

Attainment of Ethnic Minority Secondary School Students in Cyprus*

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Abstract

There is evidence that the attainment of ethnic minority children differs from that of native children. Examining this and the reasons behind it is important in ensuring equal opportunities and a sound education for all children. This paper identifies differences in attainment between minority and native students in Cyprus by examining the grades of students from two secondary schools in Modern Greek and Mathematics. Using the Rasch analysis, results showed that ethnic minority groups perform significantly lower than native students and regression analysis indicated that ethnic background, gender, family socio-economic status, generation status, absenteeism, and age have a significant effect on attainment. The study in Cyprus, homes in on the educational reality in Cyprus, highlights the need for immediate policy implementation on the part of the government and identifies areas of further study.

Keywords: education, attainment, quantitative study, minorities, Cyprus

Introduction

The arrival and settlement of immigrants in many countries, especially after the nineteenth century, is a phenomenon that has lent a heterogeneous character to many societies in different countries all over the world (Lynch, 1989). As a result, people with dissimilar cultural, religious, linguistic, and ethnic backgrounds have ended-up living in places and circumstances different to those of their 'homelands'. The student population is also affected by this change, with worrisome results regarding attainment¹ being reported for ethnic minority groups in many different countries: black students in the UK (Connolly, 2006; Demack *et al.*, 2000) and the US (Glick and White, 2003; Rumberger and Palardy, 2005), Pakistani (Demack, Drew, and Grimsley, 2000) and Bangladeshi students (Demie, 2001) in the UK, Hispanic students in the US (Fryer and

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1 Attainment in educational studies refers to the standard of students' work compared to national and local benchmarks. In contrast, achievement refers to the progress students have 'made since they were last tested to gain their current test results' (Education, Children and Young People Scrutiny Board, 2008, p. 3).

Levitt, 2004; Ma, 2005), Turkish and Moroccan students in the Netherlands (Driessen, 1995; Hofman, 1994), Albanian students in Greece (Korilaki, 2004). The disparity in educational outcomes among different ethnic groups has become known in research as the 'minority achievement gap' (D'Amico, 2001; Olszewski-Kubilius, 2006).

Examining whether and for what reasons some minorities underachieve, and then tackling problem areas, is considered important for delivering a sound education to all students and thus preparing them for living their lives fully within a well-functioning society with equal opportunities. The international literature has identified a variety of factors as likely to affect attainment. These include gender, generation status, socio-economic status, absenteeism, and age. Some of the earlier findings on these factors are presented below.

Some studies suggest that females outperform males in most subjects, including Reading or Language or Writing (Fryer and Levitt, 2004; Hao and Bonstead-Bruns, 1998; Hoxby, 2002), and Mathematics (Bempechat *et al.*, 1999; Lee and Smith, 1995; Roscigno and Ainsworth-Darnell, 1999). Other studies, however, have shown males outperforming females in Mathematics (Glick and White, 2003; Lee and Loeb, 2000) and others still have shown no significant gender differences (McCoy, 2005; Rong and Grant, 1992). Further, many studies have not examined gender in analyses (Condrón and Roscigno, 2003; Portes and MacLeod, 1996; Sheldon and Epstein, 2005), or have not examined the attainment of male and female students in relation to minority and majority groups separately (Entwisle and Alexander, 1990; Sammons, 1995).

In terms of generational difference in immigrant populations, some studies show a tendency of lower generation status students towards better school performance. For example, Padilla and Gonzalez (2001) and Rumbaut (1995) found first-generation students to have better performance than second- or third-generation children. However, there are studies that show opposite results (Ream, 2005; Rong and Grant, 1992; Wojtkiewicz and Donato, 1995), and a plethora of studies that have not considered this factor (Hustinx, 2002; Orr, 2003).

There are many studies showing that students of higher socio-economic status tend to achieve higher than students of lower socio-economic status (Connolly, 2006; Cook and Evans, 2000; Fejgin, 1995; Zvoch and Stevens, 2006). Here also, there are many studies that have not included this important factor in their analyses (Barnett *et al.*, 2002; Callahan, 2005; Hoxby, 2002; Rong and Grant, 1992). Others have used a single (Demack *et al.*, 2000; Driessen, 1995; McCoy, 2005; Pearce, 2006) or some weak indicators (e.g. free school meal) for the measurement of family status of students (Sheldon and Epstein, 2005; Zvoch and Stevens, 2006), thus potentially introducing bias through misclassification.

In the literature, low attendance levels appear to predict low performance (Caldas, 1993; Rumberger and Larson, 1998; Smyth, 1999). Many studies, though, have not examined absenteeism in relation to minority and majority students separately (Kahne *et al.*, 2005; Smyth, 1999), or the effect of absenteeism on student attainment in particular (Kahne *et al.*, 2005; Phillips, 1997). Also, the reviewed studies have not investigated absences for a long period, but only for a short time-period, such as a few days (Bos *et al.*, 1992) or a single semester (Kahne *et al.*, 2005;

Rumberger and Larson, 1998). In addition, none of the reviewed studies has examined the effect of absences on student attainment in particular subjects.

