when students are occupied with paid labor (Abuya, Oketch, & Musyoka, 2013; Zuilkowski, Jukes, & Dubeck, 2016), are performing domestic work (Nakajima, Kijima, & Otsuka, 2018), or are engaged in other unpaid work such as agricultural labor. Leaving school in order to look for (paid) work is also a common reason given for a child dropping out (Branson, Hofmeyr, & Lam, 2014).

Pregnancy is a frequently cited cause of dropout for girls; in South Africa, one-third of female dropout is attributed to pregnancy (Spaull, 2015). Pregnancy does not always lead to dropout, however. Gustafsson (2011) finds that, while pregnancy increases the odds of dropout, around 50% of the of 18-year-olds in South Africa who had given birth or were currently pregnant were still in school, and this proportion increased for younger girls. Grant and Hallman (2006) have similar findings.

The association of household and child characteristics with dropout are also well-established in the literature. Lower parent (or household head) education and literacy levels are strongly associated with dropout (No, Sam, & Hirakawa, 2012; Kuépié, Shapiro, & Tenikue, 2015; Nakajima, Kijima, & Otsuka, 2018; Huisman & Smits, 2015; Adelman & Székely, 2016; Akyeampong, Rolleston, Ampiah, & Lewin, 2012; Lloyd C. B., 2000; King, Orazem, & Paterno, 2008; Nakajima, Kijima, & Otsuka, 2018). Household composition also relates to dropout: being in a home where one parent (or both) has passed away or is missing (No, Sam, & Hirakawa, 2012; Huisman & Smits, 2015; Adelman & Székely, 2016), having unmarried parents (Lloyd C. B., 2000) and having a higher dependency ratio of children (particularly younger siblings) to adults (Huisman & Smits, 2015; Nakajima, Kijima, & Otsuka, 2018) are all associated with dropout.

Poverty is associated with higher dropout, through the increased burden of school fees and other associated expenses, increased opportunity cost of schooling relative to potential income from work, and

increased vulnerability to financial shocks (Adelman & Székely, 2016; Akyeampong, Rolleston, Ampiah, & Lewin, 2012; Cardoso & Vermer, 2007; Hunt, 2008; Glick & Sahn, 2010; Huisman & Smits, 2015; Nakajima, Kijima, & Otsuka, 2018; Kuépié, Shapiro, & Tenikue, 2015; No, Sam, & Hiraakawa, 2012). Ethnic and other minority statuses, which often co-occur with poverty and other disadvantages, are also commonly associated with higher probabilities of children dropping out (No, Sam, & Hiraakawa, 2012; Hunt, 2008; Momo, Cabus, De Witte, & Groot, 2019). In addition, the location of the household, including rural and urban geography, characteristics of the labor market, and community development are all factors related to dropout (No, Sam, & Hiraakawa, 2012; Kuépié, Shapiro, & Tenikue, 2015; King, Orazem, & Paterno, 2008; Nakajima, Kijima, & Otsuka, 2018; Huisman & Smits, 2015; Hunt, 2008).

Gender plays a mixed role in dropout. In many contexts girls are associated with a higher incidence of dropping out than boys, but in some contexts, particularly in Latin America, boys are more likely to drop out than girls (Lloyd, El Tawila, Clark, & Mensch, 2003; No, Sam, & Hiraakawa, 2012; Adelman & Székely, 2016). Furthermore, the age of the student relates to dropout in two common ways. First, the opportunity costs of staying in school increase as a child gets older, making dropout more likely (Hunt, 2008; Lloyd C. B., 2000; Kuépié, Shapiro, & Tenikue, 2015). Second, children who begin school late or repeat grades become the oldest children in their classroom (No, Sam, & Hiraakawa, 2012; Huisman & Smits, 2015; Kuépié, Shapiro, & Tenikue, 2015). This often leads to poor social relationships, a factor which No, Sam and Hiraakawa (2012) find increases the incidence of dropout.

School characteristics interact with and at times exacerbate other causes of dropout (Adelman & Székely, 2016; Glewwe & Jacoby, 1994). The relationship is multifaceted and includes distance to school (the size of the area served by a school is negatively associated with girls staying in school) (Huisman & Smits, 2015; Hunt, 2008), school facilities (especially sanitation facilities for menstruating girls) and school safety (Hunt, 2008).

*b. What does the literature say about the direct role of learning in dropout?*

A growing literature discusses the link between low performance in school and a higher likelihood of a child dropping out (Hunt, 2008; Cardoso & Vermer, 2007). Glick and Sahn (2010) find a strong, highly significant association between test scores at the start of grade two and completing grade six in Senegal – a one standard deviation improvement in test score is associated with a 22-percentage point increase in the probability of completing grade six. Nakajima, Kijima and Otsuka (2018) find that, with the exception of rural girls, reading and writing skills at age 12 have a highly significant association with upper primary completion and entry into secondary school in Andhra Pradesh, India. Jukes (2006) builds upon Liddell and Rae's 2001 longitudinal study to find that a 0.25 standard deviation increase in grade two exam scores is associated with being 1.48 times more likely to complete grade seven in rural South Africa. Akyeampong et al (2012) come to similar conclusions in Ghana, as do Momo et al (2019) in a systematic literature review on the causes of early school leaving in Africa and Asia.

