Prioritization of girls' schooling: Is there an intergenerational impact in Niger?

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ABSTRACT

This paper aims to assess the impact of the parents' education on the progeny schooling using the Demographic and Health Survey (DHS) data of Niger. It focuses on verifying whether the mothers' education better impacts the children schooling, and therefore measures the intergenerational efficiency of the pro girls schooling policies in the case of Niger. The results prove that the education of female today could lead to a significant increase in the education of the children of tomorrow. However, this rise is slightly (or even not significant according to econometric models) lower than the rise due to the education of male. Furthermore, having both parents educated and uneducated have respectively strongly positively and negatively significant impact on the probabilities that their children go to school. Therefore, with the goal of an education system dynamically efficient, there is a necessity not to neglect the endeavors and political decisions for male in Niger. Any prioritization of one sex over the other is not justified in a mid or long-term vision, especially females' one over males.

Keywords: Parental education, intergenerational impact, prioritization, probability of schooling.

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INTRODUCTION

Niger is a West African country which population is estimated at 17.1 million individuals (general census, 2012). The population is very young: the under 15 years old represent 51.6% and the over 65 years only 3.5%, according to the same source. The country's demographic growth is one of the fastest of the world. According to Niger DHS, 2012 - Final Report, the intercensal population growth rate which is strongly relied on the fertility increased from 3.3% for the period 1988-2001 to 3.9% for the period 2001-2012. On this basis, the population would double within 20 years. A particular way that is seen to play a crucial role in the population growth reduction is girls' schooling. Positive results from this policy are still expected since the total fertility rate [1] passed from 7.1 to 7.6 according to DHS 2006 and DHS 2012 respectively.

This paper aims to assess the impact of the parents'

education on the progeny schooling. It focuses on verifying whether the mothers' education better impacts the children schooling, and therefore measures the intergenerational efficiency of the pro girls schooling policies in the case of Niger. For this purpose, we use the Demographic and Health Survey (DHS) data. It is noted that many authors found that there is an intergenerational impact of the education. Among them, we can quote Belzil and Hansen (2003) who found that parents' education account for 68% of the explained cross-sectional variations in schooling attainments. Using Swiss data, Bauer and Riphahn (2007) also found substantial correlations of child-parent educational outcomes. Furthermore, according to Currie and Moretti (2003), mother's education positively affects the human capital of children. Greenwood (1997), at her turn, showed that the benefits of parental educational attainment with an intergenerational dimension include the effect on the fertility and on the quality of parental investments in children, and the altered costs of educating children to a

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[1] This indicator measures the average number of children a woman aged 15-49 years would give at the end of her reproductive life.

given level of achievement.

Moreover, specifying the parent and child gender, the intergenerational effect is not evident as Black et al. (2005), and Chevalier et al. (2013) showed using respectively Norwegian and U.K data. Black et al. (2005) using Norwegian data found little evidence of a causal relationship between father's education and children's education. They also found a significant causal relationship between a mother's education and her son's education but no causal relationship between a mother's education and her daughter's education. By contrast, Chevalier et al. (2013), using U.K data using adequate model, found that there is no mother's education effect, while father's education remains significant but only for daughters.

Because of the divergence in literature, it appears more important to understand this intergenerational effect of education in Nigerien case. Also, this intergenerational effect of education is not much developed for African countries even if we can denote that Thomas (1996), and Nimubona and Vencatachellum (2007) have analyzed the intergenerational effect in South Africa. This paper is an extension of the literature in observant the intergenerational effect of education in Niger and in comparing the effects of mother's and father's education.

Our study uses the last available data of Demographic and Health Survey (DHS) in Niger, which was led in 2012. Using these data, we compare the proportions of school enrolment and primary completion between the parental education for the whole sample and for the subsamples of child's gender, residency area, region and wealth quintile. The Probit model is used to determine the marginal effects of parental education on the school enrolment and the primary completion controlling by the child's gender, age, residence area, region, wealth quintile, and the gender and age of the household's head.

While it is true that there are many studies on intergenerational impact, very few of these studies have addressed a comparison between the effects of father's education and the effects of mother's education on children' schooling. Burke and Beegle (2004) found in Tanzania, that mother's schooling is more strongly associated with a daughter's attendance hours than those of her son; and a father's schooling significantly increases a boy's hours of attendance but does not significantly affect girls' attendance. In Guinea, Glick and Sahn (2000) found that improvements in father's education rais the schooling of both sons and daughters (favoring the latter) but mother's education has significant impact only on daughters' schooling.

This paper then contributes to the literature by making a comparative assessment between the impacts of education of both parents on their children using an econometric model in Niger's case. We found that there is an intergenerational transmission of the education. However, the enrollment rates and the completion of primary education are on average slightly higher among young people whose only fathers are educated than among those with only the mother educated. Nevertheless, the econometric models showed that the difference between the effects of only father educated and only mother educated is not significant even if the first effect is visibly greater. We showed therefore that in Niger, it is a necessity to focus educational political decisions for both girls and boys and not focus on only one gender. The remainder of the paper is organized as follows: In section 2, we introduce the data and present the descriptive statistics. The econometric model and results are discussed in section 3. Finally, section 4 concludes this paper.

DATA AND STATISTICS

Data

The Demographic and Health Survey (DHS) is one the most exhaustive survey led in developing countries. Its main objective is to afford socioeconomic, demographic, health and nutrition indicators. Both households and individuals (women aged 15-49, men aged 15-59, and children under 5 for anthropometry) data are collected. Education information about parents and children is collected for 5-17-year-old youths. Our study uses the last available data of DHS for Niger[2]; it was led in 2012 about 11,900 households, 11,698 women and 4,445 men. The data are nationally-representative and collected with a two-stage cluster sampling. Primary units were Clusters; they were selected proportionally to their sizes. Households were the secondary units; they were selected with equal probability.

School enrolment following parental education

We focused here on youths aged 8-17 years. At 8 year-old, children are supposed to be enrolled in primary school, and parental information is available in dataset for children aged 17 or less. Results (Table 1) show that neither father nor mother was enrolled in school for 93.59% of the teenagers of the considered group. Father was enrolled but not mother for 2.98% and inversely, mother was enrolled but not father for 1.97%. Lastly, 1.46% of the group has their both parents educated. The overall analysis reveals that 77% of the youths were registered to school when only the father went to school, that is two percentage points more comparing to the case where only the mother is educated. Naturally, when both parents are educated, children go more to school; they less go if none of the parents went to school: respective proportions are 93 and 29%.

