

SCHOOL ACHIEVEMENT AND FAMILY BACKGROUND IN GREECE: A NEW EXPLORATION OF AN OMNIPRESENT RELATIONSHIP

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Introduction

The changes that occurred during the last three decades in the Greek educational system have been characterised by the gradual abolition of selection at the lower levels of the (public) educational system, and the introduction of new selective procedures at the end of the upper-secondary school (the *lyceum*). Whereas in the past, winning a place in upper-secondary school had been considered a success, in the last decade there has been a strong public pressure for 'freer' access to Universities and other institutes of Higher Education (HE). However, since the places in HE are limited, Greece has experienced a situation where 'demand' exceeded 'supply'. This imbalance had –and still has– to be controlled by the system of National HE-entrance Examinations.

This paper will present some of the findings from a national survey, carried out in the school-year 2005-06, in various parts of Greece. The main aim of the study was to explore the effects of various *personal*, *school-level* and *family* factors on the *student performance* in the (national) Higher-Education entrance examinations. Here only the effects of *family* factors will be examined.

Initially, a discussion on the theoretical debates about school assessment, selection and inequalities is attempted. This is followed by a brief reference to the main research findings and theoretical debates in the existing Greek bibliography, in parallel to a description of the system of access to HE. Then the research methodology and tools used in the study are described. Subsequently, the main statistical techniques used for the creation of a causal model –through Structural Equation Modelling (SEM) analysis– are given as well as a discussion of the main findings.

School Achievement and Inequalities

During the 1950s and 1960s, the study of education –until then dominated by the traditional individualistic values of 'excellence' and 'merit'– became more closely associated to the social scientific approach. That is not surprising at all, if one considers the context of the education environment on a global scale, after the Second World War. The focus on the most important factors for educational

achievement has been widely influenced by large-scale research programs carried out in the 1960s and 1970s, and linked to general policy-making processes taking place throughout the Western World toward the reduction of 'inequalities' in the educational provision. Notable examples of such a kind of research have been the so-called 'Plowden Report' (DES, 1967), the 'Coleman Report' (1966), and the comparative study carried out by T. Husen and his associates in mathematical achievement in 12 countries (Husen, 1975).

The importance of the socio-economic status (SES) of an individual has been documented from numerous studies, not only in educational research, but also in health-related issues, psychological development etc. (Bradley and Corwyn, 2002; Sammons, West and Hind, 1997; Thomas, Sammons, Mortimore and Smees, 1997). Its relation to educational achievement has also been established from international research (see Anguiano, 2004; Arum, 1996; Campell και Koutsoulis, 1995; Considine and Zappalà, 2002; Georgiou, 1999; Georgiou και Christou, 2000; Konstantopoulos, 2006; Power et al., 2003; Power and Whitty, 2006; Schulz, 2005). Even the OECD 'Program for International Student Assessment' (PISA) acknowledged the SES as a crucial factor in the explanation of variation in performance between different schools that participated in the standardized testing of 15-olds in 57 countries (OECD, 2007, 2009).

Of course, we need to keep in mind that the debate on the inequalities of educational opportunities (in 'access' or 'outcome') is highly influenced by different theoretical perspectives and ideological standpoints.

The controversies derived from this debate are caused mainly by the fact that, very often, social phenomena are investigated, analysed and explained under a deterministic model, which distinguishes between 'cause' and 'outcome'.

According to theories that stress the *genetic origins of intelligence*, 'intelligence' and intelligence differences are –totally or mainly– biologically 'inherited' (Hernstein, 1973; Jensen, 1969).

On the other hand, theories that stressed the *social factors that influence achievement*, have as a key assumption that education is a crucial social institution and plays a fundamental role in maintaining the existing society –or 'social order' or 'social structure'.

