



6-3-2009

Aspirations and Schooling: Analysis of the formation and intra-household impact of educational aspirations in rural China

Joyce Meng

University of Oxford, joycemeng@gmail.com

Follow this and additional works at: http://repository.upenn.edu/gansu_dissertations

Meng, Joyce, "Aspirations and Schooling: Analysis of the formation and intra-household impact of educational aspirations in rural China" (2009). *Gansu Survey of Children and Families Dissertations*. 3.
http://repository.upenn.edu/gansu_dissertations/3

Joyce Meng, Parent and Child Aspirations and Continuation of Schooling, dissertation, MSc in Economics for Development, University of Oxford, 2009.

This paper is posted at ScholarlyCommons. http://repository.upenn.edu/gansu_dissertations/3
For more information, please contact libraryrepository@pobox.upenn.edu.

Aspirations and Schooling: Analysis of the formation and intra-household impact of educational aspirations in rural China

Abstract

Conventional household decision-making models exclude children as participatory agents with bargaining power, even though as the child ages and transitions into adulthood, he or she exerts more control over many decisions affecting his or her life, even in tradition-bound societies. In decisions regarding school enrollment and continuation, the preferences of young people remain an important, yet under-explored factor. Especially in a developing country context, few economics studies have attempted to explore the connection between extrinsic socioeconomic variables and the formation of intrinsic educational aspirations, with the latter influencing educational outcomes. This study is the first to investigate whose aspirations matter in education within the household, and how factors such as income, wealth, and child age affect the relative importance of these aspirations, a proxy for decision-making power.

Using longitudinal survey data from rural China, this paper first explores the determinants of parent and child aspirations for schooling, and then investigates the different factors that affect the relative importance attributed to parent and child schooling preferences on school continuation. The five main results of the study are: (1) Aspirations for children are lower than parental aspirations, and correspond more strongly to measures of ability, while gender and wealth were not significant. In contrast, wealth is a significant positive predictor for mother and father aspirations, and mothers have lower aspirations for female than male children. (2) Higher children's aspirations are significant predictors of staying in school, even after controlling for ability, socioeconomic, and demographic variables, and are more important than parental aspirations. (3) Mother's aspirations are strongly correlated with children's aspirations, but do not influence school continuation. In contrast, father's aspirations do not predict children's aspirations, but significantly influence school continuation, especially of boys. (4) Age increases the weight on father and child aspirations, suggesting that intrinsic motivation matters more at higher levels of education. (5) Income increases the weight on father aspirations, but decreases that of the child. These results support the inclusion of children's preferences in household decision making models and human capital investment models, and provide insights into the intrinsic influences that affect intra-household decisions.

Comments

Joyce Meng, Parent and Child Aspirations and Continuation of Schooling, dissertation, MSc in Economics for Development, University of Oxford, 2009.

EXAMINER'S COPY

Aspirations and Schooling

Analysis of the formation and intra-household
impact of educational aspirations in rural China

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

6/3/2009

Candidate Number: **443756**

Word Count: 9,598

Table of Contents

Abstract:.....	3
Section 1. Introduction	4
1.1 Youth Transitions and Agency.....	4
1.2 Aspirations and Poverty	4
1.3 Research Question	5
1.4 Data:.....	5
1.5 Education in China	5
Section 2. Theory and Estimation Methods.....	6
2.1 First Stage- Determinants of Aspirations	6
2.2 Second Stage - Aspirations Weight in Household Decision-Making of Schooling	9
Section 3. Econometric Results.....	14
3.1 Descriptive Statistics:	14
3.3 Discussion of Econometric Results: Determinants of Aspirations:	16
3.4 Discussion of Econometric Results: Household Decision-Making in Enrollment:	20
Section 4. Conclusions	24
References	27

Abstract:

Conventional household decision-making models exclude children as participatory agents with bargaining power, even though as the child ages and transitions into adulthood, he or she exerts more control over many decisions affecting his or her life, even in tradition-bound societies. In decisions regarding school enrollment and continuation, the preferences of young people remain an important, yet under-explored factor. Especially in a developing country context, few economics studies have attempted to explore the connection between extrinsic socioeconomic variables and the formation of intrinsic educational aspirations, with the latter influencing educational outcomes. This study is the first to investigate whose aspirations matter in education within the household, and how factors such as income, wealth, and child age affect the relative importance of these aspirations, a proxy for decision-making power.

Using longitudinal survey data from rural China, this paper first explores the determinants of parent and child aspirations for schooling, and then investigates the different factors that affect the relative importance attributed to parent and child schooling preferences on school continuation. The five main results of the study are: (1) Aspirations for children are lower than parental aspirations, and correspond more strongly to measures of ability, while gender and wealth were not significant. In contrast, wealth is a significant positive predictor for mother and father aspirations, and mothers have lower aspirations for female than male children. (2) Higher children's aspirations are significant predictors of staying in school, even after controlling for ability, socioeconomic, and demographic variables, and are more important than parental aspirations. (3) Mother's aspirations are strongly correlated with children's aspirations, but do not influence school continuation. In contrast, father's aspirations do not predict children's aspirations, but significantly influence school continuation, especially of boys. (4) Age increases the weight on father and child aspirations, suggesting that intrinsic motivation matters more at higher levels of education. (5) Income increases the weight on father aspirations, but decreases that of the child. These results support the inclusion of children's preferences in household decision making models and human capital investment models, and provide insights into the intrinsic influences that affect intra-household decisions.

Section 1. Introduction

1.1 Youth Transitions and Agency

The 2007 World Development Report on Youth Transitions highlighted the need to better understand the role of young people in the decision-making of households. A 2005-2006 survey conducted in different developing countries asked young people aged 15-24 who they felt had the most important influence in important transitions decisions, such as education, marriage, and work. Despite differences across countries, at least half of the youth surveyed felt that they had the most influence in the majority of cases (WDR, 2007). Similarly, a 2001-2002 survey of adolescents and youth in Pakistan by the Population Council found that 75% of male youth and 50% of female youth indicated that they played a role in the decision to leave school, hence illuminating the importance of adolescence and youth agency (Population Council, 2002).

The vast majority of household decision making literature, however, neglects children as decision-making agents. Empirical examination of intra-household allocation of education expenditure (Himaz, 2008; Yueh, 2001), time (Ejrnæs and Portner, 2004), and school enrollment (Emerson and Souza, 2002; Kruger, et al 2007) concentrate mainly on the factors influencing parental decisions and bargaining, such as child gender, birth order, differences in returns to schooling, and mother's empowerment and education, among other factors. Similarly, the three broad approaches to modeling determinants of schooling - fertility decision, human capital investment, and demographic models - do not explicitly incorporate children's preferences or account for the transition to adulthood. Fertility decision models, based on household production functions to identify which households are more likely to choose to educate their children (Becker and Lewis, 1973), generally assume unitary decision-making and treat children in aggregate (Hossain, 1990), which has been challenged empirically and theoretically. Human capital investment models, in which parents maximize lifetime utility subject to an inter-temporal budget constraint and child's human capital accumulation function (Sawada and Lokshin, 1999; Jacoby and Skoufias, 1997), likewise have the shortcoming of assuming that the individual child remains a dormant agent in the first period, dependent on the schooling decisions of the parents acting unitarily. Finally, although demographic models provide useful empirical insight into the explanatory factors contributing to schooling, the vast majority of studies have focused on the resource-dilution effect (Zajonc et al, 1979) or on birth order and sibling competition (Ota and Moffatt, 2002), and do not explicitly account for preferences of household members and their aspirations. In light of Heckman and Li's (2000) findings of heterogeneous returns to education in China among individuals through semi-parametric methods, disaggregating the schooling decision to parent and child aspirations captures a dimension often missed in conventional models. Since individuals sort into different schooling levels on the basis of comparative advantage, aspirations may capture heterogeneous capabilities and expected payoffs to education.

1.2 Aspirations and Poverty

Work by social scientists such as Appadurai (2004) on poverty traps and social exclusion indicate that extrinsic circumstances of individuals impact on both intrinsic motivation and choices. Although the issue of aspirations creation and failure has been examined greatly in psychology and sociology, economists have only recently started analysis on the subject, perhaps as a reaction to the failure of many education policy interventions focused solely on extrinsic factors.

Investigating the determinants of aspirations has particular policy salience, especially in light of new education interventions aiming to change attitudes and behavior in order to improve outcomes. An inter-disciplinary literature review reveals important linkages between the formation of aspirations, poverty, and educational outcomes that deserve further exploration. Mediation models and empirical sociological studies in OECD countries have shown that aspirations affect a child's social and academic capital, which in turn impacts educational achievements (Majoribanks, 1998; Sewell and Shah, 1968; Frome and Eccles, 1998; Cabinet Office, 2008). Notably, an impact evaluation of Akanksha, an NGO offering non-formal education to children in slums of Bombay to raise self-esteem, confidence, and aspirations found that Akanksha alumni differed substantially from their peers in the dimensions of occupational success, self-esteem, aspirations, and agency, and outperformed their peers in various education and employment indicators (Krishnan and Krutikov, 2008).

1.3 Research Question

By integrating parent and child educational aspirations survey data with a standard model for determinants of schooling, this paper explores the dimensions of youth transitions and agency in school enrollment decisions. Using data from the Gansu Survey of Children and Families (GSCF), this paper first examines the socioeconomic and family background determinants of mother and father aspirations for the child, as well as the child's self aspirations in 2004. Next, using enrollment in 2007 as an outcome variable, the paper investigates whose aspirations matter in education within the household, and how factors such as income, wealth, and child age affect the relative importance of these aspirations.

1.4 Data:

The GSCF is a longitudinal, multi-level study of rural children's welfare outcomes, including academic achievement, educational attitudes, health, behaviors and experiences, and psycho-social development. Consisting of extensive and linkable questionnaires administered to the child, the parents, teachers, school principals, and community leaders, the first wave of the survey conducted in July 2000 took a random sampling of 2000 children aged 9 to 12 in 20 rural counties. In June 2004, the same children were surveyed again, with additional information about the oldest younger sibling and father. In June 2007, a household survey was conducted, which followed-up on the academic experiences of the children.

The integrated approach of the GSCF data provides multi-faceted insights into the community, family, and school environment affecting a child's education. The combination of child academic performance metrics, school characteristics, and household-based surveys of individual family members allows for an in-depth examination of the formation of aspirations and intra-household complexities in the schooling decision.

1.5 Education in China

Despite China's economic boom, Gansu Province, located in northwest China, remains one of the nation's poorest provinces. Nevertheless, over the past few decades, the government has made enormous strides to improve the overall enrollment and adult literacy. In particular, the Law of Compulsory Education, effective as of July 1, 1986, mandated the completion of primary and lower secondary school, for a total of nine years (China Education & Research Network, 2005). According to the most recent official statistics, first time

enrollment of school-aged children has reached 98.2% - a stark improvement to enrollment rates lower than 20% fifty years ago (Gansu Ministry of Education, 2004).

Nevertheless, challenges persist in light of rising regional economic inequality contributing to disparities in local government resources to finance public education. In poor areas, children tend to start school later and leave school earlier (Hannum and Park, 2002). Explanations for lower school attainment include credit constraints and limited resources to finance education expenses, lower return to schooling due to the costs of attendance or limited payoff in the job market, health issues related to poverty, among other factors. In particular, bridging the gender gap has emerged as a key policy concern.

