

**Parental Aspirations and Educational Outcomes:
Evidence from Andhra Pradesh, India**

*Thesis submitted in partial fulfillment of the requirements for the
Degree of Master of Science in Economics for Development
at the University of Oxford*

1 June 2018

By

Ishleen Kaur Sethi

Abstract

This study examines the effect of parents' aspirations on children's educational outcomes using data from the Young Lives study in Andhra Pradesh in India. It contributes to the sparse literature on this topic by first testing the overall impact of aspirations, and second, by uncovering any non-linearities of this effect. Through the channel of children's aspirations-for-self, parental aspirations affect future-oriented behaviour and outcomes. This study estimates these impacts by exploring the effect of deviations from the average aspirations within the parents' "aspiration window" (Ray 2006) on the outcome variables at three time periods. The results provide support for the idea of an aspirations gap where both the extent and the direction of the deviation are likely to have differing effects on outcomes. Findings imply that higher aspirations are beneficial for both outcomes, although outcomes are potentially impacted in a non-linear fashion.

Table of Contents

1	Introduction.....	4
2	Literature Review.....	7
3	Identification Strategy.....	10
	3.1 Conceptual Framework.....	10
	3.2 Empirical Strategy.....	11
4	Data.....	13
	4.1 The sample.....	13
	4.2 Variables measured.....	14
	4.3 Estimation concerns.....	16
5	Results and Discussion.....	18
	5.1 Schooling Outcomes.....	18
	5.2 Robustness Checks.....	23
	5.3 Limitations.....	27
6	Conclusion.....	28
7	References.....	29

1 Introduction

Traditional work in poverty reduction has focused on providing those living in poverty with opportunities and building assets which lift constraints in the areas of health, education and investment. Recent work in the field of behavioural economics has moved the focus to internal constraints faced by those in poverty through the formation of mental models, aspirations, and ideas of self-efficacy. This literature has studied the significance of internal constraints in perpetuating poverty and has argued that these are equally important to external constraints. Important consequences for policy-making arise, emphasising the need for policies that lift internal constraints as well as external ones. With this in mind, the traditional method of providing the poor with basic necessities or channels of income will not necessarily bring them out of poverty.

Specifically, the role and consequences of aspirations on poverty has gained precedence in recent work. Aspirations can be thought of as socially constructed reference points, which affect future-oriented behaviour and frame decisions. The importance of aspirations has been long studied in fields outside of economics. For example, studies in social psychology (Bandura 1997, Bandura 1991) agree that people form aspirations based on those in their immediate surroundings, and studies in anthropology (Appadurai 2004) argue how people's aspirations, or the lack thereof, affect their choices and behaviour. Since people regulate their effort based on these reference points (Selten, Pittnauer & Hohnisch 2012), it is essential to understand the determinants of aspirations and ways to influence them which lead to positive changes in behaviour and outcomes. Much of recent literature in behavioural economics has focused on the role of aspirations for self on future outcomes. The idea of aspirations serving as mental 'boundary states' suggests that individuals aspire to certain goals which could potentially be achieved if some constraints were lifted or behaviour was altered (Bernard et al. 2014). It is important to note that this is different from expectations of the future, which further take into account the current state of the individuals, resources available and likely outcomes based on observation of similar individuals.

In an influential contribution on theorising aspirations, Ray (2006) proposes two key points about aspirations. Firstly, he suggests that individuals form aspirations based on their “aspiration window”, dependent on the physical proximity and similarity of others to oneself. Physical proximity increases the visibility of other people’s decisions and outcomes, whereas similarity, usually in terms of income or wealth, serves as a benchmark for the range of possible outcomes. Similarity, in turn, is subjective and will depend on social and economic mobility. Secondly, Ray argues that it is the aspiration gap, the difference between our present situation and our aspirations, which influences behaviour more than the aspiration levels or the individual’s present situation. Focusing these ideas in the context of the poverty, Appadurai’s proposition that the poor lack the capacity to aspire is vital. Their conditions and the lack of role models lead to aspirations failure, which perpetuates a behavioural poverty trap (Dalton, Ghosal & Mani 2016). Thus, policies which can alter the capacity to aspire and motivate the poor to set higher goals can have significant effects on their outcomes.

This paper builds on this theoretical structure and contributes to the sparse literature on the role of parents’ aspirations for children’s educational outcomes. Aspirations could exist in many domains of the individual’s life, though the most discernible and widely studied are educational and occupational aspirations, the former of which forms the focus of this paper. It uses parents’ self-reported aspirations for their children’s education when they are considerably young and at pre-school level using the Young Lives dataset to make two key contributions in this space. Firstly, measuring aspirations and children’s educational outcomes in a longitudinal dataset makes it possible to measure longer term effects of aspirations which have received limited attention. Secondly, it tackles potential endogeneity of aspirations in two ways. I control for the child’s ability using the Peabody Picture Vocabulary Test (PPVT) test conducted at age 5, at an appropriate age to capture intelligence and ability. As discussed in detail later, many studies have shown that PPVT is highly correlated with commonly-used tests of intelligence and thus, forms a good measure of ability. Moreover, endogeneity in parents’ aspirations could also stem from the reverse causality between wealth and aspirations. Although aspirations could generate higher wealth by positively affecting future outcomes, this could in turn feed into even higher

aspirations. This paper's design partially controls for this channel by comparing aspirations within a small subgroup of parents based on their location and wealth quartile. As suggested by Ray (2006), these two factors are the main determinants of an individual's aspiration window. By considering the average aspirations within these subgroups, this methodology partially controls for the reverse effect of income on aspirations.

This paper focuses on the role of parental aspirations for children's education outcomes in two main areas. Specifically, it evaluates the impact on children's achievement as measured through quantitative tests as well as private school enrolment at the ages of 5, 8 and 12. The results provide evidence for a strong relationship between aspirations and both education outcomes. Higher aspirations affect maths test scores at all ages measured in this study and are robust to controlling for a range of child and household characteristics. Although at age 5, innate ability is a stronger predictor of scores than parental aspirations, this relationship reverses at mid-primary and secondary school level. Following from Ray's theory on aspiration gaps and developing the analysis further, I find that the effect of aspirations on scores is potentially non-linear, although limited power restricts conclusive evidence – aspiring to goals much higher or lower than those in your aspiration window seems to limit the impact on test scores, the largest impact coming from those who are close to the average. As proposed by Ray, this study also finds that aspirations at these levels motivate individuals to work towards realistic goals which can result in better outcomes. However, further analysis by varying the cut-off finds that the highest impact is being driven by households with the smallest gaps, contradicting one aspect of Ray's theory which states that those with very small gaps are likely to have the smallest effect similar to those with very high gaps. Extending the analysis to school choice, I find that parents' aspirations also matter for school choice, as parents with higher aspirations are more likely to send their children to a private school.