The traditional branches of these approaches (the so-called *functionalist theories*) accept the dominant societal values and norms and are interested primarily in how they are actually taught in schools (Parsons, 1959). *Radical approaches*, on the other hand, stressed the limits that certain social characteristics place upon the

opportunities that each pupil has in his/her way through formal schooling. Those approaches stressed the role of school as a mechanism of social reproduction, through which the capitalist system transmits those norms and values necessary for its existence (Althousser, 1972; Anderson, 1968; Poulantzas, 1973; Williams, 1957). Following the same tradition, but at the same time deeply influenced by M. Weber's ideas, other radical writers stressed the barriers that the labour-market structure and the status of various occupations erect against any attempt for high class mobility that could be caused by better schooling (Bowles and Gintis, 1976; Carnoy and Levin 1976; Jenks 1972).

A very systematic attempt to trace the cultural sources of school inequalities, and to avoid the economic determinism of earlier 'radical' theories, was made possible thanks to the work of Bourdieu and Passeron. In their books, *Les Héritiers* (1964) and *La reproduction* (1970), they claimed it is the cultural rather than the economic inequalities that are reflected in the inequalities of access and achievement.

According to Bourdieu's perspective, attributing school inequalities only to economic disparities is what preserves and reinforces the dominant structure of social relations, since it implies that if, for example, some poor families improve their financial situation, or a system of generous financial support for working class pupils (i.e. studentships, grants) is introduced, then simultaneously all those mechanism that cause the exclusion of the lower parts of the social strata will disappear at once. What is going on in the school is a very 'sophisticated' process of reproduction of the social inequalities through an 'exchange' of different - or differentiated - types of *habitus* and 'cultural capital'. The most 'favoured' social groups seek the legitimisation of their power by presenting their cultural privileges as personal merits and values (see Bourdieu, 1984, 1993, 1998).

Recent studies on achievement have employed more complex notions of class positioning and socioeconomic status (SES), and highlighted the significance of other personal and/or contextual variables (gender, parental educational attainment, housing type, religion, ethnicity and student age etc.), raising issues –on theoretical, methodological and empirical grounds— of wider socio-economic structures, ideological conflicts and policy-making processes (Ball et al., 2002; Bodovski, 2010; Byfield, 2008; Flere et al., 2010; Gilborn, 2008; Kao and Rutherford, 2007; Wildhagen, 2009).

Nevertheless, consideration of possible social class differentials at the transitory level between secondary and tertiary education is rare in the sociological literature (for recent attempts on secondary-education achievement in general, see Archer et al., 2003; Ball et al., 2002; Halsey, 1993; Marsh and Blackburn, 1992; Marshall,

1997; Reay et al., 2001, 2005; Sullivan, 2001; Zarycki, 2007), and almost non-existent in works referring to the Greek educational context.

Inequalities in Access to Higher Education in Greece

Education-reform attempts in Greece have not been quite bold and radical in the last four decades (Benincasa, 1998; Dimaras, 1975; Gouvias, 1998a,b, 1999, 2002; Mattheou, 1980; Nikta, 1991; Pasmazoglou, 1987; Sianou-Kyrgiou, 2006).

Changes –slow and controversial– were the result of a growth of the popular demand for democratisation of the system, from lower to higher grades. Whereas in the early sixties the highest enrolment ratios achieved in the country had been 61% in the lower-secondary school and 41% in the upper-secondary school (metropolitan area of Athens), in early 1990s an almost universal secondary education was achieved, with a national secondary-level (gross) enrolment ratio of 98%, a figure that has remained stable ever after (UNESCO, 2008). Students expect on average a sizeable rate of return on their investment of four years foregone earnings, plus incidental expenses related to University studies. Such a ‘stake’, along with the social prestige associated with University education, makes families willing to invest a considerable amount of resources to make sure that their offspring will succeed in National Examinations (Chryssakis et al., 2007; KANEP-GSEE, 2009; Sianou-Kyrgiou, 2008).

As various research evidence has proved, representation of various socio-economic groups in HE (i.e Universities and higher Technological Education Institutions /TEIs) is relatively unequal, despite the progress made during previous decades in the direction of a more ‘fair’ balance of the student population (Chryssakis, 1991; Fragoudaki, 1985; Gouvias, 1998a,b, 2002; Kasimati, 1991; Kontogiannopoulos-Polydorides, 1985, 1995a,b, 1996; Sianou-Kyrgiou, 2006).