Hannum and Park's analysis of indicators of children's educational engagement revealed that children from socioeconomically disadvantaged households tended to have a lower level of academic engagement, including lower educational aspirations and academic confidence (Hannum and Park, 2007). In addition, since educational reforms have occurred very recently, parents are often poorly educated compared to current standards, hence reducing their capacity to effectively support their children (Stevenson and Baker, 1986), form realistic and actionable aspirations (Raj, 2002), or value education (Brown, 2002). Hence, although analyzing the material, extrinsic factors contributing to educational attainment remain important, further investigation of psychological factors - such as aspirations, self-confidence, and agency - offers important insight into the educational vulnerabilities associated with socioeconomic deprivation.

Section 2. Theory and Estimation Methods

2.1 First Stage- Determinants of Aspirations

Models of aspirations in development economics broadly fall into two categories - aspiration traps and aspiration gaps. Aspiration traps lead to a perpetual disparity in the education of children from poor and rich families -resulting in sustained inter-generational differences in income and wealth - when the evaluation of future returns to education proves exceptionally difficult for an individual whose social relations have never experienced something similar. As a result, the lack of capacity to aspire becomes an inherited burden, constrained by the prior stock of experiences (Heifitz et al, 2006). In aspiration gap models, the level of investment is a function of the difference between aspirations and the current standard of living - greater investment in education occurs only within an "aspirations window", a function of an individual's socioeconomic status, religious, ethnic, cultural, and other factors. If the gap is too large or too small, then investment is less likely to occur (Ray, 2002). Empirically, various studies have shown that controlling for individual and family factors, higher aspirations are significant predictors of educational and occupational outcomes by young people, though the effect is not universal (Gutman and Akerman, 2008; Strand, 2007; Macmillan and Washbrook, 2008; Fuligni, 1997). Existing empirical studies of aspirations, however, mainly focus on OECD countries. Very limited analysis of the formation and evolution of aspirations has been conducted in developing countries, in which trends may differ substantially.

This paper is mainly concerned with analyzing the determinants of aspirations of parent and child and the resultant effect on schooling - a challenging task, especially since aspirations evolve throughout the transition

to adulthood and adapt to wider social and environmental circumstances, experiences, influences, and perceptions of limitations and barriers (Punch and Sheridan, 1978).

A literature review of studies concerned with the development of aspirations suggest that gender (Betz and Hackett, 1981; Wilgenbusch and Merrell, 1999), family support and parental perceptions (Bond and Saunders, 1999; Sacker et al, 2002), socioeconomic background (Armstrong and Crombie, 2000; Kao and Tienda, 1998; Schoon and Parsons, 2002), cultural values (Fordham and Ogbu, 1981; Modood, 2003), perception of barriers (Gutman and Akerman, 2008; Prince's Trust, 2004), sense of self efficacy (Bandura, 1997), peer relations, and the school environment can affect the formation of aspirations.

Most of these studies, however, focus only on the formation of child aspirations and take parental aspirations as exogenous, or neglect comparison with the determinants of parent aspirations. Especially since the same variables can influence mother, father, and child aspirations heterogeneously, this study provides unique insight into the development of aspirations for each individual family member.

Educational aspirations for an individual can be formulated as:

$$A_t = f(C_{ijkt}, H_{jkt}, E_{kt})$$

A_t represents aspirations at time t , C_{ijk} contains a set of characteristics specific to child i in household j in community k , such as the child's academic ability, age, gender, health, birth order, among other factors. H_{jkt} represents household-level variables, such as socioeconomic status, demographic characteristics, and perceptions, attitudes, and beliefs of other household members which influence the development of the individual's aspirations. E_{kt} represents community-wide influences, such as labor market conditions, school quality, and shared cultural beliefs by peers and referent groups.

Since aspirations change with time, introducing a dynamic perspective helps contextualize the evolution of aspirations. Attainment discrepancy models used to describe organizational behavior systems (Levinthal and March, 1981) offer an intuitively appealing understanding of the evolution of aspirations. Past aspiration levels anchors incremental changes, and performance feedback governs the direction of aspiration level adaptation. In short, the decision makers set aspirations, compare actual outcomes with the aspiration, and modify future aspirations based on the comparison. Aspiration levels are expected to move at a slower rate of change than the immediate outcome (Lant, 1992). The simplest version of the model can be described below, where S_t measures actual performance.

Equation 1

$$A_t = \beta_0 + \beta_1 A_{t-1} + \beta_2 (S_{t-1} - A_{t-1}) = \beta_0 + (\beta_1 - \beta_2) A_{t-1} + \beta_2 S_{t-1}$$

The model posits a decision rule in which aspirations in the current period reflect updates to the prior aspiration level based on the discrepancy between actual performance to the desired objective. In the case of schooling, the attainment discrepancy can reflect the disparity between actual academic performance and payoff to schooling compared to aspired or desired payoff or return to schooling for that period.

In order to further analyze S_t – the actual achievement or state of reality – the notion of an aspirations gap proves useful. Debraj Ray (2002) defines the aspirations gap as the following:

$$g(A, S) = \max \left(\frac{A - S}{A}, 0 \right)$$

For an individual seeking to close the aspirations gap with investment i and facing a cost function $c(i)$, the optimal solution is to minimize the sum of gap and cost, subject to a resource constraint. Ray concludes that individual's investment efforts are minimal for both high and low aspiration gaps; the occurrence of aspirations failures occurs when the gap fails to be actionable. In order for aspirations to make a difference – to fall within a critical “aspirations window” – society must be sufficiently connected such that an individual can believe his or her objectives can be attainable with effort. Since the aspirations gap motivates investment for the future, and therefore future educational outcomes, S_t can be represented as a function of the lagged aspirations gap, as well as the child-specific, household-specific, and environmental-specific variables.

$$S_t = f(g(A_{t-1}, S_{t-1}), c(i); C_{ijkt}, H_{jkt}, E_{kt})$$

As shown above, aspirations motivate investment in the future, which affects the next period's performance outcome. Simultaneously, aspirations in the next period adjust based on the discrepancy between outcomes and aspirations. In short, aspirations influence effort and investment, but they themselves adapt to outcomes. Substituting into the original equation, current aspirations reflect the collective influence of past aspirations, as well as individual, household, and greater environmental influences.

Equation 2

$$A_t = \beta_0 + (\beta_1 - \beta_2)A_{t-1} + \beta_2 f(g(A_{t-2}, S_{t-2}), c(i); C_{ijkt-1}, H_{jkt-1}, E_{kt-1})$$

Estimation Method

Two different model identifications are used to investigate the formation and evolution of the aspirations variable. The first model represents a cross-sectional view of aspirations, in which father, mother, and child aspirations are regressed against a vector of child-specific variables (C_{ijk}), household characteristics (H_{jk}), and village fixed effects (α_k) to control for the immediate and greater socioeconomic environment. Aspirations are measured in the years of schooling desired for the child - 6 years for completion of primary school, 9 years for middle school, 12 years for high school, 15 years for vocational college, and 16 years for university or above. Robust standard errors are used to address the issue of heteroskedasticity.

$$A_i = \beta_0 + \beta_1 * C_{ijk} + \beta_2 * H_{jk} + \alpha_k$$

The second model focuses on an empirical specification of the attainment discrepancy model in equation (2), in which aspirations in wave 2 are regressed on the wave 1 levels of aspirations and wave 1 child-specific, household-specific, and village-specific variables. The addition of the lagged dependent variable recognizes that the cross-sectional regression may have omitted time-invariant factors embedded in aspirations, and hence controls for these factors.

$$A_{i,2004} = \beta_0 + \beta_1 A_{i,2001} + \beta_2 * C_{ijk,2001} + \beta_3 * H_{jk,2001} + \alpha_k$$

Several difficult econometric concerns emerge due to the nature of the aspirations variable. First, family aspirations are not formed independently of each other – children’s aspirations likely reflect the views and opinions of their parents. To analyze this effect, child aspirations are regressed excluding and including parental aspirations, though parental aspirations are likely endogenous. Second, the presence of omitted variable bias can bias coefficients, as various child-specific and household-specific variables may be correlated to unobservable factors affecting aspirations. For example, greater wealth or high levels of parental education may be correlated with the level of self efficacy or social empowerment, which can affect aspirations. To provide a robustness check, aspirations are analyzed for sibling pairs to analyze the factors that contribute to differences in level of aspirations *within* a household (Section 3.3). In addition, simultaneity bias may be present for variables that parents directly control, such as the number of children, which can be chosen according to the quality-quantity decision framework.

Third, especially since years of schooling aspired is a very subjective measure, each survey respondent may have interpreted the question differently, resulting in possible reporting biases. For some, the question on desired years of schooling for the child may signify an idealized achievement – for others, a more actionable, realistic objective.

Fourth, the inclusion of the lagged dependent variable creates endogeneity since unobserved time-invariant factors will be part of the lagged dependent variable as well as part of the error term. Given the lack of a convincing instrument for aspirations and only two periods of data, the coefficient on the lagged dependent is expected to be biased upwards. Nonetheless, this regression helps contextualize the results of the cross-section by absorbing the impact of time invariant omitted variables. As shown in Section 3.3, the results from the cross-sectional specification and estimation of equation (2) appear to be generally consistent.

Without an explicit experimental design to address the issue of measurement error or omitted variable bias, identification of the determinants of aspiration is difficult. The objective, however, is not to offer definite estimates on the factors contributing to the formation of aspirations, but rather, derive some general insights, robust to empirical regularities. In addition, many potential sources of bias influencing aspirations in general are less likely to explain differences in the aspirations of parents and children from the same family.

2.2 Second Stage - Aspirations Weight in Household Decision-Making of Schooling

In the traditional approach to microeconomic theory, households act as unitary decision entities, modeled by a single utility function maximized under a budget constraint. Evidence has confirmed that the unitary view, however, faces serious theoretical and empirical challenges that undermine policy relevance (Alderman et al, 1992; Haddad et al, 1997). In order to model household allocations where parents and children have different preferences, two alternative classes of non-unitary models can be used: the family bargaining model (McElroy and Horney, 1990) and the collective model (Chiappori, 1992).

This paper adapts upon the Pareto efficient intra-household decision model proposed by Emerson and Souza (2002) to model child school attendance and labor participation in Brazil. The main innovation is that the child’s preferences are added explicitly to the household utility maximization problem, such that the child

himself or herself participates in the decision-making process. Although parents make important decisions regarding schooling, children increasingly have greater influence as they age.

Assuming a household comprised of a father (subscript f), mother (subscript m), and n children (subscript c), the household's utility maximization problem thus becomes:

Equation 3

$$\begin{aligned} \max U = & \lambda_f u_f(c_f, c_m, c_p, c_{c1} \dots c_{cn}, l_f, l_m, h_{c1} \dots h_{cn}, n; z_f) \\ & + \lambda_m u_m(c_m, c_f, c_p, c_{c1} \dots c_{cn}, l_m, l_f, h_{c1} \dots h_{cn}, n; z_m) \\ & + \sum_{i=1}^n \lambda_{ci} u_{ci}(c_m, c_f, c_p, c_{c1} \dots c_{cn}, h_{ci}; z_{ci}) \end{aligned}$$

Subject to the budget constraint:

$$c_f + c_m + c_p + \sum_{i=1}^n c_{ci} \leq (1 - l_f)w_f + (1 - l_m)w_m \sum_{i=1}^n (1 - e_{ci})w_{ci} + I_f + I_m$$

In the above equation, u_f , u_m , and u_c comprise the father, mother, and child's utility function, respectively. Total consumption in the household is equal to father's consumption of private goods (c_f), mother's consumption of private goods (c_m), the sum of children's consumption of public goods (c_c), and the household's consumption of public goods (c_p). Parents value each child's human capital achievement, denoted h_{cn} for child n, as well as the number of children, n. Although each child cares about the consumption of his or her parents and siblings, he or she is primarily concerned with his or her own human capital achievement. This assumption appears consistent with empirical studies on the effects of sibling rivalry and competition for parental resources for education in developed and developing countries (Wolter, 2003; Morduch, 2000).

