

# Reviewing the language compensation policy in the National Senior Certificate

**Stephen Taylor**

*The National Senior Certificate or “matric” examination is a key point of access to further education and the labour market in South Africa. Since 1999, matric candidates whose first language is not Afrikaans or English and are, therefore, forced to write in a second or third language have received a compensation of five per cent of their original mark in non-language subjects. Whether this policy, which was intended as an interim measure, should continue is a matter of on-going debate. Two questions must be answered for a decision to be made. The first is an empirical question: is there a significant disadvantage facing candidates not writing in their first language? The second is normative: should these candidates receive the compensation?*

*This paper employs several statistical techniques, beginning with a replication of the method used previously by Umalusi (the official education quality assurance council), to arrive at a credible estimate of the language disadvantage faced by candidates qualifying for the compensation. After demonstrating that a language disadvantage does persist, the normative question of whether the policy should be continued is discussed. It is argued that the answer to this question depends on various political, economic and philosophical considerations regarding the fairness and the purpose of the matric examination.*

**Keywords:** Education, language compensation policy, Rasch, instrumental variable, South Africa

## Introduction

The National Senior Certificate (NSC) or “matric” examination is widely regarded by South Africans as the all-important school-leaving examination. Apart from the pressure on schools and government to achieve high pass rates, attaining a NSC

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substantially improves the prospects for further educational opportunities and successful labour market participation for individuals (Branson, Garlick, Lam & Leibbrandt, 2012).

In order to obtain a NSC, candidates must take one language at the Home Language level, one First Additional Language subject, Mathematics or Mathematical Literacy, Life Orientation and a further three subjects. Candidates must pass at least six of the seven subjects, achieving at least 40% for three subjects and 30% for the remaining three. For practical reasons, candidates must write all non-language subjects in either English or Afrikaans. Therefore, since 1999, a candidate whose first language is not Afrikaans or English has received a compensation of five per cent of their original mark in non-language subjects. This paper investigates whether this policy, initially envisaged as an interim measure, should be continued.

Language in education remains a thorny issue in South Africa. On the one hand, the pedagogical benefits of first-language instruction, especially in the early grades, are widely recognised. The influential work of Cummins (2000) suggests that a strong foundation in first-language literacy is important for the effective acquisition of a second language. On the other hand, there are practical reasons for providing education in English, especially in secondary school. As Alidou, Boly, Brock-Utne, Diallo, Heugh and Wolff (2006: 10) explain: “an educational system which emphasizes the use of African languages will only be viable if the socio-economic environment values these languages”. Indeed, Posel and Casale (2011) find that English proficiency is strongly associated with higher wages in South Africa, after other productive characteristics such as years of education. Therefore, unless there are major structural adjustments to the economy, such as enforcing a particular language-in-the-workplace policy or a retreat from the global economy – adjustments which are probably not feasible – South Africans will benefit from becoming fluent in English.

Policy and practice reflect these tensions. Most children are educated in their first language during the Foundation Phase (Grades 1 to 3) and then experience a transition to English as the Language of Learning and Teaching (LoLT) in Grade 4. However, there is some debate as to whether this transition should occur later at, say, Grade 6 or 8. Without entering this debate, it is important to recognise that literacy, in particular reading acquisition, is extremely unsatisfactory in South African schools. Data from the Progress in International Reading Literacy Study (PIRLS) of 2006 indicate that more than 90% of learners in schools with mainly African-language children had not yet learnt to read with comprehension by Grade 5 (author’s own calculations using raw PIRLS data). While this dismal situation largely reflects learner socio-economic status and low school quality and not necessarily language policy (Taylor & Yu, 2009), such reading deficiencies are likely to contribute to insurmountable learning deficits in all subject areas that will, ultimately, influence educational attainment negatively.

Fleisch (2008) describes how language disadvantages operate in the school system through children being confronted with unfamiliar words, through the

problems associated with teachers switching between languages (which effectively diminishes instructional time) and through a lack of exposure to the language of instruction outside of school. Moreover, many teachers themselves are not fluent in the language of instruction, which further hinders learning (NEEDU, 2013: 33).

There are, thus, strong reasons to expect children who are not learning or writing a test in their first language to be at a disadvantage. This applies to the non-language subjects in the NSC examination, which are offered only in English and Afrikaans. In recognition of this expected disadvantage and on the recommendations of a ministerial research team in 1998, since 1999 a compensation of five per cent of their original mark on non-language subjects has been awarded to matric candidates whose first language is not Afrikaans or English, and who do not take either Afrikaans or English as a subject at the Home Language level. For ease of reference, this group of learners will, henceforth, often be referred to as “compensation candidates”.

The compensation policy was initially intended as an interim measure, based on the expectation that the English proficiency of learners would improve over time due to policy interventions. The question of whether this practice remains justifiable and preferable is a matter of on-going debate amongst policy makers. Although this question has various economic and political implications, a necessary starting point in arguing for the continuation of this practice would be to demonstrate that those candidates qualifying for the compensation do indeed face a significant language disadvantage in the relevant subjects.

The primary research objective of this paper is to determine whether there is a measurable language disadvantage facing compensation candidates in the matric examination. It should be noted that, although there is an abundance of theoretical literature examining the process of learning in a second language (e.g. Collier, 1989; Cummins, 2000), there is less work specifically dealing with the effect of being tested in a second language. One empirical study in South Africa (Vorster, Mayet & Taylor, 2013), compared the performance of the same children in the same numeracy test when writing in English and when writing in their home language. This study found that children performed substantially worse when they were not writing in their home language. However, this study focused on Grade 3 children and its relevance to the present research question pertaining to matric is, therefore, limited.