The results of this study are in line with the literature and theory regarding aspirations discussed above. It provides compelling evidence that parents' aspirations play an important role in impacting education outcomes for their children. Goals set for children in the early part of their lives are a strong predictor of their learning outcomes as far as into secondary

schools. These findings are an important addition to the literature on upward mobility and indicate that changing people's perceptions of what is possible given their circumstances could change aspirations and lead to better future-oriented behaviour. As much of the work on intergenerational mobility has focused on how higher parental education leads to higher enrolment and achievement for children, the results of this paper also provide a salient policy implication – raising parents' aspirations for their children could impact outcomes in a more immediate and cost-effective way than waiting to increase education and achievement over a generation. Many recent studies have focused on the determinants of aspirations and evaluated ways in which aspirations can be adjusted. Exposure to role models, either through policy interventions or media interventions, has been central in the work on impacting aspirations in developing countries like India (Beamen et al. 2012), Ethiopia (Bernard et al. 2014), Madagascar (Nguyen 2008) and Uganda (Riley 2017). These are discussed in greater detail in the following section.

In the next section, I discuss the existing literature on aspirations. In section 3, I elaborate the conceptual framework and the empirical strategy. Section 4 describes the data, variables and measurement in detail. A formal discussion of the results follows in Section 5, and Section 6 concludes.

2 Literature Review

A vast amount of literature in social psychology, anthropology and economics has studied the formation and importance of aspirations. Identifying the determinants of aspirations has played a key role in most of this literature, to understand how aspirations are formed and can be affected. Observing and learning from similar others has been a common theme across most of the literature, suggesting that the social environment of an individual plays a key role in aspiration formation. Both early and recent works talk about “vicarious experience” (Bandura 1997, Bernard et al. 2014), and Ray (2006) talks about an individual's “aspirations window” to refer to this process of observing, learning and forming aspirations. Nguyen

(2008) also finds that the effect of exposure to a role model only affects educational outcomes if the role model is from a similar background.

More importantly, aspirations serve as a mechanism for changes in behaviour. Especially in the context of poverty, aspirations can work well to influence behaviour and as a result, influence outcomes. Selten et al. (2012) put forward the idea that individuals regulate effort based on these reference points. Aspirations, then, could work as both an inspiration or a frustration for the poor. In the former case, they could motivate individuals to learn from the successes of others around them and work harder to achieve goals which they formerly thought were beyond their prospective future outcomes (Beamen et al. 2012, Bernard et al. 2014, Ray 2006). Conversely, if aspirations are too high or too low they could induce frustration and reduce the motivation and effort put into achieving goals. This is especially detrimental to the poor who may continually fail to meet their aspirations due to difficult conditions and limited mental bandwidth (Mani et al. 2013). As a result, they could be caught up in a vicious cycle of continuously lowering aspirations, which further aggravates their situation (Dalton, Ghosal & Mani 2016).

Recent work takes a slightly different stance on the channels through which aspirations affect behaviour. It is likely that the gap in aspirations, rather than absolute aspiration levels, determine effort and future-oriented behaviour (Ray 2006). Depending on how far aspirations are from an individual's current situation, an aspiration gap could either work to increase effort or reduce it. Ray argues that very small or very large aspiration gaps would have the same effect of lowering effort – the former is not enough motivation to change behaviour whereas the latter works as a source of disappointment and frustration in a similar vein to what was described of very high aspirations. Presently, most of the evidence in the literature of aspiration gaps comes from a developed country context. Studies in the US (Kearney, Levine 2016) and France (Goux, Gurgand & Maurin 2014) have shown that lowering aspirations of children from low-income backgrounds to more realistic levels results in lower dropout rates. This paper adds to this literature in the context of a developing country.

The link between aspiration gaps and behaviour is not as widely studied, especially in the context of learning outcomes. Although educational attainment is important for future labour market outcomes, cognitive skills play as important a role in determining future outcomes. Hanushek et al. (2015) find that an increase of one standard deviation in numeracy scores leads to, on average, an 18 percent wage increase in 22 countries. To the best of my knowledge, there is scarce evidence on the role of parental aspirations in children's learning outcomes. Riley (2017), although considering aspirations for self, finds that watching an aspirational movie before national exams significantly increases math test scores and the probability of achieving the required grades for university in Uganda. Similar results in Chile show that changing mindsets can have a positive effect on achievement scores (Claro, Paunesku & Dweck 2016). Dercon and Serneels (2014) also find a strong relationship between maternal aspirations and children's test scores in India. Given that small changes in early childhood can affect long-term outcomes (Cohen et al. 2009, Bandura et al. 2001, Heckman 2008), it is critical to consider how parental aspirations and the associated gaps during early childhood can impact children's trajectory by influencing children's own aspirations and early performance.

The discussion is broadened to also evaluate the effect of aspirations and associated gaps on private school enrolment. Research over the years has established that across countries, children studying in private schools consistently perform better than those in government schools (Tooley 2005, Hanushek 2002). Particularly in the case of India, evidence exists to support the same findings – private school education leads to better learning and later outcomes in life (Tooley, Dixon & Gomathi 2007, Dreze, Sen 2002, Goyal, Pandey 2012). The main channels driving higher performance are better inputs, infrastructure and teacher-pupil ratios in private schools. In light of these findings, this paper considers whether parents' aspirations also affect choice of school type for their children, which can then have a long-term impact on their welfare.

This paper contributes to the existing literature by addressing these gaps – scarce evidence on the effect of aspiration gaps, particularly in developing countries; and limited focus on cognitive achievement or school choice in the short- and medium-term. I build on this

evidence by focusing on households in Andhra Pradesh in India and measuring the impact on test scores and private school enrolment from pre-primary to secondary school level.

3 Identification Strategy

3.1 Conceptual Framework

Recent work acknowledges that the formation of aspirations, and the associated gaps, is dependent on the aspiration window or reference points that individuals consider. This, in turn, is dependent on two key factors – how easy it is to observe others’ behaviours and how similar they are to oneself. This study considers both these factors to estimate the effect of aspirations gaps on educational achievement – the former is proxied by the sentinel sites the household is located in, and the latter is proxied by the wealth quartile the household falls in. Once households have been sorted into subgroups based on these two criteria, theory suggests that parents’ aspirations within each of these subgroups should be largely similar. Any deviations from this average is a measure of the aspiration gap perceived by the parents, that is, the difference in their aspirations from the average household in their aspiration window.