Earlier studies have suggested that older students in a year group tended to perform better than younger students (Crosnoe, 2005; Fryer and Levitt, 2004; Sammons, 1995). However, in studies with students much older than their classmates, age appeared to have a negative effect on school performance (Driessen, 1995; Lee and Loeb, 2000; Ma, 2005). The majority of reviewed studies, though, have not included age in their analyses (Connolly, 2006; Pearce, 2006; Ream, 2005).

In Cyprus, a fairly new European country member, the school population has become progressively more heterogeneous (Oikonomidou, 2003) during the last decade, due to the settlement of immigrants. This situation is predicted to continue in an accelerated fashion with the expansion of the European Union. The rapid demographic changes have affected school composition (*ibid.*) as well. According to information supplied by the Ministry of Education and Culture of the Republic of Cyprus (where the research was conducted in 2004-2005²) regarding secondary schools, the number of minority students in the 2004-2005 academic year had doubled compared to the corresponding figure in the academic year 2001-2002, whilst the number of native students was similar. A more recent report of the Ministry of Education and Culture (Annual Report, 2009) showed that the number of foreign-language students in primary schools continues to increase. In particular, for the academic year 2005-2006, there were 3,759 students attending the local primary schools (6.7% of the total) for whom Greek was not their mother language. This number rose to 4,605 (9% of the total) for the academic year 2008-2009. No data is reported for secondary schools but one would expect a similar trend.

There are presently no studies on the attainment of ethnic minority secondary school students in Cyprus. Research related to minority students is limited to a few qualitative studies, which explore issues of multicultural/intercultural education in Cypriot schools (Angelides *et al.*, 2003 and 2004; Martidou-Forsier, 2003; Panayiotopoulos and Nicolaidou, 2007; Papamichael, 2008). In some of these cases, there are hints of problematic performance on the part of ethnic minorities. For example, in the study by Panayiotopoulos and Nicolaidou (2007) there is reference to low academic performance among non-indigenous students. It is also suggested that the high concentration of minority students in a particular school was a factor pushing parents of native students to stop sending their children to that particular school because of perceived lower academic standards.

From the above, it is obvious that no firm conclusions can be reached about the attainment of minority secondary school students in Cyprus based on prior literature alone, especially because the school population has been changing so rapidly. Furthermore, as highlighted above, earlier

2 The current study has only considered schools under the control of the Republic of Cyprus as access to data across the divide was difficult.

studies on attainment of minority students are mired by methodological problems. A study examining the attainment of minority students in Cyprus and looking at a large number of possible factors responsible for this attainment is the one way of remedying this situation. On this basis, we conducted a study aiming to answer two research questions:

- (1) What are the patterns of attainment for minority and native secondary school students in the Republic of Cyprus?
- (2) Which of the examined factors influence the attainment patterns of these students?

Methodology

School and Student Sample: Two Greek-Cypriot public secondary schools (known as 'gymnasiums') in different cities (Larnaca and Paphos) were included in the study. As the intention was to examine schools with a substantial number of ethnic minority students, the schools were randomly selected from the total number of schools with a concentration of minority students equal to or greater than 5%. All students (769 in total) enrolled in these gymnasiums during the academic year 2004-2005 were included. Children from Georgia formed the largest ethnic minority group in these schools, whilst smaller numbers of other groups (Russians, British, Romanians, Bulgarians, Africans, and Americans) were pooled together under a category of 'Others'. Specifically, the sample included 72 'Georgians', 98 'Others', and 597 'Natives'. Across the Republic of Cyprus, these numbers would account for 10.4% of Georgian, 25.4% of 'Other' and 2.2% of Native children enrolled in all secondary schools (suggesting that the objective of capturing schools with a substantial number of ethnic minorities was achieved).

Academic Achievement: The attainment level of students was measured utilising student grades from three consecutive trimesters in two different subjects: Modern Greek, a subject of theoretical context where language is of paramount significance, and Mathematics, a practical subject which is less language-dependent. Other theoretical subjects, for example History, and practical subjects, such as physics, could also serve similar purposes and these areas could be used in future studies. As there are no external examinations, trimester grades from each gymnasium offer the only available indication of student attainment during an academic year. The trimester grades are to a large extent dependent on the curriculum taught during the trimester. They reflect the average of a number of tests over the period in question based on material of the national curriculum taught during the year. Even though we initially planned to examine the scores from end-of-year exams as well, and the relevant information was collected, it was realised that the term-time grades were much more consistent and tended to reflect the attainment of individual students much more accurately than the final exam scores. This might have been due to a tendency by students who had passed their year from semester grades, not to pay as much attention to the final exam, thus bringing down the mean score and not allowing for appropriate separation between different levels of ability among students.

