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# The impact of educational attainment on household poverty in South Africa

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This article investigates the relationship between the educational attainment of the household head and household poverty in South Africa. The results indicate a clear negative relationship between education and poverty. Households in which the head has a low level of education are more likely to be poor compared to a household where the head has a higher level of education. Literacy of the household head is also inversely related to household poverty. Rural and black households are the most vulnerable, with distinct differences between the province of residence. Despite large resource allocation towards education, educational outcomes have not improved. This raises questions concerning the lack of association between resource allocation and educational outcomes.

## Die impak van opvoeding op huishoudelike armoede in Suid-Afrika

Hierdie artikel bestudeer die verband tussen die vlak van opvoeding van die huishoof en huishoudelike armoede in Suid-Afrika. Die resultate toon 'n duidelike negatiewe verband tussen opvoeding en armoede. Huishoudings waar die hoof oor 'n lae vlak van opvoeding beskik is meer geneig om arm te wees relatief tot huishoudings waar die hoof 'n hoër vlak van opvoeding het. Geletterdheid van die huishoof is ook negatief verwant met huishoudelike armoede. Landelike en swart huishoudings is die mees vatbaar, met verskille tussen provinsies. Ten spyte van 'n groot allokasie van hulpbronne vir onderwys, het onderwys uitkomst nie verbeter nie. Dit vra vrae oor die afwesigheid van 'n verband tussen hulpbronnalokasie en onderwysuitkomst.

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South Africa is burdened with high levels of poverty, the majority of which is to a large extent attributed to the injustices of the previous political regime. Education is recognised as one important means of fighting poverty, since education enables a broader scope of employment possibilities and the opportunity of earning a higher income (Bonai 2007, Schiller 2008). Several studies have reported a negative relationship between education and poverty in South Africa.<sup>1</sup> None of these studies, however, explicitly explored the influence of education on poverty as educational attainment was mainly of secondary importance in these studies. Given South Africa's levels of poverty and the continuous emphasis on access to education, it remains surprising that no previous South African study has explored the relationship between poverty and education in greater detail.

This article aims to fill this gap in the literature. Using a more recently released data source, the aim of this article is to determine the impact of household head education on household poverty, and whether the literacy level of the household head has an impact on household poverty.

## 1. Literature review

### 1.1 Poverty and education

According to Ravallion (1994: 3), poverty exists when a person fails to attain a level of economic well-being deemed necessary to constitute a reasonable minimum by the "standards of the specific society in which the person lives". Poverty is also associated with hunger, lack of shelter and clothing, as well as illness and illiteracy (World Bank 2001). As such, poor people are vulnerable to adverse events beyond their control and are often treated badly by the state by being excluded from voice and power.

1 Cf Klasen 1997 & 2000, Woolard & Leibbrandt 2001, Serumaga-Zake & Naude 2002, Woolard & Klasen 2005.

Some researchers view education as one of the most important instruments to reduce poverty (Becker 1992, Tilak 2002). Weisbrod (1966: 10) argues that education

produces a labour force that is more skilled, more adaptable to the needs of a changing economy, and more likely to develop the imaginative ideas, techniques, and products which are critical to the processes of economic expansion and social adaptation to change.

In addition, Nieuwenhuis *et al* (2007: 7) view education as “an essential social process [which] has the potential to shape the future of society”.

Higher education may lead to a reduction in poverty by increasing employment opportunities and higher income (Becker 1992, Teal 2001). This is supported by Van der Berg (2002: 1), who states “... education enhances the earnings potential of the poor, both in competing for jobs and earnings and as a source of growth and employment in itself.” Higher educational degrees act as a signal of diligence to employers, and increase access to a greater number of available jobs. By contrast, lower skilled individuals are less likely to find employment and if they do, they are usually the first to be dismissed during economic slowdowns. The probability of falling into poverty is thus higher for lower educated individuals (Schiller 2008). It is important to note that the emergence of globalisation has increased competition in the labour market, making lower skilled labour ever more replaceable and therefore investment in higher levels of education essential (Bonal 2007, Tarabini 2010).

