



# **Literacy at South African mission Stations**

Johan Fourie, Robert Ross and Russel Viljoen

**ERSA working paper 284**

Economic Research Southern Africa (ERSA) is a research programme funded by the National Treasury of South Africa.

The views expressed are those of the author(s) and do not necessarily represent those of the funder, ERSA or the author's affiliated institution(s). ERSA shall not be liable to any person for inaccurate information or opinions contained herein.

# Literacy at South African Mission Stations\*

Johan Fourie<sup>†</sup>, Robert Ross<sup>‡</sup> and Russel Viljoen<sup>§</sup>

May 10, 2012

## Abstract

Accurate measures of education quality – primarily, years of schooling or literacy rates – are widely used to ascertain the contribution of human capital formation on long-run economic growth and development. This paper, using a census of 4500 missionary station residents in 1849 South Africa, documents, for the first time, literacy and numeracy rates of non-White citizens in nineteenth-century South Africa. The census allows for an investigation into the causes of literacy at missionary stations. We find that age, residency, the missionary society operating the stations and numeracy, as a proxy for parental education, matter for literacy performance. The results provide new insights into the comparative performance of missionary societies in South Africa and contribute to the debate about the role of missionary societies in the economic development of colonial settings.

## 1 Introduction

It is, or should be, evident that literacy and numeracy are among the essential qualities required to function in the modern world. Indeed, literacy is generally used by economic historians as the best indication of human capital, or in other words of the economic “quality” of any given population. This in its turn can be considered as one of the prime motors of what is conventionally described as economic progress (Mankiw, Romer and Weill 1992).

One apparent cause of human capital acquisition, and thus literacy, is religious conversion. At the start of the twentieth century, Weber (1930) posited his theory of the Protestant Ethic, explaining why Protestantism results in higher productivity and income. Since then, the Weberian hypothesis has caused arguments and empirical proof in favour and against the role of religion as causal

---

\*This is a preliminary version. The authors would like to thank Joerg Baten for valuable comments and suggestions. Excellent research assistance was provided by Laura Rossouw and Jeanne Cilliers.

<sup>†</sup>Department of Economics, Stellenbosch University, South Africa. Corresponding author: johanf@sun.ac.za.

<sup>‡</sup>Department of History, Leiden University, the Netherlands and the Department of History, University of South Africa, South Africa.

<sup>§</sup>Department of History, University of South Africa, South Africa.

explanation of a country's economic performance, the most recent of which, Becker and Woessmann (2009), argue that higher literacy among Protestants of the nineteenth century (and not a Protestant work ethic) contributed to higher economic prosperity. Scheltegger and Torgler (2009) counters by showing that today's work ethic is influenced by both denomination-based religiosity and education.

In search of further evidence, the debate has shifted to the role of missionaries in former colonies. In much of Africa, and specifically in South Africa, the initial drive for the establishment of a literate population came from the missions. Indeed, Frankema (2012) shows that variation in school enrolment rates across African colonies before World War II is almost entirely attributable to missionary activity, and not state-sponsored investment in education. Protestant missionaries left the greatest legacy. Gallego and Woodberry (2010) show that Protestant missionary activity in the past is more correlated with schooling today than areas where Catholic missionaries settled, echoing earlier ideas along similar lines (Woodberry and Shah 2004). According to Gallego and Woodberry (2010), the effect is mainly driven by variation in the Catholic sample; Catholic missionaries leave a similar legacy to the Protestants where competition was allowed between the two orders. Instead of competition, Nunn (2011) posits gender as the mechanism through which colonial missionary activity affects African education today. He shows convincingly that both Catholic and Protestant missionary stations in Africa had positive, long-run impacts on educational attainment, but that Protestant missionaries impacted females and Catholics, males (Nunn 2011).

At a less exalted level of generalisation, it is clear that the first generation of the Westernised elite in South Africa came out of the missions. This is true not only for the amaXhosa, the Batswana, the Basotho, the amaZulu and the many groups in the northern provinces (e.g. Williams 1959, Landau 1994, Etherington 1978, Erlank 1998, Delius 2001, Comaroff and Comaroff 1997, Kirkaldy 2005); it is also the case for the "coloureds" of the Cape provinces (Landau 2010, Scully 1997, Elbourne 2002). A distinction can be made in that among the former "Westernisation" and the creation of an elite went in parallel and in the latter, in large measure, some degree of Westernisation preceded entry to elite status. Nevertheless, in both cases a substantial cultural transformation occurred, driven in the first instance by the power of mission Christianity.

A central part of the mission process entailed the acquisition of literacy. Missionaries, and especially their wives and daughters, spent a large proportion of their time teaching their adherents to read and write. But, beyond the spiritual benefits which may have accrued, reading and writing were necessary accomplishments to allow successful participation in the colonial economy. This benefited both the individuals concerned and, though this was often not recognised, the economy as a whole.

Literacy, and indeed numeracy, are subjects for which statistical statements are of prime importance. In this paper we present and analyse data on the literacy and numeracy of the inhabitants of (almost all) the mission stations in what was then the Cape Colony. We show that, in contrast to the existing literature

which only contrast Catholic from Protestant missionary stations, significant differences existed within the educational offering of the various Protestant missionary societies active in the Cape Colony. In this way we can illuminate the process by which the first generation of black and coloured literates in South Africa acquired the skills, and so provide a baseline from which further studies can develop.

## 2 Mission stations at the Cape and the 1849 Census

This analysis is based on the 1849 census of mission stations at the Cape, printed (in full) in *Master and Servant: Addenda to the Documents on the working of the Order in Council of the 21<sup>st</sup> July 1846, including Memorials &c and reports by the resident magistrates on the missionary institutions, with a summary of the whole*, published in Cape Town in 1849 by order of the Legislative Council. The data which it contains have been digitised by the College of Human Sciences of UNISA, and will in due course be made fully available electronically. The circumstances under which the census was conducted were detailed in Ross and Viljoen (2009) and do not need to be repeated here. Suffice it to say that the district magistrate was required to visit every mission station in his district for the purpose of collecting the information which the Government thought it required. This was complied with, with the exception of Wupperthal and the Namaqualand stations, which were too distant for the Clanwilliam magistrate to reach.<sup>1</sup> The location of the stations visited can be seen in Figure 1. It will be noted that the reach included the newly annexed district of Victoria, with its headquarters at Alice in the Eastern Cape, but excluded what was then British Kaffraria.

The data the magistrate was required to collect included, naturally enough, the names, ages, sexes, occupations and possessions of the station residents, and also how long he or she had been living on the mission. Special attention was paid to the work performed outside the stations by the adolescents, as it was believed that the stations were responsible for the shortage of labour for the farmers. In addition, the magistrate was required to note for each resident if “he” could read or write. In a few stations, indeed, the literacy of women was not ascertained. The test was simple, and direct. “This you will ascertain from personal examination, for which purpose it will be advisable that you should take with you a copy of the Bible in Dutch, from which you will require those who are represented as able to do so to read a few verses” (Master and Servant Addenda, 27). Presumably an analogous test was used to check whether those who claimed the skill were indeed able to write. The census thus gives very direct evidence of the mission station residents’ literacy.