Using data from 2010 NSC examinations, this paper employs four strategies in an attempt to measure the effect of writing non-language subjects in a second language. The first strategy replicates the method used by Umalusi (2004) in their review of the language compensation policy. This strategy compares pre-adjustment performance in non-language subjects between Afrikaans learners and compensation candidates who performed equally well in English FAL. Although this strategy appears promising at first, it has been shown that English FAL is not a suitable “comparator” subject.

A second strategy examines whether compensation candidates find language-intensive subjects, such as History and Geography, more difficult (relative to subjects that are less language-intensive, such as Mathematics) than other learners do. This strategy, although an improvement on the first, remains subject to some statistical bias due to measurement error inherent to test scores. Therefore, instrumental variable regression, using one non-language-intensive subject as an instrument for another non-language-intensive subject to correct for measurement error, is applied as a third strategy.

A fourth strategy recognises that, even in less language-intensive subjects, such as Mathematics, language proficiency may influence performance. Therefore, an item analysis of the 2009 Mathematics paper is presented. Using race as a proxy for language, the performance on language-intensive items is compared for black and white learners who performed equally well on items that were not language intensive.

The next section presents these four strategies to estimate the magnitude of the language disadvantage. Thereafter, a simulation exercise shows the potential impact on the matric pass rate if the language compensation policy were discontinued. The paper concludes with a discussion about whether candidates facing a language disadvantage *should* be compensated. Various political, economic and philosophical considerations pertaining to the fairness and to the purpose of the NSC are explored.

## Estimating the language disadvantage

### Strategy 1: Using First Additional Language as a base subject

As observed by Umalusi in 2004, the English FAL performance of compensation candidates was again particularly low in 2010. Figure 1 shows percentile plots for compensation candidates who took English FAL and for Afrikaans students who took English FAL.<sup>1</sup> The distribution of English FAL achievement was considerably better for Afrikaans students than it was for compensation candidates. For example, performance at the 30<sup>th</sup> percentile of Afrikaans students was equivalent to performance at the 70<sup>th</sup> percentile amongst compensation candidates. Furthermore, only 34% of compensation candidates scored above 50% for English FAL (150 out of 300). The low English proficiency of compensation candidates presents a strong a priori reason to expect these students to face a language barrier when writing non-language subjects in English.

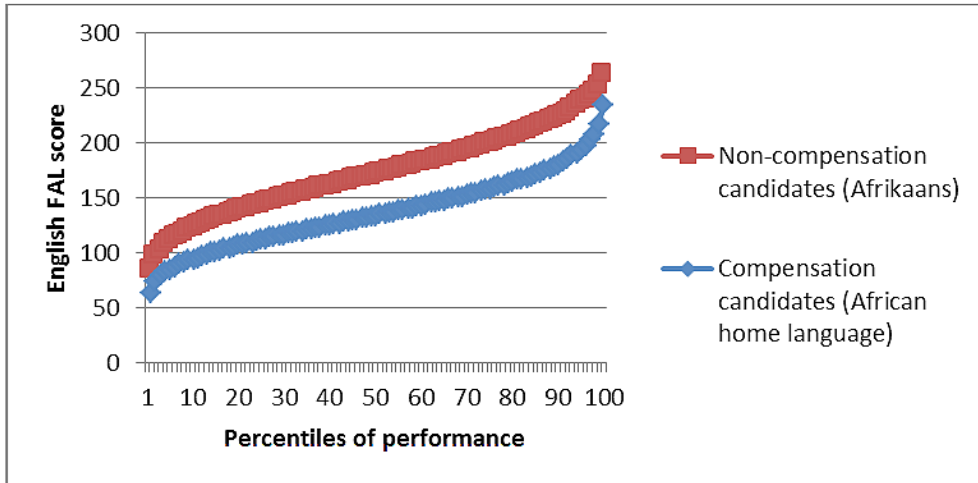


Figure 1: Percentile plots of English FAL for compensation candidates and other candidates

In figure 2 the approach used by Umalusi (2004) is replicated using one of the subjects that featured in the Umalusi report – Accounting. Kernel density curves (corresponding to the right-hand axis) depict the distributions of English FAL scores for two groups of students – compensation candidates taking English FAL and Afrikaans students taking English FAL. The distributions depict the proportion of learners (along the vertical axis) who achieved specific English FAL scores (along the horizontal axis). The distribution of scores for the Afrikaans learners lies to the right of that for the compensation candidates, indicating better overall performance of Afrikaans learners in English FAL. The straight lines show predicted scores in Accounting based on an Ordinary Least Squares (OLS) regression in which the explanatory variables were achievement in English FAL and whether the student is Afrikaans.<sup>2</sup> This regression can be represented formally by the following equation:

$$\hat{Y}_1 = \hat{\beta}_1 + \hat{\beta}_2 Y_2 + \hat{\beta}_3 A + e$$

Where  $\hat{\beta}_1$  is the constant or y-intercept,  $\hat{\beta}_2$  is the estimated coefficient on subject  $Y_2$  which, in this case, is English FAL.  $\hat{\beta}_3$  is the estimated coefficient on the dummy variable  $A$ , which takes a value of 1 if the learner is Afrikaans and 0 if the learner qualifies for the language compensation, and  $e$  is an error term capturing unexplained variation in Accounting ( $\hat{Y}_1$ ).