Studies examining school characteristics also point to a link between low learning and dropout. Effective teaching by well-trained teachers with low rates of turnover and absenteeism are linked to better learning, more positive experiences of school, and reduced dropout rates (Momo, Cabus, De Witte, & Groot, 2019; Lloyd, El Tawila, Clark, & Mensch, 2003; Lloyd C. B., 2000; Hunt, 2008; No, Sam, & Hiraakawa, 2012; King, Orazem, & Paterno, 2008; Akyeampong, Rolleston, Ampiah, & Lewin, 2012). Alternatively, large

classroom sizes and high student to teacher ratios (Abuya, Oketch, & Musyoka, 2013; Huisman & Smits, 2015; No, Sam, & Hirakawa, 2012) as well as inadequate learning resources (Momo, Cabus, De Witte, & Groot, 2019; Bedi & Marshal, 2002; Lloyd C. B., 2000) diminish the quality of a school and contribute to higher dropout rates.

There are multiple mechanisms through which low learning leads to dropout. Failing grades are a commonly cited reason by children and families for a child leaving school and suggest a direct link between low learning and dropout decisions (Hunt, 2008; Glick & Sahn, 2010; Branson, Hofmeyr, & Lam, 2014). In education systems where failing grades bar access to the next grade level, parents and students must choose between repeating the grade or leaving school. Some parents take failing grades as a signal that the child is not benefiting from school and choose to discontinue schooling. Others elect repetition, however, the act of repeating a grade itself increases the probability of dropout (Hunt, 2008; Glick & Sahn, 2010; Branson, Hofmeyr, & Lam, 2014). Glick and Sahn (2010) find, for example, that children who repeat a grade are more likely to drop out than children of similar ability who are not made to repeat a grade.

Information on relative academic achievement also influences schooling decision making. In a study in Cambodia, academic achievement was reported to parents in the form of ranks, showing where children rank compared with their peers. Examining students in grades 1 – 5, the study finds that relative academic achievement (one standard deviation increase in academic achievement over the mean score) reduces dropout probability by more than half. The researchers believe that parents use their children's relative rank to decide if they should continue schooling (No, Sam, & Hirakawa, 2012). Furthermore, students' perceptions of their own achievement can impact dropout decisions. A study of a high school scholarship program in Mexico found that only the top tercile of children by test score took advantage of the program, with the most likely explanation that children in the bottom two terciles did not believe they had the skills necessary to succeed in secondary school (De Hoyos Navarro, Attanasio, & Meghir, 2019).

Low learning also can attenuate the expected benefits of attending school vis-à-vis the opportunity costs (Bedi & Marshal, 2002; Hunt, 2008). As low learning reduces the expected benefits of schooling, they cease to outweigh the costs of attendance. Hanushek, Lavy and Hitomi (2008), for example, use longitudinal data on primary school children in Egypt and find that, holding the individual's own ability and achievement constant, students attending a school that is perceived to be higher quality are more likely to stay in school. They assert that students (or parents) perform cost-benefit analyses such that the expected benefits of the (perceived) higher quality education are more likely to outweigh the costs of continued schooling.

*c. What does the literature say about the indirect role of learning in dropout?*

Low learning also contributes to dropout in complex, indirect ways by interacting with other drivers of dropout. A family's immigrant or ethnic minority status, which is associated with higher dropout, can also affect learning as the child may not speak the language of instruction well (Momo, Cabus, De Witte, & Groot, 2019). Poverty interacts with work, schooling, and learning when it results in children working regularly or seasonally, resulting in less schooling through tardiness, absences and limited study time which in turn lead to lower learning (Hunt, 2008). Poverty, work, schooling and learning interact with gender, such as when girls are required to perform domestic labor and look after siblings. Girls who are

regularly involved in domestic work are less likely to have acquired literary skills during primary school (Nakajima, Kijima, & Otsuka, 2018) and in some contexts are more likely to drop out of school.

Grade repetition, both a result of and potential cause of low learning, interacts with gender by increasing the likelihood of pregnancy: Grant and Hallman (2006) find that late entry to school and grade repetition increase the likelihood of a girl becoming pregnant while in school by more than eight times. Pregnancy goes on to interact with household characteristics as the risk of dropping out while pregnant is increased by lower socioeconomic status, larger household size, and rural residence (Grant & Hallman, 2006). Furthermore, multiple studies investigating pregnancy and dropout find performance in school to be a predictor of which girls will become pregnant, dropout, and eventually return to school (Grant & Hallman, 2006). When Zuilkowski, Jukes & Dubeck (2016) asked girls who had dropped out due to pregnancy to describe their trajectories from student to dropout, their explanations began not with pregnancy or economic drivers, but with a variation of “I wasn’t doing well in school.”<sup>1</sup>

Finally, all of these factors interact with and exacerbate each other – poor attendance due to any of the above factors can lead to low learning, and low learning can lead to poor attendance, and eventually dropout (Akyeampong, Rolleston, Ampiah, & Lewin, 2012; Hunt, 2008).

### **III. Methods**

We use longitudinal quantitative and qualitative data collected as part of the Young Lives surveys to investigate the relationship between learning achievement and school continuation or dropout. We use the quantitative surveys to analyze the empirical associations between test score performance and likelihood of dropping out three to four years later, and results from the qualitative data collection to understand both direct and indirect ways low learning contributes to dropout, including by contributing to and interacting with more proximate causes of dropout.

#### **III.A. Longitudinal Quantitative Methods**

The Young Lives longitudinal quantitative surveys include data on schooling completion, an administered cognitive skills test, and a breadth of child and household characteristics. The Young Lives surveys follow two cohorts of children, an older and a younger cohort, in Ethiopia, India (the states of Andhra Pradesh and Telangana), Peru and Vietnam. Data was collected in 5 rounds over more than 15 years, beginning in 2002. Longitudinal data on children’s schooling and learning is rare in low- and middle-income countries, with the longitudinal nature of Young Lives data providing a relatively unique opportunity to analyze the relationship between learning in one period and later dropout in a subsequent period.