---

<sup>1</sup>There is also data on the settlement of “Hottentots and other natives” at the farm at Scott’s Bottom in Bathurst district, but as this was not a mission station it is excluded from the following analysis.

Their numeracy is another matter. This has to be inferred from their reported ages, using the information from age-heaping, a well-established technique (A’Hearn, Baten and Crayen 2009).

Figure 2 shows the reported age distribution of all Cape missionary station residents: the graph clearly shows how rounded numbers (30, 35, 40, for example) are more popular than exact ages (such as 33, 37, etc). Through a statistical technique known as the Whipple Index, these misreported numbers can be converted into a measure of numeracy. The Whipple Index represents the extent to which age data reveal heaping at certain ages, notably those ending in 0 or 5. Equation 1 and 2 shows how to do convert this a standardized measure between zero and 100.

Equation 1 calculates the Whipple Index:

$$W = \frac{\sum (n_{25} + n_{30} \dots + n_{65} + n_{70})}{\frac{1}{5} \sum_{i=23}^{72} n_i} \times 100 \quad (1)$$

A linear transformation yields the ABCC-index:

$$ABCC = (1 - \frac{(WI - 100)}{400}) \times 100 \quad (2)$$

These linear transformations (the ABCC-index) can then be interpreted as an estimate of numeracy.

Table 1 provides the descriptive statistics of the 1849 missionary census. In total, 4,443 individuals are included in the census; Genadendal is the largest missionary station with 1,099 observations (close to 24% of the total), followed by Elim with 373. Hermon, with only 11 residents, is the smallest station.

Average age of the adult male household heads vary somewhat between stations, from a mean age of 32.9 years at Lovedale to 44.5 years at Ebenezer. Table 1 also shows large variations in the average residency period on the stations: at Saron, which had only been founded in 1846 (Strassberger 1969: 28), the mean residency period is only 1.1 years while that of Bethelsdorp is 25.6 years. We also construct a dummy variable for those residents that arrived at missionary stations after emancipation of slaves (1838). The variable takes a one if a resident arrived at the station after 1838 and a zero if he had lived longer at the station. The “Eman”-variable in Table 1, therefore, reflects the proportion of the residents at each station that arrived after 1838. There is considerable variation in the emancipation dummy; while all the residents of six of the stations arrived after 1838, only 14% of residents at Schietfontein did. The “Born”-variable reports the proportion of residents at each station that arrived before their 16<sup>th</sup> birthday at the station. Eight stations report no residents who arrived before their 16<sup>th</sup> birthday, while 54% of residents at Enon had. The gender dummy shows that at six stations only males were surveyed, while three other stations also report high gender ratios; females at these stations were presumably not interviewed which would create biases if cross-station comparisons are made without controlling for these demographic differences. Even though

nearly 80% of all the individuals in the census are married, there are large variations across stations; while only 18.2% of individuals are married at Hermon, all the individuals at Clarkson, Uitenhage indicated that they are married.

Table 2 provides the same descriptive statistics as Table 1, but grouped by missionary society. More than half of all individuals in our sample resided at stations operated by the Moravian Society, while nearly a quarter of the remaining individuals belonged to stations operated by the London Missionary Society. Only 3.9% of individuals belong to stations operated by the Free Church of Scotland and 4.3% to the Wesleyan Methodist Society.

### 3 Human capital performance at Cape missionary stations, 1849

Table 3 reports literacy and numeracy rates by age cohorts. Both variables reveal a decline in performance as we move up the age cohorts suggesting that older individuals tended to have both weaker literacy and numeracy skills. Given the accuracy of the literacy measure, the sharp decline suggests that age is an important determinant of an individual's ability to read and write. While close to half of all 13 to 22 year-olds could read, less than 10% of individuals older than 63 could.

Table 4 shows literacy and numeracy rates by station. The large variation of both measures across the sample is already indicative of differences in education practices between stations; while the 388 individuals at Zoar only attain a literacy rate of 4.9%, the 191 residents of Enon has a 48.7% literacy rate.

Table 5 reports literacy and numeracy rates by society. Here, too, there are signs that large differences existed in the educational attainment of missionary residents within the Protestant tradition. The South African Missionary Society (with 490 residents) clearly paid little attention to education, their subjects attaining a literacy rate of only 5.7%. In contrast, the Free Church of Scotland (with 175 residents) attained a high 40.6%, while the Wesleyan Methodist had a rate of just above 35%. Of course, the higher literacy of the Wesleyan Methodist Society may be explained by the different characteristics of the residents; perhaps the Wesleyan Methodist Society attracted younger residents (as seems to be the case in Table 2) which would then explain its higher literacy rate. The next section uses regression analysis to control for these observed characteristics, and points to possible determinants of these disparate literacy rates.

The downward trend across the age cohorts for both literacy and numeracy rates reflected in Table 2 offers some confidence that both measures capture an element of human capital acquisition within missionary stations. However, the results reported in Tables 4 and 5 strongly oppose this view, with very low correlations between the literacy and numeracy rates across stations or societies. The low correlation at the station level is supported by low correlations at the individual level, reported in Table 6. Here, a negative correlation is expected:

one in the literacy dummy denotes someone able to read; one in the age-heaping variable denotes someone unable to give a precise estimate of his age. The low correlations have two potential inferences: either literacy and numeracy were not generated by the same education processes, or numeracy – measured through age heaping – is only a very rough proxy for human capital acquisition, defined as the stock of competencies and knowledge embodied in a person.

Given the accuracy of our literacy measure, we continue to use literacy as our measure of human capital attainment. In the next section, we identify the determinants of literacy at Cape missionary stations, and attempt to show how these results reinterpret the existing historical narrative.

## 4 Determinants of literacy

We use two estimations to identify the determinants of literacy: first, we regress the average station characteristics on the mean station literacy score. Equation 3 estimates:

$$Y_i = \alpha + \beta Soc_i + \gamma Age_i + \delta Res_i + \theta Ageheap_i + \varepsilon \quad (3)$$

where  $Y$  is the average literacy score by station  $i$ ,  $\alpha$  is a constant,  $Age_i$ ,  $Res_i$  and  $Ageheap_i$  are explanatory variables,  $Soc_i$  is our variable of interest with  $\beta_i$  denoting the coefficient for each of the missionary societies, and  $\varepsilon$  is a randomly distributed error term. While the results reported in Table 7 do provide some tentative conclusions, their robustness is weak given the small sample size of only 28 stations. Table 7 reports that average age reduced literacy rate, although the result is only statistically significant in Model 3 (i.e. when controlling for age-heaping). The length of residency is positive and significantly related to literacy scores; the longer individuals resided at missionary stations, the higher their literacy score. The five missionary society dummies (LMS = London Missionary Society, We = Wesleyan Methodist, Rh = Rhenish Missionary Society, Mo = Moravian Society, FC = Free Church of Scotland) offer clues as to which society's residents performed better, *ceteris paribus* (we use the South African Missionary Society as reference group).