This paper focuses on two characteristics of this deviation. Firstly, whether the deviation is positive or negative, and secondly, the extent of deviation from the average aspiration in the subgroup. As discussed in the previous section, the direction and the extent of the gap can affect behaviour in different ways, either by inspiring and motivating the child or by inducing frustration instead.

To investigate which of these channels dominate, the discussion now turns to the mechanisms through which parents’ aspirations can affect test scores. Research on intergenerational mobility has documented how aspirations can transmit from one generation to the next. Evidence from India (Dercon, Singh 2013) and Ethiopia (Favara

2016) finds a strong correlation between parents' and children's aspirations. This transmission is crucial because a change in children's aspirations for self can have a long-lasting impact on their educational and occupational outcomes later in life. Broadly speaking, higher aspirations for self can have positive changes in behaviour as individuals have higher motivation and persistence. In the case of the younger cohort considered here, the increased effort manifests in the form of higher quantitative test scores and private school enrolment. I specifically consider scores on the quantitative test as it has been shown that scores on mathematics and quantitative tests are more elastic to a change in effort and persistence, as compared to reading or verbal ability (Riley 2017, Bettinger 2012) .

3.2 Empirical Strategy

Using the Young Lives data on the younger cohort in round 2, parents' aspirations were based on their answer about the future education of their child. A total of 1,950 children and caregivers were surveyed in round 2, and households were divided into subgroups based on two criteria:

1. **Wealth quartile:** the survey reports the wealth index of households, which has three components, namely housing quality, consumer durables and services. The wealth index value ranges from 0 to 1 and is an average of these 3 components. Each household is assigned to one of the wealth quartiles depending on the value of their wealth index. The associated mean and standard deviation of parents' aspirations for each of the quartiles is summarised in Table 1. Testing the mean aspirations across the wealth quartile reveals a significant difference among the four groups – poorer households in the sample aspire to almost 2.3 fewer years of schooling than their wealthier counterparts. This could be reflective of either realistic aspirations or an aspirations failure as discussed in Appadurai (2004) and Dalton et al. (2016). In the Indian education system, tertiary education begins after finishing grade 12 and so aspiring to complete 12 years of education is realistic for low-income households as tertiary education can be both expensive and significantly raise the opportunity cost of education. Alternatively, it could also be suggestive of an aspirations gap as mid-

income households aspire to at least one more year (e.g. technical or vocational education) which can significantly increase wages over a grade 12 qualification.

Table 1: Average aspirations by wealth quartile

	Mean in Quartile 4 [Top Quartile]	Difference between [...] and Top Quartile		
		Quartile 1	Quartile 2	Quartile 3
Aspirations	14.879 (0.131)	-2.293*** (0.185)	-1.587*** (0.185)	-1.107*** (0.186)

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

2. **Sentinel site:** data in Andhra Pradesh is collected from 20 sentinel sites, as discussed later in section 4.1. This information is used to define the physical proximity of households to one another, a proxy for how easy observation of outcomes is.

Combining the 2 pieces of information for each household resulted in the creation of 82 subgroups in the data.

To first measure the impact of deviations in parents' aspirations on education outcomes, I rely on the following model and the assumption of linearity:

$$S_{it} = \beta_0 + \beta_1 A_{it} + \beta_2 C_{it} + \beta_3 HH_{it} + \varepsilon_{it}$$

where S_{it} refers to the schooling outcome for the child. This paper considers the child's quantitative test results at the age of 5, 8 and 12. The analysis is also extended to cover the type of school the child is likely to be enrolled in (pre-school, age 5) and once formal schooling begins (age 8 and 12). A_{it} represents the parents' deviation from the average educational aspirations for their subgroup in round 2, C_{it} represents child characteristics like age, ability, gender and height-for-age, and HH_{it} represents household characteristics such as maternal education. Including a wide range of controls for child's characteristics such as ability and health, and household characteristics, mitigates the problem of endogeneity as discussed in section 4.3.

I then study the impact of the deviation at different levels from the average to ascertain whether aspirations at different levels have different impacts on outcomes. The supporting view argues that depending on how far aspirations are from current or realistic outcomes, they could serve as an inspiration or frustration for the children. The opposing view simply states that the higher the aspirations, the better the outcomes. Since the deviations in the data range from -15 to 7 years of education years, ideally I would divide the sample into multiple groups depending on how close the deviation is to the mean and measure the impact for each of these groups. In practice, this can be thought of as four distinct groups of aspiration deviations – extremely negative, slightly negative, slightly positive and extremely positive. However, the sample size is limited for such a breakdown and any analysis will be underpowered. Therefore, this paper defines a dummy for households where aspirations lie close to the mean versus those where they lie further away. Theory suggests that the impact may differ at each of these groups because very high or very low aspirations could frustrate and negatively impact outcomes, whereas aspirations close to the mean should motivate individuals towards higher goals. Using the same specification as above, I add a dummy for low deviations to measure the differential impact of aspirations across these two groups.

4 Data

4.1 The sample

Young Lives is a longitudinal international study which follows 15,000 children across India (Andhra Pradesh), Ethiopia, Peru and Vietnam over 15 years. Two cohorts of children are surveyed in each of the 4 countries, 2,000 children in the younger cohort born in 2001-02 and 1,000 children in the older cohort born in 1994-95. It covers wide-varying topics to examine the nature of childhood poverty, encompassing household surveys, school surveys, community surveys and qualitative research. The data was collected over 5 rounds of surveys, each three years apart, starting in 2002 and ending in 2016. Using a longitudinal

dataset aids in understanding the impact of aspirations on longer-term outcomes for children, especially because attrition over the rounds is small (2.6% from Round 1 to 4, (Young Lives 2015)) and unlikely to bias inference (Dercon, Outes-Leon 2008).

Households in Andhra Pradesh were chosen based on a sentinel site surveillance system. While the 20 sentinel sites were chosen based on the objectives of the study, households within these sites were chosen randomly. Selection of sentinel sites maintained a pro-poor bias in line with the study aims and ensured a balance in terms of regional diversity. Thus, the households within the sample are not representative of India or of Andhra Pradesh as a whole: they are less likely to own their house, have children with less educated caregivers, and have mothers who are less likely to breastfeed or receive antenatal care (Kumra 2008). Kumra argues that even though the Young Lives households appear to be slightly wealthier than the state counterparts, this is likely due to the fact that the national survey was conducted 6 years before the Young Lives survey round being compared.