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<sup>1</sup> An example of Halima, an 18-year-old who dropped out of fifth grade after becoming pregnant, illustrates their findings: “Halima’s case is similar to that of many of the youth in this study, in that the risk for dropout began with poor performance in school – a feeling of being behind the other students and unable to catch up. While the immediate reason for Halima’s dropout was her pregnancy, she was at risk for pregnancy because she saw no future for herself outside of being a wife and mother. Halima said that going back to school was not an option – not because she was a mother, but because ‘I don’t understand [the instruction]’” (Zuilkowski et al., 2016, pg 106.).



This data was used in a recent study by Das, Singh, and Chang (2020) to investigate the association between test scores at the end of primary school and access to higher education – whether the child is still in school at age 22. We build on this analysis by focusing here on test scores and dropout in the earlier years of schooling, and analyzing qualitative data to examine the mechanisms for the relationship between test scores and dropout.

In order to investigate the relationship between low learning and subsequent school dropout, we focus on the younger cohort of Young Lives children and examine how cognitive skills test scores in one survey round are associated with whether the child is still in school in the following round, three to four years later. The younger cohort was on average age 8 in round 3 of data collection (the first round of data that we utilize) and therefore most were of school-going age.

We conduct two sets of analysis focused on this cohort of children. For all children attending school at age 8 (round 3 of data collection), we analyze the relationship between math test scores at age 8 and a binary indicator of whether the child is still in school or has dropped out of school by age 12 (round 4 of data collection). Second, focusing on the same cohort of children, we analyze the relationship between the test scores of the children in school at age 12 and whether they are in school or have dropped out by age 15 (round 5 of data collection). Table 1 presents the demographic makeup of this cohort of children as well as summary statistics.<sup>2</sup>

We define a child as having dropped out if they were enrolled in and regularly attending schooling in the first period and in the second period were not attending regularly nor enrolled in school. Appendix I provides more details on how this definition of dropout was determined based on the survey questions about children's schooling.

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<sup>2</sup> For more information on the Young Lives study and methodology, see Morrow (2017).

**Table 1. Sample Statistics**

	<b>Ethiopia</b>	<b>India</b>	<b>Peru</b>	<b>Vietnam</b>	<b>Pooled Totals</b>
Observations (Attending school at age 8)	1,374	1,806	1,820	1,791	6,791
Of those in school at age 8, % who dropped out between ages 8 and 12	3.6%	2.1%	0.2%	1.3%	1.7%
Of those in school at age 12, % who dropped out between ages 12 and 15	4.7%	7.6%	2.8%	13.9%	7.4%
Rural	58%	74%	28%	79%	60%
Female	48%	47%	50%	49%	48%
Attended pre-primary schooling	29%	92%	93%	91%	80%
Avg. Head of Household Education <sup>3</sup>	3.46	5.21	7.70	6.56	6.87
Started Grade 1 Late <sup>4</sup>	41%	10%	3%	3%	14%

The tests assessing learning levels were administered in households and were designed to assess skills expected to be gained in formal education. While these tests are a proxy for school learning, we cannot rule out the possibility children learn some of the tested skills outside of school. Following the example of Singh (2019), we focus on mathematics test scores, noting that performance on international tests in math and language skills tend to be highly correlated (Cabarse, Cabusa, & Baran, 2018; Singh A. , 2019). The Young Lives mathematics tests are divided into two sections: the first aims to measure basic quantitative and number notions, and the second aims to measure the ability to perform basic mathematics operations. The assessments were designed to be both context- and age-appropriate for each country, norm-referenced, and comparable between rounds. There is some overlap in items across countries, but the tests are not exactly the same.

We pool the data from the four countries and use Item Response Theory (IRT) to harmonize test scores. The IRT model maps the relationship between an individual’s ability and the probability of answering a question correctly, providing a measure of proficiency that accounts for both the difficulty of a question and the latent skill of the test taker. This offers a score that indicates the child’s overall ability and is comparable across all four countries. The IRT scores for each round are normalized across the pooled sample (with a mean of 0 and a standard deviation of 1). We present them by country in Table 2.<sup>5</sup>

<sup>3</sup> Head of household education is an ordinal variable where 0=no formal education, 1 – 12 = grade of highest education, 13= post-secondary vocational school, 14= University, and 15=Masters or Doctorate Degree. While years 13-15 are ordinal, in keeping with standard practice, we treat it as a cardinal variable in our regressions.

<sup>4</sup> The Young Lives data includes country-specific indicators for “starting late”, defined as starting school after age 7 in Ethiopia, or age 6 in India, Peru and Vietnam.

<sup>5</sup> Details of Young Lives cognitive test development, along with in-depth discussion of utilizing IRT scores to analyze psychometric testing in the Young Lives data, can be found in Cueto et al. (2009) and Cueto and Leon (2012).