The results reported in Table 7 suggest that residents at stations of the London Missionary Society, Wesleyan Methodists and Free Church of Scotland, controlling for age, residency and numerical ability, achieved significantly higher literacy rates than the residents of the Rhenish, Moravian and South African missionary societies.

While Table 7 provides clues as to the differential educational performance of the missionary societies, the small sample size inhibits our ability to draw strong inferences from the results. We therefore use regression analysis at the individual level – through linear probability modelling – to ascertain those factors that most affect individual literacy performance.

A linear probability model (LPM) is used where the dependent variable is binary, in this case, where the individual is either literate (1) or non-literate (0). The sample size now increases to between 3989 and 4056 depending on

the number of explanatory variables used, which also increases the precision with which we measure our coefficients of interest. A greater sample also allows for the inclusion of a number of additional controls, such as our measure for residents who arrived at the stations after emancipation (“Eman”), those who resided at the stations before their 16<sup>th</sup> birthday (“Born”) and male and married dummies. In addition, we also include Age-squared (“Age2”) and Residency-squared (“Res2”) variables to account for any non-linearity. Equation 4 shows a simple specification of the estimation:

$$y_j = \alpha + \beta Soc_j + \gamma \Phi_j + \varepsilon \quad (4)$$

where  $y$  is a binary variable of literacy for each individual  $j$ ,  $\alpha$  is a constant,  $Soc_j$  is again our variable of interest with coefficient  $\beta_j$ ,  $\Phi$  is a vector of explanatory and  $\varepsilon$  is a randomly distributed error term. One of the problematic features of the LPM is that heteroskedasticity<sup>2</sup> is nearly always present. Robust standard errors are computed in order to control for this.

Table 8 reports the results. As before, age is found to be negatively related to literacy rates; *ceteris paribus*, older individuals tend to have lower literacy rates. The statistically significant positive coefficient for Age2 suggests that this is concave: the effect diminishes the higher the age, although the coefficient is economically tiny. In Model 1, the length of residency at missionary stations, similar to our results above, seems to have a statistically important positive impact on literacy. However, once we control for “Eman” and “Born” the effect of residency disappears.

In all six specifications, the “Eman”-variable is economically and statistically significant, even when controlling for age, residency and “Born”. This reflects the difference between the residents of missionary stations who resided at missionary stations before the abolition of slavery and those who only arrived at the stations after 1838. The size of the coefficient suggests that, controlling for all the other variables, a person who arrived after 1838 at a station would have 12.6% lower probability of being literate in 1849. Similarly, a person arriving at a missionary station before their 16<sup>th</sup> birthday has a 24% higher likelihood of being literate, *ceteris paribus*. This result is surprisingly consistent across all the specifications, and probably points to the importance of education programmes for the young at the stations vis-à-vis the educational options of those residents who had not spent their formative years at missionary stations.

The five missionary society dummies all appear to be significantly better than the reference group, which is the South African Missionary Society. The Wesleyan Methodists reveal the largest coefficient: according to Model 6, residing at a Wesleyan Methodist station rather than a South African Missionary Society station increases the probability of being literate by 34%, *ceteris paribus*. The London Missionary Society, the Rhenish Missionary Society and the Free Church of Scotland also perform well relative to the South African Missionary Society. The coefficient on the Free Church of Scotland is 0.16, smaller

---

<sup>2</sup> A collection of random variables is heteroskedastic if the variation of the sub-populations differ substantially.



than some of the other societies. This is mostly explained by the large, negative coefficient for a single FC station, Gwali/Tyumie in the Eastern Cape, in itself perhaps of consequence of the isiXhosa-speaking character of this particular station.<sup>3</sup> The Moravian society initially also appears to be statistically different from the South African Missionary Society (even though the economic significance is quite small), but this effect disappears in the final model.

Males consistently perform worse than females on literacy scores. One caveat should be pointed out here, though: not all females answered the question pertaining to literacy. The extent to which women did not answer because they were illiterate will determine the sampling bias. There is little evidence of this happening, though, as most of the non-response is grouped by station, suggesting that at some stations women were requested to answer the literacy questions while at others not. Sampling bias could, thus, only be a serious issue if women at those stations that had lower female literacy were not asked to complete the literacy questions. There is no reason to believe this happened. The higher literacy rate of women, therefore, seems to confirm Nunn's (2011) results that female education received priority at Protestant missionary stations.

In general, marriage seems to have had little impact on literacy. Finally, we also include a measure of age-heaping. While age-heaping is often used as a proxy for human capital attainment, we include it here as a proxy for parent education, arguing that an individual's awareness of their age is to some extent dependent on their parents' ability to transfer that knowledge to them. The results confirm our expectation of a negative, significant coefficient. However, for our purposes here, the results seem to matter little in its impact on other explanatory factors, suggesting that while parental education may be important, it certainly cannot explain away the impacts of any of the other independent variables. In other words, the differential impact of the missionary societies remains even if we control for a (rough) measure of parents' education levels.

Focussing specifically on the variable of interest, a type I error would entail assuming that a certain missionary society contributed positively to literacy, when in fact it did not. Since all of the coefficients of missionary stations are statistically significant at the one percent level, the probability of a type I error is less than 1 per cent. The results remain valid across different estimation methods, as can be seen in Table A1 in the Appendix which shows the coefficients when using LPM, logit and probit models (Wooldridge, 2009: 247).

## 5 Liberation through education

One basic finding of this article, then, is that, even taking into account all the differences between the mission stations and missionary societies, a steadily increasing proportion of those people who had come to live in these communities

---

<sup>3</sup>The magistrate in question, H.C. Calderwood, was an ex-missionary, and perhaps sympathetic to the Gwali residents, but if he had adhered to the stated rule and only used a Dutch bible this would have been problematic for those who could not speak, let alone read, Dutch, even if they were literate in isiXhosa.

were able to read and to write. It is of course difficult to make statements relating to trends on the basis of single points of observation, such as a census. In this case, however, the large sample size of 4500 individuals and the consistent increase in literacy between age cohorts, with the younger being more literate, allows us to be confident in the robustness of such a statement. Mission stations were not only providing some degree of protection from the oppression which had been the lot of the slaves and most of the Khoekhoe, and also, as the missionaries believed, the key to salvation, but also the ability to read, write and count.