Variables: Parental birthplace is the only accurate and available indicator for defining ethnicity in the population sample and is the method that schools and the Ministry of Education and Culture in Cyprus use. This way of defining students' ethnic background has been used in other studies as well (e.g. Hustinx, 2002). 'Georgians' were defined as those children who had at least one parent born in Georgia. These are known locally as '*Rossopontioi*' or '*Ellinopontioi*'. 'Others' were students who had at least one parent born in a country other than Cyprus or Georgia. Students who had one Cypriot parent and the other from another country were considered to belong to the ethnic group of the non-native parent. 'Natives' were mainly those whose parents had both been born in Cyprus. For practical reasons, a very small number of students from Greece were also included in the native category; this was felt appropriate in view of the similarities in language, religion and culture. The population of Cyprus at large also includes Turkish-Cypriots as well as people from three 'religious groups', Maronites, Armenians and Latins but this particular student sample included nobody from these groups. This is not surprising as the overwhelming majority of Turkish-Cypriots study across the divide in the northern part of the island and those from the 'religious groups' tend to prefer English-speaking private schools.

Student generation status was indicated by place of birth. That is, students born abroad with at least one parent born abroad were defined as first-generation, and those born in Cyprus with at least one parent born abroad were defined as second-generation. This way of differentiating students between first and second-generation immigrants has been used in other studies (e.g. Goyette and Xie, 1999). Students born in Cyprus of parents born in Cyprus or Greece were defined as natives.

Other variables used were gender, socio-economic status (based on the highest level of parental education and parental occupation), and absenteeism (absences from teaching periods in the two examined subjects, as well as the overall number of absences for the whole academic year). Student age (measured in months), year group, and school were also controlled. Absenteeism was examined in relation to student performance in the particular subjects. The categories employed for each of these variables were:

- For gender: male and female;
- For parental education: primary education, secondary education, and further studies;
- For parental occupation: manual unskilled workers, manual skilled workers, civil servant and private workers, teachers and senior civil servants and senior private workers, and professionals and chief managers;
- For year group: first year, second year, third year;
- For school: School A and School B. Attainment, absenteeism, and age were used in the statistical analysis as continuous variables.

Analytical Methods: Rasch analysis was employed, in order for the student grades (A, B, C, D, E), which represent ordinal data, to be transferred into a linear scale which could then be used for the

regression analysis (as linearity is a presupposition for this analysis). Rasch analysis processed the grades of all students from different trimesters and gave an overall performance index for each student. A particular model of the Rasch 'family' was used for the needs of the present study – the Partial Credit Model (Wright and Masters, 1982).³

Based on the Rasch scores, some descriptive statistics were created first. Then, a regression analysis (Ordinary least-squares regression) was employed to assess how accurately an independent variable predicts a dependent variable, determining the proportion of the variation in the dependent variable that can be accounted for by the variation in the independent variables. Regression analysis could also indicate whether or not a particular relationship is statistically significant (Allen, 1997). Two multiple regression models (one for each subject) with attainment as dependent variable and a number of factors as independent variables were performed to check on possible influences of the independent variables on student attainment. Due to the small population sample, the regression models included all students, despite the fact that they came from three different year groups. The age difference among students was, however, controlled by including their age and year group in the models. As the particular study dealt with data on different levels – that is student-level data and school-level data – multilevel models would normally be the appropriate method of analysis. But because the number of schools was small, this technique could not be used in this case. The statistical package SPSS Version 12.0 was used for the analyses.

Limitations: Some limitations of the present research need to be mentioned. Firstly, the findings may not be suitable for generalisations or assumed to be representative of the whole population, as the study is based on the population of two schools. Secondly, the student scores of attainment are based not on a standardised test but on marks given by teachers. This could introduce bias, which could invalidate results. Nevertheless, as this is the only assessment available in Cyprus at present, it represents a pragmatic approach. Also, the fact that a number of grades from three different trimesters are used reduces the possibility of introduction of bias from single measurements.

Sources of Information: Student grades and absences were obtained from the most accurate and valid available source: a database held by the Ministry of Education and Culture, which is based on the students' official report cards. Parental origin, education, occupation, student birthplace, and age were collected from school-held records. All the information on school records was collected from parents. As parents are assumed to be the ultimate authority on student/family information (Entwisle and Astone, 1994), using school records as a source of information can, to a great extent, ensure the reliability of the information collected. It should be noted that the official interpretation of this data may introduce categorisation (e.g. as 'native' or 'non-native') that does not accurately reflect parents' or students' perceptions of themselves.

3 For more information about Rasch models, see Bond and Fox (2001).

Ethics: Ethical issues arise from the nature of the research project itself, as it deals with ethnic differences and personal information of a sensitive kind. For this reason, a particular procedure of access and acceptance has been followed. Official permission for using students' grades and absences was obtained from the Ministry of Education and Culture in Cyprus. Student data was collected using an indicative number and not names. Schools were asked to participate on a voluntary basis. The right of students and schools to privacy has been protected, and their confidentiality and anonymity guaranteed. International guidelines dealing with ethical issues in educational research (e.g. Cohen *et al.*, 2004), have also been honoured.

Results

Descriptive Statistics

In this section, a table of descriptive statistics and a number of graphs are presented. The table offers demographic data broken down into the three different ethnic groups examined, 'Natives', 'Georgians', and 'Others'. The graphs show patterns of attainment across the variables that the present study examines, i.e. ethnicity, gender, generation status, parental education, and parental occupation.