The intuition behind this approach is this: for two students achieving the same mark in English FAL one would expect the Afrikaans student to perform better in Accounting than the African language candidate because the Afrikaans student writes Accounting in their first language while the African language candidate does so in English. This is indeed what the regression results depicted in figure 2 suggest: at every level of English FAL achievement the predicted Accounting score is higher for Afrikaans learners than it is for candidates who qualify for the compensation.

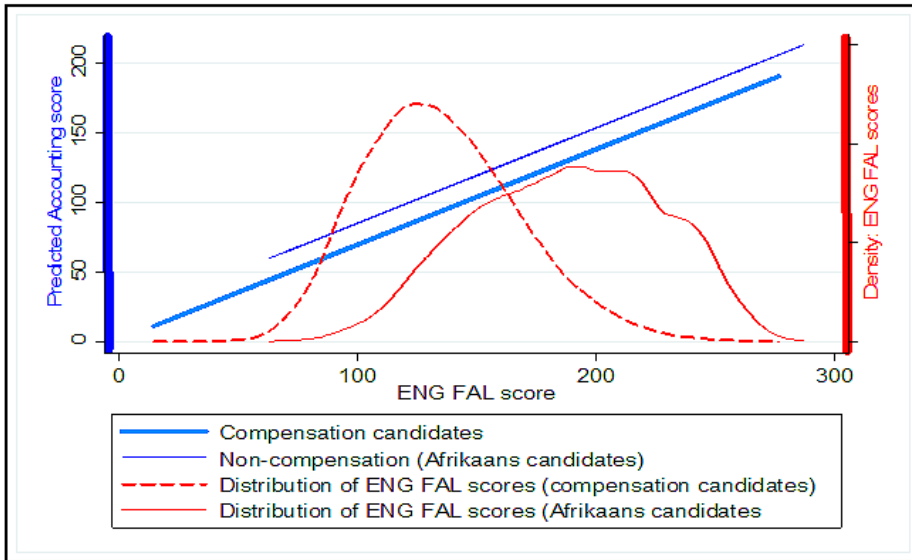


Figure 2: Predicted Accounting scores at given levels of performance in English FAL

There is, however, a statistical problem with this approach. This is demonstrated by figure 3, where equation (1) is inverted so that English FAL is the outcome variable ( $Y_1$ ) and the Accounting score is an explanatory variable ( $Y_2$ ). Now, those qualifying for compensation perform worse in English FAL at given levels of Accounting performance. Thus, it would appear that we have contradictory results: Figure 2 points to a language disadvantage in Accounting, whereas figure 3 seems to suggest the opposite.

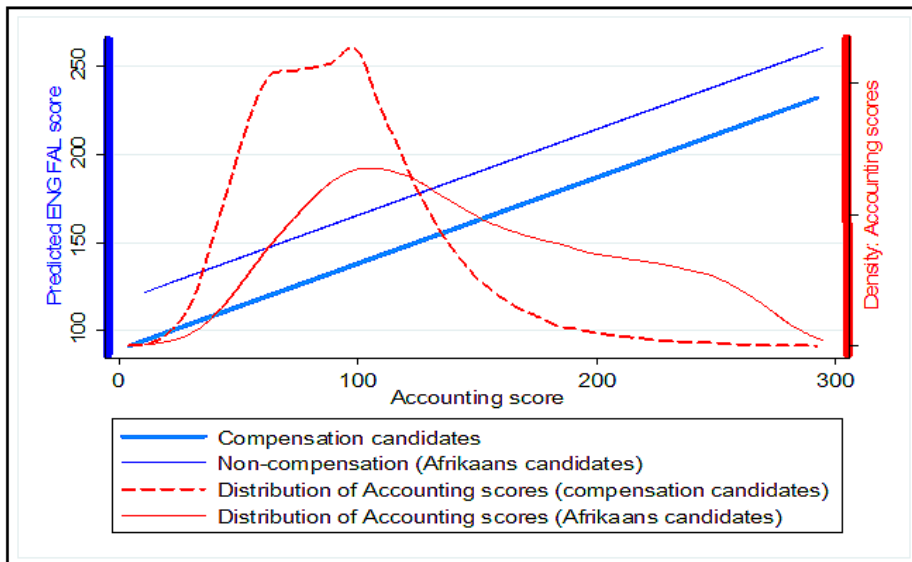


Figure 3: Predicted English FAL scores at given levels of performance in Accounting

The reason for this apparent contradiction is somewhat technical. Regardless of which subject is  $Y_1$  and which is  $Y_2$  in equation (1), the assumption is that  $Y_2$  takes account of proficiency, therefore,  $\hat{\beta}_3$  represents the estimated effect of writing in one's first language. However,  $Y_2$  (in Umalusi's case, English FAL) will not perfectly measure this proficiency. A test score will always be a noisy measure of true proficiency because of the degree of randomness that is present in determining test performance (e.g. a bad night's sleep, different interpretations of markers) and because different examinations will test somewhat different aspects of proficiency. If true proficiency were uncorrelated with  $A$  (whether a candidate is Afrikaans or qualifies for compensation), the extent to which this proficiency is imperfectly measured by  $Y_2$  would simply be reflected in the error term  $e$  and it would not matter. However, if true proficiency is correlated with  $A$ , the coefficient on  $A$  ( $\hat{\beta}_3$ ) will be biased because it will capture some of the proficiency that is unaccounted for by  $Y_2$ . In South Africa one would certainly expect true proficiency to be correlated with  $A$  due to differences in socio-economic status and school quality between these two groups of learners. Therefore, the coefficient on  $A$  ( $\hat{\beta}_3$ ) will be upwardly biased, hence, the gap between Afrikaans candidates and compensation candidates will be over-estimated in both figures 2 and 3.