Patterns of unequal access opportunities still exist and can even be traced, either by looking at the –admittedly few– empirical studies that attempted to create multivariate causal models (Gouvias, 1998a; Kontogiannopoulos-Polydorides, 1985, 1995b, 1996), or by examining –at a more descriptive level– the composition of the student population in various departments (Chryssakis, 1991; Chryssakis and Soulis, 2001; Chryssakis et al., 2007; Gouvias, 1998b, 2002; Kiridis, 1996; Kyprianos, 1996; Sianou-Kyrgiou, 2006, 2008, 2009; Sianou-Kyrgiou and Tsiplakides, 2009).

Today a prerequisite for admission to tertiary education is the score achieved in the HE National Examinations, which includes assessment in six ‘general-education’ and

'track' subjects that are examined at national level. These subjects have a common core of 2 compulsory subjects and 4 elective subjects from the specific 'track' s/he has chosen (i.e. according to one of the three major fields of study: a. Humanities and Social Sciences; b. Natural Sciences; and c. Technology).

The HE-entrance examination system was undoubtedly strict during the seventies and early eighties. In mid-eighties, only a fraction (35%, and if we exclude those gaining a place at TEIs, only 18%) of candidates finally succeeded to enter into a HE institute (Gouvias, 1998b, p. 306). During the nineties, though, it became more 'open', not because of a change in the degree of difficulty of the examination matter and/or processes, but rather because of the creation of new HE places (i.e. new HE institutes, or new departments in the existing ones).

Ninety (90) new departments have been established from 1998 till 2006 (an increase of 24%, or 10 academic departments per year). Today (2011) there are 23 Universities and 16 higher Technological Education Institutes (TEIs) (GMNELLRA, 2010). The number of students followed the same pace. While in 1990/91 there were over 195,000 students registered in some HE institution, today (latest figures available for academic year 2007-08) the registered students exceed 310,000 – reaching 460,000 if we include those who, for some reason, stay on beyond the normal period of study (ibid.).

Despite the 'opening-up' of HE during the last twelve years, some University Faculties have retained their 'elitism', regarding class composition of the student body. Children of the higher occupational strata are over-represented at the expense of the children of farmers and workers, not only in certain HE institutes, especially in the most prestigious Universities of the large urban centres (Athens, Thessaloniki etc.). The representation of socio-economic groups in the various academic disciplines is even more 'unequal', with the 'prestigious' departments (Engineering, Computer Science and Medical Schools) accepting the sons and daughters of top managers, and executives, and the departments of 'low status' and uncertain future prospects (Katsanevas, 2008) enrolling the offspring of the 'lower layers' of the social strata (farmers, manual workers, skilled technicians, office clerks, retailers etc.) (see Gouvias, 1998a,b, 2002; Polydorides, 1995b, 1996; Sianou-Kyrgiou, 2006, 2008, 2009; Sianou-Kyrgiou and Tsiplakides, 2009; Tsakloglou, and Cholezas, 2005).

Research Questions

From the literature review above it became evident that 'school achievement' is a very important indicator of wider social inequalities and is inextricably linked to a plethora of personal, school, family and other social factors.

The main aim of this study is to examine *the relationship between 'school achievement' –and more specifically performance in the HE-entrance examinations-- and certain socio-economic characteristics of upper-secondary school students, at national level*. Individual characteristics (e.g. personality traits, attitudes, degree of satisfaction with the school environment, levels of stress *vis-à-vis* academic testing, assessment of academic abilities and skills, aspirations etc.) were not included in the design of the study. That was done due to mainly two reasons: 1) there were numerous –often insurmountable— obstacles for collecting such information from the school units; 2) the scope of the study was to record issues and prospects at a meso-level or macro-level, and *identify 'external' variables* that, irrespectively of personal characteristics, affect each student's achievement and his/her future educational trajectories.

More specific research questions to be explored were the following:

- What are the main demographic variables that influence student achievement in the upper-secondary school and performance in the HE examinations, and what kind of differentiation –if any— is evident?
- What are the influences of SES and 'cultural capital' on student achievement in the upper-secondary school and on performance in the HE examinations?