This study uses the younger cohort's data from round 2 until round 4 collected from Andhra Pradesh in India. The younger cohort were aged 5, 8 and 12 at rounds 2, 3 and 4 respectively.

4.2 Variables measured

Children's cognitive development is measured through a mathematics test administered to all children in each of the rounds starting in round 2. In round 2, mathematics ability was measured through the Cognitive Development Assessment - Quantitative test (CDA-Q) whereas a basic mathematics test was administered in rounds 3 and 4. The standardised CDA test has a few subtests, and only the quantitative subtest was used in the Young Lives survey. Children's understanding of mathematical concepts – including, but not limited to, few, many, most, half and similar concepts – was assessed through simple statements. Thereafter for round 3 and 4, the CDA was not used and the quantitative assessment consisted of few statements and maths problems.

Children’s scores on the standard Peabody Picture Vocabulary Test (PPVT) from round 2 are used as a measure of the child’s innate ability. Developed by Dunn and Dunn in 1959, PPVT has been updated several times, and the Young Lives study used the PPVT-III (Dunn, Dunn 1997) in India. I use the PPVT scores as a control for the child’s ability as it is highly correlated with intelligence measures, such as the Wechsler and the McCarthy Scales (Campbell 1998, Gray et al. 1999, Campbell, Bell & Keith 2001). This will be important for analysis as omitting this variable can lead to biased estimates because ability is likely to be correlated with both aspirations and the learning outcomes considered here.

Table 2: Descriptive Statistics

	Mean	Q1	Q2	Q3	Q4
Educational aspirations	13.63 (2.95)	12.59 (3.06)	13.29 (2.95)	13.77 (2.89)	14.88 (2.36)
1-9 years (%)	0.03	0.04	0.04	0.02	0.01
10-12 years (%)	0.35	0.50	0.40	0.33	0.15
13-16 years (%)	0.62	0.46	0.56	0.65	0.84
Wealth Index	0.46 (0.19)	0.21 (0.07)	0.38 (0.03)	0.52 (0.04)	0.72 (0.08)
Cognitive Development Assessment score	300.00 (49.99)	288.44 (45.20)	299.59 (48.58)	292.52 (49.74)	320.83 (50.51)
Math test z score (round 3)	300.01 (14.99)	294.15 (15.15)	299.49 (15.35)	300.58 (13.93)	305.76 (13.12)
Math test percentage (round 4)	44.00 (22.77)	35.56 (21.17)	41.09 (22.16)	44.70 (21.91)	54.31 (21.75)
Peabody Picture Vocabulary Test score	27.45 (21.12)	22.98 (18.88)	24.17 (16.20)	24.02 (16.62)	38.75 (26.97)
Female	1.47 (0.50)	1.42 (0.50)	1.50 (0.50)	1.46 (0.50)	1.48 (0.50)
Mother’s education	4.55 (6.98)	2.18 (6.28)	3.76 (7.10)	4.18 (8.15)	8.11 (4.43)
Height-for-age z score	-1.64 (1.11)	-2.00 (0.96)	-1.73 (1.29)	-1.62 (1.00)	-1.22 (1.03)
Age (months)	64.27 (3.89)	64.00 (3.85)	64.48 (3.83)	64.56 (3.81)	64.05 (4.02)

Educational aspirations are taken from round 2, the first time parents were surveyed about aspirations for their children. Answers to the question “*Ideally what level of formal education would you like the YL child to complete?*” were coded on an ordinal scale consisting of grade levels and various levels of tertiary education. A very small number of answers for which the years of education were not available and could not be assigned on the ordinal scale were excluded from analysis, such as ‘adult literacy’ and ‘religious education’.

The descriptive statistics for all the variables used are reported in Table 2, including the overall mean and the mean by each wealth quartile, where Q1 is the bottom quartile and Q4 is the top quartile.

4.3 Estimation concerns

As mentioned above, educational aspirations such as adult literacy and religious education were excluded from the analysis. This is not problematic for analysis and inference because it applies to a relatively small proportion of the sample, only 17 households. Similarly, attrition is small in absolute terms (2.6% for the younger cohort in India) and should not affect inference.

On the contrary, missing or inconsistent data for key variables is a potential issue.

- There are 78 parents (4% of sample) who did not answer the question on aspirations and these responses were coded as either Not Applicable or Not Known. Missing aspirations in this regard is problematic because it is likely that parents who could not answer this question did not fully understand the concept of aspirations or had not given it much thought. The reasons for missing values in aspirations are very likely to affect learning outcomes for children in these households and by excluding these observations from analysis, the effect of aspirations would be biased.
- In addition, missing data for parents who do not reside with the child is problematic because the reasons for being absent are likely to be correlated with parents’ aspirations and the child’s cognitive development. As part of the robustness checks, I restrict my sample to only include households where both parents are present,

although this affects a small number of households – round 2 has 44 households where the child’s father does not live in the household and 18 where mothers do not.

- Maternal education, which is used as a control in the main specification, is inconsistently measured across rounds, and the number of missing observations increases over the rounds. Measurement error in maternal education will lead to attenuation bias in estimation, causing the OLS estimates to be biased downwards. As maternal education has a large number of missing values in the following rounds, it is not possible to use values from the following rounds. Hence, I use maternal education as reported in round 2 and acknowledge the presence of attenuation bias.

To control for simultaneity between aspirations and children’s test outcomes, I use the child’s PPVT score at age 5 in my estimation. As discussed earlier, PPVT scores are highly correlated with measures of intelligence and ability. Thus, adding this to the specification allows me to partially control for the unobserved ability that causes simultaneity bias. Moreover, 99% of the children in the younger cohort are below the primary school enrolment age at round 2, implying that parents are unable to observe ability through formal school assessments. This further mitigates the extent to which child ability could be feeding back and impacting parents’ aspirations.

The issues mentioned above could potentially bias the estimates, but the availability of data limits the full resolution of these issues. In an ideal setting, I would have corrected for these issues in the data collection stage by noting years of education for all categories of educational aspirations and actual attainment such that those with adult literacy or religious education would not be excluded from analysis. Having parents’ aspirations in round 1 when children were 1-2 years old would have prevented children’s ability from feeding into parents’ aspirations at all. Additional information on households, for example the reason for parents being absent from the household, surveying both parents for education levels and verifying with previous round answers, would also be beneficial in minimising missing information and measurement error.