The Population Sample and the Variables Used in the Study

As table 1 overleaf indicates, about three-quarters of the student population were 'Natives', while the remainder were 'Georgians' and 'Others'. In the group of 'Natives' and 'Georgians' about one-half of them were female, while in the group of 'Others' 60% of the sample were female. All the 'Georgians' were of first-generation status, while approximately one-half of the 'Others' were of second-generation status, and the rest of first generation.

Regarding parental education, approximately one-third of native parents only, had received further studies while about one-half of the 'Georgian' and 'Other' parents had undertaken further studies. This indicates that minority parents possessed higher educational levels than native parents did. In terms of parental occupation, it appeared that about one-third of native parents were in the two higher occupational categories. From the two minority groups, around one-quarter of the 'Other' parents and less than one-fifth of 'Georgian' parents were classed in these categories. 'Georgian' parents had the highest proportion of workers in the two lower occupational categories, followed by that of 'Other' parents. This indicates that minority parents had a lower occupational level than native parents, with 'Georgian' parents having the lowest level of all.

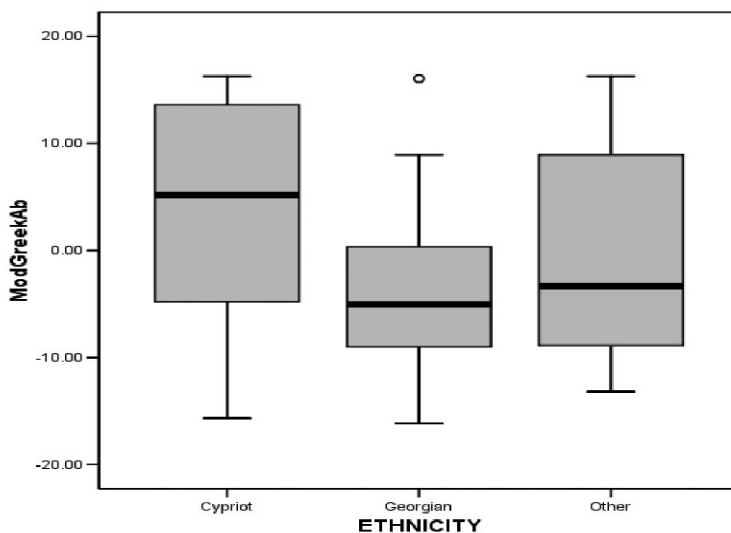
Student Attainment across Ethnic Groups

As regards student attainment, it appeared that the average score of 'Natives' was much higher than the score of the two minority groups in both subjects (figure 1, for the graphical representation in Modern Greek). The average attainment of 'Georgians' and 'Others' was quite close in both subjects, even though 'Others' appeared to be performing slightly better.

Table 1: Descriptive Statistics for the Variables Used in the Study by Ethnicity

	Natives (%)	Georgians (%)	Others (%)
<i>Population sample</i>	776	94	127
<i>Gender</i>			
Male	50.6	54.2	398
Female	494	458	60.2
<i>Generation status</i>			
Natives	100	0.0	0.0
First generation	0.0	100	571
Second generation	0.0	0.0	429
<i>Parental education</i>			
Primary education	4.5	1.4	1.0
Secondary education	61.3	54.2	42.9
Further studies	34.2	44.4	56.1
<i>Parental occupation</i>			
Unskilled workers	6.5	15.3	12.2
Skilled workers	16.2	38.9	21.4
Civil servants and private workers	47.6	37.5	41.8
Teachers and senior civil servants and senior private workers	22.1	8.3	19.4
Professionals and chief managers	7.5	0.0	5.1

Figure 1: Rasch Scores for Students from Each Ethnicity-related Category Comparing Attainment Levels in Modern Greek



Gender-correlated Student Attainment

Females from all ethnic groups had higher average attainment in Modern Greek than males (figure 2). A similar pattern appeared for Mathematics.

Generation-correlated Student Attainment

The average attainment for both first- and second-generation minorities in Modern Greek was much lower than those of 'Natives', with second-generation students achieving slightly higher than first-generation students (figure 3). A similar pattern appeared for Mathematics.

Parental Education-correlated Student Attainment

Students' average score rose as parental educational levels increased (figure 4). As a consequence, the average score of children whose parents had received secondary education was higher than those whose parents had primary education alone. The children whose parents had received further studies achieved the highest average of all. This pattern was common to both subjects studied.

Figure 2: Rasch Scores for Student Attainment in Modern Greek Correlated with Gender

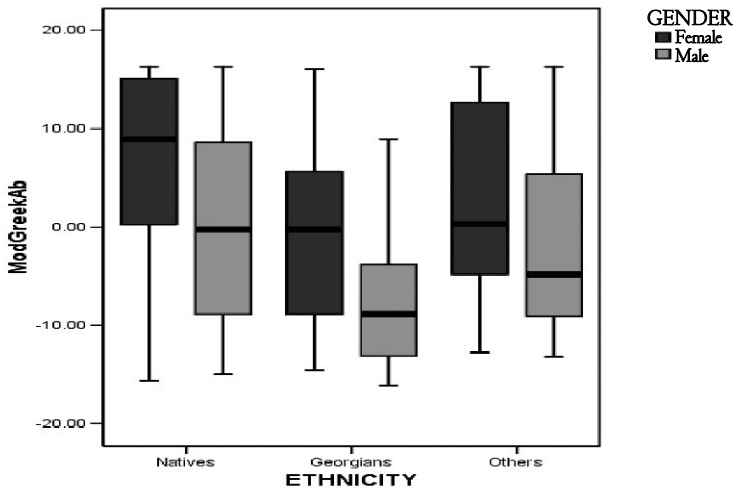


Figure 3: The Rasch Scores for Student Attainment in Modern Greek Correlated with Generation