Consumption of leisure is denoted l_f and l_m , respectively, for father and mother. Instead of leisure, children spend all their non-labor time in school, represented as e_c . w_f , w_m , and w_c correspond to the wage rates for father, mother, and child, and I_f and I_m indicate the exogenous non-labor income of the father and mother. The terms z_f , z_m , and z_c account any individual, household, or community characteristics that affect the father, mother, and child's utility, respectively.

Notably, the parameter λ - the weight on each individual's utility function - represents the relative bargaining power of the household member, where $\lambda \in (0,1)$ and $\sum \lambda = 1$. Analyzing the factors that influence λ , such as age and income, is a main objective of this study.

For purposes of simplification, assume $c_f + c_m + c_p + \sum_{i=1}^n c_{ci} = C$, parents don't indulge in leisure ($l_f = l_m = 0$), there is no public good ($c_p = 0$), and each additional unit of consumption is valued equally, regardless of the recipient. Father's and mother's wages are normalized to their production functions, $w_f = h_f$ and $w_m = h_m$, and children's wages are normalized to one ($w_c = 1$).

Notably, the human capital production function differs for each child because of disparities in innate abilities and societal bias, such as lower wages and opportunities afforded to females. A child's knowledge production function also depends on the human capital of the father and mother, as the effectiveness of a child's

schooling increases with the existent pool of human capital available at home (Majoribanks, 1997; DeBaryshe et al, 1993). Hence, for child n, his or her human capital production function can be represented as:

Equation 4

$$h_{cn} = f_{cn}(e_{cn}; h_f, h_m), \text{ where } f_{cn}(0) = 1, \frac{\partial f_{cn}(e_{cn}; h_f, h_m)}{\partial e_{cn}} > 0, \frac{\partial f_{cn}(e_{cn}; h_f, h_m)}{\partial h_f} > 0, \text{ and } \frac{\partial f_{cn}(e_{cn}; h_f, h_m)}{\partial h_m}$$

With these simplifying assumptions, the objective function and the budget constraint become:

$$\begin{aligned} \max U &= \lambda_f u_f(C, h_{c1} \dots h_{cn}; z_f) + \lambda_m u_m(C, h_{c1} \dots h_{cn}; z_m) + \sum_{i=1}^n \lambda_{ci} u_{ci}(C, h_{ci}; z_{ci}) \\ C &\leq h_f + h_m \sum_{i=1}^n (1 - e_{ci}) + I_f + I_m \end{aligned}$$

Substituting the budget constraint and child human capital production function (4) directly into the utility function, the utility maximization problem hence becomes:

Equation 5

$$\begin{aligned} \max_{\{e_{c1} \dots e_{cn}\}} U &= \lambda_f u_f \left(h_f + h_m \sum_{i=1}^n (1 - e_{ci}) + I_f + I_m, f_{c1}(e_{c1}; h_f, h_m) \dots f_{cn}(e_{cn}; h_f, h_m); z_f \right) \\ &+ \lambda_m u_m \left(h_f + h_m \sum_{i=1}^n (1 - e_{ci}) + I_f + I_m, f_{c1}(e_{c1}; h_f, h_m) \dots f_{cn}(e_{cn}; h_f, h_m); z_m \right) \\ &+ \sum_{i=1}^n \lambda_{ci} u_{ci} \left(h_f + h_m \sum_{i=1}^n (1 - e_{ci}) + I_f + I_m, f_{ci}(e_{ci}; h_f, h_m); z_{ci} \right) \end{aligned}$$

Assuming an interior solution, in which the child spends at least some time in school, the first order condition for the schooling of child j becomes:

Equation 6

$$\frac{\partial U}{\partial e_{cj}} = \lambda_f \left[-\frac{\partial u_f}{\partial e_{cj}} + \frac{\partial u_f}{\partial f_{cj}} * \frac{\partial f_{cj}}{\partial e_{cj}} \right] + \lambda_m \left[-\frac{\partial u_m}{\partial e_{cj}} + \frac{\partial u_m}{\partial f_{cj}} * \frac{\partial f_{cj}}{\partial e_{cj}} \right] + \lambda_{cj} \left[\frac{\partial u_{cj}}{\partial f_{cj}} * \frac{\partial f_{cj}}{\partial e_{cj}} \right] + \sum_{i=1}^n \lambda_{ci} \left[-\frac{\partial u_{ci}}{\partial e_{cj}} \right] = 0$$

Using the first order condition to solve for the optimal level of education for each child in the household, the optimal level of schooling for each child becomes:

Equation 7

$$e_{ci}^* = e_{cn}(h_f, h_m, I_f, I_m; \lambda_f, \lambda_m, \lambda_{c1} \dots \lambda_{cn}, z_f, z_m, z_{ci})$$

As (6) shows, the schooling level for each child increases with parental human capital attainment, wealth in the family, and the efficacy of the child-specific human capital production function. Parents with high human capital themselves are more likely to desire higher levels of education for their children for two main reasons. First, parents with higher capital earn more, hence reducing the burden of the opportunity cost of a child schooling. Second, the child's human capital achievement function becomes more productive with a greater stock of human capital at home. There is a potential resource dilution effect with a greater number of children.

Notably, aspirations have two possible interpretations. First, aspirations can be embedded within the z_f , z_m , and z_c terms as an individual-specific variable that affects the utility function of the father, mother, and child, respectively. As aspirations reflect the degree of future-orientation, intrinsic motivation, and the inherent value placed on education, aspirations may affect the observed level of education beyond extrinsic measures of parental income, parental schooling, and other demographic controls. Second, aspirations can also be interpreted as a proxy for each family member's choice of e^* because they reflect idealized individual preferences, a surrogate solution of the individual's utility maximization problem.

In this framework, the utility function takes a very general form, and the model does not explicitly incorporate credit constraints or the inter-temporal impact of educational investment on future income and income distribution. Acknowledgement of credit constraints are expected to lower e^* , though children may be less aware. Due to varying preferences of family members, one can expect different levels for the aspired or preferred level of schooling for the child. For example, the greater the level of altruism of the parent, the greater the utility derived from child human capital, resulting in a higher e_f^* and e_m^* . If an inter-generational transfer occurs in which the child is expected to support his or her elderly parents, then an inter-temporal dimension can be introduced to link the future consumption of parents to the income and hence, the human capital, of the child, resulting in a higher desired e_f^* and e_m^* . Moreover, the preferences of children may diverge dramatically from that of their parents. Children may discount the future more heavily by preferring consumption and leisure today over education, resulting in a lower level of e_{cj}^* .

Estimation Method

Using aspirations of father, mother, and child as an explanatory variable for the schooling decision, this paper seeks to analyze two hypotheses: first, to test whether aspirations of family members matter in making enrollment decisions, even after accounting for demographic and socioeconomic variables known to be significant inputs into the enrollment decision. Second, to analyze the relative importance of each household member's aspirations and the different factors affecting these weights, as a proxy for the bargaining power of each family member.

A linear probability model (LPM) was favored over a binary choice framework to better control for village fixed effects that capture labor market and migration opportunities. Non-linear fixed effects model have practical and methodological shortcomings that introduce bias through the incidental parameters problem (Fernandez-Val, 2009) and raises questions about the statistical properties of the maximum likelihood estimator (Greene, 2002). In addition, given the estimation of various interaction terms to capture bargaining power, the LPM model is easier to interpret, as marginal effects in limited dependent variable models depend on the values of the covariates (Angrist and Pischke, 2008).

Nevertheless, a probit with village dummies and a fixed effect logit model were fitted to check whether coefficients in the LPM were similar to the marginal effects, indicating the presence of no substantial non-linearities. Though OLS estimators are inefficient in the LPM framework compared to weighted least squares since the exact form of heteroskedasticity is known, the OLS estimation with robust standard errors produces satisfactory results for analysis, especially around the mean (Angrist and Pischke, 2008).

The following linear probability model is estimated:

$$E_{2007} = \beta_0 + \theta_f A_{f,2004} + \theta_m A_{m,2004} + \theta_c A_{c,2004} + \beta_1 * C_{ijk,2004} + \beta_2 * H_{jk,2004} + \alpha_k,$$

To further understand the elements affecting the size of θ , a proxy for the bargaining weight of the family member, aspirations are interacted with different child-specific and household-specific variables:

$$E_{2007} = \beta_0 + A_{f,2004}(\theta_f + \varphi_f * C_{ijk,2004} + \phi_f * H_{jk,2004}) + A_{m,2004}(\theta_m + \varphi_m * C_{ijk,2004} + \phi_m * H_{jk,2004}) + A_{c,2004}(\theta_c + \varphi_c * C_{ijk,2004} + \phi_c * H_{jk,2004}) + \beta_1 * C_{ijk,2004} + \beta_2 * H_{jk,2004} + \alpha_k,$$

Enrollment is measured as a binary outcome variable – 1 if the child is attending school in 2007, 0 if the child has left. To address the issue of simultaneity bias, in which aspirations are a function of current enrollment, the explanatory variables are taken from levels measured in 2004 and the sample restricted to children who were currently enrolled in school in 2004 (92.5% of the sample). Each family member's aspirations are interacted with various demographic and socioeconomic variables, such as income, child age, birth order, gender, and child test scores, to analyze the factors that affect decision-making power. Village fixed effects are introduced to address labor market, migration opportunities, and greater environmental and socioeconomic influences that can affect enrollment.

Aspirations, however, are likely to be an endogenous variable, especially since they are formed in accordance with the contemporaneous and prior economic and social capital of the child. Instrumenting aspirations, however, may introduce greater issues, especially in light of subjective measurement and the lack of a credible exogenous variable. The benefit of the estimated regression is that enrollment in 2007 is regressed on aspirations from three years prior, thus addressing the concern of reverse causality. The three year time gap may also reduce the impact of unobservable factors affecting enrollment in 2007 that may be simultaneously correlated with aspirations in 2004, after controlling for village fixed effects. Although it will be impossible to rule out omitted variable bias influencing the coefficients on the aspiration variable, one advantage of the survey data is that it provides very detailed information on individual and family factors likely to influence enrollment decisions, which can be included as controls. In addition, it is much less likely that unobserved factors correlated with both aspirations and enrollment would affect the interactions of the aspirations of individual members with other child or household characteristics.

The interpretation of the θ parameters is two-fold. First, θ can represent the importance of each family member's aspirations in contributing to enrollment – a proxy for the influence of each family member's subjective preferences. Second, if θ fails to be significant, then either the family member's desired preferences do not have an impact on actual outcomes due to low decision making power or agency within the household, or the aspirations of the family member do not lie within the aspirations window. In the latter case, the aspiration level may be so unrealistic that it no longer becomes actionable. Distinguishing between the two interpretations of θ can be challenging – hence, the results of the first stage about the determinants of aspirations help identify and contextualize the results in the second stage.