While lower education may lead to higher levels of poverty, poverty may also result in lower levels of education. Tilak (2002) refers to education poverty as the deprivation of the opportunity to obtain an adequate level of education. In addition, education and income poverty are mutually reinforcing in the sense that “poverty of education is a principal factor responsible for income poverty; and income poverty does not allow people to overcome poverty of education” (Tilak 2002: 198). Poor students are also less likely to complete a reasonable amount of education, not necessarily as a result of low intellectual ability, but rather due

to low enrolment rates, since poorer households seldom possess the financial means to pay for education.<sup>2</sup> Case & Deaton (1999) and Meth & Dias (2004) also suggest that, in South Africa, the cost of education is often too high for the poor and, in particular, poor Blacks to afford, which, together with a lack of resources, exacerbates education and income poverty. The poor are thus more likely to drop out of school at an early stage. Brown & Park (2002) also suggest that poverty may exhibit a negative effect on educational attainment mainly because children from wealthier households have more advantages in school compared to children from poorer households since the former generally have better learning environments.

It is thus evident that while lack of educational attainment may lead to poverty, insufficient financial resources may also explain the inability to obtain a satisfactory level of education in the first instance. The most common methods of dealing with this type of endogeneity or simultaneity would be to make use of instrumental variable regressions such as two-stage least squares. In practice, however, finding a suitable instrumental variable is usually easier said than done, particularly since the specific instrumental variable must be uncorrelated with the error term and correlated with the endogenous explanatory variable (*cf.* for instance, Brown & Park 2002). When it is not impossible to control for endogeneity, the coefficient estimates may be biased and the impact of this bias on the size of the parameters is uncertain (Wooldridge 2009).

## 1.2 Empirical evidence

International studies have continuously reported a negative relationship between poverty and education. Anyanwu (2005) endeavoured to provide a poverty profile for households in rural Nigeria using data from the 1996 National Consumer Survey. Anyanwu (2005) finds that poverty is more prevalent in households where the head has no or primary education compared to households in which the head has obtained secondary or post-

2 *Cf.* Tilak 1999, Brown & Park 2002, Meth & Dias 2004, Schiller 2008.

secondary education, with this negative relationship also being found for both male- and female-headed households. Geda *et al* (2005) employ household data from the 1994 Welfare Monitoring Survey in Kenya, and find educational attainment to be the most important determinant of household poverty status. The probability of a household being poor was found to be much higher if the head has less than secondary-level education.

Weber *et al* (2007) use data from the US Panel Study of Income Dynamics and report that higher education of the household head is associated with a lower probability of a household being poor. Education has a large effect, with a household being 39% less likely to be poor for each additional year of education of the household head. Tilak (2007) reviews previous research conducted in India and reports in general a negative relationship between education and poverty. Illiteracy is also found to increase poverty. However, while illiteracy measures generally include all people, regardless of their level of schooling, mere literacy together with no education serves to increase poverty. Tilak (2007) also finds that the relationship between poverty, education, and literacy only becomes significant and negative once a reasonable amount of primary education has been completed.

With respect to South African studies, Woolard & Leibbrandt (2001) employ data from the 1995 October Household Survey and 1995 Income and Expenditure Survey, as well as the 1993 Project for Statistics on Living Standards and Development (PSLSD) survey. The authors analyse the Foster-Greer-Thorbecke (FGT) measures and poverty shares for each level of education and find that poverty is more prevalent among groups with no or primary education, with poverty being most severe among those with no education. Van der Berg (2002) uses the 1993 PSLSD data and reports that poverty is higher in households where the head has less than complete secondary education compared to households where the head has complete secondary education or higher. In addition, literacy ratios are also reported for Black and White children between the ages of 12 and 18, with White

children having substantially higher literacy levels compared to Black children.

Using data from the 1993 Southern African Labour and Development Research Unit (SALDRU) survey, Klasen (1997) finds that nearly 80% of households are poor if the head has no level of education., Poverty is less prevalent in households with a well-educated head. In terms of reverse causality, lower access to quality education is also acknowledged as an important consequence of poverty, which serves to reproduce inter-generational poverty. In a later study, Klasen (2000) again employs the 1993 SALDRU survey and finds, using average years of education in the household as indicator of educational attainment, that higher education is associated with higher household expenditure and thus less poverty. Woolard & Klasen (2005) employ the 1993 PSLSD and the 1998 KwaZulu-Natal Income Dynamics (KIDS) surveys and report a negative relationship between education and poverty. Serumake-Zake & Naude (2002) conducted an independent sample of 593 Black households in the North-West province. Using a binary probit model, they find higher levels of education to be associated with lower levels of poverty. Thus, the higher the total years of education in the household, the lower is the probability of a household being poor.