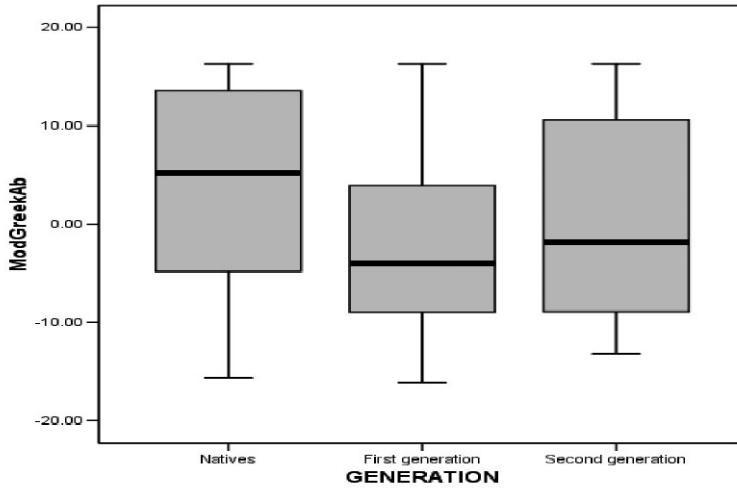
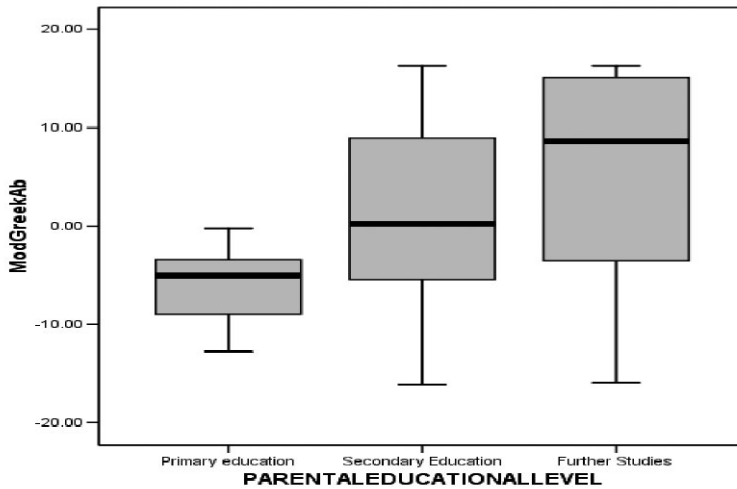


Figure 4: Rasch Scores for Students from Different Parental Educational Categories in Modern Greek



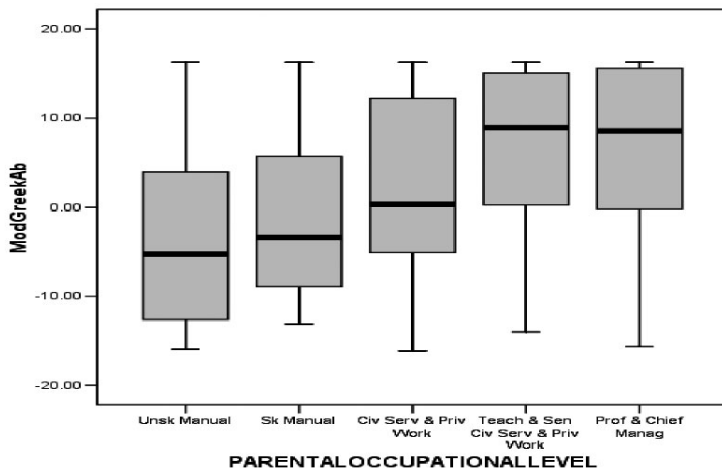
Parental Occupation-correlated Student Attainment

Students' average score improved along with increasing parental occupational levels (figure 5). Hence, children whose parents were skilled workers achieved higher scores than children whose parents were unskilled workers. Children whose parents were civil servants and private workers were higher-achievers than children whose parents were grouped in the two lower occupational categories. Finally, children whose parents were teachers or senior civil servants and senior private workers or professionals and chief managers scored the highest of all.

Absenteeism Rates

'Natives' had fewer absences in both subjects (an average of 4.69 in Modern Greek and 3.66 in Mathematics) than children from the two minority groups (an average of 10.01 in Modern Greek and 8.58 in Mathematics for 'Georgians' and an average of 8.42 in Modern Greek and 6.53 in Mathematics for 'Others'). 'Georgians', in particular, had the highest average number of absences.