The mission station inhabitants were certainly not typical of the mass of ex-slaves and Khoekhoe in the Cape Colony, even though they comprised approximately 16.5% of the “coloured” population of the colony living outside Cape Town, and about 7.3% of the total population, including whites and the inhabitants of the city, where no division on the basis of race was made. They would not have been the only literates from among this group in the colony. There were missions which educated former slaves and Khoe in all the major towns—Cape Town (Ludlow 1999), Stellenbosch, Worcester (Strassberger 1969), Port Elizabeth, Graaff-Reinet and Grahamstown (Ross 1999). In the Kat River Settlement in the Eastern Cape, in the years before the War of the Axe, “the infant, juvenile, evening and Sabbath schools ... were affording instruction to upwards of 1,200 persons, diffusing extensively a knowledge both of the Dutch and English languages” (Innes 1849, see also Ross 1999). Then there were those who learned to read in the Islamic schools of Cape Town, primarily Dutch in Arabic script (Davids 1992). In other words, there were a variety of opportunities for the coloureds to acquire a basic education, of which the mission stations were only one, though probably the most important, numerically.

The mission inhabitants were not all immediately able to make use of their skills of literacy and numeracy. The stations were seen as places which tied up labour, and thus forced up wages, to the disadvantage of the farmers. One of the more rabid of the farmers commented that “the institutions are swarming with boys and girls old enough for work, but wanted at *school*” (cited in Ross & Viljoen, 2009: 393). In fact, as the census made clear, most of those on the mission who could work for the farmers did do so, as the possibilities for earning a living on most of the stations was limited. Nevertheless, for all his vindictive ferocity, T.B. Bayley, the farmer in question, did have a point. The years after the emancipations (of both slaves and Khoekhoe, through Ordinance 50) saw an increase in the bifurcation of the rural labour force, which had begun before 1828. On the one hand, there were those who were held in what for the slaves was literally bondage, and which after emancipation (and even before for the Khoekhoe) was continued by a whole variety of legal and extra-legal means (Van Arkel, Quispel & Ross 1983). These formed the oppressed mass of the rural “coloured” population, held in thrall by the tot system and alcohol dependency, debt bondage and often raw violence. On the other hand, there were those who by a combination of good luck, opportunity and strength of character were able to escape from this position. They may have continued to work as seasonal labourers on the wine and wheat farmers, or as travelling sheep-shearers (Bundy

1984), but they had some possibility of escape, some refuge to which they could retreat as necessary.

Within this, there were of course distinctions on the basis of gender and of age. Pamela Scully (1997) pointed out how the missionaries attempted to impose the forms of family life to which they were accustomed on the residents of the station. Indeed, the census is generally organised in terms of households. These were expected to have a male head. The gender hierarchies of Europe were propagated as though they were the natural order of affairs, or at the very least as those which morality required. The oppression this entailed is evident, and the pressure on those who strayed from the missions' norms was often unbearable, as is shown by a number of infanticide cases around the missions. Nevertheless, the external drive for conformity is only a part of the story. There were clear advantages to living on a mission station, which most of their inhabitants presumably thought outweighed the discipline which was imposed on them. Even if the men, and indeed generally the unmarried women, had to work on the farms, it was possible for some to withdraw from the labour process under which they, or at least their parents, had suffered before emancipation. Mission station residents could engage in seasonal work, but enjoyed the freedom of mobility.

It stands to reason that those who had most chance of joining the more privileged section of the bifurcated labour force were those who had acquired extra skills, of which literacy was the most important. Education could be literally liberating. A similar point has been made for other slave societies, most notably for the Americas (Engerman and Sokoloff 2011). As regions with varying shares of ex-slaves after independence, the mid-nineteenth century Americas offer a legitimate benchmark to measure the relative educational attainment, shown in Table 9, of the Cape coloured population. The Cape missionary societies average literacy rate of 23% is significantly lower than most of the cities in the sample, except for the coloured populations of San Juan and Havana. However, compared to the region (or country) averages – the more acceptable comparison given that none of the missionary stations included here are located in cities – Cape missionary stations achieve higher literacy rates than the nineteenth century populations of Chile, Puerto Rico, Jamaica and Brazil, and similar rates to those of Argentina and Cuba. The claim that the educational attainment of the non-white South African is and always have been deficient, is unfounded.

The coloured and later the black elite of the Cape Colony came in the first instance from those who had learnt to read and to write from the missionaries, and their wives and daughters. Indeed, from 1838, there was a “kweekschool”, or teaching training establishment, in Genadendal, which was beginning to turn out young men to work in the mission schools, and later in those run by the Anglican and Dutch Churches (Krüger, 175-183, 269). There was also a steady stream from the schools of the Kat River who began as teachers and then moved into a variety of other positions throughout the colony. In the early 1850s, the school at Lovedale, near Alice, would begin to provide secondary education. Both of these developments should be unsurprising given our results: Genadendal had the largest number of literate residents (257) in 1849, while Lovedale had the

second highest literacy rate (48%). Being on a missionary station mattered, but being on the right type of missionary station may have mattered even more. The slow process of bringing the ex-slaves, the Khoekhoe and the amaXhosa, in the first instance, into the colonial economy, at any level above that of unskilled labourer, began from those societies that offered education, and not necessarily devotion, as beacon of hope.

## 6 Conclusions

The significance of missionary stations in building human capital has recently received renewed interest. Nunn (2011), for example, shows that Protestant missionary stations in Africa, by emphasising educational attainment for their subjects, have had a greater impact on long-run African economic performance than their Roman Catholic counterparts. Using a census of Cape Colony missionary stations undertaken in 1849, we contribute to this literature by investigating the determinants of literacy at Cape missionary stations, operated by six different Protestant missionary societies. The census allows us to control for numerous possible explanations of literacy: the age of individuals, the length of residency at the station, emancipation rates, youth rates, gender biases, marriage patterns and even a proxy for parental education. We find that none of these additional factors explain away the differential impact of Protestant-only missionary societies.

The results show that the London Missionary Society, the Wesleyan Society, the Rhenish Society and the Free Church of Scotland were more successful at delivering literacy to their subjects than the South African Missionary Society (the reference group) and the Moravian Society (which had the largest number of residents). In general, though, literacy rates were relatively high, even compared to similar ex-slave societies in the Americas. In the post-emancipation nineteenth century, missionary stations offered ex-slaves, the Khoekhoe and the amaXhosa a way to escape the discriminatory labour practices on farms.

Being female and born at a station improved literacy scores, but the remaining differences between Protestant missionary stations may point to another (latent) variable ignored by the earlier research which differentiated between Protestants and Catholics only. Our results show that, while residence at a Protestant missionary station improved literacy, the type of Protestant missionary society that operated the station may have mattered even more. Explaining this intra-Protestant variation is an invitation for future research.