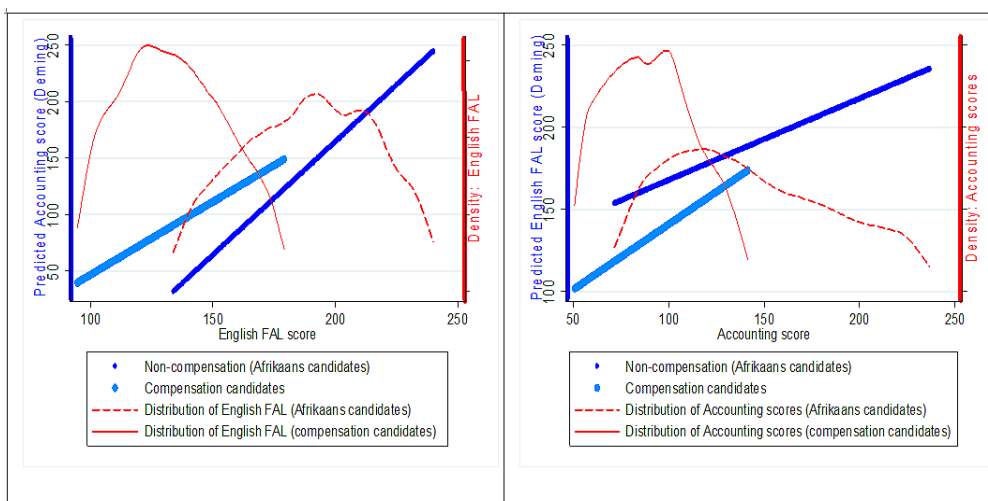
There is a further problem that is caused by this measurement error, known as regression to the mean. This refers to the phenomenon that individuals recording particularly high or low outcomes on any measurement will tend to record outcomes that are closer to the population mean on a second measurement.<sup>3</sup> Regression to the mean in the case of English FAL and Accounting is definitely present. Learners who achieved at the 10<sup>th</sup> percentile of performance in English FAL, achieved at the 33<sup>rd</sup> percentile of achievement in Accounting on average. Learners who achieved at the 90<sup>th</sup> percentile in English FAL, achieved at the 74<sup>th</sup> percentile in Accounting on average.

Regression to the mean becomes a problem when comparing two populations with very different distributions of achievement. In figure 2, the range of English FAL scores in which there was a significant overlap between Afrikaans learners and compensation candidates was roughly between 130 and 180. Therefore, the regression results are driven largely by what is going on within that range. However, within that range one is comparing some of the top-performing compensation candidates with some of the lowest-performing Afrikaans learners. Therefore, within that range of English FAL scores, compensation candidates would tend to perform lower in Accounting, and Afrikaans learners would tend to do better in Accounting, simply due to regression to the mean. In terms of equation (1), therefore,  $\hat{\beta}_3$  would be upwardly biased.

Figures 4 and 5 represent two strategies to use English FAL as a type of base subject in a way that avoids bias caused by regression to the mean. The first uses an alternative to OLS regression called Deming regression. OLS produces a line of best fit

through minimising the sum of the squared *vertical* discrepancies between observed  $y$  values (for instance, observed Accounting scores) and the predicted  $y$  values (for instance, predicted Accounting score at given English FAL scores). This is how the lines in figures 2 and 3 were produced. For this reason, when the  $y$  and  $x$  variables are flipped around the resulting lines of best fit are not necessarily symmetrical. Deming regression, however, minimises both the *vertical* and *horizontal* discrepancies between observed and predicted values simultaneously. Thus, it analyses the relationship between two variables without forcing one to be the dependent variable and the other the explanatory variable. The limitation of Deming regression is that it can analyse only two variables at one time.

Figure 4 shows predicted values from Deming regressions. In the first pane of figure 4 the English FAL score is the  $x$ -variable while, in the second pane, the Accounting score is the  $x$ -variable. This time the predicted values across the two graphs are symmetrical. In both panes it would seem that compensation candidates actually find Accounting relatively easier than English FAL compared to Afrikaans students. Put differently, for given levels of English FAL achievement African learners actually performed better in Accounting than Afrikaans learners.