All previous South African studies found evidence of a negative relationship between poverty and education in South Africa. However, education was not the primary focus in any of these studies. In addition, the data sets used in these studies only date to 1998. This article uses a more recent data set conducted in 2005/2006. Finally, besides Van der Berg (2002) who analysed literacy to some degree, no other study has overtly tested for the impact of literacy, and specifically literacy of the household head, on household poverty in South Africa.

## 2. Data and methodology

### 2.1 Data

The data originates from the Income and Expenditure Survey for 2005/2006 (IES 2005/2006), which was conducted between September 2005 and August 2006 and comprised a total of about 24 000 households. The IES is conducted every five years and collects information on items and services acquired by South African households, as well as various sources of monetary and in-kind income. The data collection was done by collecting details of all expenditure and income by a participating household and all acquisitions of goods and services for the household's own consumption within the given reference period (Stats SA 2005). While previous studies have employed Income and Expenditure Surveys from previous years (1995 and 2000), the IES 2005/2006 has not been used in previous South African research. In addition, the IES is a popular survey in poverty analysis and has also been employed by the World Bank (Woolard & Leibbrandt 2001, Govender *et al* 2007).

### 2.2 Empirical methodology

Poverty is generally measured using the income or consumption approach. The consumption method is widely viewed as the preferred approach (Sen 1979), for a number of reasons. Data on consumption are more reliable and thought to better capture long-run welfare levels than current income (World Bank 2001). Consumption may be better measured than income and may also better reflect a household's ability to meet basic needs. Moreover, consumption is a more direct measure than income, since income tends to vary more over time, whereas expenditure is usually smoothed and offers a more reliable picture of the actual level of consumption (Coudouel *et al* 2002, Samson *et al* 2006). The consumption approach is used in this article.

Poverty can be measured at the individual or household level. The majority of the questions in household surveys are asked at the

household level while questions regarding, for instance, age and gender, are asked at the individual level (Woolard & Leibbrandt 2001). Measurement at the household level is generally preferred to the individual level, as income and expenditure data are difficult to break down to an individual level since the data are usually derived from household surveys. In addition, concepts such as food expenditure and electricity are shared among household members, making it difficult to construct disaggregation of household level variables across individuals (Fiegehen & Lansley 1976, Samson *et al* 2006). This article measures poverty at the household level. Household surveys do, however, have limitations. Household surveys convey little about the inequalities within households. Households also differ in terms of composition and size, which make comparisons between households difficult to interpret. Information required to measure individual welfare is, however, seldom available (Woolard & Leibbrandt 2001, Govender *et al* 2007).

Since the size and composition of households differ, a simple comparison of total household consumption can be misleading. Normalisation is therefore required where household consumption is transformed to equal consumption per equivalent adult, where a household of a given size and composition is taken to have the equivalent needs of a given number of adults (Woolard & Leibbrandt 2001). To account for differences in household size, total household consumption is divided by the number of equivalent adults, and adjusted to take economies of scale, denoted as  $\theta$ , into account (Deaton & Muellbauer 1980).<sup>3</sup> According to Lanjouw & Ravallion (1995) and Booyen (2003), a  $\theta$  coefficient of 0.6 constitutes an adequate and reliable adjustment for household economies of scale. In the South African literature, 0.6 is widely accepted as an adequate value for  $\theta$  (Booyen 2003 & 2004; Booyen & Van der Berg 2005) and is therefore also used in this study.

3 The number of equivalent adults is simply calculated by calculating household size to the power of  $\theta$ . Thus: (household size) <sup>$\theta$</sup>



Two poverty lines, which are pre-determined levels of the standard of living that must be reached if a person is not to be deemed poor (Ravallion 1994), are estimated. The first poverty line is set at the 40<sup>th</sup> percentile of adult equivalent consumption (Woolard & Leibbrandt 2001, Punt *et al* 2005) which is equal to R7920 per adult equivalent per annum. Following Ngwane *et al* (2001) and Punt *et al* (2005), the second poverty line is set at the 20<sup>th</sup> percentile of adult equivalent consumption (often referred to as an “ultra poverty line”), which equals R5 122 per adult equivalent per annum.