Figure 1 shows that when any one of the two parents is

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[2]A DHS is usually led every five years. To date, Niger undertook five DHS. The last one has started by the end of 2017 and is currently in process. The three first DHS was respectively led in Niger in 1992, 1998 and 2006.

Table 1. Proportions of sub-sample of parents and percentage of school enrolment for 8 – 17 year-old youth.

Parent's education	Number of observations	Proportion	Percentage of school enrolment
Both Parents no educated	39,860	93.59%	29%
Only Father educated	1,407	2.98%	77%
Only Mother educated	913	1.97%	75%
Both Parents educated	821	1.46%	93%
Total	43,001	100%	33%

Analytic weights assumed except for the number of observations.
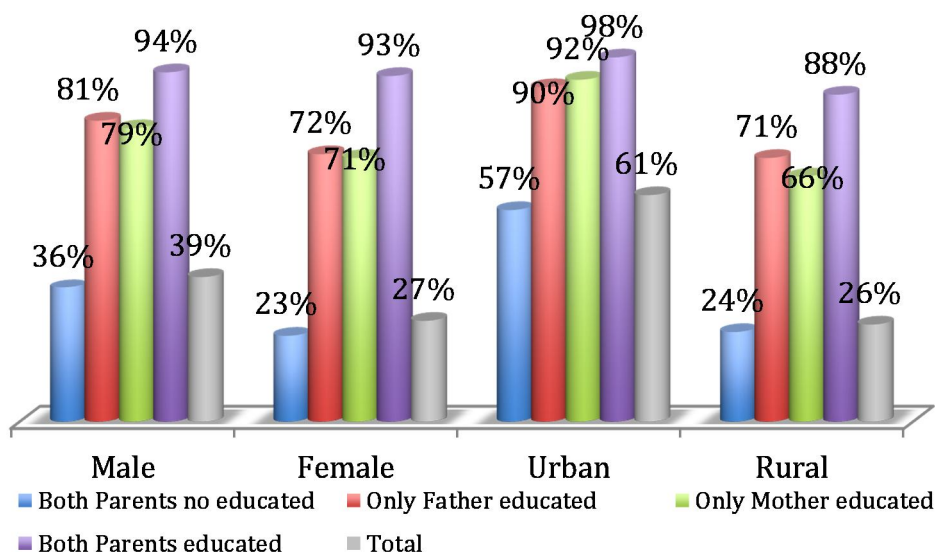
Figure 1. Proportion of school enrolment for 15 – 17 year-old by gender, residency area, and household head gender.

educated, 36% of boys aged 8-17 are registered in primary school at least and 23% of girls. When just one of the two parents is educated, boys still went to school more than girls. Both go to school in higher number if the educated parent is the father. The difference between boys and girls was about one percentage point when the two parents went to school.

In the rural area, with only the mother enrolled in primary school, two-thirds of teenagers went to school while the proportion is 71% when the educated parent is the father. In the urban area, the trend is inversed: youths are two percentage points more enrolled in primary school when it's the mother that was educated rather than the father. Graph 1 also shows that girls are 12 percentage points less enrolled than boys; and rural youth are very marginalized for schooling. Only 26% of them went to school whereas 61% of urban teens did.

The analysis through the eight administrative regions of the country (Table 2) shows that in the capital city Niamey, with one of the parents educated, no matter which one, 94% of teenagers are schooled. In Agadez (80% vs. 89%), Diffa (69% vs. 73%) and Dosso (69% vs.

70%), children go more to school when just the mother is educated. In the other regions, children with an educated father and an uneducated mother go more to school in comparison to those with an uneducated father and an educated mother: Maradi (80% vs. 89%), Tahoua (80% vs. 89%), Tillabéri (80% vs. 89%), Zinder (80% vs. 89%). Moreover, for all regions, the percentages of children enrolled in school are lowest when both parents are uneducated. They are highest for children whose both parents are educated excepted surprisingly in Diffa where the proportion of children enrolled in school is lower when both parents are educated comparing to cases where only one of the parents is educated. It should be noted that almost all children whose both parents are educated in Niamey are enrolled in school.

Analyzing the teenagers' schooling through the wealth quintile of the households they are members (Figure 2), we notice that the enrolment rate is highest for children whose both parents are educated over all the wealth groups. On the basis that only one of the two parents is educated, results show opposite trends between poorest and wealthiest groups. Indeed, it appears that in the

Table 2. Proportion of school enrolment for 8 – 17 year-old youth by the region (en %).

Regions	Both Parents no educated	Only Father educated	Only Mother educated	Both Parents educated	All
Agadez	38	80	89	98	43
Diffa	20	69	73	63	23
Dosso	33	69	70	91	35
Maradi	29	77	63	89	32
Tahoua	22	74	70	96	25
Tillaberi	31	76	70	91	34
Zinder	23	78	76	92	26
Niamey	65	94	94	99	69

Analytic weights assumed except for the number of observations.
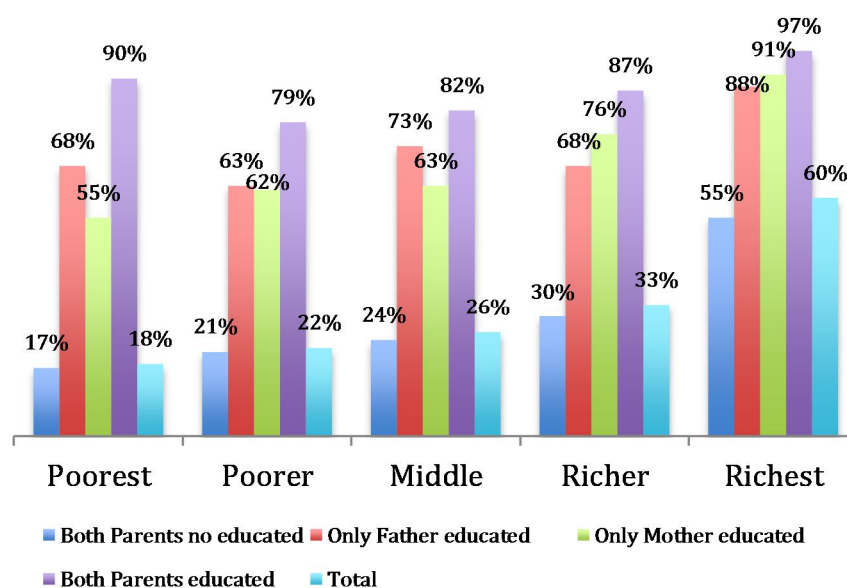
Figure 2. Proportion of school enrolment for 8 – 17 year-old youth by the wealth quintile.

poorest groups, when the father is educated but not the mother, more children are enrolled than if the mother is educated but not the father, the difference is about 13 percentage points for the first quintile. On the contrary, in the wealthiest groups, teenagers are more enrolled if the educated parent is the mother. In the richer group, 68% of children are schooled when the father is educated but not the mother and 76% if the mother is educated but not the father. In the wealthiest group, these proportions are respectively 88 and 91%.