Using a Bourdieuan perspective, the authors believe that a combination of familial strategic steps, on the one hand, and of implicit, often unconscious, dispositions and orientations of the students themselves, on the other, is the decisive factors that influence students' achievement and, consequently, transitions based on that achievement; transitions that might determine their future educational and –most importantly- occupational trajectories (Bourdieu, 1984, 1990a,b, 1998).

Although the present paper does not deal with the *micro-level* (i.e. the individual school, classroom and/or family settings), utilizing the concept of *habitus* in relation to the individual dispositions, the authors believe that the mediation of familial 'capital' (*economic, social and cultural*) by purportedly individual characteristics, such as *student achievement*, is evident of wider socio-economic disparities that are often masked under the commonly accepted principle of 'meritocracy'.

Data and Methods

The target population consists of students in the final year of public (i.e. State) upper-secondary school (the so-called *lyceum*). More specifically, as variable that reflects student achievement, *performance (total score) in the 6 subjects of the National HE-entrance Examinations* was selected. The reason is that only this particular score is comparable across the country because the corresponding examinations are administered nationally and uniformly to all participating students (i.e. same day, same administrative settings and examination questions, uniformity of rules and standards of grading). Hence, the specific decision was taken in order to avoid problems of selectivity bias and make the data collected as reliable as possible. However, student achievement in previous academic years was also recorded since it accounts for the student's prior academic accomplishments and may offer a possible source of relationship with the final year's grades. Selectivity bias was also the reason for not including other school types in the final sample (e.g. *lycea* for students with 'special needs', religious-education *lycea* and 'evening' *lycea* – i.e. *lycea* for working adolescents), since those schools operate under different legal status (different timetable, curriculum, teaching methods, learning material and assessment requirements). Finally, private *lycea* were not included in the sample because of problems of access to their empirical data (e.g. special procedures required for each individual school), whereas access to public *lycea* was officially provided from the Greek Ministry of Education.

The employed sampling technique was cluster sampling since it enables the researcher to draw data from a geographically scattered population in a practical and efficient manner. In our case each public *lyceum* was considered a cluster. The number of schools selected in our sample was obtained based on the reliability criterion developed by Limakopoulou and Katsis (2006). More specifically, following Bayesian statistical methods, the number of schools in the sample is determined in a way such that the probability of the alpha reliability coefficient in any scale exceeding 0.70 is optimized. The final sample consisted of 50 public *lycea* and 874 students, distributed proportionately across urban and rural districts of the country.

The data collection was carried out during the spring semester of the 2005-06 school-year, after written permission was given by the Ministry of Education and the Pedagogical Institute of Greece.¹ Each school unit was contacted separately, and permission from the head-teacher and the teachers' council was also provided before

¹ The Pedagogical Institute of Greece (founded in 1985) is, by statute, the main advisory body to the Ministry of Education.

the field work. The whole process was monitored by the research team throughout the distribution of the research instrument and the collection of data, in order to safeguard the validity of the study.

The students in the final grade of each *lyceum* in the sample were asked to complete an anonymous questionnaire, for about ten minutes of duration. The questionnaire consisted of questions regarding the students' demographic characteristics, their previous achievement (i.e. their mean score in previous years of the *lyceum*), the occupational and educational level of their parents, various (proxy) indicators of 'cultural capital' (e.g. the possession of literature books), the time (hours) spent each day for school-work, and reference to private, in-house tuition for any school subject. Additionally, there were questions about their relationship with parents and teachers, as well as about their out-of-school (free) time. Finally, each head-teacher was requested to provide anonymously information regarding each student's national examinations score.

The statistical techniques employed in the analysis included descriptive statistics, factor analysis and structural equation modeling (SEM).

Results

We will present the results derived from the data analysis of our sample's answers in the questionnaire. Firstly, we proceed with descriptive statistics, in order to pinpoint the most important 'themes' / 'dimensions' emerging from students' answers. Subsequently we identify 'latent' variables, using an exploratory factor analysis. Finally, an SEM analysis is carried out and an overall causal model is constructed.