For the purpose of measuring poverty, the Foster-Greer-Thorbecke (FGT) measures are used, which include the headcount index ( $P_0$ ), the poverty gap index ( $P_1$ ) and the squared poverty gap index ( $P_2$ ) (Foster *et al* 1984). The headcount index measures the prevalence of poverty and shows the proportion of the population deemed poor. The poverty gap reflects the depth of poverty and measures the average distance that a poor person is from the poverty line. The squared poverty gap is a measure of the severity of poverty and is a weighted sum of poverty gaps, where the weights are the proportionate poverty gaps themselves (Ravallion 1994).

The equation for the FGT class of poverty measures depends on a parameter  $\alpha$ , which takes the value of zero for the headcount index, one for the poverty gap, and two for the squared poverty gap in the following expression:

$$P_\alpha = \frac{1}{n} \sum_{i=1}^q \left[ \frac{z - y_i}{z} \right]^\alpha \quad (1)$$

where  $z$  is the poverty line,  $y_i$  is the level of adult equivalent consumption,  $n$  is the sample size and  $q$  is the number of poor individuals (Foster *et al* 1984).

A simple probit model is estimated to determine which variables are significant in explaining poverty status, i.e. whether a household is poor or not. In this case, the probit model is

appropriate given the binary nature of the dependent variable. In addition, the model allows the reporting of changes in the response probability, i.e. marginal effects (Gujarati 2003). Marginal effects are evaluated at the means of the explanatory variables and the regressions use White-heteroskedasticity consistent standard errors, which are robust to heteroskedasticity.

Variables expected to have an influence on the probability of a household being poor are the education attainment of the household head, the gender of the household head, population group, whether a household is located in an urban or rural area, the household size, the province of residence and whether the household has a source of income or not.

Based on the relevant literature, a higher prevalence of poverty is expected to be associated with a lower level of education,<sup>4</sup> female-headed households are more likely to be poor, whereas Blacks experience the highest level of poverty among the different race groups (Woolard & Leibbrandt 2001, Punt *et al* 2005). In addition, poverty is expected to be more prevalent among households situated in rural areas (Woolard & Leibbrandt 2001, Serumaga-Zake & Naudé 2002, Anyanwu 2005). Household size and poverty are expected to be positively correlated (Lanjouw & Ravallion 1995), while poverty should be higher for a household with no source of income (Van der Berg *et al* 2006). Finally, poverty is expected to be highest in the Eastern Cape and lowest in the Western Cape and Gauteng (Woolard & Leibbrandt 2001). The following model was estimated:

$$Poor (P = 1 | X) = G (\beta_0 + \sum \beta_{1k} educ + \beta_2 female + \beta_3 race + \beta_4 rural + \beta_5 hsize + \beta_6 prov + \beta_7 inc) \quad (2)$$

where *educ* refers to the educational attainment in the household; *female* denotes the gender of the household head; *race* is the population group of the household head; *rural* refers

4 Cf Woolard & Leibbrandt 2001, Tilak 2002 & 2007, Van der Berg 2002, Anyanwu 2005.

to whether a household is located in a rural or urban area; *hsize* denotes the size of the household; *prov* is the province of residence of the household; and *inc* refers to a household with no source of income. The categories are as follows: *female* = male-headed household (base); female-headed household; *race* = Black (base); Coloured; Asian; White; *rural* = household located in an urban area (base); household located in a rural area; *prov* = Western Cape (base); Eastern Cape; Northern Cape; Free State; KwaZulu-Natal; North West; Gauteng; Mpumalanga; Limpopo; *inc* = household has a source of income (base); household has no source of income. Two regressions are estimated for the different indicators of educational attainment. Thus, for equation (2), *educ* refers to: the education level of the household head in regression 1 (Table 6) with the categories being “none” (base), “primary”, “secondary”, and “post-secondary”; and the literacy level of the household head in regression 2 (Table 7), where the inability of the household head to read and write is used as the base category. On *a priori* grounds, the expected signs are:

$$\beta_1 < 0, \beta_2 > 0, \beta_3 < 0, \beta_4 > 0, \beta_5 > 0, \beta_7 > 0$$

With respect to  $\beta_6$ , poverty is expected to be highest in the Eastern Cape and lowest in Gauteng and the Western Cape (Woolard & Leibbrandt 2001).