Figure 5: Rasch Scores for Student Achievement in Modern Greek Correlated with Parental Occupational Categories



Linear Regression

This section presents the results from the multiple regression models for the subjects of Modern Greek and Mathematics (tables 2 and 3 respectively). The tables show which of the examined factors had a significant effect on students' attainment in the two subjects. It appeared that, even after controlling for gender, generation status, parental education and occupation, absences, age, year group and school, the gap between native students and the two ethnic minority groups remained statistically significant in both subjects. 'Others' performed lower than native students in both Modern Greek and Mathematics whilst 'Georgians' performed even lower than 'Others'. The gap was more pronounced for both groups in the subject of Modern Greek.

Gender differences were quite large and statistically significant for both subjects. Specifically, males seemed to be in a disadvantaged position, consistently performing lower than females.

The socioeconomic status of families appeared to affect attainment significantly with an increase in parental education or parental occupation level predicting an increase in student attainment in both subjects. As regards absenteeism, its effect on student attainment was statistically significant in both subjects. The model predicted a decrease in attainment in both subjects as the number of absences increased.

The effect of age on student attainment appeared to be statistically significant only for the subject of Mathematics. Its effect was negative, that is, as the age (in months) increased, student attainment decreased. Also, school variable was statistically significant only for the subject of Mathematics. Students from School B appeared to have lower average attainment than students from School A. The year group appeared to have no significant effect and as such it was excluded from both regression models.

Table 2: Parameter Estimates of the Regression Analysis in Modern Greek (Rasch Score)

<i>Factors</i>	<i>Unstandardised Coefficients</i>		<i>Standardised Coefficients</i>	<i>t</i>	<i>Sig.</i>
	<i>B</i>	<i>Std. Error</i>	<i>Beta</i>		
(Constant)	-0.152	1.789		-0.085	0.932
Georgians	-5.760	1.037	-0.173	-5.556	<0.001
Others	-3.074	0.894	-0.105	-3.439	0.001
Gender	-6.190	0.574	-0.318	-10.776	<0.001
Parent educational level secondary	3.420	1.579	0.173	2.166	0.031
Parent educational level further	6.999	1.680	0.349	4.167	<0.001
Parent occupational level 1	2.926	1.202	0.117	2.435	0.015
Parent occupational level 2	4.083	1.103	0.209	3.700	<0.001
Parent occupational level 3	5.803	1.268	0.245	4.577	<0.001
Parent occupational level 4	4.557	1.634	0.108	2.789	0.005
Absences	-0.314	0.034	-0.283	-9.363	<0.001

Model Summary: R: 0.601, R-square: 0.362, Adjusted R-square: 0.353, F: 42.479, Sig: <0.001.

Generation status was also excluded from the final regression models of both subjects, as it assumed non-significant values when other variables were taken into account. In fact, it caused multicollinearity⁴ problems with the ethnicity variable. This would suggest that both variables

4 This is a situation where an explanatory variable in a model is related to one or more of the other explanatory variables (see Hutcheson and Sofroniou, 1999).

(generation status and ethnicity) offer similar information. However, as both factors were important for a study of this nature, the regression models of both subjects were run again after replacing the variable ethnicity with generation, in order to examine its effect on student attainment. The results indicated that even after controlling for different factors, the first-generation minorities achieved significantly lower scores than native students in both subjects. The difference for second-generation minorities was significant in Mathematics but not in Modern Greek. The gap for first-generation students was almost twice as large as that of second-generation students. The values of the other variables were similar to the regression models run with the ethnicity variable.

Table 3: Parameter Estimates of the Regression Analysis in Mathematics (Rasch Score)

<i>Factors</i>	<i>Unstandardised Coefficients</i>		<i>Standardised Coefficients</i>	<i>t</i>	<i>Sig.</i>
	<i>B</i>	<i>Std. Error</i>	<i>Beta</i>		
(Constant)	9.782	3.345		2.925	0.004
Georgians	-4.076	0.707	-0.187	-5.765	<0.001
Others	-1.931	0.603	-0.101	-3.200	0.001
Gender	-2.901	0.388	-0.228	-7.481	<0.001
Parent educational level further	2.822	0.481	0.215	5.865	<0.001
Parent occupational level 1	2.162	0.810	0.133	2.668	0.008
Parent occupational level 2	2.413	0.741	0.189	3.257	0.001
Parent occupational level 3	3.254	0.852	0.210	3.821	<0.001
Parent occupational level 4	3.148	1.107	0.114	2.844	0.005
Absences	-0.224	0.027	-0.262	-8.224	<0.001
Age	-0.468	0.225	-0.065	-2.081	0.038
School	-0.897	0.432	-0.065	-2.077	0.038

Model Summary: R: 0.565, R-square: 0.320, Adjusted R-square: 0.310, F: 31.977, Sig.: <0.001.

Discussion

We have shown that ethnic minority groups in Cyprus perform significantly lower than native students. Low attendance rate, low parental education, low parental occupation, low generation status, together with being a male student, has a significantly negative effect on school attainment.