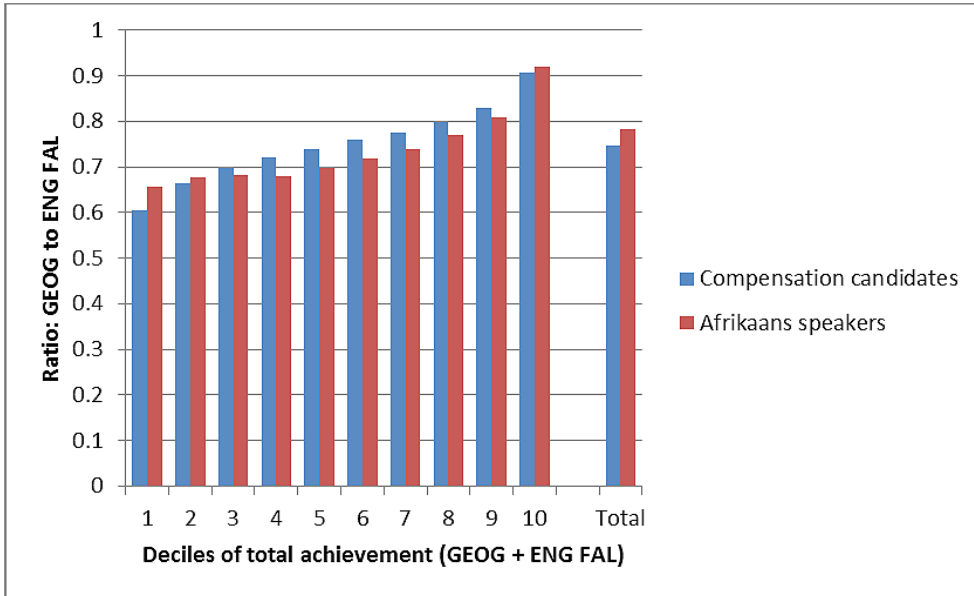


**Figure 4: Predicted values from Deming regressions**

The same unexpected result was obtained when using a different method to overcome regression to the mean. Figure 5 was derived by adding Geography and English FAL marks together and then dividing learners into deciles based on combined achievement. Decile 1, for example, includes the 10% of learners who performed the worst in Geography and English FAL combined. The graph shows, for each decile of total achievement, the ratio of Geography marks to English FAL marks, first for compensation candidates and then for Afrikaans learners. For most deciles (especially deciles 3 to 9 in which there were sufficient numbers in both groups of learners) the ratio of Geography to English FAL was larger for compensation candidates, indicating



that this group found Geography easier (relative to English FAL) than Afrikaans learners did. The same result was obtained for Accounting and History, which were analysed in the same way, but the results are not shown here.



**Figure 5: Ratio of Geography marks to ENG FAL marks for each group by performance decile**

There is, however, a logical way to reconcile this result with there still being a language disadvantage in subjects such as Geography: there may be even more of a language disadvantage facing African language learners in English FAL than in the non-language subjects.

When tested in any subject, a learner’s performance will depend on their “technical proficiency” in that subject and on their competency in the language of testing. Put differently, the following formal relationship applies to any subject:

$$Y_{ij} = \beta_{0j} + \beta_{1j}T_{ij} + \beta_{2j}L_{ij} + u_{ij} \quad (2)$$

Where  $Y_{ij}$  refers to the score obtained by student  $i$  in subject  $j$ ,  $T_{ij}$  refers to the technical proficiency of student  $i$  in subject  $j$ ,  $L_{ij}$  refers to the competency in the language of the test of student  $i$  in subject  $j$  and  $u_{ij}$  refers to all other factors influencing performance. The language intensiveness of the test is reflected in  $\beta_{2j}$  and the extent to which the test relies on technical proficiency is expressed by  $\beta_{1j}$ . In subjects that are not language intensive (i.e. small  $\beta_{2j}$ ), a large gap in language competency between two students will have little effect on their performance. On the other hand, in a language subject such as English FAL,  $\beta_{1j}$  effectively falls out of the equation and  $\beta_{2j}$  becomes the all-important parameter because the technical proficiency that is being tested is one’s language competency. The English FAL paper

is explicitly designed to test language competency ( $L_{ij}$ ). In contrast,  $L_{ij}$  has only a partial impact on Geography performance. Although it sounds like a truism, English FAL is far more language intensive than Geography.

Next, consider that the effective language disadvantage ( $Z$ ) in subject  $j$  depends on the subject's language-intensiveness ( $\beta_{2j}$ ) and the language ability gap ( $x$ ) so that:

$$Z_j = \beta_{2j} \cdot x \quad (3)$$

A key point is that there is most likely going to be a language gap in the case of English FAL. Firstly, Afrikaans and English are both Germanic languages making it easier for an Afrikaans child to adapt to English than for a child who speaks isiXhosa or isiZulu, for example. Secondly, Afrikaans children may tend to grow up with a more extensive exposure to English through parents, community members, media and books than African language children do. Under what conditions, then, will the effective language disadvantage for compensation candidates be larger in English FAL than in Geography? Formally, when will  $Z_E > Z_G$ ? From equation (3),  $Z_E > Z_G$  can be rewritten as:

$$\beta_{2E} \cdot X_E > \beta_{2G} \cdot X_G? \quad \text{Which, rearranged, gives:} \quad (4)$$

$$\frac{\beta_{2E}}{\beta_{2G}} > \frac{x_G}{x_E} \quad (5)$$

Although we expect the language competency gap in Geography ( $X_G$ ) to be larger than the language competency gap in English FAL ( $X_E$ ) we also expect  $\beta_{2E}$  to be larger than  $\beta_{2G}$  (because English FAL is more language intensive than Geography). This inequality, thus, demonstrates why it is perfectly possible for there to be a greater overall language disadvantage in English FAL than in Geography and, therefore, why one observes in figures 4 and 5 that compensation candidates experience English FAL to be harder (relative to non-language subjects) than Afrikaans-speaking learners.

To summarise this section, even after correcting for measurement error caused by regression to the mean, the use of English FAL as a type of base subject is problematic because there may be an even greater language disadvantage faced by compensation candidates when writing English FAL.