	<b>Ethiopia</b>	<b>India</b>	<b>Peru</b>	<b>Vietnam</b>
Ages 7-8 (Round 3)	- 0.922 (0.856)	- 0.098 (0.836)	0.186 (0.647)	0.798 (0.775)
Ages 11-12 (Round 4)	-0.640 (0.844)	-0.314 (0.904)	0.126 (0.755)	0.800 (0.857)

We analyze the relationship between IRT test scores and dropping out of school using a logistic regression model with the binary indicator of whether the child has dropped out as the dependent variable and test score in the prior round as the independent variable of interest. The logistic regression model assumes a linear relationship between the independent variable of interest (test score), and the dependant variable (dropout).<sup>6</sup> Using the pooled sample, we include country dummy variables as control variables. We include the following additional control variables: gender, urban or rural residence, whether the child attended any early childhood education, household wealth, the education level of the household head, and if the child entered school at a late age, per the country-specific standard (See Table 1 for summary statistics for each by country). For household wealth, the Young Lives surveys include a wealth index that is a relative measure of wealth within each country (based on sub-indices for housing quality, access to services, and consumer durables). The indices are not comparable across countries. We normalize the wealth index for each country, with mean 0 and standard deviation 1, and use these normalized indices in the pooled regressions.

### **III.B. Longitudinal Qualitative Methods**

In addition to quantitative survey rounds, Young Lives researchers collected qualitative longitudinal data in each country in 2007, 2008, 2011, and 2014. Designed to take place between quantitative survey rounds, the qualitative research followed approximately 200 children, their caregivers, and a mosaic of teachers, health professionals, and community elders across the four countries. Out of each country’s 20 sentinel (i.e. core sampling cluster) sites, 4-5 sites were selected for the qualitative research to capture variations in location (rural/urban), ethnicity (majority/minority groups), and social and economic circumstances. Approximately 50 children were selected from each country’s larger quantitative sample and followed from ages 5-7 to 12-13 for the younger cohort and ages 11-14 to 19-20 for the older cohort.

While original transcripts from the qualitative research were not available for analysis, we used the Young Lives online repository, bibliography searches, and author searches based on recommendations from the Young Lives qualitative research team to conduct an exhaustive review of reports and publications using the Young Lives qualitative data. We identified and reviewed 76 reports, notes, articles, and dissertations using Young Lives qualitative data, searching for direct quotes and observations which discussed learning and educational trajectories. Thirty-six reports, notes, articles, and dissertations are included in the final paper. Using a deductive approach, codes were developed based on our

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<sup>6</sup> While there may be a non-linear relationship between these variables, we are not powered to detect non-linearities due to the relatively low number of dropouts among observations.

hypotheses and applied to the data which were analyzed thematically (Braun & Clarke, 2012; Boyatzis, 1998).<sup>7</sup>

The Young Lives qualitative studies use a consistent set of pseudonyms for child participants, making it possible to connect quotes, analysis, and findings related to individual children across sources and rounds of qualitative data collection. These pseudonyms are used in the qualitative section when discussing individual children's experiences.

#### **IV. Quantitative findings: The association between test score performance and dropping out of school**

The first set of results gives the association between test scores among children who are in school at age eight and whether the child has dropped out by age 12, controlling for our set of demographic and country variables. We find a strong, significant relationship between achievement on mathematics tests and the odds of dropping out of school four years later. A one standard deviation higher math score is associated with a 50% reduction in the odds of dropping out. Said another way, a child with a one standard deviation lower math score has 50% higher odds of dropping out (Table 3).

Next, we examine the same children, focusing on the subset of children who remained in school at age 12. The second set of results gives the association between test scores at age 12 (among children who are in school at age 12) and whether the child has dropped out by age 15. We find a similar, strong, and significant relationship between math test scores and dropout at this age. One standard deviation in math scores is again associated with about a 50% change in the odds of dropping out.

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<sup>7</sup> In social science research, social desirability bias is a concern, as respondents may prefer giving a "socially desirable" response to questions if they think the truth is either undesirable or embarrassing in some way. Good qualitative researchers build rapport with respondents to reduce this kind of bias, but it is still possible. In our analyses, however, we believe any presence of such bias is likely to support our hypotheses. It is possible that there would be embarrassment in most cultures in acknowledging to researchers that one's child is not performing well in school. It may therefore be more socially desirable to blame lack of finances, a need to work, distance to school, or some other factor for children dropping out. We characterize three levels of acknowledgement of the role of low learning in drop out: Some parents (or children) may be upfront and acknowledge the role of low learning in decisions for children to leave school; some parents may acknowledge more proximate causes, like work or marriage, which are true proximate causes but were in part driven by low learning; and some may claim proximate causes such as work or marriage drove dropout only because of social desirability bias when in fact low learning was the main driver. Our qualitative analysis captures the first two levels but would struggle to capture the third. Therefore, to the extent there is social desirability bias against acknowledging the role of low learning in dropout decisions, low learning would play a larger role than recognized in our analysis.

<b>Table 3: Logistic regression results</b>		
	<b>Odds Ratio of Dropout at Age 12 (1)</b>	<b>Odds Ratio of Dropout at age 15 (2)</b>
Age 8 Math Test	0.472*** (0.094)	
Age 12 Math Test		0.513*** (0.043)
Rural	1.195 (0.471)	0.966 (0.206)
Female	0.609** (0.125)	0.784* (0.105)
Pre-primary School Education	0.426** (0.124)	0.710** (0.111)
Household Wealth Index	0.768* (0.118)	0.739** (0.071)
Household Head Education	0.818*** (0.031)	0.901*** (0.018)
Late Start	1.240 (0.326)	0.801 (0.187)
Ethiopia	0.240** (0.140)	0.068*** (0.023)
India	0.555 (0.308)	0.177*** (0.042)
Peru	0.060*** (0.048)	0.095*** (0.027)
Constant	0.102*** (0.066)	0.728 (0.208)
<i>n</i>	6516	6153
Standard errors are clustered at the sentinel sampling site level. ***p<0.001 **p<0.05 *p<0.1		

Further, we find that many of the factors that are identified in the literature as precipitating dropout, included as control variables, are also significant. A one standard deviation increase in relative (within country) household wealth is associated with a reduction in the odds of dropout between ages 8 and 12 by

23%, while it reduces the odds of dropout between the ages of 12 and 15 by 26%.<sup>8</sup> A one-grade increase in education of the household head reduces the odds of dropout by 18% between 8 and 12, and by 10% between 12 and 15. Having any formal pre-primary school education reduces the odds of dropping out by 57% between 8 and 12, and by 29% between 12 and 15.