Despite controlling for gender, generation status, parental education and occupation, absences, age, year group and school, ethnic-minority, secondary-school students in Cyprus have been shown to achieve significantly worse than their native counterparts. That minority students underachieve has been reported previously in other countries (e.g. Glick and White, 2003; Zvoch

and Stevens, 2006). From the three groups studied, 'Georgians' achieved the lowest average score, followed by 'Others', whereas 'Natives' scored the highest. The same pattern was followed in both subjects examined, with the gap in Modern Greek being greater. This is possibly because Modern Greek is a subject of theoretical context and more language-dependent. Other studies that examined Reading and Mathematics have found larger gaps in Reading (e.g. Cook and Evans, 2000), but there are also studies with opposite results (e.g. Hoxby, 2002; Ream, 2005).

Gender appeared to be a significant predictor of student attainment in both subjects. Females from all ethnic groups seemed to be in a more advantageous position academically than males. Gender differences found in this study are consistent with those of earlier studies which show females outperforming males in Language or Reading (e.g. Fryer and Levitt, 2004; Hao and Bonstead-Bruns, 1998; Hoxby, 2002) and Mathematics (e.g., Bempechat *et al.*, 1999; Lee and Smith, 1995; Roscigno and Ainsworth-Darnell, 1999). The fact that 'Others' performed better than 'Georgians' might also be partly explained by the fact that females formed the majority of the sample in the group of 'Others'.

First-generation minorities had significantly lower attainment than native and second-generation students. Actually, the gap for first-generation minorities in Mathematics was twice as large as that of second-generation minorities, although compared to native students second-generation minorities had no significant differences in Modern Greek when other factors were taken into account. These findings are consistent with a number of studies that showed second-generation students performing better than first-generation students (e.g. Ream, 2005; Rong and Grant, 1992; Wojtkiewicz and Donato, 1995).

First-generation students are those that were born abroad, moved to Cyprus and entered gymnasiums at any stage and at any year group. Children with experience in the national education system of the country are expected to be more familiar with the local language, while children who migrated recently are likely to have more language problems, leading to lower academic achievement. Many researchers have argued that the lack of skills in the dominant language is one of the most important factors for the underachievement of minority students (Demie, 2001; May, 1994). Panayiotopoulos and Nicolaidou (2007) showed that the teachers who participated in their study perceived language difficulties of ethnic minority students in Cyprus to be a major factor in underperformance. In addition, the fact that all 'Georgians' in our dataset were of first generation status might go some way in explaining their lower attainment when compared to 'Others' – about one-half of which were of second-generation status. It should be mentioned that the effect of generation status was not detectable when the variable ethnicity was added to the regression models, as it pushed generation status into non-significance due to multicollinearity problems.

The effect of family socioeconomic status was significant for academic attainment. The findings are in agreement with those reported elsewhere (e.g. Connolly, 2006; Cook and Evans, 2000; Fejgin, 1995). The socio-economic make-up of each ethnic group might be an important reason for the differential attainment observed. Poor socio-economic status could affect attainment

in a number of direct (e.g. able to afford private tuition or other educational resources) and indirect ways (e.g. children being forced to get jobs to supplement family income thus minimising time for study).

As regards the relationship between absenteeism and attainment, findings are in agreement with those studies showing that low attendance rates are associated with lower performance (e.g. Caldas, 1993; Smyth, 1999). The fact that minority students have a higher number of absences compared to 'Natives' might, in part, explain the lower performance of minorities. Being absent from the classroom has a significantly negative influence on school achievement, as it might lead to missing out important concepts and information from the lesson.

Findings regarding age, in terms of their attainment in Mathematics, are in line with previous studies showing a negative correlation between age and school performance (e.g. Driessen, 1995; Lee and Loeb, 2000; Ma, 2005). An explanation for this might be that higher age applied to those students with poor attainment who had to repeat one or more academic years. It might also reflect the situation whereby older ethnic minority students who were judged by the school as very deficient in the local language were placed in a class with younger students. The language deficiencies would probably lead these students to academic failure thus making the association between increasing age and lower attainment even stronger.

One of the participant schools appeared to have a significant negative effect on the attainment of students in Mathematics. This cannot be explained from the findings of this study and additional studies, sampling many more schools, would be needed to clarify this further. The international literature examined many factors relevant to school that might have a potential influence on student achievement. For example, the contextual effects, that is to say, the 'differences in the racial and social class composition of the school ... can affect achievement over and above the effects associated with students' individual characteristics and family background' (Rumberger and Willms, 1992, p. 379). Also, the influence of peers, which, based on their high or low achievement and motivation levels, can create a "culture of success" in school or the opposite (Jencks and Mayer, 1990).

The differences in attainment between native and ethnic minority students appeared to be partly explained by the above-mentioned factors, which are basically related to the children themselves. Be that as it may, many other factors, which have not been examined in this study, might also be responsible for the attainment patterns identified. Some examples are the monocultural character of Cypriot schools (Angelides *et al.*, 2003), the assimilationist character of the current educational system (Angelides *et al.*, 2004), the lack of academic and psychological support for minority students (Panayiotopoulos and Nicolaidou, 2007), and the absence of multicultural training of teachers (Angelides *et al.*, 2007; Martidou-Forsier, 2003; Panayiotopoulos and Nicolaidou, 2007). The nationalistic element of the Cypriot educational system (Philippou, 2007), which largely reflects the Greek system as criticised for its ethnocentrism by Fragoudaki and Dragona (1997), and the racism in the wider society (ECRI, 2006a; ECRI, 2006b; Trimikliniotis, 2007; Trimikliniotis and Pantelides, 2003) might also be related. Furthermore, the negative feelings

of Cypriots for particular ethnic groups, such as Turks (Loizos, 1998; Spyrou, 2002; Spyrou, 2006), the racist attitude on the part of native students towards minority students, Georgians and Russians in particular (Theodosiou-Zipiti *et al.*, 2010), the biased and xenophobic attitudes on the part of teachers and students (Afantiti-Lamprianou *et al.*, 2008; Papamichael, 2008), as well as racism in school policies (Theodosiou-Zipiti *et al.*, 2010) might have an impact on the school life of ethnic minority students.