## References

- [1] B. A'Hearn, J. Baten, D. Crayen. 'Quantifying Quantitative Literacy: Age Heaping and the History of Human Capital', *Journal of Economic History* 69 (2009), 783-808

- [2] J. Baten, and J. Fourie, ‘Numeracy in the eighteenth-century Indian Ocean region: Evidence from Cape Colony Court of Justice records’, *ERSA Working Paper series*, forthcoming (2012).
- [3] S. Becker, and L. Woesmann, ‘A Human Capital Theory of Protestant Economic History’, *Quarterly Journal of Economics*, 124, 2 (2009), pp. 531-596.
- [4] C. Bundy, *Vagabond Hollanders and Runaway Englishmen: White Poverty in the Cape Before Poor Whiteism: The Societies of Southern Africa in the 19th and 20th Centuries Vol. 13*. 1984.
- [5] J. Comaroff and J. Comaroff, *Of Revelation and Revolution: Volume I, Christianity, Colonialism and Consciousness in South Africa; Volume II, The Dialectics of Modernity on a South African Frontier* (Chicago, University of Chicago Press, 1991, 1997).
- [6] A. Davids, *The Afrikaans of the Cape Muslims from 1815 to 1915*, doctoral dissertation (1992), University of Natal.
- [7] P. Delius, ‘Witches and Missionaries in Nineteenth Century Transvaal’, *Journal of Southern African Studies*, 27, 3, (September 2001), pp. 429-443.
- [8] E. Elbourne, *Blood Ground: Colonialism, Missions, and the Contest for Christianity in the Cape Colony and Britain, 1799-1853* (Montreal, McGill University Press, 2002).
- [9] S. Engerman and K. Sokoloff, ‘Economic Development in the Americas Since 1500: Endowments and Institutions’ (Cambridge, Cambridge University Press, 2011).
- [10] N. Erlank, ‘Gender and Christianity Among Africans Attached to Scottish Mission Stations in Xhosaland in the Nineteenth Century’ (PhD thesis, Cambridge University, 1998).
- [11] N.A. Etherington, *Preachers, Peasants and Politics in Southeast Africa, 1835-1880: African Christian Communities in Natal, Pondoland and Zululand* (London, Royal Historical Society, 1978).
- [12] E. Frankema, ‘The Origins of Formal Education in Sub-Saharan Africa: Was British Rule More Benign?’, *European Review of Economic History*, (forthcoming, 2012).
- [13] F. Gallego, and R. Woodberry, ‘Christian Missionaries and Education in Former Colonies: How Competition Mattered’, *Journal of African Economies*, 19, 3 (June 2010), pp. 294-329.
- [14] R. Grier, ‘The Effect of Religion on Economic Development: A Cross-National Study of 63 Former Colonies’, *Kyklos*, 50, 1 (March 1997), pp. 47-62.

- [15] J.R. Innes, 'Memorandum on the Kat River Settlement', in *British Parliamentary Paper 635 of 1851 (Select Committee on Kafir Tribes)*. *Master and Servant: Addenda to the Documents on the Working of the Order in Council of the 21<sup>st</sup> July 1846, Including Memorials and Reports by the Resident Magistrates on the Missionary Institutions, with a Summary of the Whole* (Cape Town, 1849).
- [16] A. Kirkaldy, *Capturing the Soul: The Vhavenda and the Missionaries* (Pretoria, Protea Book House, 2005).
- [17] B. Krüger, *The Pear Tree Blossoms: A History of the Moravian Mission Stations in South Africa, 1737-1869* (Genadendal, Moravian Book Depot, 1966).
- [18] P.S. Landau, *The Realm of the Word: Language, Gender, and Christianity in a Southern African Kingdom* (Portsmouth, New Hampshire, Heinemann, 1994).
- [19] P.S. Landau, 'Transformations in consciousness', in C.A. Hamilton, B.K. Mbenga and R. Ross (eds), *The Cambridge History of South Africa Vol. 1: From Early Times to 1885* (Cambridge, Cambridge University Press, 2010).
- [20] E.H. Ludlow, 'Working at the Heart: The London Missionary Society in Cape Town, 1819-1844', in J. de Gruchy (ed.), *The London Missionary Society in Southern Africa: Historical Essays in Celebration of the Bicentenary of the LMS in Southern Africa, 1799-1999* (Cape Town, David Philip, 1999).
- [21] R. McCleary and R. Barro, 'Religion and Economy', *Journal of Economic Perspectives*, 20, 2 (Month 2006), pp. 49-72.
- [22] N. Nunn, *Gender and Missionary Influence in Colonial Africa* (Harvard University, Mimeo, 2011).
- [23] N. Nunn, 'Religious Conversion in Colonial Africa', *American Economic Review*, 100, 2 (May 2010), pp. 147-152.
- [24] R. Ross, 'The Social and Political Theology of Western Cape Missions', in H. Bredekamp and R. Ross (eds), *Missions and Christianity in South African History* (Johannesburg, University of the Witwatersrand), pp. 97 - 112.
- [25] R. Ross and R.S. Viljoen, 'The 1849 Census of Missions in the Cape Colony', *South African Historical Journal*, 61, 2, (2009), 389-406.
- [26] R. Ross, 'Congregations, Missionaries and the Grahamstown Schism of 1842-3', in J. de Gruchy (ed.), *The London Missionary Society in Southern Africa: Historical Essays in Celebration of the Bicentenary of the LMS in Southern Africa, 1799-1999* (Cape Town, David Philip, 1999).

- [27] C. Schaltegger and B. Torgler, *Was Weber Wrong? A Human Capital Theory of Protestant Economic History: A Comment on Becker and Woessman* (Queensland University of Technology, Mimeo, 2009).
- [28] P. Scully, *Liberating the Family: Gender and British Slave Emancipation in the Rural Western Cape, South Africa, 1823-1853* (Portsmouth, New Hampshire, Heinemann, 1997).
- [29] E. Strassberger, *The Rhenish Mission Society in South Africa, 1830-1950* (Cape Town, Struik, 1969).
- [30] D. Van Arkel, G.C. Quispel and R. Ross, *De Wijngaard des Heeren? De Oorsprong van "die Blanke Baasskap" in Zuid-Africa* (The Hague, Martinus Nijhoff, 1983).
- [31] M. Weber, *The Protestant Ethic and the Spirit of Capitalism* (New York, Scribner, 1930).
- [32] D. Williams, 'The missionaries on the Eastern Frontier of the Cape Colony, 1799 – 1853' (PhD thesis, University of the Witwatersrand, 1959).
- [33] R. Woodberry and T. Shah, 'The Pioneering Protestants', *Journal of Democracy*, 15, 2 (April 2004), pp. 47-61.
- [34] J.M. Wooldridge, *Introductory Econometrics: A Modern Approach* (New York, South-Western, 2002).