5 Results and Discussion

5.1 Schooling Outcomes

5.1.1 Short Term

In this section, I discuss the outcomes using an OLS regression of child's test scores and private school enrolment on deviation from average aspiration in subgroup. This paper tests 6 hypotheses which relate to the children's test scores and school choice at different ages. As pointed out by Dercon and Singh (2013), the Young Lives data is highly clustered and so I cluster the standard errors by the 82 wealth and sentinel site subgroups in all the specifications. The results for outcomes measured at age 5 of the child are summarised in Table 3.

As the first step, I regress parents' aspiration gap on the test scores alone and find significant effects on test performance at the age of 5. This suggests that aspiring to one additional schooling year for their children leads to an increase in CDA test scores of 1.26 points. However, aspirations are potentially endogenous here because parents could be determining their aspirations on the observed ability of their child at that age, leading to simultaneity bias. Adding a control for PPVT scores as a proxy for innate ability, the impact of aspirations reduces by more than half. After controlling for a range of household and child characteristics, the coefficient on the main variable remains significant, implying the important role aspirations play in affecting learning outcomes for children.

Specification (5) in Table 3 reports the impact of aspirations on likely enrolment in public versus private schools. Findings suggest that higher aspirations can have a significant positive effect on choosing private schools over government schools. The coefficient is much higher than ability as parents may not be able to accurately observe ability before primary school enrolment. It is also noteworthy that the coefficient on aspirations is as high as mother's education which is traditionally considered as an important predictor in the literature. Given that prior evidence supports a performance-gap in private versus

government schools, early life aspirations can play a key role in children’s education and occupational outcomes through the choice of school type. Thus, an increase in aspirations not only improves learning outcomes by increasing motivation, but also by parents investing in private school enrolment which has traditionally been thought of as an opportunity to improve future outcomes.

Table 3: Impact on round 2 outcomes

	(1) CDA test score at age 5	(2) CDA test score at age 5	(3) CDA test score at age 5	(4) CDA test score at age 5	(5) Likely to attend Private school	(6) Likely to attend Private school
Aspiration deviation	1.264*** (0.328)	0.572** (0.287)	0.566** (0.284)	0.566** (0.284)	0.012*** (0.002)	0.012*** (0.003)
Low deviation				2.144 (2.337)		0.132* (0.067)
PPVT (ability)		1.153*** (0.067)	1.032*** (0.066)	1.025*** (0.069)	0.004*** (0.001)	0.004*** (0.001)
Female			1.707 (2.037)	1.735 (2.028)	-0.038* (0.021)	-0.036* (0.021)
Mother’s education			0.652*** (0.212)	0.647*** (0.211)	0.012*** (0.004)	0.012*** (0.004)
Height-for-age score			3.857*** (1.159)	3.804*** (1.143)	0.069*** (0.068)	0.066*** (0.017)
Age			1.417*** (0.316)	1.422*** (0.320)		
Constant	300.167*** (2.952)	269.201*** (2.683)	182.328*** (20.574)	181.336*** (20.980)	0.757** (0.332)	0.698** (0.296)
Observation	1,776	1,708	1,705	1,705	1,756	1,756
R squared	0.007	0.259	0.286	0.287	0.147	0.163

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

I then turn to disentangle the extent of the impact at different levels of the aspiration deviations. In an ideal setting, the sample size would be sufficient to divide the data into multiple groups for measuring the heterogeneous impact of aspirations at different levels of the deviation. However, the dataset here is inadequate for such analysis and thus I define a dummy for whether parents’ aspiration lie close to or far away from the mean. As part of the

robustness checks, I divide the sample into four groups and test whether the non-linear effects hold for the four groups.

Here, specification (4) in Table 3 introduces a dummy for parents whose aspirations lie close to the average, regardless of whether they are above or below. By dividing the sample into two groups based on how far the deviation is from the average of the subgroup, I can ascertain whether empirical analysis supports the hypothesis that 'more is better' or the contrary argument that aspiration gaps can have heterogeneous effects on individuals' behaviour. I take two years below and above the average as the cut-off because the average aspirations for the sample is about 13 years, which is the first year of tertiary education in India. Having two more schooling years over that average, or less, are reflective of important cut-offs in the education system which have a significant bearing on earnings and occupations – completing two more years would earn a tertiary degree and having two years lesser means an incomplete secondary education. The coefficient on Low Deviation in Table 3 reflects the additional impact on households with deviations between two years above and below the mean, measuring the combined effect of both positive or negative aspirations close to the mean.

The results from specifications (4) and (6) suggest that the aspiration gap can have varying effects on educational outcomes for children. In terms of learning outcomes, the coefficient on low deviations is positive but insignificant, implying that, on average, being closer to the mean does not affect test scores at a young age. This seems to support the hypothesis that more is better and higher aspirations can positively impact learning outcomes regardless of the level of the deviation. Shifting focus to school choice, those with aspirations closer to the mean are much more likely to send their children to a private school once they are the appropriate age. The results for the group closer to the mean are much larger compared to those who have aspirations further away, with the former having a higher likelihood of being enrolled in private school by almost 13% (compared to 68% for the latter). A higher willingness to increase the human capital investment for their children by choosing a private school is in line with and reflects having higher aspirations for their children's future.

5.1.2 Medium Term

As the mathematics tests conducted at age 8 and 12 for the younger cohort were different than the one conducted at age 5, I will split the analysis for the rounds to aid in inference of the coefficients. Considering the outcomes in round 3 and 4 helps to overcome the issue of reverse causality as outcomes are considered at $t+1$ whereas all the right-hand side variables are lagged at time t . The results are summarised in Table 4.

