Impact of Family Factors on School Enrollment in Bolivia

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ABSTRACT

This study identifies the influence of human capital, financial capital and family factors on school enrollment in Bolivia. The sample is drawn from the 1998 DHS. Human capital was measured by parents' education. Financial capital was measured using a social class index. Family factors included: (1) mother's knowledge of select health issues, (2) hygiene and health environment in the household, and (3) awareness and use of health services. Logistic regression was used to model the effect of the above factors on school enrollment. Demographic variables such as age and gender of the child were also adjusted for in the model. Results of the study indicate that mother's education, the socioeconomic status of the family and the mother's knowledge of health issues all influence children's school enrollment. Mothers who could correctly identify when during their ovulatory cycle they could conceive were 1.5 times (p-value =.012) more likely to have their child enrolled in school. Mothers who correctly identified how much their child should drink during diarrheal episodes were 1.6 times (p-value =.001) more like to have their child enrolled in school. The odds of a child being enrolled in school also went up with increases in the mother's education and the family's socioeconomic status, and decreased for girls. Implications for practice, policy and future research are discussed.

Keywords: determinants, knowledge, health, gender.

INTRODUCTION

The influence of family environment on educational outcomes has been the subject of considerable research, both in developed and developing countries (Coleman 1994; Guo and Harris 2000; Parcel and Dufur 2001; Wong 1989). Several models examine various mechanisms through which family environment affects children's education. Buchmann and Hannum (2001) attempt to explain the larger structural forces including national conditions, state policies and global forces influencing both educational and economic outcomes through two intermediate factors: supply and demand. In this model, supply includes schooling factors (inputs, processes and organization) and community factors (structure and resources). Demand includes socioeconomic status, structure, and organization (Buchmann and Hannum 2001).

In a second model, described by Guo and Harris (2000), the relationship between family poverty and intellectual development is mediated by several variables including the physical environment at home, mother's involvement with the child, cognitive stimulation at home, the child's health, and the quality of child care (Guo and Harris 2000). Coleman (1988) identified three types of family capital influencing education: human, financial and social. Human capital is generally measured as parents' education or more simply the father's or mother's level of formal schooling (Coleman 1988). Financial capital is generally measured through the family's ownership of physical resources such as a television car or telephone.

In addition to family resources, research on school-based nutritional programs has shown an increase in both cognitive performance and school enrollment through improved nutrition and health (Agarwal et al. 1987; Meyers et al. 1989; Moore 1994; Powell et al. 1998; Simeon 1995; World Food Program 1996). In a study in Peru,

children who were given a meal at school achieved higher scores on vocabulary tests (Pollitt et al. 1996). In another similar study in Bangladesh, children were more likely to enroll in school and remain in school when provided with a meal (Ahmed and del Ninno 2002). However, the immediate influences of family factors such as the mother's knowledge of health issues, access to clean water and type of toilet facility in the household, access to and knowledge of health care services, and family planning have not yet been explored in depth.

The purpose of this study is to identify whether family factors, in addition to human and financial capital factors, increase school enrollment in Bolivia. If family factors are an important predictor of school enrollment, policy makers should be able to increase school enrollment by improving caregivers' and families' health knowledge, access to health services, and health environment at home. Thus, we hypothesize that family factors may also be an important mechanism influencing school enrollment in Bolivia.

(Insert Figure 1 About Here)

METHODS

The data from this study come from the 1998 Bolivian Demographic and Health Survey (Instituto Nacional de Estadisticas, 1998). The sample includes data from the household, individual, and child's surveys. The data from all three surveys were merged. The household file provides information on school attendance and the mother and child files are used to measure the health environment. Information on the data collection process can be found in the literature (Instituto Nacional de Estadisticas, 1998).

This study includes children between the ages of 9 (when a sharp decline in school enrollment is observed) and 14 (no information about enrollment status is available from the DHS for children older than 14 years). The total sample size was 7,355, the number of boys in the sample was 3,653 and the number of girls was 3,702.