Descriptive statistics

Initially, we examined the distribution of student achievement in *lyceum*. Thus, we conducted a descriptive statistical analysis for the Grade Point Average (GPA) in both compulsory ('general') subjects and elective ('track') subjects at the end of *lyceum*'s final year. More specifically, we present (Graph 1) the box plots for each GPA variable as well as the corresponding statistical measures (Table 1a). We note that students in Greece are graded on a scale of 1 through 20. The analysis demonstrates that students score higher on average in compulsory courses but display a bigger variation in their grades in elective subjects. Furthermore, the middle 50% of the grades in compulsory subjects are within approximately 6 scale points (9.70 to 15.80) whereas in elective courses it is more symmetric, spanning more than 8 scale points (6.30 to 14.65).

Graph 1 here

Table 1a here

Also in Table 1b, we offer a descriptive statistical analysis of the students' GPA in grades 10 and 11, i.e. during the two grades before the final year in *lyceum*.

Table 1b shows higher mean values of student performance than in Table 1a, as well as smaller values of standard deviation. This can be partly attributed to the fact that the statistical measures in Table 1b are derived from in-school grading procedures usually affected by the individual school's policy and socioeconomic environment.

Table 1b here

Regarding the variable of cultural capital of the students, we examined, as proxy measures, material resources within the home environment, such as the existence of a pc or a connection to internet, the availability of exclusive room for the student (i.e. not shared with a sibling or parent). We also collected information about literature reading, attendance of cultural activities and owning items that signified intellectual pursuits. Tables 2 and 3 depict a general representation of the cultural capital of the students in the sample.

Tables 2 & 3 here

We also examined one of the most cited in international bibliography proxy measures of 'cultural capital': parental educational level (i.e. level of education completed by the parents of the students, according to the ISCED classification). Table 4 below presents the parental educational level of the students of our sample.

Table 4 here

The results from Tables 2-4 demonstrate the educational and cultural traits of Greek youth concurring with the findings of, among others, Koulaidis, Dimopoulos, Tsatsaroni and Katsis (2006).

Factor Analysis

The next step is to use factor analysis in order to extract the main factors that influence student performance in the HE-entrance examinations. The variables used for the construction of the main factors (23 in total) refer to *performance* itself (dependent variable), the *educational* and *occupational* level of parents and various aspects of *cultural capital* (see discussion above).

For the appropriateness of the use of factor analysis, the Kaiser – Meyer – Olkin (KMO) criterion provided a coefficient of 0.8 and the Bartlett test of sphericity yielded a statistically significant result ($X^2 = 5.628,2$, $df = 253$, $p < 0.0001$), both indicating inter-correlations among the initial 23 variables.

Initially, a principal component analysis was carried out. The results gave us 23 emerging factors, that is the same number as the originally inserted variables.

The first seven factors explained 58.2% of the total variance and since their eigenvalues exceeded 1 (Bryman and Cramer, 1995, pp. 261-262; Tabachnick and Fidell, 2007, pp. 644-645) we retained them for further analysis.

One obstacle in the interpretation of results in multivariate-analysis models that use categorical variables is that for them indicators of 'means', 'median', 'deviation' and 'variance' do not make much sense. Therefore, various scholars, such as Jöreskog (2002) and Jöreskog and Moustaki (2006) suggested the need to use 'polychoric' correlations and Ordinal Factor Analysis, through the *LISREL* statistical package. By using the specific software, five latent indicators emerged: three that relate to students' *family* background, and two that represent the students' free (i.e. 'out-of-school') time. The results of the above Ordinal Factor Analysis, and more specifically the factor loadings after the orthogonal rotation, are presented in Table 5 below.

Table 5 here

Based on the literature review on achievement and the authors' main research questions, on the one hand, and the findings presented in the table above, we can proceed with an elucidation of the meaning of the seven emerging factors.

The first factor corresponds to two distinct composite variables: a) performance in the HE-entrance Examinations (i.e. the GPO in compulsory and elective subjects), which is given the title 'Performance'; and b) previous achievement in grades 10 and 11 which is given the title 'Past performance'.

The *second factor* refers to the availability of family material resources (e.g. owning a PC at home), and it is labeled as 'Wealth'.