Results for the richest groups and the urban area follow the same trend. The more the households' life conditions are better, the more having unschooled fathers are unschooled does not entail low schooling rate of the children. However, as a reminder, around 80% of Nigerien population is rural. The country is regularly ranked trough UNDP Human Development Index (HDI) as one of the least developed of the world.

Completion of primary school following parental education

The previous subsection provides the proportions of school enrollment for 8 - 17 year-old youths. However, to highlight the education level, the completion in primary school is better than the only school enrolment. In this section, we compare the percentages of 15 - 17 year-old youths who completed primary school following parental schooling. We chose the age group of 15-17, because young people are supposed to finish their primary school by the age of 15 at the latest, and the information on parents in the database is only available for young people under the age of 17. It should be noted that among these young Nigeriens aged 15 - 17, only 1.25% has at least one educated parent while 98.75% of them have both parents uneducated (Table 3).

Table 3 also shows that only 12% of 15-17 year-olds

Table 3. Proportions of sub-sample of parents and percentage of primary complete for 15 – 17 year-old youth.

Parent's education	Number of Observations	Proportion	Percentage of primary complete
Both Parents no educated	28,373	98.75%	11%
Only Father educated	196	0.58%	55%
Only Mother educated	133	0.37%	54%
Both Parents educated	137	0.31%	74%
Total	28,839	100%	12%

Analytic weights assumed except for the number of observations.

youths have completed primary school. This proves that education remains a major challenge for Niger if it wants to achieve the Sustainable Development Goals on education. More than half of the children whose at least one parent is educated have completed primary school. The proportion of children who have completed primary school and whose only fathers are educated (55%) is slightly higher than that of children who have completed primary school and whose only mothers are educated (54%). When the both parents are educated, children complete primary school in high number, with almost three-quarters of them.

These results suggest that educating today's girls would lead to a significant increase in the education of the children of tomorrow. However, the education of boys should not be neglected, because it would also lead to an increase in the education of the children of tomorrow, even slightly more important than the education of girls would. Consequently, it is much better to bet on both girls' and boys' education, and the country would win an additional 20% of educated children than if it focused solely on girls. Moreover, the proportions of primary school completion for 15 – 17 year-old youths vary following the demographic and socioeconomic characteristics of children. In any way, primary school completion rate is by far lower amongst children whose parents are not educated. On the opposite, the rate is higher for children whose parents are educated.

Furthermore, Figure 3 points out that contradicting results following children gender. While the percentage of male children who have completed primary school with only an educated father is higher than that of male children whose only mothers are educated, the proportion of female children who have completed primary education with only an educated father is lower than that of female children whose only mother is educated. Among children whose both parents are educated, girls are much more likely to complete primary school than boys. On the other hand, the overall analysis shows a discrepancy in girls disfavor, only 8% of girls aged 15 - 17 have completed primary school while 16% of boys have.

The urban vs. rural analysis states that the proportion of primary education completion is still higher among those whose only fathers are educated than those whose only mothers are educated. On the other hand, rural children face more much primary schooling obstacles.

The proportion of children who have completed primary school is nine times higher in urban areas in comparison with rural areas. Also, regardless of parental education levels, rural children are much marginalized.

Table 4 shows that the proportion of completion of primary for 15 - 17 year-old youths varies following the region. Niamey the country's capital city has by far the highest proportion of completion of primary education, with 43% of these young people holding the first school degree. Agadez follows Niamey with 20 percentage points in less. In the other regions, the proportion completion of primary does not exceed 10%. Tahoua (7%) and Tillaberi (8%) are the regions where the proportion of children aged 15-17 having completed the primary education is the lowest.

The regional analysis also shows that in all regions, the proportion is lower among young people whose two parents are uneducated. On the opposite, it is higher among those with both parents educated except Diffa where the highest proportion is recorded among those with only the mother educated and Tillabery where the highest proportion is recorded among those whose only fathers are educated. In Agadez, Maradi, Tahoua, Tillabery and Zinder regions, the proportion of completion of primary education is higher among for children whose only fathers are educated in comparison to that of children whose only mothers are educated. It is the opposite Diffa and Niamey regions. In Dosso region, there is any difference between the two proportions. This difference exceeds 20 percentage points in Agadez, Maradi, Zinder and Diffa.

Furthermore, Figure 4 shows that the higher the household quintile is, the more important is the proportion of 15-17 year-old youths who have completed primary school. Among the first three quintiles, less than 5% of 15-17year-old youths have completed primary school, with only 2% for the poorest quintile. Only 9% of 15-17 year-old youths have completed primary school in the fourth quintile. However, more than one- third of 15-17 year-old youths have completed primary schooling in the wealthiest quintile.

When comparing the percentages of completion of primary school in the wealth quintiles following parents' education, results point out that in the two richest quintiles, the proportion is lower among young people whose two parents are uneducated and higher among
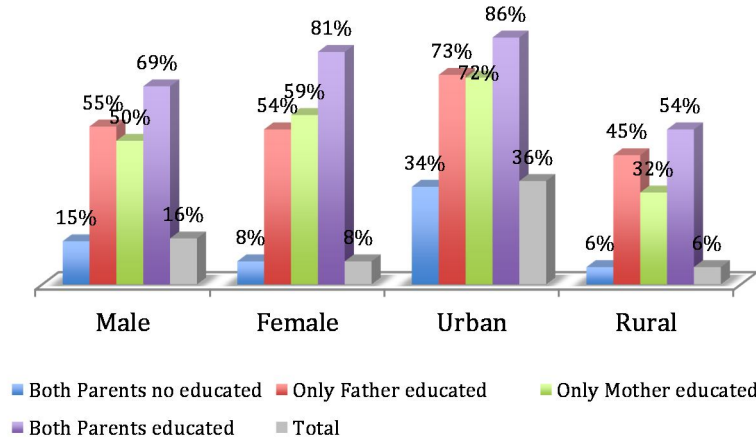
Figure 3. Proportion of complete primary for 15 – 17 year-old by gender, residency area, and household head gender.