Section 3. Econometric Results

3.1 Descriptive Statistics:

Table 1 provides some basic descriptive statistics and summary information about the child and the household. To measure the level of aspirations, parents were asked: *What is the highest level of schooling you wish your child could complete?* Children were asked: *What is the highest level of schooling that you want to complete?* Choices included: graduation from primary school, junior high school, senior high school, and college or higher.

Notably, parent and child aspirations for the desired level of schooling are very high, with aspirations for girls slightly lower than that for boys. For male children, 87% of mothers, 84% of fathers, and 64% of children themselves indicated an objective of completing university. For female children, 81% of mothers, 79% of fathers, and 62% of children themselves desired to complete university. This consistently high level of aspiration limits the variation of the data, but given the sample size, is sufficient.

The gap between aspirations and expectations of each parent is approximately two years - the majority of parents expected their children to graduate from senior high school. The average total education expenditure per child was 391 RMB (\$47 USD) for boys and 365 RMB (\$44 USD) for girls. Math and language test scores were normalized by the mean and standard deviation for the child's grade.

Table 1. Summary of Key Variables

Variable (2004)	Obs	Mean	Std. Dev.	Min	Max	Girls (Mean)	Boys (Mean)
Mother's Aspirations for Child Education (years)	2489	15.30	1.73	6	16	15.13	15.43
Mother's Expectation for Child Education (years)	2485	13.19	2.66	6	16	12.97	13.36
Father's Aspirations for Child Education (years)	2520	15.12	1.98	6	16	14.97	15.25
Father's Expectation for Child Education (years)	2523	13.08	2.81	6	16	12.75	13.35
Child's Aspirations for Education (years)	2747	14.51	2.41	6	16	14.45	14.58
Number of Household Members	2804	4.75	1.02	2	10	4.89	4.64
Number of Children	2778	2.38	0.72	1	6	2.52	2.25
Child Age in 2004	2757	14.28	1.96	7	20	14.35	14.23
Math Test Score	2656	17.43	12.86	0	50	16.79	17.97
Language Test Score	2656	21.70	11.27	0	50	21.53	21.81
Log(Wealth per capita)	2770	8.11	0.88	4.83	12.21	8.05	8.18
Log(Income per capita)	2784	7.09	1.05	1.32	11.68	7.03	7.16
Father's Education (years)	2732	7.02	3.45	0	16	6.99	7.05
Mother's Education (years)	2779	4.26	3.43	0	14	4.01	4.47
Log(Education Expenditure)	2513	5.60	0.75	3.22	9.07	5.58	5.61

As shown in Table 2, three years later, 28% of boys and 37% of girls had left school. The average number of years completed by a student who left school in 2007 was 8.3 years for boys and 8.1 years for girls, and the difference is marginally statistically significant (p-value of 0.17). The students most likely to leave school were generally enrolled in the lower grades of junior high school in 2004, corresponding to the completion of the mandatory nine years.

Table 2. Enrollment Status by Gender and Grade

Male Child						Female Child					
Grade ('04)	Left School ('07)	% Grade	Enrolled ('07)	% Grade	Total	Grade ('04)	Left School ('07)	% Grade	Enrolled ('07)	% Grade	Total
0	2	100.0%	0	0.0%	2	0	2	100.0%	0	0.0%	2
1	1	4.2%	23	95.8%	24	1	3	17.6%	14	82.4%	17
2	2	5.7%	33	94.3%	35	2	0	0.0%	25	100.0%	25
3	12	13.5%	77	86.5%	89	3	15	30.0%	35	70.0%	50
4	30	25.0%	90	75.0%	120	4	23	21.5%	84	78.5%	107
5	48	27.9%	124	72.1%	172	5	70	40.0%	105	60.0%	175
6	22	18.6%	96	81.4%	118	6	25	27.2%	67	72.8%	92
7	84	29.3%	203	70.7%	287	7	105	43.9%	134	56.1%	239
8	100	35.2%	184	64.8%	284	8	71	38.4%	114	61.6%	185
9	72	37.1%	122	62.9%	194	9	81	45.8%	96	54.2%	177
10	5	12.5%	35	87.5%	40	10	1	5.6%	17	94.4%	18
11	0	0.0%	6	100.0%	6	11	1	33.3%	2	66.7%	3
13	2	40.0%	3	60.0%	5	13	1	50.0%	1	50.0%	2
14	0	0.0%	1	100.0%	1	14	2	66.7%	1	33.3%	3
Total	380	27.6%	997	72.4%	1,377	Total	400	36.5%	695	63.5%	1,095

The correlation matrix (Table 3) below illustrates that although father and mother aspirations are highly correlated (0.48), child aspirations appear to be less in line with parental aspirations (0.12 with father, 0.14 for mother). One potential explanation is that in light of the generally low levels of parental education, the child may have more realistic aspirations than the parent, or have a differing view on the return or value of his or her schooling. The correlation between aspirations and expectations is 0.60 for the father and 0.44 for the mother, suggesting that although aspirations are high, they generally vary in line with expectations.

Table 3. Correlation Matrix

Variable (2004)	Child Aspiration	Father Aspiration	Mother Aspiration	Father Expectation	Mother Expectation	Ln(Wealth)	Ln(Income)	Father Education
Child Aspiration	1.000							
Father Aspiration	0.119	1.000						
Mother Aspiration	0.145	0.485	1.000					
Father Expectation	0.166	0.445	0.316	1.000				
Mother Expectation	0.136	0.299	0.436	0.601	1.000			
Ln(Wealth)	0.050	0.089	0.099	0.199	0.194	1.000		
Ln(HH Income)	0.046	0.048	0.075	0.174	0.190	0.511	1.000	
Father Education	0.116	0.098	0.128	0.177	0.168	0.139	0.138	1.000
Mother Education	0.108	0.101	0.101	0.210	0.196	0.223	0.186	0.402

Evolution of Aspirations

Aspirations adapt to the wider social and economic environment, reflecting accumulated experiences and life transitions. A comparison of changes in mother and child aspirations from 2004 to 2007 confirms that children's aspirations are more likely to change with age, as compared to mother's aspirations, in which 66% reported no change, 9% indicated a decrease in aspirations, and 25% exhibited an increase. Contrary to evidence from OECD countries, children's aspirations appear to increase with age - 38% of children reported an increase in aspirations, 42% indicated no change, while 20% exhibited a decline.

3.3 Discussion of Econometric Results: Determinants of Aspirations:

Table 4. Determinants of Aspirations, Cross-Section (Wave 2) with Village Fixed Effects

Variable	Child Aspirations (1)		Child Aspirations (2)		Mother Aspirations		Father Aspirations	
	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value
Father's Aspirations			0.0304	(0.392)				
Mother's Aspirations			0.0984***	(0.007)				
Total Children	-0.114	(0.260)	-0.173	(0.104)	0.00285	(0.971)	0.0918	(0.290)
First Born Dummy	0.0912	(0.614)	0.0897	(0.630)	-0.0996	(0.452)	-0.0361	(0.805)
Last Born Dummy	-0.00101	(0.995)	-0.0646	(0.706)	-0.0170	(0.885)	0.0372	(0.774)
Primary Support Dummy	0.209**	(0.031)	0.144	(0.151)	0.0551	(0.457)	0.113	(0.167)
Child Health (1-5 Index)	-0.0892	(0.130)	-0.0308	(0.600)	0.0292	(0.521)	-0.0439	(0.373)
Mother Health (1-5 Index)	0.0100	(0.853)	0.0104	(0.853)	0.0212	(0.613)	0.0244	(0.596)
Father Health (1-5 Index)	-0.0915	(0.100)	-0.141**	(0.013)	0.0409	(0.345)	0.0852*	(0.068)
Ln(Land per capita)	0.0426	(0.736)	0.00535	(0.968)	-0.0609	(0.509)	-0.0597	(0.562)
Math Test Score	0.229***	(0.000)	0.167***	(0.002)	0.0800*	(0.058)	0.154***	(0.001)
Language Test Score	0.169***	(0.002)	0.133**	(0.023)	0.0226	(0.596)	0.0276	(0.556)
Ln(Wealth per capita)	0.113	(0.101)	0.0437	(0.529)	0.101**	(0.046)	0.129**	(0.021)
Ln(Income per capita)	-0.0159	(0.778)	-0.00308	(0.958)	0.0561	(0.217)	0.0330	(0.519)
Father Education	0.0278*	(0.076)	0.0214	(0.185)	0.0315***	(0.005)	0.00360	(0.770)
Mother Education	-0.00372	(0.813)	-0.00232	(0.884)	0.0115	(0.357)	0.0159	(0.250)
No Household Members	0.0795	(0.211)	0.0684	(0.303)	0.0386	(0.432)	-0.0283	(0.604)
Child Gender (1=female, 0=ma)	0.00914	(0.926)	0.0858	(0.398)	-0.208***	(0.005)	-0.111	(0.170)
_cons	11.33***	(0.000)	10.86***	(0.000)	12.26***	(0.000)	8.386***	(0.000)
N	2442		2158		2341		2255	

Note: Output on grade and age dummies has been suppressed; *denotes $p < 0.10$; ** denotes $p < 0.05$; *** denotes $p < 0.01$

Children Aspirations

As shown in Table 5 (Model 1), children with high aspirations generally have greater academic ability (as measured by math and language scores) or are expected to be the future primary supporters of their parents. Birth order, gender, income, and wealth variables did not appear to significantly affect the level of aspirations. Father's education was marginally significant.

Recognizing that parental aspirations are endogenous, child aspirations appear to be influenced by mother's aspirations but not father's aspirations (Model 2). Especially since mothers play an essential role in the care-giving of children and are generally more involved in their lives, mother's aspirations appear to have a more significant effect than father's aspirations. When parental aspirations are included, coefficients on other explanatory variables do not differ substantially, although father's health increases in significance and some evidence of a marginal dilution effect with a greater number of children appears.

In general, children's educational aspirations are better linked with actual academic aptitude and performance compared to parental aspirations. As shown in Table 5 (Model 1), the coefficient on math test scores is 1.4x and 2.9x greater than that of the father and mother, respectively. Likewise, the coefficient on language test scores is more than 8.0x greater than that of the father and mother. Especially since fathers and mothers have an average of 7 and 4 years of education, respectively, children may have a more realistic assessment of their own academic capabilities and the productivity of their own knowledge production function, aligning their academic aspirations accordingly.

Conversely, children's aspirations appear less sensitive to gender, income, and wealth than parental aspirations. Given their youth, children may be more forward-looking than their parents, or simply unaware of credit and financial constraints. Child aspirations also did not appear to differ significantly by birth order or the

number of children in the household. In Model 1, being the expected primary supporter did on average increase aspirations by 0.2 years, as children who believe they will shoulder future economic responsibility may desire greater human capital for future earnings. The inclusion of mother's aspirations attenuated the effect, partially because mother's aspirations may have captured the difference. When birth order variables and the primary support dummy were interacted with gender, none of the coefficients were significant.

Figure 1 graphs aspirations of a male and female child of average socioeconomic background to provide a visual representation of aspirations at different ages and grades. Aspirations drop to a trough at age 12 for both male and female children, approximately the age of primary school completion. Afterwards, aspirations rise more sharply for male children than for female children, perhaps the result of a socialization process that favors boys over girls or self restrictions associated with gender role stereotypes. Notably, of children at the age level of completion of secondary school, average aspirations for males increase, while that of females decrease. Recognizing that the formation of aspirations begins early and changes throughout childhood in response to children's own increasing understanding of their own abilities and subjective sense of opportunities and challenges, it may be especially important to provide support to counter attitudinal and practical obstacles at critical transitional educational junctures.