## APPENDIX

**TABLE A1: The coefficient estimates of the linear probability model, the marginal effects probit model and the marginal effects logit model**

|         | LPM    | Probit | Logit  |
|---------|--------|--------|--------|
| Age     | -0.013 | -0.01  | -0.013 |
| Age2    | 0.000  | 0      | 0      |
| Res     | 0.003  | 0.012  | 0.015  |
| Res2    | 0.000  | 0      | 0      |
| Eman    | -0.122 | -0.046 | -0.057 |
| Born    | 0.239  | 0.074  | 0.07   |
| LMS     | 0.263  | 0.246  | 0.325  |
| We      | 0.344  | 0.267  | 0.338  |
| Rh      | 0.160  | 0.178  | 0.241  |
| Mo      | 0.040  | 0.046  | 0.064  |
| FC      | 0.378  | 0.29   | 0.365  |
| Male    | -0.025 | -0.022 | -0.027 |
| Married | 0.030  | 0.019  | 0.023  |
| Ageheap | -0.044 | -0.034 | -0.041 |

**TABLE 1: Descriptive statistics by station of the 1849 Census**

| Station       | Soc | Town           | Prov | N    | %      | Age   | Res   | Born   | Eman    | Male    | Married |
|---------------|-----|----------------|------|------|--------|-------|-------|--------|---------|---------|---------|
| Avontuur      | LMS | George         | WC   | 52   | 1.17%  | 42.60 | 4.65  | 0.00%  | 100.00% | 100.00% | 88.46%  |
| Bethelsdorp   | LMS | Port Elizabeth | EC   | 166  | 3.74%  | 43.99 | 25.61 | 23.49% | 6.02%   | 48.80%  | 88.55%  |
| Clarkson      | Mo  | Uitenhage      | EC   | 80   | 1.80%  | 39.21 | 8.83  | 11.25% | 93.75%  | 50.00%  | 100.00% |
| Dyzelskraal   | LMS | George         | WC   | 43   | 0.97%  | 44.09 | 8.08  | 0.00%  | 79.07%  | 48.84%  | 97.67%  |
| Ebenezer      | Rh  | Clanwilliam    | WC   | 52   | 1.17%  | 44.50 | 17.91 | 25.00% | 44.23%  | 100.00% | 59.09%  |
| Elim          | Mo  | Caledon        | WC   | 372  | 8.37%  | 40.69 | 10.30 | 14.25% | 66.13%  | 48.79%  | 69.27%  |
| Enon          | Mo  | Uitenhage      | EC   | 191  | 4.30%  | 35.09 | 18.51 | 54.45% | 20.94%  | 49.74%  | 64.94%  |
| Farmersfield  | We  | Albany         | EC   | 104  | 2.34%  | 38.22 | 7.88  | 5.77%  | 100.00% | 97.12%  | 93.27%  |
| Genadendal    | Mo  | Caledon        | WC   | 1084 | 24.40% | 42.60 | 20.65 | 36.90% | 45.94%  | 50.92%  | 71.93%  |
| Goedverwacht  | Mo  | Piketberg      | WC   | 26   | 0.59%  | 37.69 | 5.88  | 0.00%  | 96.15%  | 100.00% | 84.62%  |
| Groenekloof   | Mo  | Malmesbury     | WC   | 234  | 5.27%  | 43.39 | 18.39 | 25.64% | 43.16%  | 94.44%  | 80.34%  |
| Gwali         | FC  | Alice          | EC   | 127  | 2.86%  | 39.31 | 19.07 | 44.09% | 21.26%  | 37.80%  | 70.08%  |
| Hankey        | LMS | Uitenhage      | EC   | 276  | 6.21%  | 38.98 | 10.91 | 18.84% | 41.67%  | 51.45%  | 83.21%  |
| Haslopehills  | We  | Cradock        | EC   | 61   | 1.37%  | 40.56 | 5.43  | 1.64%  | 81.97%  | 70.49%  | 98.36%  |
| Hermon        | Rh  | Paarl          | WC   | 11   | 0.25%  | 37.45 | 0.97  | 0.00%  | 100.00% | 54.55%  | 18.18%  |
| Kruisfonteyn  | LMS | Uitenhage      | EC   | 84   | 1.89%  | 35.65 | 6.56  | 9.52%  | 95.24%  | 50.00%  | 95.24%  |
| Lovedale      | FC  | Alice          | EC   | 48   | 1.08%  | 32.88 | 5.14  | 20.83% | 100.00% | 41.67%  | 53.19%  |
| Pacaltsdorp   | LMS | George         | WC   | 212  | 4.77%  | 40.60 | 19.09 | 36.79% | 27.83%  | 48.58%  | 85.85%  |
| Pniel         | SA  | Paarl          | WC   | 102  | 2.30%  | 37.60 | 2.73  | 0.00%  | 100.00% | 48.04%  | 93.02%  |
| Saron         | Rh  | Tulbagh        | WC   | 122  | 2.75%  | 41.43 | 1.10  | 0.00%  | 100.00% | 100.00% | 90.98%  |
| Schietfontein | Rh  | Beaufortwest   | WC   | 21   | 0.47%  | 39.05 | 14.22 | 14.29% | 14.29%  | 100.00% | 95.24%  |
| Shilo         | Mo  | Alice          | EC   | 263  | 5.92%  | 40.88 | 9.68  | 8.75%  | 63.88%  | 47.53%  | 89.35%  |
| Stynthal      | Rh  | Tulbagh        | WC   | 61   | 1.37%  | 41.61 | 3.04  | 0.00%  | 100.00% | 96.72%  | 93.44%  |
| Theopolis     | LMS | Bathurst       | EC   | 71   | 1.60%  | 43.79 | 20.71 | 33.80% | 26.76%  | 94.37%  | 78.87%  |
| Trappesvalley | We  | Bathurst       | EC   | 26   | 0.59%  | 36.69 | 7.87  | 15.38% | 92.31%  | 73.08%  | 73.08%  |
| Zoar          | SA  | Riversdale     | WC   | 388  | 8.73%  | 38.05 | 9.65  | 9.54%  | 34.54%  | 49.74%  | 82.22%  |
| Zuurbraak     | LMS | Swellendam     | WC   | 166  | 3.74%  | 42.06 | 14.07 | 22.89% | 58.43%  | 100.00% | 94.94%  |
| Total         |     |                |      | 4443 |        | 40.65 | 14.36 | 22.91% | 52.40%  | 59.59%  | 80.08%  |