Table 4. Proportion of complete primary for 15 – 17 year-old by the region (in %).

Regions	Both Parents no educated	Only Father educated	Only Mother educated	Both Parents educated	All
Agadez	22	71	37	95	23
Diffa	8	56	80	56	9
Dosso	9	40	40	68	10
Maradi	9	56	19	89	9
Tahoua	6	29	26	58	7
Tillaberi	8	61	59	42	8
Zinder	9	70	42	76	10
Niamey	41	62	77	78	43

Analytic weights assumed except for the number of observations.
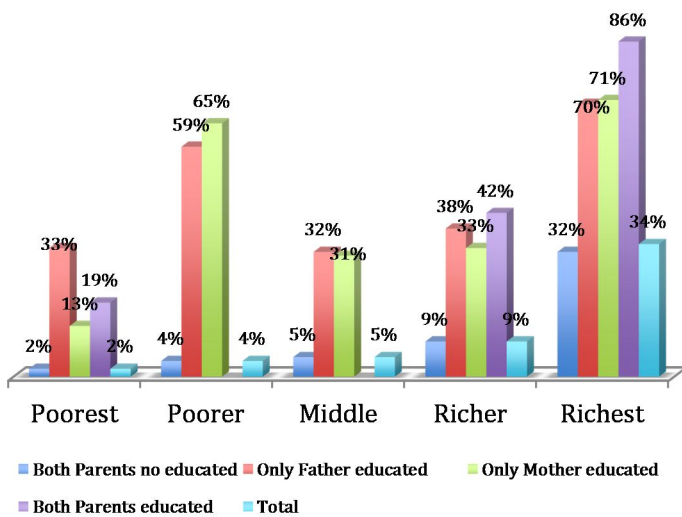
Figure 4. Proportion of primary completion for 8 – 17 year-old youth by the wealth quintile.

those with both parents educated. In the fourth, the

Middle and the Poorest quintiles, the proportion of children having completed primary education and whose only fathers are educated is higher comparing with children having completed primary education and whose only mothers are educated. The difference between the two proportions is low for Middle quintile but high for the Poorest one. In the second and wealthiest quintile, the proportion is higher among children whose only mothers are educated, but slightly in the latter quintile. Finally, it should be noted that very few 15-17 year-old youths with educated father and mother belong to the three poorest quintiles of wealth.

Analyses on the proportion of school enrollment for 8 - 17 year-old youths and on the proportion of completion of primary school for 15 - 17 year-old youths lead to some conclusions:

(i) Young people whose two parents are not educated are proportionately the least educated, regardless of the child's gender, residence area, region and wealth quintile;
(ii) Young people with both parents educated are proportionately the most educated, regardless of the

characteristics of the child except in two regions Diffa and Tillabéry;

(iii) Globally, the enrollment ratios and the completion of primary education are on average slightly higher among young people whose only father is educated than among those with only an educated mother; however, according to some socioeconomics characteristics, we noticed that the proportions among young children with only educated mothers are higher;

(iv) Finally, the section showed that for education, girls are discriminated, rural youth are marginalized, and the richest are advantaged.

ECONOMETRIC MODEL AND RESULTS

Econometric model

Descriptive statistics allowed to compare children' education levels following the education of their parents. The econometric models will allow to see if the differences are significant and assess the intergenerational impact of parents' education. Likewise the descriptive statistics, we focus on the school enrollment of 8-17 year-old youths and the completion of the primary school of 15-17 year-old youths for econometric models. These two variables are our dependent variables. For each one, we consider two independent models.

In Models 1, the variables of interest are "Father highest year of school" and "Mother highest year of school". These two continuous variables represent the number of years of successful schooling by the two parents respectively. In models 2, the variables of interest are dummy variables. To compare the effects of schooling of parents on the children' education, the dummy variable "mother educated and father no educated" is used as the reference while the dummy variables "no parent educated", "only father educated" and "Both parents educated" are included in the model.

In all two models, we used the child's gender, age, residence area, region, wealth quintile, household's head sex and age, and the household size as control variables [3]. Note that for wealth quintile, we have considered separate wealth indexes for urban and rural areas, available in our data, because, the DHS wealth Index calculated on national level has been criticized as being too urban in its construction and not able to distinguish the poorest of the poor from other poor households (Rutstein, 2008). The ages are included in models as dummy variables, each age for child age and age group for the age of the household's head.

For each model, we consider on the one hand the whole sample, and on the other hand the subsamples of boys and girls. The determinant variables being dummy,

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[3] Annex A1 in the appendix provides descriptive statistics of these control variables

Probit models are used. Therefore, we determine the Marginal Effect of the interest variables on the dependent variables. When the determinant variable is dummy, the partial effect is not relevant to measure the effects on dependent variable whereas in some of the authors in literature, this type is treated as partial effect. The marginal effect, which is the true effect and used in the paper, is different from the partial effect (Mondal, 2008).

Explicitly, the models 1 and 2 can be specified as follow:

Model 1:
$$y_c = \propto_0 + \propto_1 n_{educ_f} + \propto_2 n_{educ_m} + f(sex_c, age_c) + g(Sex_{HH}, age_{HH}) + h(Rur, Reg, Q, H\_Size) + \varepsilon_1$$

Model 2:
$$y_c = \beta_0 + \beta_1(NS_m * NS_f) + \beta_2(NS_m * S_f) + \beta_3(S_m * S_f) + f(sex_c, age_c) + g(Sex_{HH}, age_{HH}) + h(Rur, Reg, Q, H\_Size) + \varepsilon_2$$

Where:
y_c is the dependent variable. In the first part, it represents the dummy variable of the school enrollment of 8-17 year-old youths. In the second part, it represents the dummy variable of the completion of primary school of 15-17 year-old youths. n_{educ_f} and n_{educ_m} represent respectively the number of years of successful schooling by father and mother. $(NS_m * NS_f)$, $(NS_m * S_f)$ and $(S_m * S_f)$ are respectively the dummy variables representing "no parent educated", "only father educated" and "Both parents educated". sex_c and age_c are respectively the gender and the age of the child while sex_{HH}, and age_{HH} are respectively the gender and the age of the household' head. Rur, Reg, Q and H_Size) are respectively the dummy variable of whether the household lives in rural areas, the region, the wealth quintile and the size of the household. Finally, $\propto_1$, $\propto_2$, β_1, β_2 and β_3 are parameters representing the intergenerational effects. While the partial effects of the intergenerational effects are the parameters $\propto_j$ and β_j, the marginal effects are $\varphi(X \propto) \propto_j$ and $\varphi(X\beta)\beta_j$ where $\varphi(.)$ is the standard normal density function, X is the set of covariates (interest and control variables) and $\propto$ and β are the set of parameters in the models.