Mother Aspirations

Mother aspirations appear to be the least sensitive to child math and language test scores, and are generally the highest in comparison to father and child aspirations. Since mothers had on average 4.2 years of schooling – below completion of primary school – they either may not be as well equipped to adjust aspirations to child true academic aptitude, or they desire a high level of education for their children regardless of current academic performance. In general, mother's aspirations increased with child age. Mothers also had lower aspirations for female children than male children at a 1% statistically significant level, unlike the findings for fathers' and children's own aspirations.

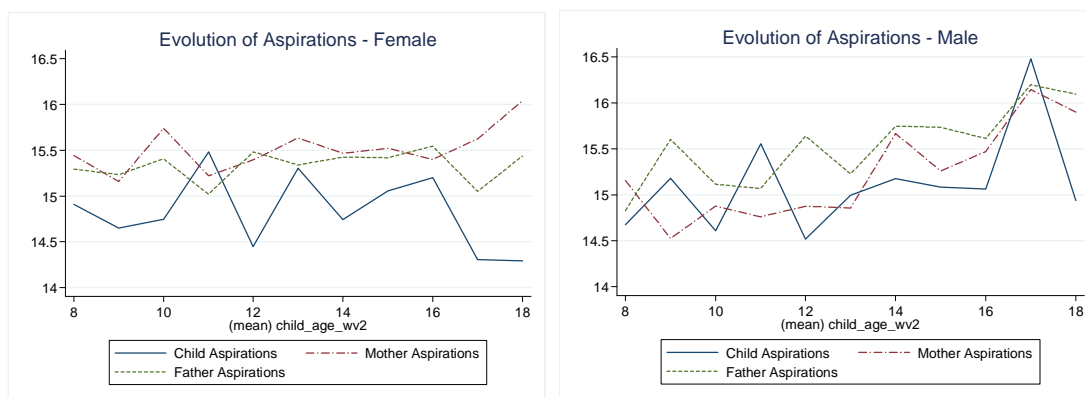
Father's education significantly increased the level of mother's aspirations, while mother's own education did not. The positive coefficient on father's education confirms the theory, in which a higher pool of human capital at home increases the productivity of the child's human capital production function and thus the optimal level of education desired. The fact that mother's education is not statistically significant perhaps reflects the fact that since most mothers did not complete primary school, they do not substantially improve the productivity of the child's human capital production function. As a result, mother's education has limited bearing on the desired level of schooling for the child.

Father Aspirations

Although high, father's aspirations were generally lower than that of mother's aspirations and closer to expectations of children's actual years of education completed. Although the coefficient on child gender was negative, it was not statistically significant. Higher math test scores were associated with greater father aspirations, but language test scores failed to be a significant predictor. For both mother and father, the coefficient on wealth was statistically significant at the 5% level, which is consistent with the theory, in which higher family non-wage income increases the desired level of schooling for the child.

Father's health was a marginally significant variable for both father and child. Greater health of the father increased the level of father's aspiration. On the other hand, greater health of the father was associated with a decrease in the aspiration of the child. One potential explanation is that families with a healthy head of household were likely more secure in their economic position, and hence could afford higher aspirations for their progeny. Conversely, children may be motivated by an ailing father to increase their level of academic achievement in order to provide greater support for the future.

Figure 1. Aspirations for Average Male and Female Child at Different Ages



Note: Regressions were run separately for male and female children, thus allowing coefficients on the explanatory variables to differ. The plot above assumes a first-born child of average income, wealth, test scores, and family background. Inferring from the sample mean of ages at each grade, the child is assumed to attend first grade at eight years old, second grade at nine years, and so forth.

As discussed in Section 2.1, estimation of aspirations, a subjective measure for each individual, is inherently difficult due to the presence of measurement error and omitted variable bias. As a robustness check, the sample was reduced to include only households in which two children were interviewed – the target child and the child's eldest youngest sibling. Household fixed effects were introduced to further control for unobservable factors and fundamental differences in each family member's subjective answer.

The results in Table 6 confirm many of the earlier findings from Table 5. Higher child aspirations were associated with better test scores and being the expected primary caregiver to parents. Moreover, as before, mother's aspirations were a significant positive predictor of child's aspirations, although inclusion of mother's aspirations attenuated the effect of the primary support dummy variable. Within a household, girls reported higher educational aspirations than boys, although mother's aspirations for female children were significantly lower than that for male children at a 1% level. This finding supports the theory that parents seeking to maximize their return on human capital investment across their children will focus on the child with greater earning potential in the labor market, thus favoring boys over girls. On the contrary, children are mainly concerned about the productivity of their own knowledge production function (conversion of schooling into human capital and positive measures of academic attainment), and hence are not as limited by gender.

The limited variation in the data, however, suggests low predictive power. Within a household, parents have very similar aspirations for both children. 85.5% and 81.4% of mothers and fathers had equal aspirations for both siblings, respectively (correlation of 0.541 and 0.443). In addition, test scores of children from the same household were very similar given the common family environment, parental attitudes towards education, and stock of existent human capital. Nevertheless, the results provide a useful basis of comparison to contextualize the results from Table 5.

Table 5. Determinants of Aspirations, Cross-Section (Wave 2) with Household Fixed Effects

Variable	Child Aspirations (1)		Child Aspirations (2)		Mother Aspirations		Father Aspirations	
	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value
Mother's Aspirations			0.181*	(0.056)				
First Born Dummy	0.163	(0.448)	0.206	(0.368)	-0.0848	(0.519)	-0.0429	(0.804)
Last Born Dummy	0.175	(0.443)	0.247	(0.309)	0.0842	(0.551)	0.0279	(0.864)
Primary Support Dummy	0.317**	(0.026)	0.238	(0.117)	0.210**	(0.015)	0.156	(0.125)
Math Test Score	0.0525	(0.583)	-0.0344	(0.732)	0.0107	(0.840)	0.115*	(0.083)
Language Test Score	0.243**	(0.013)	0.207*	(0.060)	0.0276	(0.674)	0.0981	(0.174)
Child Gender (1=female, 0=ma)	0.260*	(0.084)	0.324**	(0.046)	-0.264***	(0.008)	-0.178	(0.105)
_cons	12.50***	(0.000)	9.963***	(0.000)	14.99***	(0.000)	9.711**	(0.011)
N	1651		1572		1573		1493	

Note: Output on grade and age dummies has been suppressed; *denotes $p < 0.10$; ** denotes $p < 0.05$; *** denotes $p < 0.01$

In Table 7, aspirations in 2004 were regressed on lagged aspirations and socioeconomic variables in 2000 to investigate the evolution of aspirations. Although the coefficient on the lagged dependent variable is likely biased upwards, the results assist in contextualizing the earlier cross-sectional results by controlling for time invariant unobservables affecting aspirations. The low coefficient on the lagged variables suggest that aspirations are either not well-formed at younger ages, or are dynamic and change greatly during adolescence. The correlation between child aspirations in wave 1 and 2 is 0.143, and the correlation between mother aspirations in wave 1 and 2 is 0.169, both relatively low. The sign and significance of the child and household explanatory variables appear consistent with earlier results despite the inclusion of the lagged dependent. Cognitive ability factored much more significantly in the evolution of child aspirations than in mother's aspirations. A higher prior level of wealth was strongly associated with greater mother's expectations in the next period, but did not affect the evolution of child's aspirations at a statistically significant level. Likewise, father's education positively affected the desired level of schooling, potentially by increasing the productivity of the child human capital production function, as predicted in the theory.

Table 6. Evolution of Aspirations with Village Fixed Effects

Variable	Child Aspirations (1)		Child Aspirations (2)		Mother Aspirations	
	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value
Child Aspirations (Wave 1)	0.0546**	(0.016)	0.0551**	(0.016)		
Mother Aspirations (Wave 1)			0.0408	(0.137)	0.0347*	(0.088)
Total Children	-0.162	(0.156)	-0.190*	(0.098)	-0.00398	(0.969)
First Born Dummy	0.366	(0.115)	0.311	(0.186)	0.0941	(0.591)
Last Born Dummy	0.414*	(0.069)	0.380*	(0.098)	0.0908	(0.582)
Primary Support Dummy	0.257**	(0.037)	0.244**	(0.047)	0.183*	(0.059)
Child Health (1-5 Index)	0.0312	(0.719)	0.0205	(0.814)	0.0188	(0.796)
Mother Health (1-5 Index)	0.0300	(0.664)	0.0336	(0.624)	-0.0749	(0.212)
Father Health (1-5 Index)	-0.116	(0.126)	-0.0927	(0.220)	0.00727	(0.912)
Ln(Land per capita)	-0.110	(0.417)	-0.118	(0.385)	-0.0499	(0.616)
Cognitive Test	0.0356***	(0.000)	0.0303***	(0.001)	0.0125*	(0.054)
Ln(Wealth per capita)	0.119	(0.203)	0.114	(0.231)	0.173***	(0.007)
Ln(Income per capita)	-0.0316	(0.702)	-0.0355	(0.670)	0.0558	(0.296)
Father Education	0.0369**	(0.049)	0.0322*	(0.087)	0.0331**	(0.025)
Mother Education	-0.0139	(0.448)	-0.0152	(0.408)	0.00308	(0.827)
No of Household Members	0.0985	(0.147)	0.113	(0.101)	0.0514	(0.358)
Child Gender	0.00570	(0.962)	0.0410	(0.734)	-0.140	(0.140)
_cons	10.62***	(0.000)	12.38***	(0.000)	12.79***	(0.000)
N	1759		1736		1551	

Note: Output on grade and age dummies has been suppressed; *denotes $p < 0.10$; ** denotes $p < 0.05$; *** denotes $p < 0.01$

3.4 Discussion of Econometric Results: Household Decision-Making in Enrollment:

While quantifying the effect of aspirations is difficult, having high aspirations has been linked to achieving good educational and occupational outcomes (Gregg, Macmillan, and Washbrook, 2009; Khoo and Ainley, 2005). This study is the first to investigate whose aspirations matter in education within the household, and how factors such as income, wealth, and child age affect the relative importance of these aspirations, a proxy for decision-making power.

Controlling for socioeconomic and household characteristics known to affect school enrollment (Emerson and Souza, 2002; Ota and Moffat, 2007; Sawada and Lokshin, 1999), enrollment in 2007 was regressed with parental and child aspiration variables in 2004 to control for simultaneity bias.

As shown in Table 8, Model 0 excludes all aspirations variables to compare the sensitivity of covariates to inclusion of aspirations. Model 1 takes a unitary view of aspirations by averaging parent and child aspirations to construct an aggregate measure of household aspirations. On average, increasing household aspirations by one year in 2004 increased the probability of school continuation in 2007 by 4% at a <0.001% significance level, controlling for all other variables.

Model 2 then disaggregates aspirations into father, mother, and child. The summation of the coefficients on father, mother, and child aspirations very closely approximates the coefficient on the aspirations variable in Model 1. The results show that child's and father's aspirations disproportionately matter more than mother's aspirations. Model 3-6 include interaction terms to investigate how the weight on parent and child aspirations changes with various socioeconomic, household, and child characteristics. Since mother's aspirations were found to be insignificant, Models 7-8 focus only on father and child aspirations and the factors affecting their relative importance.