Table 4: Impact on round 3 and 4 outcomes

	(1) Math score at age 8	(2) Math score at age 8	(3) Math score at age 8	(4) Private School at age 8	(5) Math test % at age 12	(6) Math test % at age 12	(7) Math test % at age 12	(8) Private School at age 12
Aspiration deviation	0.509*** (0.092)	0.427*** (0.089)	0.392*** (0.085)	0.015*** (0.003)	0.986*** (0.142)	0.821*** (0.134)	0.804*** (0.137)	0.016*** (0.003)
Low deviation			1.217 (1.526)	0.124** (0.058)			3.999** (1.979)	0.122** (0.057)
PPVT (ability)		0.175*** (0.025)	0.107*** (0.024)	0.003*** (0.001)		0.272*** (0.041)	0.192 (0.036)	0.004*** (0.001)
Female			0.201 (0.649)	-.107*** (0.024)			1.589 (1.052)	-0.101*** (0.027)
Mother's education			0.386*** (0.089)	0.011*** (0.004)			0.557*** (0.138)	0.013** (0.005)
Height-for-age score			2.516*** (0.492)	0.062*** (0.015)			2.640*** (0.695)	0.046*** (0.017)
Age			0.357*** (0.115)				-0.104 (0.174)	
Constant	300.071*** (1.114)	295.271*** (1.278)	275.869*** (7.471)	0.528*** (0.058)	44.083*** (1.532)	36.559*** (1.662)	43.557*** (11.517)	0.381*** (0.057)
Observation	1,831	1,751	1,748	1,735	1,786	1,709	1,706	1,211
R squared	0.014	0.077	0.152	0.136	0.023	0.087	0.143	0.165

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Considering children's scores at ages 8 and 12, early parental aspirations continue to be a significant predictor for outcomes at later stages. However, the scores at ages 8 and 12 are provided on different scales in the data and thus are not directly comparable across rounds. Even so, it is evident that parents' aspirations at pre-primary level can predict test scores into primary and secondary levels. It is telling that aspirations are a better predictor of

learning outcomes in the medium-term as compared to innate ability or maternal education, the two other channels prominently considered in the literature.

Similar results are found on enrolment in private school – aspirations continue to be significant for enrolment at mid-primary and secondary levels and seem to predict private school enrolment slightly better than at pre-primary levels. These findings further support the argument that early changes in life trajectories can have a significant impact on not just the immediate outcomes, but also the medium-term education outcomes. By raising performance in initial years of school, children with higher parents' aspirations continue to perform better over the medium-term. Further research when children are older can aid in establishing the link with long-term educational outcomes as well as occupational choices.

Although the coefficient on the dummy for low deviation is insignificant at age 8, at age 12 this coefficient becomes highly significant. The effect size of having similar aspirations as those around you is a 4% increase in math test scores and a 12% increase in the likelihood of attending private school compared to those whose aspirations lie severely below or above the average. Contrary to the results of the short-term presented in Table 3, these non-linear medium-term effects of aspirations seem to be in line with Ray's theory that very high gaps lead to an adverse impact on behaviour and outcomes. In other words, aspiration gaps which are high but realistically achievable can have the greatest impact on future-oriented behaviour. For households who have a small positive gap, higher motivation and increased effort drive these results. On the other hand, higher results for households who have a small negative gap are driven by the fact that they are able to observe other households around them with similar living standards; having the average parent in their aspiration window aspire for higher education for their child has a positive impact on motivation for these children by making the higher goals seem not too out of reach. Positive peer effects could alternatively also explain the higher coefficient on this segment because the higher aspirations are in a realistic bandwidth above their own. In fact, it is interesting to note that these results suggest that it may be better to have slightly lower aspirations than those which are extremely high or to seek goals completely out of reach.

Alternatively, it is also possible that parents who record the highest aspirations could be rather uninvolved or disinterested in their children's education and human capital formation. When asked about their educational aspirations for their children, they are likely to report the highest grade on the scale. This would also explain the slightly lower effect for this group.

These results form a major finding of this study by corroborating the theory of aspiration gaps presented in recent research. Combining the analysis of the short- and medium-term, although Table 3 seems to imply that the level of the gap is insignificant as higher aspirations impact outcomes positively at all levels, evidence from Table 4 suggests that in the medium-term, having aspirations similar to those around you can significantly impact both learning outcomes and school choice.

5.2 Robustness Checks

Section 5.1.1 outlined the effects of varying levels of aspiration deviations on test scores. Since the average aspiration for the sample is 13 years, the cut-off in the non-linear analysis was taken as two years above and below the mean in each subgroup. I test this further in two ways to measure effects depending on the direction of the deviation and ensure robustness to varying cut-off points. Finally, I also conduct sub-sample analysis by excluding households where either of the parent is absent to address concerns outlined in section 4.3.

5.2.1 Decomposition of the Non-linear Impacts

Table 5 shows the results from the non-linear analysis by dividing the sample into four distinct groups based on the level and direction of the deviation. Dummy variables are created for each of the four groups and added to the main specification in section 3.2 to measure how impact changes through the range of deviations. Aspirations below the average by more than two years is taken as D1 and between two years below and the average as D2. Similarly, positive aspirations from the average till two years above the average are grouped

under D3 and deviations above that range are labelled D4. The coefficient on aspiration deviation measures the mean impact on D4, the group with the highest aspiration in each of the subgroups. Even though the sample is divided this way to explore non-linearities, the sample size in each of the four groups reduces significantly and is imbalanced, thereby limiting the power of the analysis.

Table 5: Impact on outcomes at varying levels of aspirations

	(1) CDA test score at age 5	(2) Math test score at age 8	(3) Math test % at age 12	(4) Private School at age 5	(5) Private School at age 8	(6) Private School at age 12
Aspiration deviation	0.623 (0.741)	-0.242 (0.297)	-0.453 (0.433)	-0.026* (0.014)	-0.027* (0.014)	-0.018 (0.014)
Aspiration deviation (D1)	-0.230 (1.163)	1.046** (0.525)	2.045*** (0.718)	0.059** (0.023)	0.067*** (0.022)	0.053** (0.024)
Aspiration deviation (D2)	0.204 (3.765)	2.856** (1.355)	4.517** (1.954)	0.163*** (.051)	0.172*** (0.051)	0.143*** (0.052)
Aspiration deviation (D3)	3.500* (2.104)	0.329 (1.876)	2.598 (2.176)	0.127** (0.061)	0.102** (0.048)	0.120** (0.048)
PPVT (ability)	1.014*** (0.071)	0.103*** (0.025)	0.180*** (0.038)	0.004*** (0.001)	0.003*** (0.001)	0.003*** (0.001)
Female	1.636 (2.006)	0.137 (0.649)	1.426 (1.054)	-0.042** (0.021)	-0.113*** (0.023)	-0.105*** (0.026)
Mother's education	0.629*** (0.207)	0.364*** (0.084)	0.512*** (0.127)	0.010*** (0.004)	0.009** (0.004)	0.011** (0.004)
Height-for-age score	3.764*** (1.137)	2.493*** (0.498)	2.568*** (0.699)	0.063*** (0.017)	0.060*** (0.015)	0.044*** (0.016)
Age	1.428*** (0.319)	0.364*** (0.113)	-0.084 (0.171)			
Constant	181.126*** (20.840)	277.752*** (7.563)	47.071*** (11.667)	0.799*** (0.291)	0.687*** (0.060)	0.519*** (0.067)
Observation	1,705	1,748	1,706	1,756	1,735	1,211
R squared	0.287	0.155	0.148	0.184	0.154	0.183

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Although the coefficients on test scores are not significant for some groups in specifications (1)-(3), the value of the coefficients are suggestive of Ray's hypothesis that varying levels of aspirations can have differing effects on children's test scores especially in the medium-term.