Effects of parents' education on the school enrolment of 8 – 17 year-old youths

Models 1 from Table 5 shows that the number of years of education of each parent has a significant positive impact on the probability of schooling of youths aged 8-17. However, the effect of father education is higher than those of mother education. In fact, one more year of school of the father entails a 3.0 percentage points

Table 5. Marginal effects of parents' education on the school enrolment of 8 – 17 year-old youths.

Variables	All		Female		Male	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
Father's number years of completed schooling	0.0304***		0.0290***		0.0323***	
	(0.0027)		(0.0037)		(0.0038)	
Mother's number years of completed schooling	0.0274***		0.0282***		0.0267***	
	(0.0038)		(0.0055)		(0.0053)	
Ref.: Only mother educated						
No parents educated		-0.1737***		-0.1608***		-0.1871***
		(0.0195)		(0.0282)		(0.0270)
Only father educated		0.0116		0.0172		-0.0001
		(0.0254)		(0.0363)		(0.0358)
Both educated		0.2032***		0.2469***		0.1617***
		(0.0330)		(0.0484)		(0.0455)
Observations	11,807	17,062	5,374	8,234	6,433	8,828
Pseudo R2	0.1804	0.1796	0.2029	0.2047	0.1698	0.1610
Mean	0.33	0.33	0.27	0.27	0.39	0.39

Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1
Control variables: child's gender, age, residence area, region, wealth quintile, household size, and sex and age of households' head.

increase in the probability of schooling of teenagers all thing equal otherwise, while the increase would be about 2.7 percentage points if the mother studied one more year, all things equal otherwise. Results also show that in girls' subsample, the probability to be schooled if the father stayed in school one year more would increase by 2.9 percentage points. It would increase by 2.8 percentage points if the mother stayed in school one year more. Likewise, the likelihood to be schooled of boys would increase by 3.2 percentage points if the father studied one year higher or more; and by 2.7 percentage points if the mother studied one year higher or more, all things equal otherwise.

Models 2 in Table 5 assess the impact on teenagers' schooling probability following their parents' education and in reference children whose only mothers are educated. The analysis shows that having only an educated father does not impact the children probability to be enrolled in primary school in reference to children whose only mothers are educated all things equal otherwise. The impact, although positive, is not significant considering the whole sample, female and male subsamples. This means that no matter which of the parents is educated and the other not, it does not make a significant difference on their children chance to be schooled. On the contrary, having both parents educated or uneducated has a significant impact on that chance. Children whose both parents are uneducated are 17.4 percentage points less likely to be schooled (16.1 percentage points for the female subsample and 18.7 percentage points for the male one) compared to children

whose only mothers are educated. Inversely, if a child's both parents are educated, his probability to be enrolled in school increases by 20.3 percentage points (24.7 percentage points for the female subsample and 16.1 percentage points for the male one) in comparison with children whose only mothers are educated.

Annex A2 in the appendix provides the complete results of the regression of the school enrolment of 8-17-year-old youths. It provides the marginal effects of parents' education and control variables, including child's gender, residency area, region, wealth quintile and size of the household, and sex and age of households' head, on the school enrolment. Results show that girls are discriminated, rural children are disadvantaged about the school enrolment, and the wealth is an important determinant of school enrolment. Living in some regions increases the chance of schooling. Results also show that else things equal else, the school enrolment is not affected by the age of the household's head. While the household size significantly affects the school enrolment of girls, the effect is shallow.

Effects of parents' education on the primary school completion for 15 – 17 year-old youths

Models 2 in Table 6 show that compared to youths with only an educated mother, having only an educated father has no significant effect on the completion of children's primary schooling, the other variables in the model held constant. The effect, although positive, is not significant.

Table 6. Marginal effects of parents' education on the primary school completion for 15 – 17 year-old youths.

Variables	All		Female		Male	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
Father's number years of completed schooling	0.0289***		0.0357***		0.0248***	
	(0.0052)		(0.0091)		(0.0065)	
Mother's number years of completed schooling	0.0197***		0.0205		0.0175*	
	(0.0076)		(0.0126)		(0.0098)	
Ref.: Only mother educated						
No parents educated		-0.1697***		-0.1574**		-0.1787***
		(0.0463)		(0.0699)		(0.0620)
Only father educated		0.0099		0.0646		-0.0290
		(0.0553)		(0.0895)		(0.0718)
Both educated		0.1433**		0.2082*		0.0855
		(0.0696)		(0.1084)		(0.0923)
Observations	1,607	2,900	515	1,302	1,092	1,598
Pseudo R^2	0.2394	0.2345	0.3426	0.3316	0.1977	0.1828
Mean	0.12	0.12	0.08	0.08	0.16	0.16

Standard errors in parentheses, *** $p<0.01$, ** $p<0.05$, * $p<0.1$.
Control variables: child's gender, age, residence area, region, wealth quintile, household size, and sex and age of households' head.

Thus, there is any significant difference between mother's education and father's education impact on the completion of children's primary education. This is true whether the child is a girl or a boy.

From models 1 in Table 6, it appears that mom's and dad's education have both a positive effect on the completion of children's primary education holding the other variables in the model constant; the effect is greater in dad's education case. In fact, an additional year of studying done by dad leads to an increase of 2.9 percentage points in the probability of the child's completion of primary studies while the increase is 2.0 percentage points for an additional year of study done by the mom. Girls are more positively affected than boys. Precisely, an additional year of studying by dad or mom increases respectively the probability that a girl obtains her first school diploma by 3.6 percentage points and 2.1 percentage points; in the case of a boy, the increase are respectively 2.5 percentage points and 1.8 percentage points.

Furthermore, models 2 in Table 6 suggest that, compared to youths with only mothers educated, the lack of education of both parent leads to a significant decrease in the probability of schooling of their children, whether they are male or female all things equal otherwise. This decrease is of the order of 15.7 percentage points for subsample of girls and 17.9 percentage points for subsample of boys. On the opposite, the education of both parents leads to an increase in the probability of children primary education completion whether they are male or female, holding the other variables in the model constant. While the effect is 20.8 percentage points, only significant at 10% level in the subsamples of girls, it is not significant in the subsample of boys.