Figures 2 and 3 illustrate the partial effect of age and income for boys and girls separately, holding all other variables at the mean. Although generalizations from the graphical depictions need to be considered carefully since the assumption that other variables, such as parental education levels and child test scores, are fixed across the entire age and income continuum is unlikely, they provide a useful visual representation of the results near the mean.

Confirming the findings of other studies of determinants of school enrollment and the motivating theoretical model for the schooling decision, mother's education, father's education, and child's academic achievement were significant and robust positive predictors of child enrollment, once accounting for child age and grade. The coefficient, sign, and significance of the child gender dummy variable, however, varied depending on the specification, especially when gender appeared in various aspiration interaction terms. One potential explanation is the collinearity between parental aspirations and aspirations interacted with gender – as shown in Section 3.1 (Descriptive Statistics). In the prior section on determinants of aspirations, father and mother aspirations for female children are systematically lower.

Wealth, income, and birth order variables did not significantly increase the likelihood of school enrollment, though income affected the importance of different family member's aspirations. When the regression was

run omitting aspiration variables – wealth, income, and birth order variables remained insignificant, suggesting that the covariates were not sensitive to the inclusion of aspirations (Model 0). Birth order variables interacted with aspirations were not significant, suggesting that the importance of aspirations does not vary depending on the child's position in the family. Given the paper's objective of analyzing the dynamics of household decision making and the relative importance of each individual's aspirations in affecting school enrollment, the following discussion focuses on coefficient on the aspirations of father, mother, and child.

Weight on Father's Aspirations

In all specifications, father's aspirations in 2004 were a significant predictor for schooling enrollment in 2007. Without considering interaction terms, the coefficient on father's aspirations was 0.014, approximately 34% of the total weight on aspirations, summed across family members.

The coefficient on father's aspiration appears to increase with income and child age, holding other variables fixed, though the effect differs depending on the child's gender, as shown in Figures 2 and 3. In general, the influence of father's aspirations on the enrollment of a female child is lower than that of a male child, as shown by the negative gender interaction. Given differences in gender roles in China, fathers may take a more limited role in a female child's education and development. Hence, as shown in Figure 2, the aspirations of female children matters more in a household when compared to male children.

Since the father is generally the primary income generator in the household, greater household income may increase father's bargaining power, thus making his aspirations count for more. Children may have the incentive to respect their father's wishes in order to obtain financial support for future needs. As the child ages, although he or she gains greater decision-making power and agency, the father's input remains highly important, especially since the costs of schooling escalate at higher grades and family support is necessary until the child becomes fully financially independent. All other interaction terms were not significant.

Weight on Mother's Aspirations

One can argue that the attainment-aspiration gap for mothers is the highest compared to that of fathers and children; as such, high aspirations alone may not provide sufficient support to improve the likelihood of continuation of schooling. In all specifications, the coefficient on mother's aspirations was not statistically significant. Although multi-collinearity may be one potential concern, the correlation between mother's aspirations and that of father (0.485) and child (0.145) are not sufficiently high to fully explain this result.

In light of the first stage results, however, a more convincing explanation is that mother's aspirations affects the formation and level of child's aspirations, but does not directly affect enrollment. Following the mediational model framework, mother's aspirations contribute to available child social and academic capital, the latter affecting educational attainment. When regressions were run separately for female and male children, the coefficient on mother's aspirations increased for female children, though remained statistically insignificant.

Weight on Child Aspirations

In Model 2, the coefficient on child's aspirations (0.0168) exceeded that of father and mother, contributing approximately 42% of the total weight on aspirations, summed across family members. With the inclusion of interaction effects, however, a more complete understanding of the different factors affecting the contribution of child aspirations to continuation of schooling emerges. The weight on children's aspirations increases significantly with age, suggesting a transition to adulthood with greater decision-making power.

The weight on child aspirations, however, attenuates with family income. Two potential explanations emerge. First, in wealthier, higher-income households, fathers maintain much greater influence and bargaining power, perhaps due to greater control over resources. Conversely, in poorer households, the child has greater latitude over his or her own educational choices because parents may have lower ability to hold resources hostage.

Second, in more disadvantaged households, parental aspirations for their children – generally very high – may be less realistic than child aspirations, which tend to be lower and reflect actual performance and abilities (Figure 1). Even though wealth was a significant predictor of mother and father aspirations in the first stage results, parental aspirations for poorer households may still remain too high relative to the actionable aspirations window, and hence lose relevance compared to child aspirations.

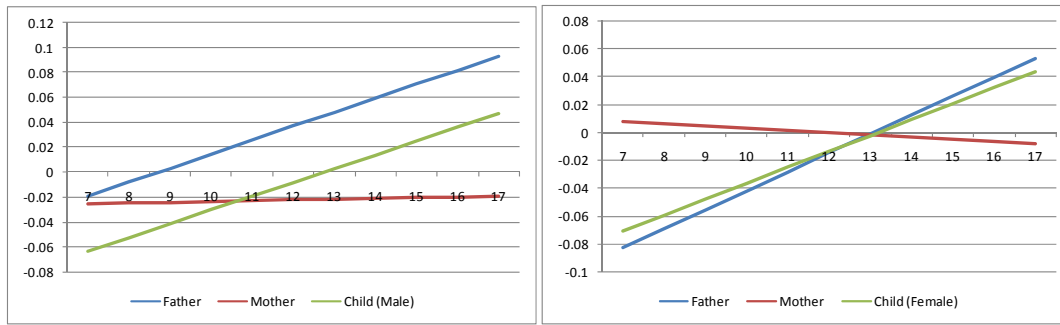
The least intuitive coefficient is the negative sign on the interaction between child's aspirations and child's test scores, though the magnitude of the effect is small. Across all specifications, child's math test score, reflective of ability, increased the probability of school continuation. The negative interaction term, however, suggests that the contribution of child's aspirations to enrollment declines with greater test scores. Two potential explanations emerge. First, higher math scores suggests that the child's enrollment is less sensitive to aspirations – if the child demonstrates high ability or aptitude, he or she is more likely to continue in school, regardless of the level of aspirations. Second, aspirations and effort may matter more for a marginal student, especially since students must attain minimum test scores to be admitted to high school. In short, students with high ability and test scores are likely to continue in school regardless, and hence, intrinsic factors may play less of a role.

Table 7. Determinants of Schooling, Linear Probability Model with Village Fixed Effects

Variable	Model 0		Model 1		Model 2		Model 3		Model 4		Model 5		Model 6		Model 7		Model 8	
	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value
Aspiration (Family Aggregated)			0.0413***	(0.000)														
Mother Aspiration					0.00938	(0.202)	0.0634	(0.404)	0.0650	(0.393)	0.0676	(0.375)	0.0655	(0.382)				
Father Aspiration					0.0141**	(0.046)	-0.223***	(0.004)	-0.227***	(0.003)	-0.230***	(0.003)	-0.226***	(0.003)	-0.200***	(0.001)	-0.200***	(0.001)
Child Aspiration					0.0168***	(0.001)	-0.0256	(0.571)	-0.0311	(0.497)	-0.0335	(0.463)	-0.0332	(0.466)	-0.0151	(0.735)	-0.0203	(0.652)
Child Aspiration*Income							-0.0106**	(0.036)	-0.0101**	(0.047)	-0.0101**	(0.048)	-0.0102**	(0.046)	-0.0110**	(0.027)	-0.0106**	(0.034)
Mother Aspiration*Income							-0.0104	(0.226)	-0.0103	(0.228)	-0.0105	(0.221)	-0.0103	(0.213)				
Father Aspiration*Income							0.0180**	(0.035)	0.0184**	(0.031)	0.0188**	(0.027)	0.0171**	(0.038)	0.0141**	(0.049)	0.0129*	(0.061)
Child Aspiration*Math Test							-0.000951**	(0.018)	-0.000991**	(0.013)	-0.000988**	(0.013)	-0.000957**	(0.016)	-0.000839**	(0.022)	-0.000829**	(0.023)
Child Aspiration*Language Test							0.000229	(0.595)	0.000295	(0.491)	0.000302	(0.481)	0.000296	(0.490)	0.000223	(0.597)	0.000273	(0.517)
Mother Aspiration*Math Test							0.000433	(0.444)	0.000460	(0.415)	0.000436	(0.438)	0.000461	(0.412)				
Mother Aspiration*Language Test							-0.00102**	(0.023)	-0.00106**	(0.017)	-0.00107**	(0.016)	-0.00104**	(0.020)				
Father Aspiration*Math Test							0.000513	(0.358)	0.000516	(0.352)	0.000543	(0.325)	0.000473	(0.391)	0.000777*	(0.054)	0.000746*	(0.062)
Father Aspiration*Language Test															-0.000931**	(0.036)	-0.000950**	(0.032)
Child Aspiration*Age							0.00949***	(0.000)	0.00943***	(0.000)	0.00956***	(0.000)	0.00955***	(0.000)	0.00872***	(0.000)	0.00874***	(0.000)
Mother Aspiration*Age							0.000562	(0.870)	0.000440	(0.898)	0.000370	(0.914)	0.000440	(0.898)				
Father Aspiration*Age							0.0112***	(0.001)	0.0113***	(0.001)	0.0113***	(0.001)	0.0110***	(0.001)	0.0111***	(0.000)	0.0109***	(0.000)
Father Aspiration*Father Edu							-0.00204	(0.253)	-0.00193	(0.275)	-0.00192	(0.275)			-0.00180	(0.288)		
Mother Aspiration*Mother Edu							0.000400	(0.842)	0.000238	(0.905)	0.000234	(0.906)						
Child Aspiration*Primary Support Dummy							-0.00374	(0.713)							-0.00168	(0.867)		
Child Aspiration*Gender							-0.00946	(0.302)	-0.00687	(0.438)	-0.00691	(0.434)	-0.00683	(0.438)	-0.00986	(0.272)	-0.00779	(0.367)
Mother Aspiration*Gender							0.00700	(0.631)	0.00736	(0.612)	0.00777	(0.592)	0.00774	(0.592)				
Father Aspiration*Gender							-0.0355***	(0.008)	-0.0357***	(0.007)	-0.0359***	(0.007)	-0.0361***	(0.006)	-0.0319***	(0.006)	-0.0318***	(0.006)
Primary Support Dummy	0.0127	(0.509)	0.000714	(0.972)	0.000719	(0.971)	0.0591	(0.702)							0.0312	(0.838)		
First Born Dummy	-0.0578	(0.216)	-0.0514	(0.313)	-0.0522	(0.305)	-0.0521	(0.304)							-0.0472	(0.351)		
Last Born Dummy	-0.0612	(0.149)	-0.0560	(0.229)	-0.0557	(0.232)	-0.0483	(0.301)							-0.0435	(0.349)		
First Born*Gender	0.0867	(0.152)	0.0616	(0.337)	0.0608	(0.342)	0.0650	(0.307)							0.0561	(0.380)		
Last Born*Gender	0.0113	(0.842)	-0.0151	(0.803)	-0.0163	(0.789)	-0.0194	(0.747)							-0.0245	(0.683)		
Father Health (1-5 Index)	-0.00343	(0.772)	-0.000350	(0.977)	0.000313	(0.980)	0.000572	(0.962)	0.00139	(0.909)								
Mother Health (1-5 Index)	0.00609	(0.602)	0.00271	(0.826)	0.00283	(0.818)	0.00343	(0.778)	0.00324	(0.791)								
Child Health (1-5 Index)	-0.0137	(0.195)	-0.0136	(0.220)	-0.0138	(0.213)	-0.0117	(0.288)	-0.0130	(0.237)								
Math Test Score	0.0389***	(0.001)	0.0407***	(0.001)	0.0405***	(0.001)	0.0356	(0.469)	0.0356	(0.471)	0.0351	(0.478)	0.0378	(0.443)	0.0457	(0.340)	0.0481	(0.315)
Language Test Score	0.0294***	(0.008)	0.0228*	(0.050)	0.0225*	(0.054)	0.145**	(0.036)	0.142**	(0.039)	0.142**	(0.038)	0.138**	(0.043)	0.132*	(0.052)	0.128*	(0.060)
Ln(Wealth per capita)	0.0191	(0.145)	0.0151	(0.277)	0.0153	(0.268)	0.0133	(0.333)	0.0125	(0.362)	0.0127	(0.353)	0.0127	(0.350)	0.0142	(0.295)	0.0136	(0.312)
Ln(Income per capita)	0.0131	(0.263)	0.0162	(0.199)	0.0163	(0.197)	0.0580	(0.713)	0.0421	(0.787)	0.0386	(0.804)	0.0624	(0.674)	-0.0393	(0.771)	-0.0286	(0.826)
Father Education	0.00940***	(0.002)	0.00966***	(0.002)	0.00968***	(0.002)	0.0409	(0.141)	0.0386	(0.159)	0.0386	(0.158)	0.00908***	(0.004)	0.0371	(0.159)	0.00900***	(0.004)
Mother Education	0.00904***	(0.006)	0.00863***	(0.013)	0.00868**	(0.013)	0.00278	(0.929)	0.00581	(0.852)	0.00592	(0.849)	0.00959***	(0.005)	0.00985***	(0.004)	0.0104***	(0.002)
Child Gender	-0.103**	(0.045)	-0.0736	(0.183)	-0.0731	(0.187)	0.505**	(0.044)	0.482**	(0.046)	0.479**	(0.047)	0.482**	(0.043)	0.564**	(0.011)	0.544***	(0.010)
Ln(Land per capita)	-0.0117	(0.623)	-0.0245	(0.324)	-0.0253	(0.311)	-0.0204	(0.417)	-0.0270	(0.282)	-0.0265	(0.290)	-0.0264	(0.291)	-0.0160	(0.522)	-0.0226	(0.366)
_cons	0.423**	(0.029)	-0.0788	(0.687)	-0.0659	(0.738)	-1.921*	(0.090)	-1.802	(0.106)	-1.812	(0.103)	-1.802	(0.105)	-1.048	(0.286)	-0.957	(0.324)
N	2123		1915		1915		1915		1915		1915		1915		1949		1949	