DEFINITION OF VARIABLES

The dependent variable is the child's school enrollment status. Human capital is measured by parents' highest educational attainment (no education, incomplete primary, complete primary, incomplete secondary and higher). Financial capital is measured by a social class index that sums the physical resources of the family including electricity, radio, television, refrigerator, and telephone; and flooring, roof and wall material. Family factors include mother's knowledge of select health issues (her own ovulatory cycle, any method of contraceptive, oral rehydration therapy, and appropriate food and liquid intakes during diarrheal episodes), hygiene and health environment (source of drinking water, type of toilet facility), and awareness and use of health services (knowledge of institutions which provide health services, source of contraceptives, and whether the individual had discussed family planning with health personnel).

DATA ANALYSIS

The dependent variable is dichotomous: thus the models are analyzed using logistic regression. Coefficients represent the odds of being enrolled in school versus not as a linear function of the independent variables. Six models examined the relationship between human and financial capital and family factors: mother's knowledge of health issues, hygiene and health environment, and awareness and use of health services. We adjusted for several variables in the models including age and sex of child, area of

residence (countryside, town, small city or capital), number of children 5 and under, and literacy (cannot read, reads with difficulty, or reads easily). The final model that retained all significant variables from the five separate models was developed adjusting for the variables previously mentioned. The above analyses were then repeated stratifying by gender. Six new models were created for boys and six for girls.

RESULTS

Logistic regression analyses for each factor and school enrollment are shown in Table 1 (only significant variables are included). The first model included human capital variables and demographic covariates. Mother's highest educational attainment significantly influenced a child's school enrollment. The odds of the child being enrolled in school increased with increases in mother's educational attainment, but not with increases in father's educational attainment adjusting for demographic variables. Odds of being enrolled in school were higher for younger children, males, children with fewer siblings age 5 and under, those who lived in large cities and children of literate mothers.

The second model included financial capital variables (socioeconomic status, floor, wall and roof materials). Of these variables only socioeconomic status was significant. Increases in socioeconomic status increased the odds of the child being enrolled in school adjusting for the demographic variables. Other than area of residence, which was not in this model, all other covariates in this model influenced odds of school enrollment as they had in the previous model.

The third model included variables related to the mother's knowledge of health issues and demographic covariates. Mothers who could correctly identify when during their ovulatory cycle they could conceive were 1.5 times (p-value =.012) more likely than mothers who could not identify when during their ovulatory cycle they conceive to have

their child enrolled in school. Mothers who correctly identified how much their child should drink during diarrheal episodes were 1.6 times (p-value =.001) more likely than mothers who could not correctly identify how much their child should drink during diarrheal episodes.

In the next model, variables related to hygiene and health environment were regressed to predict school enrollment status of the children adjusting for the same demographic covariates. Results indicated that the source of drinking water and type of facility influenced the child's school enrollment status. Children who came from homes with no piped drinking water and those who came from homes with drinking water outside the household were only .7 times (p-value = .033) and .7 times (p-value=.005). respectively as likely as those who come from home with drinking water piped inside the household to enroll in school. Demographic covariates were also adjusted for in this model and all achieved significance and were in the expected direction.

Model 5 included variables related to awareness and use of health care services. Of these variables only the source of contraceptives achieved significance. Women who had received their contraceptives from private health care services were 1.2 more likely to have their child enrolled in school compared to women who had received their contraceptives from public health care services adjusting for the demographic variables.

The final model retained from the other five models all variables significant at the .05 level. However, stepwise regression analysis revealed that mother's knowledge of health issues, human and financial capital variables were the only variables to significantly influence the child's enrollment in school when controlling for the demographic covariates. Hygiene and health environment variables and awareness and use of health care services variables did not influence the child's school enrollment

status. Mothers who could correctly identify when during their ovulatory cycle they could get pregnant were 1.5 (.017) times more likely than mothers who could not identify correctly when during their ovulatory cycle they could get pregnant to have their child enrolled in school. Mothers who correctly identified how much their child should drink during diarrheal episodes were 1.6 times (p-value =.001) more likely than mothers who could not correctly identify how much their child should drink during diarrheal episodes.

(Insert Table 1 About Here)

Tables 2 and 3 replicate the above analyses for males and females, respectively. Table 2 presents the odds of school enrollment for males according to human and financial capital and family factor variables. Model 1 for males indicated that both father's and mother's education played a positive role on boys' school enrollment. As with the models incorporating boys and girls, school enrollment decreased with increased age and increased number of children 5 and under. Compared to boys living in the country side, boys living in the capital were 6.4 times more likely to be enrolled in school; those living in small cities were 4.1 times more likely to be enrolled in schools; and those living in towns were 3.3 times more likely to be enrolled in schools.