As noted in the literature review, lower education may exhibit a negative impact on household poverty, but it is also possible that poverty may result in lower education. As noted earlier, one way of controlling for this form of endogeneity would be to employ an instrumental variable regression and then use an exogenous instrumental variable to instrument for an endogenous explanatory variable. However, no suitable exogenous instrument could be found in the IES 2005/2006 and therefore this article does not control for possible endogeneity.

### 3. Results

#### 3.1 Descriptive statistics

The results from Table 1 indicate that the headcount index is 40% and 20% at the 40<sup>th</sup> and 20<sup>th</sup> percentile poverty lines, respectively, whereas the depth and severity of poverty is lower at the poverty line of the 20<sup>th</sup> percentile, which suggests that there is less inequality among the ultra-poor. The FGT measures are disaggregated by the highest education level of the household head in Table 2. At both poverty lines, the headcount index is higher for a household in which the head has primary and no education relative to a household where the head has secondary or post-secondary education. In addition, the depth and severity of household poverty is much higher if the household head has primary or no education.

Table 1: Headcount, poverty gap and squared poverty gap

	Standard deviation	
Poverty line: 40th percentile		
Headcount ( $P_0$ )	0.4000	0.4899
Poverty gap ( $P_1$ )	0.0230	0.0399
Squared poverty gap ( $P_2$ )	0.0021	0.0061
Poverty line: 20th percentile		
Headcount ( $P_0$ )	0.2000	0.3999
Poverty gap ( $P_1$ )	0.0091	0.0256
Squared poverty gap ( $P_2$ )	0.0007	0.0038

Source: Own calculations from IES 2005/2006

Table 2: FGT measures by highest educational attainment of the household head

Level of education	Standard deviation		Standard deviation	
	Poverty line: 40th percentile		Poverty line: 20th percentile	
None				
Headcount ( $P_0$ )	0.6539	0.4758	0.3681	0.4824
Poverty gap ( $P_1$ )	0.0418	0.0484	0.0179	0.0342
Squared poverty gap ( $P_2$ )	0.0041	0.0080	0.0015	0.0049
Primary				
Headcount ( $P_0$ )	0.5327	0.4989	0.2683	0.4431
Poverty gap ( $P_1$ )	0.0308	0.0436	0.0121	0.0291
Squared poverty gap ( $P_2$ )	0.0029	0.0071	0.0001	0.0046
Secondary				
Headcount ( $P_0$ )	0.2676	0.4427	0.1142	0.3181
Poverty gap ( $P_1$ )	0.0135	0.0310	0.0047	0.0185
Squared poverty gap ( $P_2$ )	0.0011	0.0043	0.0004	0.0025
Post-secondary				
Headcount ( $P_0$ )	0.0177	0.1317	0.0049	0.0703
Poverty gap ( $P_1$ )	0.0007	0.0060	0.0001	0.0022
Squared poverty gap ( $P_2$ )	0.0000	0.0004	0.0000	0.0001

Source: Own calculations from IES 2005/2006

The FGT measures are disaggregated by the literacy level of the household head in Table 3. The results clearly indicate that poverty is less prevalent and severe among households in which the head has some level of literacy. At the 40<sup>th</sup> percentile as the poverty line, the headcount index is twice as high if the household head can neither read nor write than if the head can read or write. Using the 20<sup>th</sup>

percentile as the poverty line, the headcount index is highest for a household in which the head has no level of literacy. In addition, a high level of literacy is associated with a lower poverty gap and squared poverty gap (at both poverty lines).