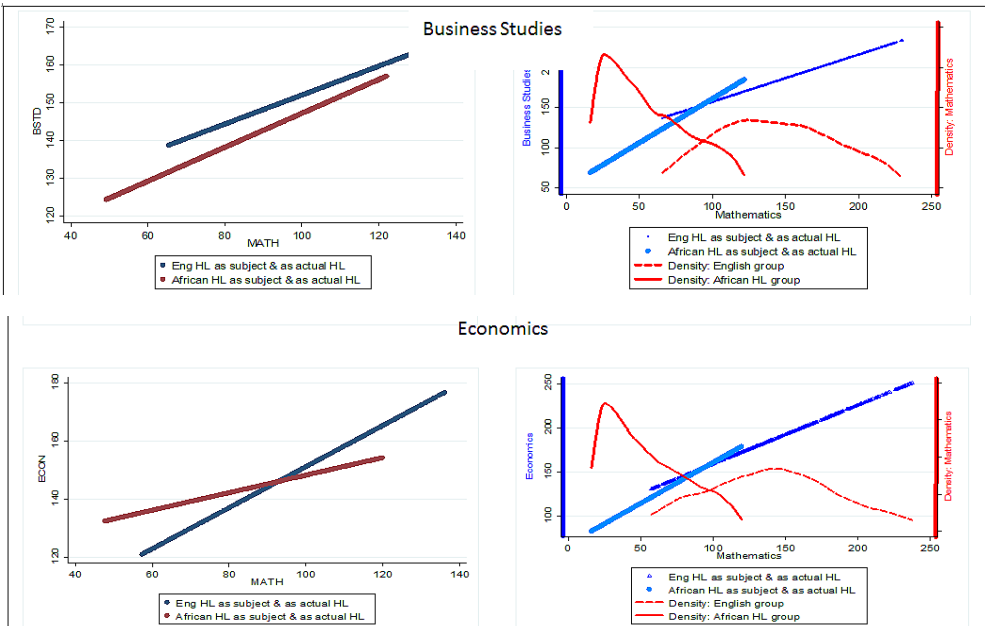
## Strategy 2: Comparing relative performance in language-intensive subjects and non-language intensive subjects

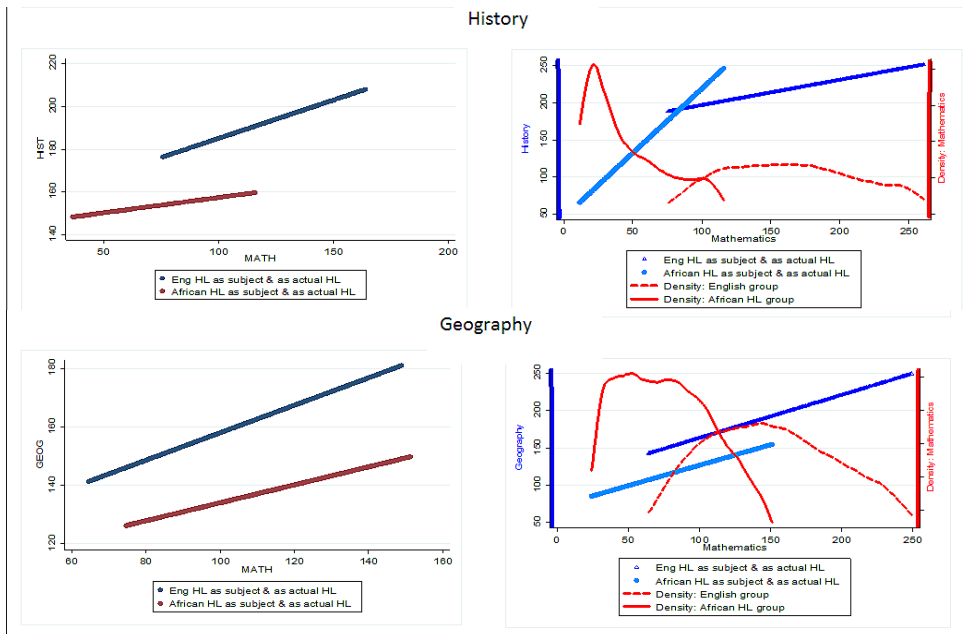
Consider again the process by which technical proficiency and language proficiency determine performance in a given subject, as described in equation (2):

$$Y_{ij} = \beta_{0j} + \beta_{1j}T_j + \beta_{2j}L_{ij} + u_j \quad (2)$$

We cannot observe the true  $T_{ij}$  or  $L_{ij}$  and, therefore, we require proxies. The best available proxy for technical proficiency is a student's score in a subject that is not particularly language intensive. Arguably, Mathematics and Accounting are less language intensive than subjects such as History, Geography, and Economics which require longer responses and essays. Therefore, the next estimation strategy predicts student performance in language-intensive subjects taking into account their performance in non-language-intensive subjects and whether the student qualifies for compensation.

Figure 6 shows a number of graphs derived from Deming regressions of Mathematics against various language-intensive subjects. In all the graphs two groups are compared: those who qualify for the compensation and those whose home language is English. The graphs on the right depict Deming regressions as well as kernel density curves to indicate where the bulk of each group's marks are located. In these graphs on the right the sample has been restricted to exclude the bottom- and the top-performing 10% of each group so as to avoid the influence of outliers. The graphs on the left depict the predicted values from Deming regressions with the sample restricted to include only English-speaking children who scored between the 10<sup>th</sup> and 50<sup>th</sup> group-specific percentiles of performance in both subjects and compensation candidates who scored between the 50<sup>th</sup> and 90<sup>th</sup> group-specific percentiles of performance in both subjects. This ensured that the lines were determined within the range of performance with sufficient overlap across the groups.





**Figure 6: Predicted values from Deming regressions for various subjects against Mathematics**

In the case of Business Studies, the graph on the right provides an inconclusive picture. The graph on the left, though, shows that, at given levels of Mathematics performance, the English-speaking students performed better in Business Studies than the compensation candidates. If one regards Mathematics as a proxy for technical proficiency, then the gap is indicative of a language disadvantage for compensation candidates.

For Economics, however, there is no clear pattern of differential relative performance between the two groups. The case of History is similar to that of Business Studies while, for Geography, there appears to be a large language disadvantage. It is also noteworthy that, for Geography, there is a fair deal of distributional overlap for the two groups. Therefore, Geography may be the subject offering the most meaningful comparison.