Interestingly, being female reduces the odds of dropout as well; all else equal, the odds of dropout between the ages of 8 and 12 are 39% lower for girls, and the odds between 12 and 15 are 12% lower for girls. This follows conflicting evidence in the literature about the gendered nature of dropout, as discussed in Section II.

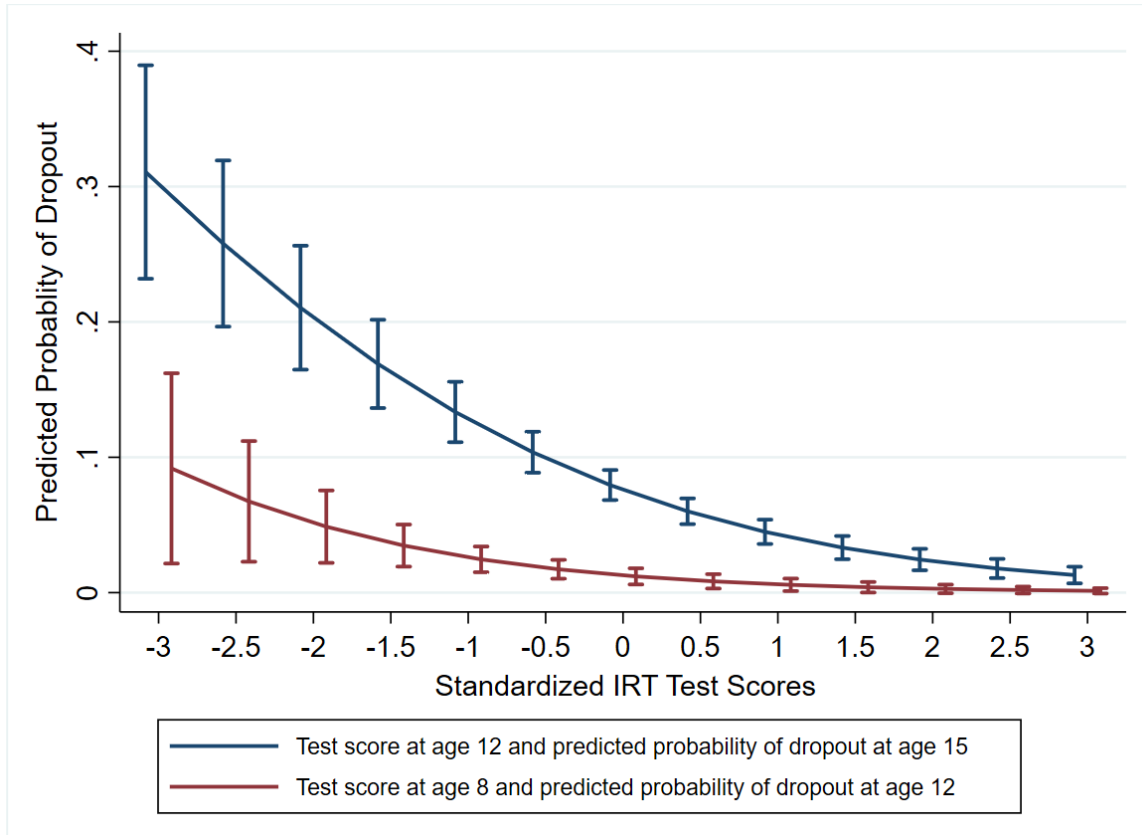
Finally, living in a rural area and starting grade 1 late have insignificant associations with the odds of school dropout, in our model.

Figure 1 charts the predicted probabilities of dropout by test score between rounds 3 and 4 (ages 8 – 12), and rounds 4 and 5 (ages 12 – 15), respectively, with 95% confidence intervals included. There is a clear relationship between test score and probability of dropout: as test score increases, the probability of dropout decreases. Note that these plots of predictive margins may indicate a non-linear relationship between test scores and dropout, where the relationship between test score and drop out changes at greater magnitudes for lower test scores. Unfortunately, the relatively low number of dropouts (particularly between rounds 3 and 4) in this dataset make it difficult to detect the precise nature of this relationship.

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<sup>8</sup> Here we treat the association between wealth and dropout as linear. As a robustness check, we ran two additional regression models utilizing a transformed wealth variable with only minor changes to the results.

**Figure 1. Predicted probability of dropout by test score over two time periods**



*Note: Graphs show the predicted probability of dropout by age 12 based on normalized test score (standardized to a mean of zero and standard deviation of 1) at age 8, and again at age 15 based on standardized test score at age 12.. Results are based on logistic regressions which control for geography (rural/urban), sex, pre-primary school attendance, a wealth index, household head education, whether the child started school late, and country dummies.*

These logistic regressions show a strong, highly significant relationship between higher test performance and lower probability of dropout, conditional on other factors commonly associated with the child, such as gender, household wealth, and caretaker education level. This indicates that a child’s learning level itself is related to dropout even after controlling for these other factors. Split-sample cross validation<sup>9</sup>, performed as a robustness check, support this conclusion.