Annex A3 in the appendix provides the complete results of the regression of the primary completion of 15-17-year-old youths. Overall, results show that else things equal else, rural children are disadvantaged and the primary completion is affected by the household wealth, the region, the age of the household's head while the household size and the sex of the household's head do not affect the primary completion.

Recommendations

In Niger, as in many of developing countries, girls face education obstacles. In 2012, 39% of 8-17 year-old Nigerien boys were enrolled in school while only 27% of girls aged 8-17 were. Furthermore, the percentage of 15-17 year-old boys who have completed primary school is twice greater than the percentage of 15-17 year-old girls. Therefore, it is understandable and even urgent to encourage girls' education for sustainable development. However, in the case of Niger where the general level of education is low regardless the child' gender, focusing only on girls' education would be a strategic mistake and an inefficiency policy out of short term. Therefore, Nigerien government should not neglect the endeavors and political decisions for boy's education for a dynamically efficient education system. Any prioritization

of one sex over the other is justified in mid or long-term analysis, especially female one over male.

Actually, the study results proved that the education of girls today would lead to a significant increase in the education of the children of tomorrow. However, this rise is slightly (or even not significant according to econometric models) lower than the intergenerational positive effect due to the education of boys. Our study shows that the parents' education affects significantly their children's education life. Although the econometrics models showed that which one of the parents is educated and not the other does not significantly matter, we saw earlier that youths whose only fathers are educated are slightly more registered in primary school that those whose only mothers are educated.

CONCLUSION

This paper aims to assess the impact of the parents' education on the progeny schooling. It focuses on verifying whether the mothers' education better impacts the children schooling, and therefore measures the intergenerational efficiency of the pro-girls schooling policies in the case of Niger. Analyses on the proportion of school enrollment for 8 - 17 year-old youths and on the proportion of primary school completion for 15 - 17 year-old youths show that young people whose two parents are not educated are the least educated, regardless of the child's gender, residence area, region and wealth quintile. Also, these analyses show that young people with both parents educated are proportionately the most educated, regardless to the characteristics of the child except in two regions. Moreover, the enrollment ratios and the completion of primary education rate are on average slightly higher among young people whose only fathers are educated than those among children whose only mothers are educated. We also find that for education, girls are face much educational obstacles, rural youth are marginalized, and the richest are advantaged.

Econometric models show that the total number of years of education of each parent has a significant positive impact on the probability of schooling of whole youths aged 8-17 and on the likelihood of primary school completion of whole youths aged 15-17. It is the same for the subsamples of boys and girls. All things equal otherwise, the effects of the years of school of the father are higher than those of the mother. The analysis also shows that having only an educated father does not impact the children probability to be enrolled in primary school or to complete primary school in reference to children whose only mother is educated all things equal otherwise. The impacts, although positive, are not significant considering the whole sample, and female or male subsamples. This means that no matter which of the parents is educated and not the other, it does not significantly make a difference on their children chance to be schooled or to complete primary school. On the other hand, having both parents educated and uneducated have respectively a strong positive and negative significant impact on their children probabilities to be enrolled in school or to complete primary school.

Since in Niger, as in many developing countries, girls face educational obstacles, it is understandable and recommendable to promote girls' education. However, in the case of Niger where the general level of education is low regardless the child' gender, focusing only on girls' education would be a mistake. Therefore, Nigerien government should not neglect the endeavors and political decisions for boy's education for a dynamically efficient education system. Any prioritization of one sex over the other is justified in mid or long-term analysis, especially female one over male. The results proved that the education of girls today would lead to a very significant increase in the education of the children of tomorrow. However, this rise is slightly (or even not significant according to econometric models) lower than the intergenerational positive effect due to the education of boys.

The main limitation of this paper is in the availability of data. Ethnicity would be a relevant control variable for child education, but it is not filled in data. In addition, education information about parents and children is collected for 5-17 years old youths; this leads to limit the study to youths under 18.

Further, this study does not make a link between parents' education and the availability of school in the milieu of the children. Youths unschooling could result from the lack of school regardless to parents' education. However, these limitations do not affect the conclusions of the study given the robustness of the results. Finally, this study would be better using Niger, DHS 2017; unfortunately, the data are not yet available for public.

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APPENDIX

Annex A1: Descriptive of variables

Subsample of 8-17 year-old youth					
Variables	**Number of Observations**	**Proportion (%)**	**Variables**	**Number of Observations**	**Proportion (%)**
Gender			**Residence area**		
Male	8,828	51.89	Urban	4,711	16.68
Female	8,234	48.11	Rural	12,351	83.32
Household head gender			**Region**		
Male	14,881	87.27	Agadez	1,193	2.11
Female	2,181	12.73	Diffa	1,704	3.16
Wealth quintile			Dosso	2,341	12.61
Poorest	3,074	20.37	Maradi	3,409	23.02
Poorer	2,883	19.80	Tahoua	2,576	22.24
Middle	3,003	19.90	Tillaberi	1,857	11.37
Richer	3,163	19.66	Zinder	2,364	19.19
Richest	4,939	20.27	Niamey	1,618	6.30
Total	17,062	100.00	**Total**	64,011	100.00
Variables	**Number of Observations**	**Means**	**Standard Deviation**	**Min**	**Max**
Age	17,062	11.55	2.68	8	17
Household head age	17,058	49.88	13.09	12	95
Household size	17,062	8.49	3.98	1	41

Subsample of 15-17 year-old youth					
Variables	**Number of Observations**	**Proportion (%)**	**Variables**	**Number of Observations**	**Proportion (%)**
Gender			**Residence area**		
Male	1,598	54.62	Urban	1,031	21.34
Female	1,302	45.38	Rural	1,869	78.66
Household head gender			**Region**		
Male	2,518	88.40	Agadez	235	2.37
Female	382	11.60	Diffa	221	2.39
Wealth quintile			Dosso	412	13.13
Poorest	411	16.78	Maradi	565	22.82
Poorer	443	19.47	Tahoua	383	21.10
Middle	452	17.97	Tillaberi	259	9.53
Richer	512	20.02	Zinder	423	19.37
Richest	1,082	25.76	Niamey	402	9.28
Total	2,900	100.00	**Total**	2,900	100.00
Variables	**Number of Observations**	**Means**	**Standard Deviation**	**Min**	**Max**
Age	2,900	15.96	0.84	15	17
Household head age	2,899	49.10	14.86	15	95
Household size	2,900	8.23	4.48	1	41