Households where parents' aspirations are slightly below the average seem to be more motivated towards higher goals, reflected in the higher coefficient on D2 compared to D4 in all 3 rounds. The coefficient on D3 is significant in the first round but ceases to be so in the following rounds. This supports the findings from section 5.1, implying that most of the significant effects on the low deviation dummy were driven by those having slightly lower aspirations than the average. On the high deviations reflected in D1 and D4, the lower impact is driven by the muted effects on those with extremely high aspirations although insignificant, whereas those with extremely negative aspirations seem to be performing slightly better than this group.

Overall, early aspirations seem to be predict learning outcomes in primary and early secondary school, but the effects differ than the short-term results in (1). A possible explanation is that aspirations are likely to dynamically evolve over time, especially since by rounds 3 and 4 children are enrolled in formal education and parents are able to observe their achievement over time. It is possible that by the time children are aged 8 and 12, parents' aspiration deviations are not perfectly reflective of their current aspirations and the averages of those who lie in their aspiration window. For example, households that lay in D3 in round 2 could have now moved to D4 if parents observed high test scores in the initial schooling years and adjusted aspirations upwards.

The differential impact of aspirations on school choice is similar to the results on test scores. The lowest likelihood of being in a private school is for households who have extremely high aspirations, although the results are slightly significant only at ages 5 and 8. The likelihood then increases slightly for children who fall under D1 (very low aspirations); jumps by 10-12% for children in D3; and is highest for children in D2 (14-17%). Supporting the main analysis in section 5.1, these results corroborate the findings of test scores that the highest impact is being driven by households who can observe others with aspirations and outcomes realistically above their own, motivating them to work harder, aim higher and increase investment in education through private school enrolment.

Results in Table 5, although indicative of heterogeneous impacts of aspirations, are inconclusive mainly because they are underpowered. The sample size here is unable to support the segregation of data into separate groups to test whether effects differ by the level of deviation. Findings indicate that raising aspirations will raise test scores overall, but policy interventions targeting groups having either very high or very low aspirations through relevant role models and exposing them to realistic outcomes could yield the highest improvement in learning outcomes. Nevertheless, further research is needed to verify these findings as there is limited power within the four groups to yield statistically significant results.

5.2.2 Sensitivity to Cut-off Points

Secondly, I test the same specification when the cut-off is either one year or three years. With a one year cut-off, results are higher and more significant than Tables 3 and 4 – the short-term impact on school choice is even higher and on test scores continues to be insignificant; the medium-term impact on both test scores and school choice increases and is significant throughout. As the cut-off is increased to three years, the coefficients reduce on all outcomes and are similar in significance to the main analysis in section 5.1. By moving the cut-off close to the mean, the impact on test scores and school choice increases, reinforcing the theory that aspirations can indeed have varying effects on schooling outcomes. However, these findings oppose one aspect of Ray's argument which states that very low aspiration gaps are detrimental and can have the same effect as having very high gaps.

5.2.3 Accounting for Missing Data

As mentioned in section 4.3, issues of missing data due to parents' absence is a potential issue for inference. I test for this by restricting my sample to only those households where both parents are present. For test scores, results for all variables are similar in size and significance. Only the coefficient on aspirations for test scores in round 2 reduces in size and loses significance, although the coefficients on the following rounds are consistent with the

unrestricted estimation. The results for private school enrolment are also similar to the unrestricted sample.

5.3 Limitations

This paper provides compelling evidence that parental aspirations significantly impact learning outcomes and school choice for children in both the short- and medium-term. Nevertheless, limitations for the analysis exist either due to data availability or study design. In addition to estimation concerns discussed in section 4.3, one consideration pertains to the main outcome variable, the quantitative test scores. Different tests were used in each of the rounds to measure quantitative ability, and corrected scores were further reported in varying formats – z scores on different tests in rounds 2 and 3, and percentages in round 4. To robustly identify the role of aspirations over the years, having the outcome variable measured using the same instrument and scales is crucial.

In addition, due to the sample size and the sentinel site sampling methodology followed in Young Lives, some communities do not have an adequate number of households. This paper defines physical proximity based on sentinel sites primarily due to this limitation. Subgroups defined on the basis of community did not have adequate sample size in each of the clusters and using sentinel sites instead increases power. However, the limited sample size and missing information lead to low power in determining whether aspiration levels have heterogeneous impacts on outcomes because of the division into multiple groups. Finally, this paper focuses on the impact of aspirations on educational outcomes in the short- and medium-term, especially the two key aspects of learning and school choice. In order to establish the long-term effect, it is imperative to follow the outcomes in the following rounds of the Young Lives study and consider education and occupational outcomes later in life.

6 Conclusion

This paper has focused on evaluating the role of parental aspirations and associated gaps on two educational outcomes, quantitative test scores and school choice. Literature studying intergenerational mobility through the transmission of aspirations, and how the latter can play an essential role in shaping children's educational outcomes beyond attendance and attainment, remains rather limited. This paper presents and tests an influential theory that aspiration gaps, rather than the pure aspiration levels, determine and influence future-oriented behaviour. It employs the notion of an aspiration window to motivate the study design and analysis at varying levels of parents' aspirations.

Using the Young Lives data from one of the largest states in India, this study finds that early-life parental aspirations are an important predictor of quantitative achievement and school choice in both the short- and medium-term. This is important from a policymaking perspective as a large part of the literature has focused on parental education shaping children's outcomes and has neglected aspirations to a large extent. Changing aspirations may not only be more time- and cost-effective but may have an immediate yet similar impact as maternal education.

Results also show that households clustered around the mean have a larger positive impact on scores and likelihood of being in a private school at age 12. The variation of the effect depending on the magnitude of the deviation from the mean suggests that aspirations may have a non-linear effect on outcomes and validates the theory on aspiration gaps. However, data limitations do not allow the study to delve deeper into the differential impact at varying deviation levels or beyond secondary school education. Further research in both early aspirations and later educational and occupational outcomes is required to offer conclusive evidence on the (non-linear) impact of aspirations.