A limitation of this analysis is that we are unable to isolate the effects of in-school learning versus extracurricular enrichment, or other factors affecting cognitive test performance such as learning disabilities. However, these findings imply that students who learn more, and therefore perform better on tests than their peers, are less likely to drop out. Conversely, students who learn less, and perform worse than their peers, are more likely to drop out of school.

<sup>9</sup> Split-sample cross validation estimates the model using randomly selected sub-samples of the data set in order to validate that the predicted probabilities hold.

A second limitation is that this analysis does not indicate the mechanisms through which low learning is associated with dropout. We now turn to qualitative analysis to investigate the ways in which learning influences whether children stay in school.

## **V. Qualitative Analysis of the Drivers of Dropout**

Recognizing the role of qualitative methods to illuminate “complexities that can be hidden by statistical trends,” (Morrow & Crivello, 2015, p. 267) this section examines the often complex process through which low learning relates to dropout. In line with Vu’s (2014, p. 241) framing of dropout not as a single event but as a “long-term process of disengaging with school,” the qualitative findings suggest low learning contributes at multiple stages on the progression towards a student dropping out of school. Young Lives qualitative researchers, in exploring dropout in interviews and group discussions, find that in many cases “children’s performance and their perception of the value of schooling are the most common” drivers underlying their decision to leave school (Duc & Tam, 2013, p. ii).

Low learning appears to drive dropout through at least two pathways. The first is a direct link between low learning and dropout, where children who are failing or feel they are not learning much in school discontinue their schooling. In the second pathway, low learning increases susceptibility to and interacts with the proximate causes often cited in the dropout literature, such as marriage or work. This section is framed around these two pathways.

It is important to note that while children and caretakers tend to place responsibility for low learning on the child, and many of the quotes below reflect this, the researchers tend to point to the poor quality education being provided to children by the education systems. Researchers find that the quality of schooling that Young Lives participants receive is typically quite poor, making it “difficult [for families and children] to predict which strategy of protection – school or work – will have the most positive outcomes for children and their families” (Crivello & Boyden, 2014, p. 389; Morrow V. , 2017).

### **V.A. Direct Links between Low Learning and Dropout**

Rather than passively failing out of school, children often exercise a great deal of agency in the decision to drop out, utilizing their own assessment of their learning and the quality of education provision to make a dropout decision. Biritu in Ethiopia, for example, recognized the shortcomings in the education she was provided, and consequentially made the decision not to continue: “When I evaluated my grades in the past seven grades, I found out that I was not able to sit for the next year national examination because we were not taught very well” (Boyden, 2013 p. 593). After failing his Grade 10 admissions exam, Quoc, in Vietnam, countered his parents' advice to continue school: “At this time I want to work, I am fed up with going to school. I cannot learn anything in lessons” (Duc & Tam, 2013, p. 18). Hung similarly failed the Grade 10 admissions exam and decided not to retake the exam or consider vocational schooling options. His father says: “We only have two sons; we encouraged him to retake the exam. But he knew he wasn’t good at studying<sup>10</sup>, so he decided to start working” (van der Gaag & Knowles, 2016, p. 97).

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<sup>10</sup> Keep in mind that while parents and children often attribute low learning to poor abilities of the children, researchers tend to place responsibility on the poor quality education being provided to the children.



In addition to leading children to feel “fed up” with school, failing or repeating grades can exercise tremendous pressure on young people via the shame of being older than classmates, and this can lead to dropout as well. Fifteen-year-old Esmeralda in Peru is one such example: “Having failed two courses that she needed to progress to the third grade, she left the school because she did not want to repeat the grade. She expressed being ashamed of re-doing a grade with younger children, particularly in the same group as her younger brother.” (MacDonald, 2011, pp. 72-73). Tufa, in Ethiopia, remained in Grade 2 from the ages of 13 to 16 (having also started school late), before dropping out. He said that falling behind his friends was a source of embarrassment, and feeling ashamed prevented him from returning (Crivello & van der Gaag, 2016, p. 30).

In other cases, parents make the decision to discontinue their child’s schooling upon finding that their child is not making adequate progress. In Vietnam, Ho Nit’s parents thought she was slow and struggled to remember what she was taught: “The letters know her but she does not know the letters” lamented her mother (Vu, 2011, p. 5). At times parents choose to withdraw their child from school in opposition to the child’s wishes. Although Long wanted to continue her studies, when she failed her Grade 9 exams her parents concluded that her inherent academic capabilities were incompatible with further schooling, despite evidence that her poor performance was likely linked to working long hours in the family fields (Zharkevich, Roest, & Vu, 2016).

The link between learning and dropout at times is exacerbated by a mismatch between the language of instruction and the language a child speaks at home. Particularly among children from ethnic minorities like the Cham H’roi in Vietnam, children who have dropped out complain of boredom in class and inability to follow lessons because they do not understand the language in which lessons are taught (Vu, 2011). Furthermore, ethnicity-based harassment, particularly in Vietnam, served to drive low learning and subsequent dropout among Young Lives participants. Following years of bullying from ethnic Kinh majority students, YThink left school in Year 10 and began working on the family farm. He confessed that, due to fear of harassment, “I couldn’t digest the lessons. So, I felt tired of learning” (Singh & Mukherjee, 2018, p. 246).