Conclusion and Recommendations for Policy and Further Research

In general, schools should be sensitive to, and inclusive of, students' cultural and linguistic needs, promote equal opportunities, and effectively deal with racism. The curriculum, teaching methods, teacher and student behaviour, school policies, and the whole school environment should be permeated by a multicultural ethos. Improving the conditions under which ethnic minority students are educated in Cypriot schools is fundamental in raising their attainment levels. This, in turn, should help the future work prospects of ethnic minority students and lift them, at least, out of relative poverty. The cumulative effect of this could potentially help the state, by raising the level of revenue from taxed income; subsequently enabling savings on benefits paid out, and may also assist in curbing criminal activity.

Findings from the present study point to deficiencies in the educational system leading to an inability to meet the educational needs of students from ethnic minority backgrounds. The Ministry of Education and Culture has already implemented some changes (focusing on language teaching) and is working on a comprehensive educational reform. As regards the education of ethnic minority students, the policy of the Ministry is to implement 'educational measures and policies that will facilitate the smooth integration of groups from different cultural identities in a creative environment, regardless of background' (Annual Report, 2009, p. 304). Within the framework of multicultural education, a number of measures have been promoted, including the creation of classes for fast acquisition of the Greek language through intensive instruction; preparation of the new curriculum and the school textbooks with the addition of intercultural elements; production and creation of appropriate educational and pedagogical material; in-service training seminars for the teachers teaching Greek as a second and/or a foreign language organised by the Pedagogical Institute. At the primary level, extra teaching periods for language support of foreign-language students as well as educational material, which include books for the teaching of the Greek language, have been provided. Also, afternoon classes have been organised by the Adult Education Centres for students and parents who are interested in learning Greek as a second language.

Furthermore, in its aim to help students from economically and socially deprived areas, the Ministry has created Zones of Educational Priority, which were brought into existence around the time the study was carried out. These zones include nurseries, primary, and secondary schools in a number of neighbourhoods in different cities. As reported in the Ministry's 2009 Annual Report,

in an attempt to 'ensure prevention of school failure and functional illiteracy' (p. 286) as well as the prevention of school exclusion, school leaving, and violence among other things, (p. 306), a series of extra measures have been implemented in these schools, including lowering the number of pupils per class, the provision of extra educational support, and free breakfast for all students.

As there is no previous research on this topic in Cyprus, this study offers a picture of the new reality of the local educational system. Also, the findings provide important information to educators, policymakers and politicians alike as it is by tackling the aforementioned factors that attainment levels can be raised. Moreover, the above results add further evidence to the international literature which show that ethnic minorities are underachieving. This paper offers possible reasons why this is so by examining a unique combination of possible contributing factors. In addition, the attainment patterns of the particular ethnic groups observed in this study (e.g. native Cypriots and Georgians) have not previously been recorded. Furthermore, the focus of the study on year-long data (regarding school performance and absenteeism) adds to insights gained by single-measurement analyses. Student absences were, in fact, examined in particular subjects in relation to student attainment in these areas. Similarly, the employment of more than one socio-economic status indicators offers a more robust measurement compared to single-indicator studies.

Further research is needed to confirm findings, including the expansion of the number of schools and students examined in order to allow the use of a multi-level approach. By investigating both individual-level factors and school-level factors, students' attainment can then be examined in greater detail. Additionally, the impact of the policies introduced by the Ministry can be scrutinised in studies looking at the common, end-of-school exams used for admission to Higher Education (introduced approximately two years ago and beyond the scope of this particular study). Qualitative methodologies could integrate these and further results to clarify factors impacting on the achievement gap.

In the meantime, the need for immediate policy implementation from central government is urgent. The educational system should provide effective language programmes in all schools with ethnic minority students. Until students have increased their competency in the Greek language, perhaps the use of minority students' home languages could be an interim medium of instruction, especially in schools with large groups of students from a particular ethnic background. This could be best achieved by employing bilingual teachers and teachers from minority groups. The educational system ought to be able to offer a multicultural curriculum and a multicultural and antiracist school environment to students, as well as multicultural in-service training to teachers. Moreover, ethnic minority students should be encouraged to limit their absenteeism rates and be more engaged in school life and learning. Monitoring the achievement of students from ethnic minority groups would also help to assess the effectiveness of the educational practices employed. Furthermore, welfare schemes might be used to support those with serious socioeconomic problems. And finally, families with low socioeconomic status could benefit from the Zones of Educational Priority being extended into more economically- and socially-deprived areas.

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