**TABLE 2: Descriptive statistics by society of the 1849 Census**

| Society                  | Abb | N    | %      | Age   | Res   | Born   | Eman   | Male   | Married |
|--------------------------|-----|------|--------|-------|-------|--------|--------|--------|---------|
| South African Missionary | SA  | 490  | 11.03% | 37.95 | 7.26  | 7.55%  | 48.16% | 49.39% | 84.18%  |
| London Missionary        | LMS | 1070 | 24.08% | 41.00 | 14.73 | 22.34% | 43.55% | 62.99% | 87.83%  |
| Wesleyan Methodist       | We  | 191  | 4.30%  | 38.76 | 7.19  | 5.76%  | 93.19% | 85.34% | 92.15%  |
| Rhenish Missionary       | Rh  | 267  | 6.01%  | 41.72 | 5.45  | 5.99%  | 82.40% | 97.38% | 85.65%  |
| Moravian                 | Mo  | 2250 | 50.64% | 41.35 | 16.66 | 28.84% | 51.24% | 55.14% | 75.03%  |
| Free Church of Scotland  | FC  | 175  | 3.94%  | 37.54 | 15.25 | 37.71% | 42.86% | 38.86% | 65.52%  |
| Total                    |     | 4443 |        | 40.65 | 14.36 | 22.91% | 52.40% | 59.59% | 80.08%  |

**TABLE 3: Literacy and numeracy rates by age cohort**

| Age cohorts | N    | Literacy | Numeracy |
|-------------|------|----------|----------|
| 13-22       | 337  | 45.99%   | 85.35%   |
| 23-32       | 1265 | 35.26%   | 67.76%   |
| 33-42       | 1041 | 23.63%   | 63.88%   |
| 43-52       | 872  | 13.19%   | 56.19%   |
| 53-62       | 585  | 10.43%   | 57.26%   |
| 63-72       | 270  | 5.93%    | 54.17%   |
| 73-82       | 73   | 4.11%    | 47.95%   |
| Total       | 4443 | 23.20%   | 65.44%   |

Source: Own calculations

**TABLE 4: Literacy and numeracy rates by station**

| Station       | N    | Literacy | Numeracy |
|---------------|------|----------|----------|
| Avontuur      | 52   | 25.00%   | 81.73%   |
| Bethelsdorp   | 166  | 26.51%   | 48.19%   |
| Clarkson      | 80   | 16.25%   | 51.56%   |
| Dyzelskraal   | 43   | 44.19%   | 55.23%   |
| Ebenezer      | 52   | 15.38%   | 69.71%   |
| Elim          | 372  | 15.55%   | 84.01%   |
| Enon          | 191  | 48.69%   | 71.99%   |
| Farmersfield  | 104  | 35.58%   | 9.62%    |
| Genadendal    | 1084 | 23.75%   | 84.06%   |
| Goedverwacht  | 26   | 7.69%    | 48.08%   |
| Groenekloof   | 234  | 13.87%   | 82.26%   |
| Gwali         | 127  | 36.64%   | 50.20%   |
| Hankey        | 276  | 39.57%   | 73.37%   |
| Haslopehills  | 61   | 14.78%   | 40.98%   |
| Hermon        | 11   | 27.27%   | 100.00%  |
| Kruisfonteyn  | 84   | 33.33%   | 61.01%   |
| Lovedale      | 48   | 47.92%   | 57.29%   |
| Pacaltsdorp   | 212  | 41.31%   | 68.99%   |
| Pniel         | 102  | 9.09%    | 62.50%   |
| Saron         | 122  | 6.56%    | 79.92%   |
| Schietfontein | 21   | 4.76%    | 41.67%   |
| Shilo         | 263  | 11.79%   | 41.83%   |
| Stynthal      | 61   | 14.52%   | 69.67%   |
| Theopolis     | 71   | 32.39%   | 19.37%   |
| Trappesvalley | 26   | 53.85%   | 43.27%   |
| Zoar          | 388  | 4.87%    | 43.17%   |
| Zuurbraak     | 166  | 19.88%   | 39.16%   |
| Total         | 4443 | 23.20%   | 65.44%   |

\* Statistically, Hermon records a numeracy rate of 102.3%, which is nonsensical. The small sample size and fewer than 20% of individuals that record ages that do not end in either a zero or five, explains this statistical anomaly. We have therefore changed the percentage to 100%.

**TABLE 5: Literacy and numeracy rates by society**

| Society                          | Abb | N    | Literacy | Numeracy |
|----------------------------------|-----|------|----------|----------|
| South African Missionary Society | SA  | 490  | 5.71%    | 47.19%   |
| London Missionary Society        | LMS | 1070 | 33.36%   | 58.41%   |
| Wesleyan Methodist               | We  | 191  | 35.08%   | 24.21%   |
| Rhenish Missionary Society       | Rh  | 267  | 10.86%   | 73.50%   |
| Moravian Society                 | Mo  | 2250 | 21.78%   | 76.33%   |
| Free Church of Scotland          | FC  | 175  | 40.57%   | 52.14%   |
| Total                            |     | 4443 | 23.20%   | 65.44%   |

**TABLE 6: Cross-correlations**

|          | Literacy | Ageheap | Age   | Res   | Eman  | Born  | Male | Married |
|----------|----------|---------|-------|-------|-------|-------|------|---------|
| Literacy | 1        |         |       |       |       |       |      |         |
| Ageheap  | -0.10    | 1       |       |       |       |       |      |         |
| Age      | -0.30    | 0.14    | 1     |       |       |       |      |         |
| Res      | 0.19     | -0.05   | 0.22  | 1     |       |       |      |         |
| Eman     | -0.27    | 0.06    | -0.11 | -0.70 | 1     |       |      |         |
| Born     | 0.43     | -0.14   | -0.40 | 0.47  | -0.49 | 1     |      |         |
| Male     | -0.08    | 0.03    | 0.07  | -0.06 | 0.08  | -0.11 | 1    |         |
| Married  | 0.04     | 0.05    | -0.07 | 0.02  | -0.03 | 0.00  | 0.12 | 1       |

**TABLE 7: OLS regression of station characteristics on mean station literacy score**

|                | Model 1 | Model 2 | Model 3  |
|----------------|---------|---------|----------|
| Age            | -0.01   | -0.02   | -0.017*  |
|                | -1.15   | -1.57   | -1.76    |
| Residency      | 0.010** | 0.010** | 0.013*** |
|                | 2.16    | 2.32    | 2.88     |
| LMS            |         | 0.239** | 0.216**  |
|                |         | 2.22    | 2.13     |
| We             |         | 0.305** | 0.368*** |
|                |         | 2.61    | 3.21     |
| Rh             |         | 0.162   | 0.106    |
|                |         | 1.46    | 0.98     |
| Mo             |         | 0.063   | 0.012    |
|                |         | 0.59    | 0.12     |
| FC             |         | 0.247*  | 0.231*   |
|                |         | 1.87    | 1.86     |
| Ageheap        |         |         | 0.271*   |
|                |         |         | 1.89     |
| Constant       | 0.61    | 0.64    | 0.52     |
|                | 1.67    | 1.65    | 1.40     |
| R <sup>2</sup> | 0.16    | 0.54    | 0.61     |
| N              | 28      | 27      | 27       |