## **V.B. Low Learning and Commonly Cited Proximate Causes of Dropout: Marriage and Work**

Our literature review highlighted the frequency with which marriage and work are cited as causes of dropout. While they are not the only proximate causes cited, we focus on them here because of their preponderance in the literature, and examine the extent to which marriage and work interact with and are preceded by low learning.<sup>11</sup>

Marriage is a commonly cited reason why girls drop out of school. However, Young Lives participants and researchers emphasize that early marriage for girls is far more likely to follow after girls drop out of school due to low learning, rather than being married off while progressing satisfactorily in school (van

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<sup>11</sup> Note that pregnancy is also a commonly cited cause of dropout, as discussed in Section II, and is often associated with early marriage. Because of sensitivities associated with discussing early pregnancy and pregnancy outside of marriage, the Young Lives qualitative research, and therefore this analysis, focuses on questions and discussion related to marriage rather than pregnancy.

der Gaag & Knowles, 2016; Tafere & Chuta, 2016). In Ethiopia, researchers observe that “(p)arents are more likely to arrange early marriage for their daughters when they feel that their future options may be limited; for example, when there are doubts over their potential educational achievements” (van der Gaag & Knowles, 2016, p. 11). In India, after failing the university admission exam, Harika describes, “I felt very sad. If I had been admitted to university I would not have married. I would have continued my education. Since I could not get admission, I stopped my studies and my parents arranged for me to marry.” (van der Gaag & Knowles, 2016, p. 58).

Girls also often feel pressure to secure a future for themselves when they see that they are learning little in school. When Fatuma, in Ethiopia, learned she had failed the national exam, “she started devising other coping mechanisms for survival ... After realizing that neither further education nor jobs were forthcoming, Fatuma began to envisage getting married. She soon married and had her first child the next year” (Tafere & Chuta, 2016, p. 20).

Similarly, poverty and the need to work to support the household is another widely cited cause of dropout. However, for Young Lives participants the decision that current income from work is more valuable than future benefits of staying in school is mediated by the quality of learning taking place in school. In Peru, Atilio learned he was going to fail his classes that year and decided he wanted to work instead, dropping out of school at 15 (Rojas, Guerrero, & Vargas, 2016). In India, despite high initial academic aspirations Yaswanth ultimately dropped out, saying “‘I feel I want to study, but I can’t ... lessons are hard to understand and learn.’ The economic situation of the family and his difficulty at school meant that Yaswanth was considering leaving after Grade 10, and was looking for ‘anything which will earn me and my mother [a way] to lead happy life ... we must have the capacity to earn’” (Vennam, Komanduri, & Roest, 2016, pp. 23-24).

Children in the Young Lives studies also hedge their investment (of time and finances) in schooling by gaining skills from work at the same time. In India, a fifteen-year-old boy explained that he needed to work during holidays in the years before he dropped out of school, asserting that “if we depend totally on education alone we will not be able to do any work in case [school doesn’t provide the skills needed to] get a job” (Morrow & Boyden, 2018, p. 28).

There are further complexities in the interaction between low learning, labor market decisions, and school dropout. For some children, school attendance is only possible through work which provides cash for school fees, learning materials, and survival. Yet the illnesses, injuries, exhaustion, and seasonal absences associated with common forms of children’s work are frequently named as key drivers of low learning (Tafere, 2010). These interactions present circular dynamics in which work reduces the opportunities to learn, and low learning tilts the opportunity cost towards favoring work. This opportunity cost grows over time, as children’s labor productivity and earning potential increase with age even while their labor remains relatively unskilled.

In Ethiopia, 14 year old Yenealem indicated that she was frequently exhausted and had little time to study: “By the time I got home from wage work, I would become very tired and I couldn’t study. Had I not gotten involved in this work, I would have been a clever student.” (Tafere & Chuta, 2016, p. 17). In India, Ranadeep left school after he and nearly half of his 43 classmates failed the Grade 10 exam. When

asked why so many of his peers also failed, Ranadeep explained that “it was because we were irregular to school ... The time we had to sow [cotton] seeds and had cultivation work on our farms, we were not able to go to school. They stopped me from going to school for a month, during which time the teachers covered most of the chapters” (Singh & Mukherjee, 2018, pp. 16-17). In Ethiopia, Bereket “dropped out of school in Grade 9 because of financial problems and poor school performance. He indicated that he scored low marks because he was missing classes to do wage work” (Tafere & Chuta, 2016, p. 16).

Both marriage and labor market participation are represented as ways Young Lives children can support themselves or their families when it has become clear that they are learning too little in school to provide better future economic opportunities.

## **VI. Discussion**

The analyses in this paper reveal a complex and dynamic relationship between low learning, other causes of school disengagement, and a child dropping out of school. The logistic regression model reveals a statistically significant and substantively meaningful quantitative association between test scores and a child dropping out of school, even after controlling for common correlates of dropout including gender, wealth, geographic location, and household head education. The relationship is of a similar magnitude when children are 12 and when they are 15, suggesting learning is not only a factor at a single point in time, such as in the transition from primary to secondary school, but on a more ongoing basis. That low learning is a substantial contributor to dropout should inform policies to improve schooling completion rates. Rather than focusing on the point when children drop out, addressing low learning early in the schooling process could ensure children stay engaged and stay in school longer.

Our findings also provide new insight into commonly cited correlates of dropout. While wealth is a significant factor, the magnitude of the association with dropout of a one standard deviation difference in the wealth index is half that of a one standard deviation difference in test scores. While much attention is given to gender equality in education research and practice, our results show that girls have lower odds of dropping out than boys across our sample. This suggests a need to consider the best way to support girls’ education, and indicates that addressing other factors, such as low learning, may be more important than gender-specific efforts for keeping girls in school longer.