In order to gauge the sensitivity of these results, the same type of analysis as in figure 6 was conducted using Accounting, rather than Mathematics, as the proxy for technical proficiency (results not presented). A similar picture emerged: In the case of Economics there was no observable language disadvantage, while in History and Geography the English-speaking candidates appeared to have performed better than the compensation candidates, at given levels of Accounting achievement.

### Strategy 3: An instrumental variable approach

The previous strategy used performance in a non-language-intensive subject, such as Mathematics, as a proxy for technical proficiency ( $T_{ij}$ ) and whether the student

qualifies for compensation as a proxy for language proficiency ( $L_{ij}$ ). However, Mathematics cannot be expected to perfectly measure technical proficiency. Therefore, an OLS regression predicting performance in Geography by Mathematics ( $T_{ij}$ ) and whether one is English or a compensation candidate ( $L_{ij}$ ) will have a biased coefficient on  $L_{ij}$  ( $\beta_{2j}$ ) because it would pick up some of the variation in technical proficiency that is not reflected in the Mathematics score.

In an attempt to correct for measurement error, a set of instrumental variable (IV) regressions were estimated. This method is regarded in statistics and econometrics as a credible way to deal with measurement error in covariates (Angrist & Pishke, 2009: 84). The idea is to use one non-language-intensive subject (say Accounting) as an “instrument” for another (say Mathematics). For example, when predicting Geography achievement using IV regression, only the variation in scores that is common to both Mathematics and Accounting will be used. This reduces the influence of cases where, for instance, a learner does well in Mathematics but poorly in Accounting.

IV regressions were estimated for five language-intensive subjects using Accounting to instrument for Mathematics.<sup>4</sup> The results are reported in table 1. The IV strategy reduces bias on the coefficient for “English” by indicating the influence of technical proficiency more accurately. For History, Geography and Life Sciences the coefficient on “English” is positive and statistically significant. In these subjects English-speaking candidates scored between 20 and 30 points (out of 300) higher than compensation candidates of a similar technical proficiency. In Economics and Business Studies, however, negative coefficients were returned on the “English” variable.

**Table 1: Instrumental variable regressions**

	<i>History</i>	<i>Geography</i>	<i>Life Sciences</i>	<i>Economics</i>	<i>Business Studies</i>
Maths ( $\beta_1$ )	0.51***	0.66***	0.69***	1.01***	1.04***
English ( $\beta_2$ )	22.10***	30.46***	23.40***	-16.80***	-15.09***
Constant ( $\beta_0$ )	112.71***	61.94***	62.43***	61.38***	52.76***
Observations	693	1751	10991	44408	46554
R-squared	0.62	0.78	0.80	0.28	0.34

### **Strategy 4: Analysing the language disadvantage within Mathematics**

Up until now, Mathematics and Accounting have been treated as subjects that are not language intensive. While it may be true that these subjects rely less on language than History or Geography, it is improbable that language competency would have no influence on Mathematics performance. In order to measure language disadvantage within Mathematics an item analysis was conducted on the 2009 Mathematics papers 1 and 2.

This analysis was based on a sample of scripts from three provinces for which item responses were recorded. The sample included 271 white students and 388 black students.<sup>5</sup> This distinction allows one to use population group as a proxy for language, since most white children would have written in their first language and most black children would have written in their FAL. Each item was then categorised subjectively into one of three categories: not language intensive, fairly language intensive, and very language intensive.

Using data for the white learners only, Rasch modelling was used to derive difficulty scores for all the items. Six very language-intensive items and six non-language-intensive items were selected from the middle range of difficulty. This means that, for learners who probably wrote in their first language, these 12 items were of similar difficulty. The six language-intensive items amounted to 18 marks and the six non-language intensive items amounted to 22 marks, thus, creating two sub-tests.<sup>6</sup> For each sub-test a percentage score for each learner was calculated.

Figure 7 shows the relative performance in these two groups of items using Deming regression. The left pane of the figure indicates that, at given levels of achievement in the non-language-intensive items, white learners did better than black learners on the language-intensive items. This confirms that, even within Mathematics, learners are at a disadvantage when not writing in their first language. Furthermore, the gap increases at higher levels of achievement, which is significant for two reasons. Firstly, this is where the majority of the students are located as the kernel density curves indicate. Secondly, black learners who scored above 60% or even 80% on the non-language-intensive items have fairly good content knowledge. Thus, when the precondition of sufficient content knowledge is in place, the language factor becomes more influential. The graph on the right excludes outliers (those who scored 100% or 0% on either set of items). Here the picture of a language disadvantage is even clearer, and is consistently about 15 percentage points.

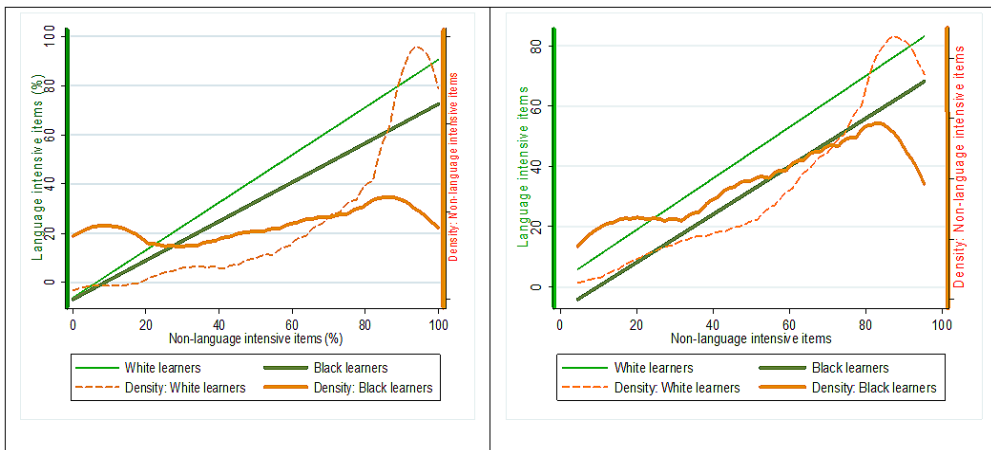


Figure 7: Relative performance in language-intensive and non-language-intensive items