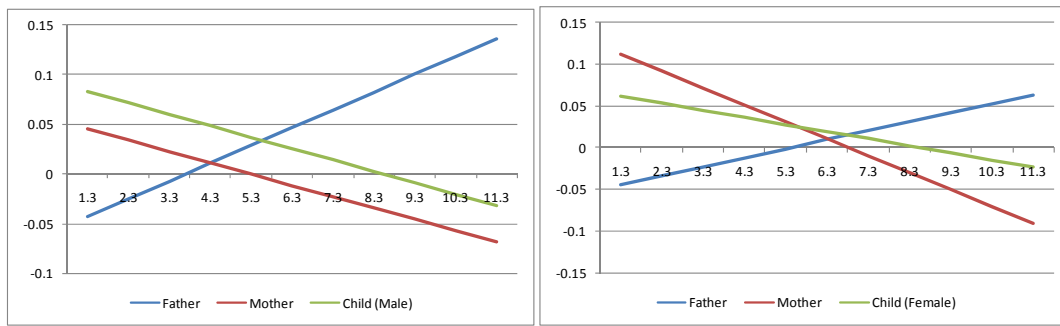
Note: Output on grade and age dummies has been suppressed; *denotes $p < 0.10$; ** denotes $p < 0.05$; *** denotes $p < 0.01$

Figure 2. Coefficient on Father, Mother, and Child Aspirations at Different Child Ages



Note: Coefficients on each family member's aspirations were calculated taking an average of child test scores, household income, and parental education, while allowing age to vary within the sample range. The means for boys and girls were calculated separately. The coefficient estimates were taken from the Model 3 full specification, run separately for boys and girls to allow coefficients to vary.

Figure 3. Coefficient on Father, Mother, and Child Aspirations at Different Income Levels



Note: Coefficients on each family member's aspirations were calculated taking an average of child test scores, child age, household income, and parental education, while allowing the log of per capita income to vary within the sample range. The means for boys and girls were calculated separately. The coefficient estimates were taken from the Model 3 specification, run separately for boys and girls to allow coefficients to vary.

Section 4. Conclusions

Aspirations serve as an important educational measure because they capture an individual's sense of the value of education. In particular, a student's aspirations reflect a child's own agency and ownership over his or her educational trajectory. Studies of academic engagement have shown that aspirations serve as a key indicator to continuation of schooling – in particular, students in China are more likely to persist in school if they personally value education (Davidson, 2006; Xu, 2002). Although high levels of aspirations do not predict outcomes in all cases, studies have shown that high aspirations have been linked to greater levels of academic achievement, though very limited work has been conducted in developing country contexts.

Analysis of aspirations in the field of economics has only recently begun, motivated by the failure of many education policy interventions focused solely on extrinsic factors and the development of new programs aimed at changing intrinsic attitudes and beliefs. Especially since aspirations mediate relations between socioeconomic and demographic variables and measures of eventual educational outcomes, analysis of aspirations provides insights into the mechanism by which factors such as parental income and educational level affect actual attainment. This study is the first to investigate whose aspirations matter in education

within the household, and how factors such as income, wealth, and child age affect the relative importance of these aspirations, a proxy for decision-making power. The following five points summarize the main findings of the paper.

First, aspirations are shaped by a confluence of individual, family, and greater environmental influences, all which impact the formation of child, father, and mother aspirations heterogeneously. Children's aspirations correspond more strongly to measures of ability than that of father and mother aspirations, while gender and wealth were not significant. In contrast, wealth was a significant predictor for the level of father and mother aspirations, and parents had lower aspirations for female than male children, consistent with the theory of human capital investment. One implication is that children's aspirations tend to be more reflective of the actual productivity of the human capital production function and less inhibited by actual socioeconomic circumstances, while parents are more concerned with current credit constraints. Although parents may have lower aspirations for girls, girls themselves tend not to have significantly lower aspirations than boys. In general, children's aspirations tend to be lower than that of mother and father, reflecting a more realistic assessment of capacity for educational attainment, lower perceived return to schooling, or a higher discount rate on the future. Especially since recent reforms of the Chinese educational system have created an inter-generational gap in level of schooling, less educated parents may be unable to judge true academic abilities of a child, especially at higher grades.

Second, higher child's aspirations correspond to a greater likelihood of staying in school, even after controlling for ability, socioeconomic, and demographic variables. In the model without interaction terms, child's aspirations outweighed that of father's aspirations in importance. The implication supports the conclusion of the World Development Report in that the agency of children ought to be considered in household decision making models or human capital investment models that determine key choices that affect the child's life. This finding suggests that household models and theories in which parents set all decisions for the child, albeit benevolently and altruistically based on their own preferences, may fail to capture important dimensions specific to the child's own utility function.

Third, although mother's aspirations significantly influence child aspirations, mother's aspirations did not directly affect schooling continuation. As mother's aspirations were highest compared to father and child aspirations and were least sensitive to child ability scores, one potential explanation is the mother's aspirations were too unrealistically high to fall within an actionable aspirations window. Nevertheless, especially since mothers play an important role in the care giving of children, a high level of mother's aspirations contributes to the formation of a child's own aspiration level, which in turn, affects school continuation. In contrast, father's aspirations do not predict child's aspirations, but significantly influence schooling, especially for boys. Father's aspirations matter less for girls, perhaps due to lower participation in the lives of female children. Consequently, girls own aspirations have greater weight in the household compared to that of male children.

Fourth, as the child ages, the influence of father and child aspirations on schooling continuation increases, suggesting that intrinsic motivation matters more at higher levels of education. Unlike studies in OECD countries in which child aspirations tend to systematically decline as children age and recognize barriers,

aspirations for children in rural Gansu tend to increase with age, though the effect is more pronounced in boys than girls, reflecting differences in socialization and the influences of gender roles. This effect perhaps captures the consequences of higher expectations associated with growth in the Chinese economy and improvement in living standards that close the attainment discrepancy between aspirations and actual outcomes, as supported by the theory. Policy interventions aiming to raise the level of aspiration and improve attitudes of self efficacy can target key transitions in a child's life in which a drop-off is expected, such as the ending of primary school.

Fifth, income increases the weight on father aspirations, but decreases that of the child. Since fathers are the typical primary breadwinner of the family, higher income increases decision-making power and weight on paternal preferences. In richer households, children have more incentive to respect father's wishes to obtain financial support for both tuition and future needs. In contrast, in poorer households, the child has greater latitude over his or her own educational choices because parents have lower ability to hold resources hostage.

Interpretation of Results and Next Steps

Due to the econometric issues discussed in Sections 2.1 and 2.2 and issues of measurement and endogeneity of the aspirations variable, one cannot infer causality – that increasing aspirations of parent and child will directly improve the likelihood of continuing schooling or affecting different socioeconomic variables will directly lead to an increase in aspirations. In light of the discussion on the aspirations gap, aspirations can motivate greater investment in education, but within an actionable window. In addition, as a subjective measure susceptible to a wide variety of social and environmental influences, aspirations capture various unobservable influences that may be difficult to measure in a survey.

Nevertheless, although the econometric identification of the determinants and impact of aspirations is easy to challenge, the objective of this study is explore and derive general insights robust to empirical regularities and useful for policy analysis. The richness of the GSCF data allows for very detailed individual and family control variables. Likewise, the three year time gap (enrollment in 2007, aspirations and explanatory variables in 2004) and comparison of siblings within the household provide a robustness check

Future studies can improve by utilizing a multi-dimensional measure of aspirations to reduce issues of subjectivity in question interpretation, as well as tracking the dynamics of aspirations through time more thoroughly. In a couple of years when all students have completed their education, the second stage can be re-estimated using the actual number of years of education completed, which would more closely map onto the aspirations variable.

References

Angrist, Joshua; Pischke, Jorn-Steffan. Mostly Harmless Econometrics. Princeton University Press. December 2008.

"Aspiration and attainment amongst young people in deprived communities." Cabinet Office: Social Exclusion Task Force. December 2008.

Adams, Jennifer; Hannum, Emily. "Girls in Gansu, China: Expectations and aspirations for secondary schooling." Chapter in Exclusion, Gender and Education: Case Studies from the Developing World, 2007.

"Adolescents and Youth in Pakistan 2001-2002: A Nationally Representative Survey." Population Council, 2002.

Alderman, Harold; Chiappori, Pierre-Andre; Haddad, Lawrence; Hoddinott, John; Kanbur, Ravi. "Unitary versus Collective Models of the Household: Is it time to shift the burden of proof?" *The World Bank Research Observer*, February 1995. Vol. 10, No. 1, 1-19.