We also find that pre-primary attendance reduces the odds of dropping out by age 12 by more than half but has a much smaller association with dropout between ages 12 and 15. This may indicate threshold effects, in which pre-primary is important for increasing children’s schooling attainment during the primary years, but for children who have persisted in school past age twelve pre-primary attendance plays a much smaller role in persistence.

The longitudinal qualitative data reveal two primary pathways through which low learning interacts with and drives dropout: directly, by influencing the decision to drop out, and indirectly, by interacting with other more commonly cited causes of dropout such as early marriage and labor market participation. Children and parents often describe low learning and failed exams as key drivers of their decision to discontinue schooling, with these factors often preceding and contributing to choices about marriage and labor market participation. Policies to reduce dropout due to early marriage or labor market participation

therefore may need to focus much earlier than the point of dropout by improving learning earlier in the schooling process.

The complex decision to reorient a child's future away from continued formal schooling often relates to the child's need or desire to provide for themselves and their households in the future. Parents, and in some cases girls themselves, speak of low educational achievement as a driver for seeking more secure options for the future, in which marriage features prominently. Early marriage thus more commonly follows school dropout due to low learning, rather than being the initial cause of dropout. Similar complexities relate to the decision by children or parents for children to work rather than continue schooling. Children stated that because they were learning little, they felt they needed to gain skills through employment rather than staying in school. Thus, low learning means that there is a high opportunity cost for time spent in school rather than working, gaining skills, and earning income, especially when the expected returns to schooling are low.

The results further suggest parents or children, or both, may perceive threshold effects in the returns to schooling. Many children in the qualitative analysis refer to their perceived inability to pass upcoming exams as a reason for dropping out. It could be that a large part of the returns to schooling comes from crossing a threshold such as passing a secondary school national exam, for example if this enables a shift in future employment from informal self-employment to formal wage employment. If low performing children in, for example, grade seven can see that the returns to grades eight, nine, ten, and then failing the exam are low, then they choose not to "waste" their time and drop out.

The qualitative data suggest that parents often blame their children's poor performance and subsequent dropout on low inherent abilities, but it is likely in these contexts that low performance is the result of poor quality education being provided. Providing parents with more information on school performance and helping them hold schools accountable for learning outcomes, rather than blaming children for poor outcomes, could help both learning outcomes and children's persistence in school.

The findings in this study suggest that low learning plays an appreciable role in school dropout, even in cases where learning and performance are not acknowledged as precipitating dropout. The review of relevant literature included in this paper recognises a long list of personal, familial, community and school characteristics that contribute to dropout, with a growing literature establishing that lower achieving children are more likely to drop out. Our quantitative analysis strongly supports the connection between low achievement and dropout, while our qualitative analysis establishes this connection as a key factor in a complex set of interactions between the child, the environment, and the how much learning they are achieving in school. It is likely, therefore, that when proximate causes of dropout such as marriage and work are taken at face value, the role of low learning as it interacts with and exacerbates other causes of dropout is at best underestimated, and at worst overlooked. This has far-reaching policy implications, including the need for an intensified emphasis on education quality to both improve learning outcomes and increase school grade attainment.

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## Appendix I.

### *Defining Dropout*

The Young Lives surveys ask both the household head and the child about a child's involvement in school. The questions do not match exactly, and we use a combination of results to define dropout. The questions from the child questionnaire and household questionnaire are:

From the child questionnaire question: *Are you currently enrolled in school?* This has the following answer options:

- *No*
- *Yes*

From the household questionnaire question: *Is this child currently in full-time education?* This has the following answer options:

- *No*
- *Yes, attending regularly*
- *Yes, but attending irregularly*

In this paper, we define school participation as being both enrolled in school (per the child questionnaire) and being in full-time education and attending regularly (per the household questionnaire). Using data on both enrollment and attendance, from the child and from the household, allows us to construct an indicator that marries formal enrollment and attendance. This is an improvement over commonly used, simple "enrollment" variables, which give no indication of a child's attendance and participation in school.

Across the four countries and two survey rounds, 84 children responded that they are enrolled in school and the household respondent said the child attended irregularly. Because attending "irregularly" is not clearly defined and could mean occasional absences or long periods of absence (effectively representing a child who has dropped out), we drop these children from the sample. Another 23 students have seemingly inconsistent responses across the two questions, with either the child saying they are enrolled and the household respondent saying they are not in full time education, or vice versa. These children are also dropped from the sample.

From these schooling variables, we define a child who has dropped out of school as a child who was both enrolled in and attending school regularly in one round of data collection, but who is neither attending school nor enrolled in the following round.

When examining dropout between ages 12 and 15, we use the subsample of children who were in school at age eight and were still in school at age twelve. We do not include children who were not in school at age 8, even if they were enrolled and regularly attending at age 12. It is worth noting however that we are unable to account for attendance and enrollment in the periods between data collection rounds.

Of our sample of 6,791 children who were enrolled in and attending school at age 8, about 2% had dropped out by age 12, and about 7% had dropped out by age 15.

	<b>Ethiopia</b>	<b>India</b>	<b>Peru</b>	<b>Vietnam</b>	<b>Pooled sample</b>
Observations (Attending school at age 8)	1,374	1,806	1,820	1,791	6,791
Dropped out by age 12	3.6%	2.1%	0.2%	1.34%	1.7%
Dropped out by age 15	4.7%	7.6%	2.7%	13.9%	7.4%