In the second model, socioeconomic status was the only financial capital variable that was significantly related to boys' school enrollment. In the model incorporating mother's knowledge of health issues, only the mother's knowledge of her own ovulatory cycle was significantly related to a boy's school enrollment. Women who could correctly identify when during their ovulatory cycle they could get pregnant were 1.6 times (p-

value = .017) more likely to have their sons enrolled in school. Increases in literacy levels were associated with increases in the odds of school enrollment for boys.

In the fourth model incorporating hygiene and health environment, the type of toilet facility was the only hygiene variable significantly associated with boys' school enrollment. Boys from households with no toilet facility, and non-flush toilets were only 61% and 55%, as likely, respectively to be enrolled in school than boys from households with flush toilets. Area of residence was significantly associated with school enrollment. Boys who resided in larger cities were more likely to be enrolled in school compared to boys from smaller cities.

In the model relating to awareness and use of health care services, women who obtained their contraceptives from private sources were 1.3 times (p-value=.030) more likely than women who obtained them from public sources to have their sons enrolled in school. The final model for boys indicated that only mother's education and financial capital (represented by socioeconomic status) was significantly associated with the odds of school enrollment for boys after adjusting for the effect of the child's age, literacy and area of residence. In this model, odds of school enrollment increased with increases in mother's education and socioeconomic status, but decreased for older boys, and increased for boys living in larger cities.

(Insert Table 2 About Here)

Table 3 presents the odds of school enrollment for girls based on human and financial capital, and family factor variables. The first model indicated that the odds of school enrollment for girls increased with increases in the mother's education, literacy level, and

living in larger cities, and decreased with age and increased number of children age 5 and under in the household.

As for boys, socioeconomic status was the only financial capital variable that was significantly related to the odds of school enrollment for girls. None of the variables relating to the mother's level of knowledge of health issues or awareness and use of health care services were significantly related to school enrollment for girls. The only hygiene variable associated with school enrollment was the type of toilet facility. However, in the final model none of the family factors were significantly related to school enrollment for girls. The variables related to school enrollment for girls included mother's education, socioeconomic status, age of child, and the number of children age 5 and under in the household.

(Insert Table 3 About Here)

DISCUSSION

The results indicate that human capital; mother's education, but not father's education, was positively associated with children's school enrollment. This suggests that an increase in mother's education increases school enrollment for their children. Furthermore, the effects of mother's education were consistently higher for girls than boys. These results are consistent with another study, which indicated that the positive impact of increased human capital is larger for girls than boys (Tansel, 1998).

The results also indicate that socioeconomic status is an important predictor of children's school enrollment in Bolivia. However, the analysis revealed that socioeconomic status was important for boys but not for girls. This data is contradictory

to previous research, which indicates that income is important to both girls and boys educational attainment and that it has a much larger impact on girls educational attainment than on boys (Tansel, 1998). However, some studies that aimed at predicting school enrollment and educational attainment failed to adjust for the number of siblings age 5 and under. In the current study, the number of children age 5 and under was found to be an important predictor of school enrollment especially for girls. This can be explained by the fact that girls are often kept home from school to take care of their younger siblings and this may be a more important predictor of school enrollment than socioeconomic status of the family.

Area of residence did not seem to play a role in school enrollment for children. Interestingly, it was an important predictor of school enrollment for boys but not for girls. The results show that mother's education, and the number of siblings age 5 and under were the most important predictors for girls' school enrollment. While boys' school enrollment could be predicted better using mother's education, the socioeconomic status of the family, number of siblings age 5 and under and the area of residence.

Limitations of this study include the lack of available data on school enrollment for children above the age of 14, when education is no longer compulsory in Bolivia. Lack of information on immunizations and access to health care for children in the sample may have further reduced our ability to predict the impact of access to health care services on school enrollment.