Armstrong, Patrick; Crombie, Gail. "Compromises in Adolescents' Occupational Aspirations and Expectations from Grades 8 to 10." *Journal of Vocational Behavior*, 2000. Vol 56, 82-98.

Bandura, Albert. "Self-efficacy: Toward a Unifying Theory of Behavioral Change." *Psychological Review*, 1977. Vol 84, No 2, 191-215.

Bandura, Albert. Self-Efficacy: The Exercise of Control. New York: Freeman, 1997.

Becker, Gary; Lewis, Gregg. "On the Interaction between the Quantity and Quality of Children." *The Journal of Political Economy*, April 1973. Vol. 81, No. 2, S279-S288.

Benabou, Roland; Tirole, Jean. "Intrinsic and Extrinsic Motivation." *Review of Economic Studies*, 2003. Vol 70, 489-520.

Betz, Nancy; Hackett, Gail. "The Relationship of Career-Related Self-Efficacy Expectations to Perceived Career Option in College Women and Men." *Journal of Counseling Psychology*. Vol 28, 399-410.

Bond, Rod; Saunders, Peter. "Routes of Success: Influences on the Occupational Attainment of Young British Males." *British Journal of Sociology*, 1999. Vol 50, 217-249.

Bourguignon, Francois; Chiappori, Pierre-Andre. "Collective models of household behavior." *European Economic Review*, 1992. Vol 36, 355-364.

Bourguignon, Francois; Browning, Margin; Chiappori, Pierre-Andre; Lechene, Valerie. "Intra Household Allocation of Consumption: A Model and Some Evidence from French Data." *Recent Advances in Economic Theory*, 1993. 137-156.

Brown, Philip. "Poverty, Education, and Intrahousehold Bargaining: Evidence from China." University of Michigan, 2003.

Brown, Philip. "Parental Investment in Children's Human Capital in Rural China." Center of Research on Education in China, May 2002. Vol 3, No 1.

Browning, Martin; Chiappori, Pierre-Andre; Lechene, Valerie. "Collective and Unitary Models: A Clarification." Oxford Department of Economics Discussion Paper Number 191. May 2004.

Chiappori, Pierre-Andre. "Collective Models of Household Behavior: The Sharing Rule Approach." Chapter in Intrahousehold Resource Allocation in Developing Countries: Models, Methods, and Policy. Johns Hopkins University Press, 1997.

Davidson, Shannon. "Mother Expectations, Parental Investment and Children's Educational Aspirations in Gansu Province." International Comparative Education, Stanford University. August 2006.

Davis-Kean, Pamela. "The Influence of Parent Education and Family Income on Child Achievement: The Indirect Role of Parental Expectations and the Home Environment." Journal of Family Psychology, 2005. Vol. 19, No. 2, 294-304.

"Development and the Next Generation." World Development Report, 2007.

Eccles Parsons, Jacquelynne; Adler, Terry; Kaczala, Caroline. "Socialization of Achievement Attitudes and Beliefs: Parental Influences." Child Development, April 1982. Vol. 53, No. 2, 310-321.

Finlayson, Douglas. "Parental Aspiration and the Educational Achievement of Children". Educational Research, 1971. Vol 14, No 1,61-64.

Emerson, Patrick; Souza, Andre Portela. "Bargaining Over Sons and Daughters: Child Labor, School Attendance, and Intra-Household Gender Bias in Brazil." Vanderbilt University Working Paper No. 02-W13, May 2002.

Fernandez-Val, Ivan. "Fixed effects estimation of structural parameters and marginal effects in panel probit models." Journal of Econometrics. Vol 150, 71-85. May 2009.

Fordham, Signithia; Ogbu, John. "Black Students' School Success: Coping with the Burden of 'Acting White'." Urban Review, 1986. Vol 18, 176-206.

Genicot, Garance; Ray, Debraj. "Aspirations, Inequality, Investment and Mobility." January 2009.

Greene, William. "The Behaviour of the Maximum Likelihood Estimator of Limited Dependent Variable Models in the Presence of Fixed Effects." Econometrics Journal. Vol 7, 98-119. 2004.

Gutman, Leslie; Akerman, Rodie. "Determinants of aspirations." Centre for Research on the Wider Benefits of Learning. June 2008.

Haddad, Lawrence; Hoddinott, John; Alderman, Harold. Intrahousehold Resource Allocation in Developing Countries: Models, Methods, and Policy. Johns Hopkins University Press, 1997.

Hannum, Emily; Kong, Peggy. "Family Sources of Educational Gender Inequality in Rural China: A Critical Assessment." Paper presented at the National Academy of Education, Toronto, 2003.

- Hannum, Emily; Park, Albert. "Academic achievement and engagement in rural China." Chapter in Education and Reform in China. Oxford: Routledge, 2007.
- Hannum, Emily; Park, Albert. "Educating China's Rural Children in the 21st Century." *Harvard China Review*. Spring 2002.
- Harris, Kathleen; Morgan, Philip. "Fathers, Sons, and Daughters: Differential Paternal Involvement in Parenting." *Journal of Marriage and the Family*, August 1991. Vol. 53, No. 3, 531-544.
- Heckman, James; Li, Xuesong. "Selection Bias, Comparative Advantage and Heterogeneous Returns to Education." NBER Working Paper No. 9877, July 2003.
- Heifetz, Aviad; Minelli, Enrico. "Aspiration Traps." Discussion Paper 610, Università degli Studi di Brescia. March 2006.
- Himaz, Rozana. "Intrahousehold Allocation of Education Expenditure and Returns to Education: The Case of Sri Lanka." Oxford University Department of Economics Working Paper Number 393. May 2008.
- Hitlin, Steven. "Parental Aspirations on Children's Values and Aspirations: Bridging two theories of Social Class and Socialization." *Sociological Perspectives*, 2006. Vol. 49, Issue 1, pp. 25-46.
- Hossain, Shaikh. "Interrelations between Child Education, Health, and Family Size: Evidence from a Developing Country." *Economic Development and Cultural Change*, July 1990. Vol. 38, No. 4, 763-781.
- Hunte, Pamela. "Household Decision-Making and School Enrollment in Afghanistan." Afghanistan Research and Evaluation Unit, December 2005.
- Jacoby, Hanan; Skoufias, Emmanuel. "Risk, Financial Markets and Human Capital in a Developing Country." *Review of Economic Studies*, July 1997. Vol 64, No 3, 311-35.
- Kao, Grace; Tienda, Marta. "Educational Aspirations of Minority Youth." *American Journal of Education*, 1998. Vol 106, 349-384.
- Khoo, Siek; Ainley, John. "Attitudes, intentions and participation." Longitudinal surveys of Australian youth research report , No 41, 2005.
- Krishnan, Pramila; Krutikov, Sofya. "Report on the Impact of Akanksha." University of Oxford, 2008.
- Kruger, Diana; Soares, Rodrigo; Berthelon, Matias. "Household Choices of Child Labor and Schooling: A Simple Model with Application to Brazil." IZA Discussion Paper No. 2776, May 2007.
- Lant, Theresa. "Aspiration Level Adaptation: An Empirical Exploration." *Management Science*, May 1992. Vol 38, No 5, 623-644.
- Marjoribanks, Kevin. "Family Background, Social and Academic Capital, and Adolescents' Aspirations: A Mediation Analysis." *Social Psychology of Education*, 1998. Vol 2, 177-197.
- Marjoribanks, Kevin. "Learning Environments, Family Contexts, Educational

- Aspirations and Attainment: A Moderation-Mediation Model Extended". Learning Environments Research, 2003. Vol 6, 247–265.
- Modood, Tariq. "Ethnic Differentials in Educational Performance" Chapter in Explaining Ethnic Differences: Changing Patterns of Disadvantage in Britain. Bristol: Policy Press, 2003.
- Morduch, Jonathan. "Sibling Rivalry in Africa." The American Economic Review, May 2000. Vol. 90, No. 2, 405-409.
- Ota, Masako; Moffatt, Peter. "The within-household schooling decision: a study of children in rural Andhra Pradesh." Journal of Population Economics, 2007. Vol 20, 223–239.
- Park, Albert; Hannum, Emily; Cheng, Kai-Ming. "Market reforms and educational opportunity in China." Chapter in Education and Reform in China. Oxford: Routledge, 2007.
- Punch, Keith; Sheridan, Barrett. "Determinants of Aspirations in Secondary School Students." Journal of Educational Administration, 1978. Vol 16, No 2, 175-186.
- Ray, Debraj. "Aspirations, Poverty and Economic Change." New York University, August 2002.
- Sawada, Yasuyuki; Lokshin, Michael. "Household Schooling Decisions in Rural Pakistan." Development Research Group, World Bank Working Paper. November 1999.
- Schoon, Ingrid; Martin, Peter; Ross, Andy. "Career Transitions in Times of Social Change: His and Her Story." Journal of Vocational Behavior, 2007. Vol 70, 78-96.
- Schoon, Ingrid; Parsons, Samantha. "Teenage Aspirations for Future Careers and Occupational Outcomes." Journal of Vocational Behavior, April 2002. Vol 60, No 2, 262-288.
- Sewell, William; Shah, Vimal. "Parents' Education and Children's Educational Aspirations and Achievements." American Sociological Review, April 1968. Vol. 33, No. 2, 191-209.
- Shafiq, Najeeb. "Household schooling and child labor decisions in rural Bangladesh." Journal of Asian Economics, 2007. Vol 18, 946–966.
- Sinclair-Desgagné, Bernard. "Endogenous Aspirations and Economic Growth." Department of Applied Economics, HEC Montréal.
- Smith, Thomas. "Mother-Father Differences in Parental Influence on School Grades and Educational Goals." Sociological Inquiry, February 1989. Vol 59, No. 1.
- Spera, Christopher. Wentzel, Kathryn; Matto, Holly. "Parental Aspirations for Their Children's Educational Attainment: Relations to Ethnicity, Parental Education, Children's Academic Performance, and Parental Perceptions of School Climate." Journal of Youth Adolescence, 2008.
- Upadhyay, Kiran. "Educational Aspirations and Expectations of Rural Youths in Rautahat District of Nepal." Contributions to Nepalese Studies, April 1984. Vol 11, No 2.
- Wilgenbusch, Tammy; Merrell, Keith. "Gender Differences in Self-Concept Among Children and Adolescents: A Meta-Analysis of Multi-dimensional Studies." School Psychology Quarterly. Vol 14, 101-120.

Wilson, Patricia; Wilson, Jeffrey. "Environmental Influences on Adolescent Educational Aspirations: A Logistic Transform Model." *Youth Society*, 1992. Vol 24, No 52.

Wolter, Stefan. "Sibling Rivalry: A Six Country Comparison." Swiss Coordination Centre for Research in Education. Discussion Paper No. 734, March 2003.

Xu, Qiong. "Father-daughter relationships during girls' adolescence in Urban China." *Educate Magazine*, 2009. Vol.9, No.1, 12-15.

Yang, Sonam; Shin, Chang. "Parental attitudes towards education: What matters for children's well-being?" *Children and Youth Services Review*, 2008. Vol 30, 1328–1335.

Yueh, Linda. "A Model of Parental Investment in Children's Human Capital." SKOPE Research Paper No 15, Spring 2001.

Zajonc, RB; Markus, H; Markus, GB. "The Birth Order Puzzle." *Journal of Personality and Social Psychology*, 1979. Vol 37, 1325-1341.