Table 3: FGT measures for the literacy level of the household head

Level of education	Standard deviation		Standard deviation	
	Poverty line: 40th percentile		Poverty line: 20th percentile	
Can't read or write				
Headcount ( $P_0$ )	0.6633	0.4726	0.3742	0.4839
Poverty gap ( $P_1$ )	0.0426	0.0486	0.0182	0.0344
Squared poverty gap ( $P_2$ )	0.0042	0.0079	0.0015	0.0049
Can read or write				
Headcount ( $P_0$ )	0.3310	0.4706	0.1543	0.3612
Poverty gap ( $P_1$ )	0.0179	0.0356	0.0067	0.0221
Squared poverty gap ( $P_2$ )	0.0016	0.0054	0.0005	0.0034

Source: Own calculations from IES 2005/2006

Table 4 shows that 18.54% of household heads have no education, whereas 31.17% have primary education. Roughly 41.68% have secondary education, with only 8.61% of household heads having post-secondary education. The disturbingly low percentage of household heads with post-secondary education is indicative of the skills shortages that South Africa faces. In addition, the heads of households located in urban areas on average have a higher level of education than those located in rural areas, whereas male heads have a higher educational attainment. In addition, the educational attainment of household heads is lowest for Blacks and highest for Whites. Table 5 reports the characteristics of a household head by levels of literacy. Roughly 20.76% of household heads can neither read nor write, whereas 78.97% can read or write. Literacy levels are

highest among those in urban areas and household heads who are White and male.

Table 4: Household head characteristics at different education levels

Level of education	None	Primary	Secondary	Post-secondary	Total
% of household heads					
All	18.54%	31.17%	41.68%	8.61%	100.0%
Urban	10.11%	25.65%	52.03%	12.21%	100.0%
Rural	29.28%	38.21%	28.49%	4.02%	100.0%
Male	14.51%	29.20%	46.07%	10.22%	100.0%
Female	23.62%	33.68%	36.14%	6.65%	100.0%
Black	21.87%	34.40%	38.12%	5.62%	100.0%
Coloured	13.53%	36.41%	44.69%	5.37%	100.0%
Asian	6.38%	11.88%	62.61%	19.13%	100.0%
White	0.46%	1.07%	62.96%	35.51%	100.0%

Source: Own calculations from IES 2005/2006

Table 5: Household head characteristics for different literacy level

Literacy	Can't read or write	Can read or write	Total
% of household heads			
All	20.76%	79.24%	100.0%
Urban	11.39%	88.61%	100.0%
Rural	32.73%	67.27%	100.0%
Male	16.38%	83.62%	100.0%
Female	26.28%	73.72%	100.0%
Black	24.61%	75.39%	100.0%
Coloured	14.98%	85.02%	100.0%
Asian	6.03%	93.97%	100.0%
White	0.05%	99.95%	100.0%

Source: Own calculations from IES 2005/2006

### 3.2.1 Regression analysis: education level of the household head

Results for regression 1 are presented in Table 6. For both poverty lines, the Wald *chi*-squared test indicates that the explanatory variables are jointly significant in explaining poverty status ( $p < 0.001$ ). All estimated coefficients have the expected signs on *a priori* grounds, while the percent correctly predicted for both models is 71.13% and 80.35%, respectively. Most estimated coefficients are statistically significant at the 1% significance level, except for the coefficients on Coloureds and Gauteng at the 20<sup>th</sup> percentile poverty line, which are insignificant.

Household poverty is negatively associated with household head education. At the 40<sup>th</sup> percentile poverty line, a household where the head has primary education is 6.78% less likely to be poor than a household where the head has no education, whereas a similar household is 3.5% less likely to be poor when using the 20<sup>th</sup> percentile poverty line. If the household head has secondary education, a household is 20.76% and 10.56% less likely to be poor than a household in which the head has no education at the 40<sup>th</sup> and 20<sup>th</sup> percentile poverty lines, respectively. In addition, where the head has post-secondary education a household is 37.19% less likely at the 40<sup>th</sup> percentile poverty line and 15.93% less likely at the 20<sup>th</sup> percentile poverty line to be poor than a household in which the head has no education. A simple F-test conducted on the post-estimation results also indicates that the probability of a household being poor decreases with an increase in the educational attainment of the household head ( $p < 0.001$ ).