CONCLUSION

In general, this study provides support that the family factor variables including mother's knowledge of health issues, hygiene and health environment, and awareness and use of health services are a mechanism by which school enrollment may be improved in

Bolivia. Although several of these family factor variables may simply reflect the effect of other factors, which more directly influence enrollment such as mother's education and financial resources, some family factors remain important. In particular, women's knowledge about their own ovulatory cycle and correct drinking pattern during diarrheal episodes are related to school enrollment. These findings suggest that prevention of and appropriate treatment of illness could improve children's enrollment in school.

Figure 1. Conceptual Model of the Impacts of Human and Financial Capital, and Family Factors on School Enrollment for Children ages 9-14 in Bolivia.

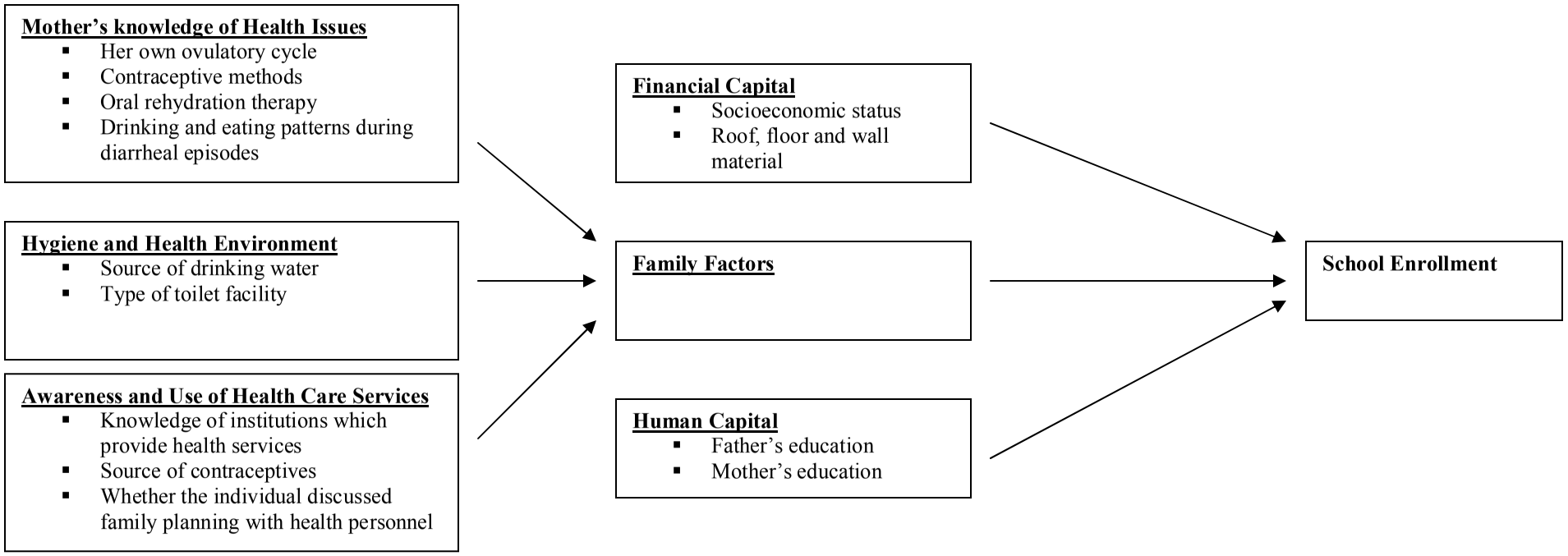

Table 1. Odds and p-values of school enrollment according to six models of human and financial capital and family factor variables, based on data from 1998 Bolivian DHS.

Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6 (Final)
Human capital						
Mother's education						
No education	.084***					.135***
Incomplete primary	.148**					.250*
Complete primary	.062***					.114***
Incomplete secondary	.208*					.316*
Higher	---					---
Financial Capital						
Socioeconomic status		1.905***				1.837***
Family Factors						
Mother's knowledge of health issues						
Ovulatory cycle						
Incorrect/Does not know			---			---
Middle of Period			1.602***			1.453*
Drinking patterns with diarrhea						
Incorrect/Does not know			---			---
Same amount or more			1.654***			1.553***
Hygiene and Health Environment						
Source of drinking water						
Not piped				.673**		
Piped outside				.691*		
Piped inside				---		
Type of toilet facility						
No facility				.793***		
Non-flush toilet				.869		
Flush toilet				---		
Awareness and Use of Health Care Services						
Source of contraceptives						
Public					---	
Private					1.249*	
Control Variables						
Age of child	.638***	.618***	.636***	.642***	.638***	.621***
Sex of child						
Male	---	---	---	---	---	---
Female	.689***	.686***	.689***	.688**	.685***	.687***
Number of children 5 and under	.777***	.820***	.756***	.752***	.758***	.799***
Area of residence						
Countryside	---		---	---	---	
Town	3.012***		3.012***	2.196***	2.740***	
Small city	2.681***		2.551***	2.660***	2.962***	
Capital	3.996***		4.595***	3.623***	4.806***	
Literacy						
Cannot Read	---	---	---	---	---	
Reads with difficulty	1.819*	1.885***	2.006***	1.927***	2.030***	
Reads easily	1.431	2.354***	2.420***	2.253***	2.628***	
-2LL	3101.51	2.980.04	3122.39	3113.88	3143.23	2.930.10
df	13	7	11	14	10	12

* p<.05, ** p <.01, *** p<.001

Table 2. Odds and p-values of school enrollment for males according to six models of human and financial capital and family factor variables, based on data from 1998 Bolivian DHS.

Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6 (Final)
Human capital						
Father's education						
No education	.310*					
Incomplete primary	.312*					
Complete primary	.602					
Incomplete secondary	.532					
Higher	---					
Mother's education						
No education	.075*					.059**
Incomplete primary	.215*					.173*
Complete primary.	.063*					.059**
Incomplete secondary	.232					.199
Higher	---					---
Financial Capital						
Socioeconomic status		1.905***				1.855***
Family Factors						
Mother's knowledge of health issues						
Ovulatory cycle						
Incorrect/Does not know			---			
Middle of Period			1.577*			
Hygiene and Health Environment						
Type of toilet facility						
No facility				.389*		
Non-flush toilet				.442		
Flush toilet				---		
Awareness and Use of Health Care Services						
Source of contraceptives						
Public					---	
Private					1.329*	
Control Variables						
Age of child	.598***	.576***	.600***	.599***	.599***	.575***
Number of children 5 and under	.818**		.802**	.801***	.799***	
Area of residence						
Countryside	----	---	---	---	---	---
Town	3.339***	1.815	3.401	3.346***	3.316***	1.931
Small city	4.120***	1.844	4.082***	3.955***	4.099***	1.952**
Capital	6.346***	1.886***	8.921***	7.754***	8.575	2.041***
Literacy						
Cannot Read		---	---	---	---	
Reads with difficulty		2.541***	2.716***	2.814***	2.622***	
Reads easily		2.609***	2.759***	2.965***	2.671***	
-2LL	1620.31	1570.02	1656.25	1656.07	1657.105	1544.78
df	14	7	9	10	9	9

* p<.05, ** p <.01, *** p<.001

Table 3. Odds and p-values of school enrollment for females according to six models of human and financial capital and family factor variables, based on data from 1998 Bolivian DHS.

Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6 (Final)
Human capital						
Mother's education						
No education	.137*					.159*
Incomplete primary	.172*					.228*
Complete primary.	.086***					.151*
Incomplete secondary	.266					.406
Higher						
Financial Capital						
Socioeconomic status			1.763***			
1.735***						
Family Factors						
Hygiene and Health Environment						
Type of toilet facility				.095**		
No facility				.160***		
Non-flush toilet						
Flush toilet						
Control Variables						
Age of child	.683***	.664***	.681***	.681***	.681***	.664***
Number of children 5 and under	.738***	.779***	.771***	.741***	.771***	.804**
Area of residence						
Countryside	---		---		---	
Town	1.676		1.859**		1.859**	
Small city	2.189**		2.705***		2.705***	
Capital	2.692**		2.728**		2.728**	
Literacy						
Cannot Read	---	---	---	---	---	
Reads with difficulty	1.335	1.358	1.559*	1.553*	1.559*	
Reads easily	2.115*	1.990**	2.860***	2.384***	2.860***	
-2LL	1448.12	1338.07	1465.32	1443.44	1465.32	1381.87
df	12	6	8	9	8	8

* p<.05, ** p <.01, *** p<.001

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