This item analysis casts the preceding estimation strategies in a new light. The language disadvantages estimated when using Mathematics as a proxy for technical proficiency probably underestimate the true disadvantage because Mathematics itself is subject to a language disadvantage.

## **The impact of removing the language compensation on the NSC pass rate**

A simulation exercise using 2010 data was conducted in order to assess the potential impact on the NSC pass rate of removing the language compensation. This excluded candidates who were immigrants, those who did not take Life Orientation, those who did not take a South African home language and at least one other language subject, those who did not take at least seven subjects, and those who did not have recorded scores for at least one subject.

The pass rate after awarding the language compensation was calculated to be 65.54%. When applying the same pass criteria to the pre-adjustment scores (i.e. before the language compensation had been awarded) the pass rate was calculated to be 61.92%. Therefore, removing the language compensation would have led to a pass rate of about 3.6 percentage points lower. Expressed in terms of numbers, 20 332 candidates who passed in 2010 would not have passed without the language compensation.

## **Concluding discussion: Should the language compensation policy be discontinued?**

Four methods were employed to measure the effect of writing non-language NSC subjects in a second or third language. The first method, following Umalusi (2004), was shown to be inappropriate for the intended purpose. The second and third methods demonstrated that, after accounting for student performance in relatively technical subjects, compensation candidates were at a disadvantage in language-intensive subjects. The fourth method strengthened this conclusion through demonstrating that, even in Mathematics which is a relatively technical subject, the compensation candidates were at a disadvantage when responding to test items that required substantial language proficiency. None of these methods offer precise estimates of the causal impact of language proficiency on test scores, but together they provide strong evidence of a language disadvantage for compensation candidates. In relating these empirical results to political, philosophical and economic factors relevant to the language compensation policy, five concluding comments are made below.

First, if the sole criterion for deciding on the future of the language compensation policy is the existence of a language disadvantage, there are still grounds for continuing the policy. Quite apart from the statistical results though, it seems intuitively obvious

that those not writing in their first language should be at a disadvantage. It is, therefore, unlikely that the disadvantage will subside over time, something which is naively implied by the intention that the compensation policy should be an interim measure.

Second, one could argue on the basis of fairness that, if a test is intended to measure a particular underlying trait, such as technical proficiency in Mathematics, and if this underlying trait does not include language proficiency, then the language of testing introduces unfairness. Following this logic, there is, however, a more scientific and, therefore, fairer way of adjusting scores than by adding five per cent to their original mark for all compensation candidates. Rasch modelling could be used to identify differential item functioning (DIF) between first- and second-language candidates. This method identifies test items where learners of equal ability perform differently depending on whether they are first- or second-language candidates. After adjusting for DIF, the Rasch model generates a set of learner scores which better reflect the underlying trait measured by the test (Zumbo, 2007). The institutionalisation of Rasch modelling in the matric examination process would, however, greatly increase the time and capacity required for processing results. Therefore, although the use of Rasch modelling would be more scientific than the arbitrary compensation of five per cent, it is not recommended that this be pursued as a solution to the language compensation question.

Third, the fairness argument may not hold if one regards the purpose of the NSC as a means to an end: a way to inform universities and the labour market of suitable candidates. If proficiency in English is just as important in university and in the labour market as it is in matric, then the compensation could cause inefficient sorting into higher education and the labour market by disguising the true proficiency of candidates. When employers do not have access to accurate screening information they tend to employ fewer people at a given wage (Strand, 1987). Therefore, at least in theory, the language compensation policy could be contributing to lower overall employment and to a sub-optimal matching of people to jobs.

Fourth, this analysis has implications for how to improve educational outcomes in matric and throughout the school system. Increasing the English proficiency of African-language candidates will improve outcomes in all non-language subjects. Considering the hierarchical nature of learning (all learning builds on prior foundations), paying special attention to the teaching of English in the Foundation Phase, as recommended in the National Development Plan (National Planning Commission, 2012), could have exponential benefits. This recommendation should, however, not be interpreted as a call for diminished emphasis on first language learning. Indeed, some pedagogical theory predicts that a solid foundation in a first language will facilitate a smooth transition to a second language (Cummins, 2000; MacDonald & Burroughs, 1991).

Fifth, if the language compensation policy were to be discontinued it should be incrementally phased out. The impact of the language compensation on the overall



pass rate is not dramatic but neither is it negligible. Reducing the compensation by a single percentage point each year over a five-year period would help avoid a situation in which a matric certificate in one year is regarded in the labour market as different to that of a subsequent year. Incrementally phasing out the policy would also reduce the risk of a scenario in which candidates suspect that they may have passed matric had they written the previous year.

Finally, debates around the language compensation policy should not distract from more important policy questions around language, such as how to improve the acquisition of reading in both first language and English, how to ensure a smooth transition to English as the language of instruction and at what stage this transition should occur.

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