With respect to the additional regressors, household poverty is higher among female-headed and rural households. Households are also more likely to be poor with an increase in household size and if the household has no primary source of income. Moreover, households with a Black head are the most likely to be poor compared to other racial groups, whereas households situated in the Eastern Cape have a higher probability of being poor relative to other provinces when compared to the Western Cape.



Table 6: Probit results, reporting marginal effects for highest education level of the household head

	Poor at 40th percentile	Poor at 20th percentile
Primary education	-0.0676*** (0.0093)	-0.0351*** (0.0054)
Secondary education	-0.2076*** (0.0093)	-0.1056*** (0.0066)
Post-secondary education	-0.3719*** (0.0057)	-0.1593*** (0.0049)
Female household head	0.0503*** (0.0071)	0.0221*** (0.0046)
Coloured	-0.0414*** (0.0128)	-0.0144 (0.0087)
Indian/Asian	-0.2932*** (0.0118)	-0.1296*** (0.0060)
Whites	-0.3609*** (0.0069)	-0.1537*** (0.0044)
Rural	0.1425*** (0.0083)	0.0704*** (0.0058)
Household size	0.0226*** (0.0014)	0.0109*** (0.0009)
Eastern Cape	0.1181*** (0.0181)	0.0780*** (0.0115)
Northern Cape	0.0794*** (0.0177)	0.0792*** (0.0151)
Free State	0.0386** (0.0194)	0.0272* (0.0149)

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	Poor at 40th percentile	Poor at 20th percentile
KwaZulu-Natal	0.0945*** (0.0175)	0.0741*** (0.0141)
North West	0.0470** (0.0200)	0.0537*** (0.0161)
Gauteng	-0.0647*** (0.0174)	-0.0133 (0.0129)
Mpumalanga	0.0415** (0.0199)	0.0473*** (0.0158)
Limpopo	0.0385** (0.0195)	0.0317** (0.0146)
No source of income	0.3539*** (0.0360)	0.2560*** (0.0359)
Observations	21030	21030
Pseudo R <sup>2</sup>	0.2153	0.1526
Wald X <sup>2</sup>	3268.32***	1864.72***
Correctly predicted	71.13%	80.35%

Note: Robust standard errors are shown in parenthesis

p < 0.001 \*\*\*, p < 0.05\*\*, p < 0.10 \*

### 3.2.2 Regression analysis: reading and writing ability of the household head

Results from regression 2 are reported in Table 7. The Wald *chi*-squared statistic suggests that the explanatory variables jointly explain the variation in poverty status using both poverty lines ( $p < 0.001$ ). On *a priori* grounds, all coefficients have the expected signs. In addition, the percentages correctly predicted for the two models equal 70.59% and 80.30%, respectively. The coefficients of North-West, Mpumalanga and Limpopo are

statistically insignificant when employing the 40<sup>th</sup> percentile as a poverty line. All other coefficients are statistically significant at the 1% significance level, but with the Free State coefficient being significant at the 10% level of significance. At the 20<sup>th</sup> percentile poverty line, the coefficients for Coloureds and Limpopo are statistically insignificant in explaining poverty status. Except for the Free State and Gauteng being significant at the 10% significance level, all the other estimated coefficients are statistically significant at the 1% level of significance.

The results indicate that households are less likely to be poor where the head has some level of literacy compared to a household where the head has no literacy. At the 40<sup>th</sup> percentile poverty line, a household is about 19.24% less likely to be poor if the head has some level of literacy compared to a household where the head can neither read nor write ( $p < 0.001$ ). Similarly, a household is 10.48% less likely to be poor if the head can read or write, relative to households in which the head has no level of literacy, when using the 20<sup>th</sup> percentile as the poverty line ( $p < 0.001$ ). As an additional test, the premise of Tilak (2007) that mere literacy is associated with higher poverty if the head has no education was investigated. The results (not shown) contradict this argument. For example, households in which the head can read or write but has no level of education are still approximately 16.0% less likely to be poor at the 40<sup>th</sup> percentile poverty line compared to a household with a head who does not possess any levels of education or literacy ( $p < 0.001$ ). At the 20<sup>th</sup> percentile poverty line, this probability is 11.27% ( $p < 0.01$ ). Thus, it appears that literacy matters for household poverty status, regardless of the educational attainment of the household head.