**TABLE 8: Linear probability modelling of the determinants of literacy, robust standard errors**

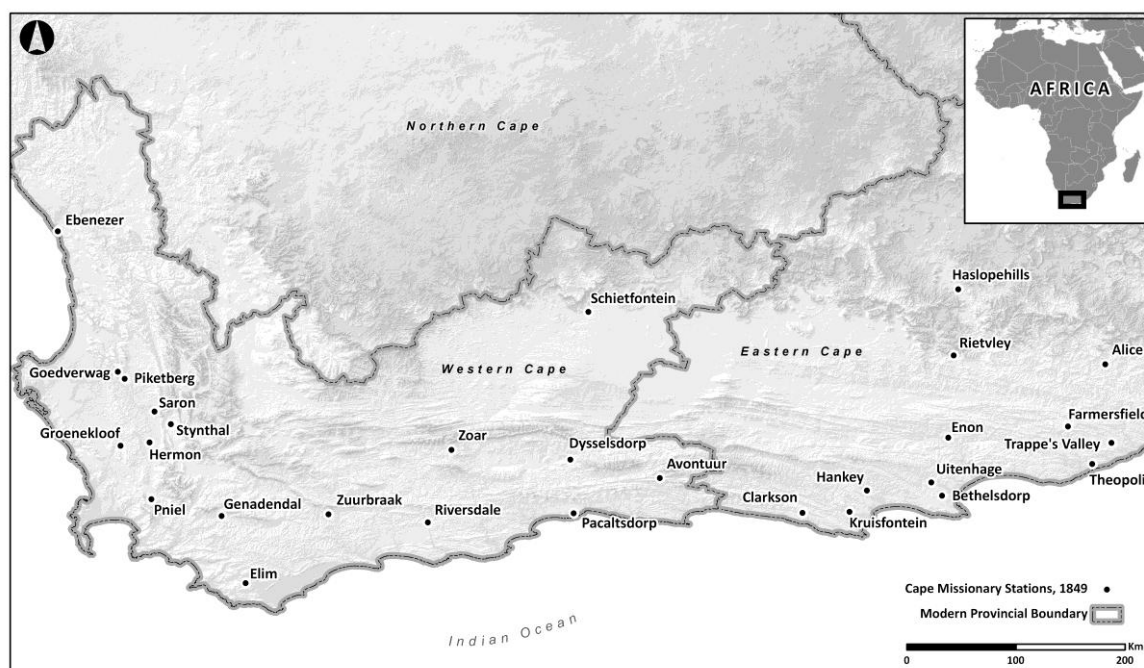
|           | Model 1            | Model 2            | Model 3            | Model 4            | Model 5            | Model 6            |
|-----------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| Age       | -0.022***<br>-7.37 | -0.014***<br>-6    | -0.015***<br>-6.74 | -0.015***<br>-6.59 | -0.015***<br>-6.73 | -0.014***<br>-6.28 |
| Age2      | 0.000***<br>4.16   | 0.000***<br>3.49   | 0.000***<br>4.18   | 0.000***<br>4.06   | 0.000***<br>4.24   | 0.000***<br>3.9    |
| Res       | 0.008***<br>4.51   | 0.001<br>0.97      | 0.002<br>1.49      | 0.002<br>1.55      | 0.002<br>1.35      | 0.001<br>1.22      |
| Res2      |                    | -0.000**<br>-2.01  | -0.000**<br>-2.44  | -0.000**<br>-2.46  | -0.000**<br>-2.3   | -0.000**<br>-2.1   |
| Eman      |                    | -0.132***<br>-5.96 | -0.129***<br>-5.9  | -0.128***<br>-5.83 | -0.126***<br>-5.78 | -0.127***<br>-5.81 |
| Born      |                    | 0.248***<br>10.29  | 0.247***<br>10.49  | 0.246***<br>10.48  | 0.247***<br>10.48  | 0.246***<br>10.44  |
| LMS       |                    |                    | 0.207***<br>8.96   | 0.203***<br>8.79   | 0.201***<br>8.48   | 0.197***<br>8.33   |
| We        |                    |                    | 0.327***<br>8.57   | 0.330***<br>8.64   | 0.327***<br>8.48   | 0.337***<br>8.77   |
| Rh        |                    |                    | 0.106***<br>3.62   | 0.112***<br>3.81   | 0.087***<br>3.02   | 0.074**<br>2.54    |
| Mo        |                    |                    | 0.056***<br>2.83   | 0.044**<br>2.21    | 0.045**<br>2.19    | 0.034<br>1.62      |
| FC        |                    |                    | 0.173***<br>4.49   | 0.156***<br>3.98   | 0.160***<br>4.02   | 0.160***<br>4.03   |
| Male      |                    |                    |                    | -0.042***<br>-3.26 | -0.043***<br>-3.32 | -0.045***<br>-3.44 |
| Married   |                    |                    |                    |                    | 0.021<br>1.49      | 0.023<br>1.62      |
| Ageheap   |                    |                    |                    |                    |                    | -0.052***<br>-4.17 |
| Constant  | 0.798***<br>14.77  | 0.658***<br>11.56  | 0.571***<br>9.87   | 0.595***<br>10.25  | 0.591***<br>9.96   | 0.600***<br>10.1   |
| R-squared | 0.163              | 0.222              | 0.261              | 0.263              | 0.265              | 0.268              |
| N         | 4056               | 4056               | 4043               | 4042               | 3989               | 3989               |

**TABLE 9: Comparison of literacy rates in Cape missionary societies and various American (South, Central and North) cities**

|                          |             | Year | City | Region |
|--------------------------|-------------|------|------|--------|
| Cape missionary stations | Cape Colony | 1849 |      | 23%    |
| Boston, MA               | USA         | 1850 | 91%  | 95%    |
| New York City            | USA         | 1850 | 94%  | 94%    |
| Philadelphia, PA         | USA         | 1850 | 93%  | 93%    |
| Santiago                 | Chile       | 1854 | 47%  | 13%    |
| Buenos Aires             | Argentina   | 1855 | 52%  | 24%    |
| San Juan (Coloured pop)  | Puerto Rico | 1860 | 18%  | 3%     |
| San Jose                 | Costa Rica  | 1860 | 40%  | 39%    |
| Havana (Coloured pop)    | Cuba        | 1861 | 7%   | 24%    |
| Kingston                 | Jamaica     | 1871 | 40%  | 16%    |
| São Paulo                | Brazil      | 1882 | 42%  | 15%    |

Source: Engerman and Sokoloff (2011); own calculations. Region denotes either State (in the case of the USA cities, or country for the rest of the cities in the sample.

**FIGURE 1: Map of Cape missionary stations included in 1849 census with present-day provincial borders**



**FIGURE 2: Age distribution of missionary census, 1849**