7 References

- Appadurai, A. 2004, "The Capacity to Aspire" in *Culture and Public Action*, eds. V. Rao & M. Walton, Stanford University Press, Stanford, CA, pp. 59-84.
- Bandura, A. 1997, *Self-efficacy: The exercise of control*, Worth Publishers, New York, NY, US.
- Bandura, A. 1991, "Social cognitive theory of self-regulation", *Organizational Behavior and Human Decision Processes*, vol. 50, no. 2, pp. 248-287.
- Bandura, A., Barbaranelli, C., Caprara, G.V. & Pastorelli, C. 2001, "Self-Efficacy Beliefs as Shapers of Children's Aspirations and Career Trajectories", *Child development*, vol. 72, no. 1, pp. 187-206.
- Beamen, L., Duflo, E., Pande, R. & Topalova, P. 2012, "Female Leadership Raises Aspirations and Educational Attainment for Girls: A Policy Experiment in India", *Science*, vol. 335, no. 6068, pp. 582-586.
- Bernard, T., Dercon, S., Orkin, K. & Taffesse, A. 2014, *The Future in Mind: Aspirations and Forward-Looking Behaviour in Rural Ethiopia*, Centre for the Study of African Economies, University of Oxford.
- Bettinger, E.P. 2012, "Paying to Learn: The Effect of Financial Incentives on Elementary School Test Scores", *The Review of Economics and Statistics*, vol. 94, no. 3, pp. 686-698.
- Campbell, J. 1998, "Book Review: Peabody Picture Vocabulary Test", *Journal of Psychoeducational Assessment*, vol. 16, no. 4, pp. 334-338.
- Campbell, J., Bell, S.K. & Keith, L.K. 2001, "Concurrent Validity of the Peabody Picture Vocabulary Test-Third Edition As an Intelligence and Achievement Screener for Low SES African American Children", *Assessment*, vol. 8, no. 1, pp. 85-94.
- Claro, S., Paunesku, D. & Dweck, C.S. 2016, "Growth mindset tempers the effects of poverty on academic achievement", *Proceedings of the National Academy of Sciences*, vol. 113, no. 31, pp. 8664-8668.
- Cohen, G.L., Garcia, J., Purdie-Vaughns, V., Apfel, N. & Brzustoski, P. 2009, "Recursive processes in self-affirmation: Intervening to close the minority achievement gap", *Science*, vol. 324, no. 5925, pp. 400-403.
- Dalton, P.S., Ghosal, S. & Mani, A. 2016, "Poverty and aspirations failure", *The Economic Journal*, vol. 126, no. 590, pp. 165-188.
- Dercon, S. & Outes-Leon, I. 2008, *Survey Attrition and Attrition Bias in Young Lives*, Young Lives.

- Dercon, S. & Serneels, P. 2014, *Aspirations, Poverty and Education*, Young Lives.
- Dercon, S. & Singh, A. 2013, "From Nutrition to Aspirations and Self-Efficacy: Gender Bias over Time among Children in Four Countries", *World Development*, vol. 45, pp. 31-50.
- Dreze, J. & Sen, A. 2002, *India: Development and Participation*, 2nd edn, Oxford University Press.
- Dunn, L.M. & Dunn, L.M. 1997, *Peabody Picture Vocabulary Test, Third Edition*, American Guidance Service, Circle Pines, MN.
- Favara, M. 2016, *Aspirations and Educational Attainments of Ethiopian Boys and Girls*, Young Lives.
- Goux, D., Gurgand, M. & Maurin, E. 2014, "Adjusting your dreams? The effect of school and peers on dropout behaviour", *IZA Discussion Paper No. 7948*, .
- Goyal, S. & Pandey, P. 2012, "How Do Government and Private Schools Differ?", *Economic and Political Weekly*, vol. 47, no. 22, pp. 67-76.
- Gray, S., Plante, E., Vance, R. & Henrichsen, M. 1999, "The Diagnostic Accuracy of Four Vocabulary Tests Administered to Preschool-Age Children", *Language, Speech, and Hearing Services in Schools*, vol. 30, no. 2, pp. 196-206.
- Hanushek, E.A. 2002, "Chapter 30 Publicly provided education" in *Handbook of Public Economics*, Elsevier, pp. 2045-2141.
- Hanushek, E.A., Schwerdt, G., Wiederhold, S. & Woessmann, L. 2015, "Returns to skills around the world: Evidence from PIAAC", *European Economic Review*, vol. 73, no. C, pp. 103-130.
- Heckman, J.J. 2008, "Schools, Skills, And Synapses", *Economic Inquiry*, vol. 46, no. 3, pp. 289-324.
- Kearney, M.S. & Levine, P.B. 2016, "Income Inequality, Social Mobility, and the Decision to Drop Out of High School", *Brookings Papers on Economic Activity*, vol. 2016, no. 1, pp. 333-396.
- Kumra, N. 2008, *An assessment of the Young Lives sampling approach in Andhra Pradesh, India*.
- Mani, A., Mullainathan, S., Shafir, E. & Zhao, J. 2013, "Poverty Impedes Cognitive Function", *Science*, vol. 341, no. 6149, pp. 976-980.
- Nguyen, T. 2008, "Information, role models and perceived returns to education: Experimental evidence from Madagascar", *Unpublished Manuscript*.

- Ray, D. 2006, "Aspirations, Poverty, and Economic Change" in *Understanding poverty*, eds. A. Banerjee, R. Benabou & D. Mookherjee, Oxford University Press, New York, NY, pp. 409-422.
- Riley, E. 2017, *Increasing students' aspirations: the impact of Queen of Katwe on students' educational attainment*, Centre for the Study of African Economies, University of Oxford.
- Selten, R., Pittnauer, S. & Hohnisch, M. 2012, "Dealing with dynamic decision problems when knowledge of the environment is limited: an approach based on goal systems", *Journal of Behavioral Decision Making*, vol. 25, no. 5, pp. 443-457.
- Tooley, J. 2005, *Reclaiming education*, Cassell, London and New York.
- Tooley, J., Dixon, P. & Gomathi, S.V. 2007, "Private schools and the millennium development goal of universal primary education: a census and comparative survey in Hyderabad, India", *Oxford Review of Education*, vol. 33, no. 5, pp. 539-560.
- Young Lives 2015, *Sampling and attrition* [Homepage of Young Lives], [Online]. Available: <https://www.younglives.org.uk/content/sampling-and-attrition>.