With respect to the additional control variables, the results are similar to those of Table 6. Female-headed households are more likely to be poor compared to a household with a male head, while an increase in household size increases the probability of being poor. Households with a Black head are the most likely to be poor compared to households with other racial groups as the head. Having no source of income increases the probability of being

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poor, and households situated in the Eastern Cape are once again more likely to be poor relative to other provinces when compared to households in the Western Cape.

Table 7: Probit results, reporting marginal effects for literacy level of the household head

	Poor at 40th percentile	Poor at 20th percentile
Can read or write	-0.1924*** (0.0093)	-0.1048*** (0.0072)
Female household head	0.0544*** (0.0072)	0.0259*** (0.0050)
Coloured	-0.0387*** (0.0132)	-0.0136 (0.0094)
Indian/Asian	-0.3196*** (0.0112)	-0.1465*** (0.0053)
Whites	-0.4032*** (0.0054)	-0.1814*** (0.0037)
Rural	0.1741*** (0.0081)	0.0901*** (0.0060)
Household size	0.0274*** (0.0014)	0.0136*** (0.0009)
Eastern Cape	0.1000*** (0.0180)	0.0731*** (0.0154)
Northern Cape	0.0712*** (0.0177)	0.0792*** (0.0156)
Free State	0.0364* (0.0196)	0.0285* (0.0159)
	(0.0196)	(0.0159)

	Poor at 40th percentile	Poor at 20th percentile
KwaZulu-Natal	0.0830*** (0.0175)	0.0728*** (0.0146)
North West	0.0247 (0.0198)	0.0464*** (0.0164)
Gauteng	-0.0833*** (0.0173)	-0.0237* (0.0133)
Mpumalanga	0.0193 (0.0197)	0.0389*** (0.0161)
Limpopo	-0.0006 (0.0190)	0.0144 (0.0145)
No source of income	0.3688*** (0.0337)	0.2846*** (0.0365)
Observations	21106	21106
Pseudo R <sup>2</sup>	0.1844	0.1342
Wald X <sup>2</sup>	3031.61***	1837.57***
Correctly predicted	70.59%	80.30%

Note: Robust standard errors are shown in parenthesis

p < 0.001 \*\*\*, p < 0.05 \*\*, p < 0.10 \*

#### 4. Conclusion

This article explored the relationship between education and poverty in South Africa, using data from the 2005/2006 Income and Expenditure Survey (IES). Poverty is more prevalent and severe for households in which the head has a low level of educational attainment. In addition, household head literacy varies negatively with household poverty prevalence. Poverty is less common among households located in an urban area and where the head is male and White, which is similar to the findings of Serumaga-Zake & Naudé (2002) and Punt *et al* (2005).

Using a binary probit model, two separate regressions were estimated to determine the effect of household head educational attainment on household poverty status. What is clearly evident is the strong tendency for lower education to be associated with a higher prevalence of household poverty. This is in accordance with the findings of, among others, Klasen (1997), Woolard & Leibbrandt (2001), Serumaga-Zake & Naudé (2002) and Van der Berg (2002). In addition, literacy levels of the household head display a significant negative impact on household poverty. A household is less prone to live in poverty if the household head can read or write compared to households where the head can neither read nor write. Similar findings are reported by Tilak (2002 & 2007). These results are at least true for the specific IES data used.

This article has limitations. First, since poverty was measured at the household level, specific poverty dynamics within the household cannot be observed. Secondly, this article does not control for the possibility of endogeneity in the regression models due to the absence of a suitable instrumental variable. The direction of causality between poverty and education is therefore not clear, and the parameter estimates cannot be accepted as entirely conclusive. Nevertheless, the results are strongly indicative of the premise that lower education is associated with greater levels of poverty and in accordance with previous research.

The immense skills shortages in South Africa are a manifestation of the generally low level of literacy and educational attainment. A lack of education substantially decreases the probability of employment, which, in turn, increases the probability of falling into poverty. By shifting the focus to more skills development and a better quality of education, the employment prospects of individuals will greatly improve. South Africa allocates a considerable amount of money towards education (SARB 2010). However, this does not seem to have improved the quality of the educational system (Van der Berg 2002). This leaves room for future research on the association between resource allocation towards education and educational quality.

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