Annex A2: Marginal effects on the school enrolment of 8 – 17 year-old youths

VARIABLES	All		Female		Male	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
Father's number years of completed schooling	0.0304***		0.0290***		0.0323***	
	(0.0027)		(0.0037)		(0.0038)	
Mother's number years of completed schooling	0.0274***		0.0282***		0.0267***	
	(0.0038)		(0.0055)		(0.0053)	
Ref.: Only mother educated						
No parents educated		-0.1737***		-0.1608***		-0.1871***
		(0.0195)		(0.0282)		(0.0270)
Only father educated		0.0116		0.0172		-0.0001
		(0.0254)		(0.0363)		(0.0358)
Both educated		0.2032***		0.2469***		0.1617***
		(0.0330)		(0.0484)		(0.0455)
Ref.: Urban						
Rural	-0.3578***	-0.3762***	-0.4048***	-0.4267***	-0.3226***	-0.3316***
	(0.0133)	(0.0111)	(0.0200)	(0.0164)	(0.0177)	(0.0151)
Ref.: Male						
Female	-0.1014***	-0.1102***				
	(0.0098)	(0.0082)				
Ref.: Region of Maradi						
Region==Agadez	-0.0301	-0.0663***	0.0948***	0.0435	-0.1449***	-0.1742***
	(0.0245)	(0.0200)	(0.0353)	(0.0289)	(0.0344)	(0.0279)
Region==Diffa	-0.2010***	-0.2104***	-0.0965***	-0.1103***	-0.2883***	-0.3002***
	(0.0186)	(0.0160)	(0.0278)	(0.0236)	(0.0250)	(0.0219)
Region==Dosso	0.0585***	0.0675***	0.0976***	0.1034***	0.0267	0.0337*
	(0.0160)	(0.0136)	(0.0242)	(0.0200)	(0.0213)	(0.0187)
Region==Tahoua	-0.0625***	-0.0698***	-0.0711***	-0.0713***	-0.0652***	-0.0783***
	(0.0161)	(0.0138)	(0.0250)	(0.0207)	(0.0212)	(0.0186)
Region==Tillaberi	0.0805***	0.0632***	0.2007***	0.1779***	-0.0207	-0.0453**
	(0.0165)	(0.0147)	(0.0243)	(0.0211)	(0.0224)	(0.0204)
Region==Zinder	-0.0679***	-0.0658***	0.0221	-0.0036	-0.1425***	-0.1237***
	(0.0170)	(0.0143)	(0.0254)	(0.0209)	(0.0228)	(0.0197)
Region==Niamey	0.0707**	0.0160	0.0799**	0.0527*	0.0663	-0.0294
	(0.0292)	(0.0220)	(0.0407)	(0.0306)	(0.0424)	(0.0318)
Ref.: Poorest quintile						
Quintile==poorer	0.0826***	0.0750***	0.0904***	0.0801***	0.0754***	0.0726***
	(0.0147)	(0.0125)	(0.0230)	(0.0190)	(0.0191)	(0.0165)
Quintile==middle	0.1326***	0.1374***	0.1416***	0.1424***	0.1267***	0.1344***
	(0.0144)	(0.0124)	(0.0226)	(0.0188)	(0.0187)	(0.0163)
Quintile==Richer	0.1798***	0.1751***	0.2080***	0.2068***	0.1567***	0.1499***
	(0.0145)	(0.0124)	(0.0225)	(0.0189)	(0.0188)	(0.0164)
Quintile==Richest	0.2499***	0.2522***	0.2688***	0.2652***	0.2363***	0.2414***
	(0.0148)	(0.0123)	(0.0231)	(0.0188)	(0.0191)	(0.0162)
Ref.: Household head is male						
Household head is female	0.1142	0.0850***	-0.0107	0.0826***	0.1931	0.0792***
	(0.0947)	(0.0126)	(0.1429)	(0.0184)	(0.1219)	(0.0174)

Annex A2: Continued

Ref.: 8 year-old						
9 year-old	0.0434**	0.0547***	-0.0052	0.0140	0.0831***	0.0908***
	(0.0177)	(0.0156)	(0.0268)	(0.0232)	(0.0233)	(0.0207)
10 year-old	0.0457***	0.0388***	-0.0071	-0.0001	0.0878***	0.0737***
	(0.0167)	(0.0146)	(0.0255)	(0.0218)	(0.0218)	(0.0193)
11 year-old	0.0691***	0.0709***	0.0490*	0.0568**	0.0842***	0.0853***
	(0.0195)	(0.0171)	(0.0291)	(0.0254)	(0.0260)	(0.0228)
12 year-old	0.0091	0.0083	-0.0144	-0.0167	0.0292	0.0333
	(0.0178)	(0.0154)	(0.0267)	(0.0226)	(0.0237)	(0.0207)
13 year-old	0.0030	-0.0075	-0.0286	-0.0266	0.0329	0.0140
	(0.0198)	(0.0169)	(0.0294)	(0.0247)	(0.0266)	(0.0228)
14 year-old	-0.0530***	-0.0595***	-0.1078***	-0.1033***	-0.0104	-0.0203
	(0.0202)	(0.0172)	(0.0306)	(0.0253)	(0.0266)	(0.0230)
15 year-old	-0.0363	-0.0824***	-0.0691	-0.1224***	-0.0129	-0.0429*
	(0.0248)	(0.0201)	(0.0451)	(0.0324)	(0.0295)	(0.0254)
16 year-old	-0.0364	-0.0424**	-0.0338	-0.0527	-0.0238	-0.0197
	(0.0280)	(0.0212)	(0.0513)	(0.0324)	(0.0334)	(0.0278)
17 year-old	-0.0983***	-0.1382***	-0.1634***	-0.2155***	-0.0574*	-0.0499*
	(0.0283)	(0.0208)	(0.0508)	(0.0302)	(0.0338)	(0.0283)
Ref.: Household is less than 36 year-old						
36-45 year-old	-0.0103	0.0268*	-0.0247	0.0394*	-0.0024	-0.0057
	(0.0195)	(0.0141)	(0.0295)	(0.0205)	(0.0260)	(0.0199)
46-55 year-old	-0.0183	0.0233	-0.0273	0.0409**	-0.0143	-0.0117
	(0.0199)	(0.0142)	(0.0299)	(0.0204)	(0.0266)	(0.0202)
56-65 year-old	-0.0064	0.0268*	-0.0198	0.0461**	-0.0014	-0.0152
	(0.0205)	(0.0147)	(0.0309)	(0.0212)	(0.0274)	(0.0210)
66 year-old or more	-0.0420*	0.0002	-0.0406	0.0296	-0.0449	-0.0469*
	(0.0239)	(0.0168)	(0.0362)	(0.0240)	(0.0319)	(0.0241)
Household size	0.0054***	0.0045***	0.0080***	0.0075***	0.0033*	0.0013
	(0.0013)	(0.0011)	(0.0021)	(0.0017)	(0.0018)	(0.0015)
Observations	11,807	17,062	5,374	8,234	6,433	8,828
Pseudo R2	0.1804	0.1796	0.2029	0.2047	0.1698	0.1610
Mean	0.33	0.33	0.27	0.27	0.39	0.39

Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

Annex A3: Marginal effects on the primary completion of 8 – 17 year-old youths

Variables	All		Female		Male	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
Father's number years of completed schooling	0.0289***		0.0357***		0.0248***	
	(0.0052)		(0.0091)		(0.0065)	
Mother's number years of completed schooling	0.0197***		0.0205		0.0175*	
	(0.0076)		(0.0126)		(0.0098)	
Ref.: Only mother educated						
No parents educated		-0.1697***		-0.1574**		-0.1787***
		(0.0463)		(0.0699)		(0.0620)
Only father educated		0.0099		0.0646		-0.0290
		(0.0553)		(0.0895)		(0.0718)
Both educated		0.1433**		0.2082*		0.0855
		(0.0696)		(0.1084)		(0.0923)

Annex A3: Continued

Ref.: Urban						
Rural	-0.4078***	-0.4577***	-0.4782***	-0.4982***	-0.3766***	-0.4276***
	(0.0367)	(0.0262)	(0.0648)	(0.0393)	(0.0453)	(0.0359)
Ref.: Male						
Female	-0.0225	-0.0467**				
	(0.0299)	(0.0201)				
Ref.: Region of Maradi						
Region==Agadez	-0.0581	-0.0682*	0.0591	0.0140	-0.1099	-0.1346**
	(0.0599)	(0.0405)	(0.1146)	(0.0655)	(0.0701)	(0.0526)
Region==Diffa	-0.1641***	-0.1253***	-0.1348	-0.0852	-0.1733***	-0.1553***
	(0.0553)	(0.0392)	(0.1184)	(0.0621)	(0.0614)	(0.0511)
Region==Dosso	-0.0585	-0.0151	0.0445	0.0250	-0.0881*	-0.0544
	(0.0455)	(0.0329)	(0.0973)	(0.0508)	(0.0506)	(0.0434)
Region==Tahoua	-0.0962**	-0.0843**	-0.1859*	-0.1224**	-0.0652	-0.0637
	(0.0469)	(0.0338)	(0.1008)	(0.0512)	(0.0527)	(0.0452)
Region==Tillaberi	-0.0476	-0.0454	-0.0745	-0.0727	-0.0179	-0.0262
	(0.0508)	(0.0380)	(0.1059)	(0.0568)	(0.0582)	(0.0511)
Region==Zinder	-0.0051	0.0112	-0.0477	-0.0047	0.0097	0.0184
	(0.0476)	(0.0335)	(0.0992)	(0.0507)	(0.0536)	(0.0449)
Region==Niamey	-0.1531***	-0.1496***	-0.1727*	-0.1368***	-0.1367**	-0.1656***
	(0.0515)	(0.0339)	(0.0941)	(0.0482)	(0.0635)	(0.0474)
Ref.: Poorest quintile						
Quintile==poorer	0.1916***	0.1575***	0.1235	0.1461**	0.2217***	0.1779***
	(0.0478)	(0.0359)	(0.0938)	(0.0569)	(0.0560)	(0.0466)
Quintile==middle	0.2721***	0.2277***	0.2379***	0.1734***	0.2857***	0.2648***
	(0.0479)	(0.0363)	(0.0889)	(0.0558)	(0.0578)	(0.0481)
Quintile==richer	0.2417***	0.2395***	0.2147**	0.2426***	0.2541***	0.2364***
	(0.0473)	(0.0356)	(0.0878)	(0.0550)	(0.0567)	(0.0471)
Quintile==richest	0.3798***	0.3548***	0.3330***	0.3183***	0.4055***	0.3872***
	(0.0495)	(0.0357)	(0.0954)	(0.0556)	(0.0589)	(0.0471)
Ref.: Household head is male						
Household head is female	0.1826	0.0465		0.1033**	0.1380	-0.0305
	(0.3144)	(0.0296)		(0.0437)	(0.3091)	(0.0404)
Ref.: 15 year-old						
16 year-old	0.1035***	0.0791***	0.1888***	0.1078***	0.0770**	0.0705**
	(0.0335)	(0.0239)	(0.0656)	(0.0373)	(0.0390)	(0.0317)
17 year-old	0.0705**	0.0203	0.0922	0.0149	0.0657*	0.0410
	(0.0336)	(0.0235)	(0.0663)	(0.0357)	(0.0389)	(0.0317)
Ref.: Household is less than 36 year-old						
36-45 year-old	-0.0478	0.1362***	-0.1060	0.1573***	-0.0488	-0.0372
	(0.1568)	(0.0386)	(0.2873)	(0.0532)	(0.1895)	(0.0608)
46-55 year-old	-0.0174	0.1387***	0.0036	0.2051***	-0.0471	-0.0560
	(0.1574)	(0.0366)	(0.2885)	(0.0509)	(0.1900)	(0.0590)
56-65 year-old	-0.0103	0.1329***	-0.0137	0.1568***	-0.0323	-0.0466
	(0.1575)	(0.0369)	(0.2883)	(0.0510)	(0.1905)	(0.0594)
66 year-old or more	-0.0751	0.0813*	-0.1397	0.0830	-0.0781	-0.0831
	(0.1557)	(0.0422)	(0.2849)	(0.0592)	(0.1871)	(0.0635)
Household size	0.0025	0.0015	0.0087	0.0014	-0.0009	-0.0004
	(0.0032)	(0.0023)	(0.0062)	(0.0034)	(0.0038)	(0.0031)
Observations	1,607	2,900	515	1,302	1,092	1,598
Pseudo R2	0.2394	0.2345	0.3426	0.3316	0.1977	0.1828
Mean	0.12	0.12	0.08	0.08	0.16	0.16

Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1.