The *third* and *sixth factors* refer to the 'possession' and the 'frequency of use of cultural goods', respectively. Very often the above sets of variables do not coincide, especially when they reflect the school-related homework. Therefore, we are talking about two distinct concepts. On one hand we have the possession of cultural goods (label: 'Cultposs'), which includes literature books (novels, poetic collections). On the other hand, we have the use of cultural goods (label: 'Cultuse'), which refers to *reading* (books), *listening* (radio or CDs and digital libraries) and/or *watching* (documentary films or talk-shows, on tv or DVDs) habits.

The *seventh factor* refers to the 'educational level' and 'occupational status' of parents (label: 'Parents').

The *fourth factor* relates to the 'availability of home educational resources' (label: 'Hedres') and corresponds to questions about the possession of 'auxiliary learning material' (e.g. the availability of exclusive room for the student).

Finally, the *fifth factor* records the main out-of-school student activities (label: 'Hobby').

In Table 6 below, we list the equivalence between the initial variables (questionnaire items) and the main *latent variables* that emerged from the factor analysis.

Table 6 here

From the above grouping, three discrete groups of variables emerged: the 'exogenous', the 'endogenous' and the 'mediators' according to their specific role in modeling and explaining student achievement (see Table 7). 'Exogenous' variables reflect the familial characteristics that affect 'endogenous' variables. Such variables are the family wealth, educational resources, educational level and occupational status of parents, possession and frequency of use various 'cultural goods', and use of out-of-school (free) time. The role of 'mediators' is also examined namely the effect of past performance in *lyceum*, time spent each day for school-work and private tuition for any school subject. These 'mediators' are affected by the 'exogenous' variables, but they also relate to various 'endogenous' variables. Our basic research model suggests that factors relating to familial characteristics and previous achievement in *lyceum* influence performance in the HE-entrance examinations, either directly, or indirectly,

through 'mediators', such as the time spend on preparation of school-work (study hours) and help provided at home for school work (study help).

Table 7 here

In a graphical form, the emerged model is the following (Graph 2):

Graph 2 here

Confirmatory Analysis

Using the *AMOS 7.0 for Windows* software, the specific causal model was tested. The following tests were used: a) the chi-square test ($X^2 = 316.050$, $df = 192$, $p < 0,001$), b) the adjusted goodness-of-fit index (AGFI = 0.957), c) the comparative-fit index (CFI = 0.977), and d) the root mean square of approximation (RMSEA = 0.027). All of the above goodness-of-fit criteria show satisfactory values for our proposed model since the AGFI and CFI indices score over 0.95 and the RMSEA quantity is below 0.05 (Broome, Knight, Joe, Simpson and Cross, 1997; Browne and Cuddeck, 1993).

Then we proceeded, with the examination of the direct and indirect effects. The effects of the 'exogenous variables' on the 'mediators' are depicted in Table 8:

Table 8 here

We can see that the latent variable 'educational and occupational status of parents' (*Parents*), as well as the variable familial educational resources (*Hedres*), positively influence the previous achievement (i.e. achievement in grades 10 and 11). Previous achievement is also negatively influenced by the out-of-school activities (*Hobby*). The latter (i.e. *Hobby*) has also a negative effect on the time spent in school-work preparation (*Study hours*). The rest of the 'exogenous' variables, especially those referring to the 'cultural capital' or the 'economic capital' (*Wealth*) of the family, do not seem to exert a significant effect on the 'mediators'.

At the same time, the model that emerged from the AMOS (see also Graph 2 above) suggests that previous achievement (*Past performance*) positively and directly influences performance in the HE-entrance examinations (*Performance*), whereas the latter is negatively affected by out-of-school activities. Variables denoting 'cultural capital', such as familial educational resources or possession of cultural goods exert a

statistically significant *indirect* effect on the dependent variable, through their influence on previous achievement (*Past performance*), whereas use of cultural goods has a direct but negative influence on performance. Finally, the 'educational and occupational status of parents' (*Parents*) positively and indirectly influences performance in the HE-entrance examinations, through its direct influence on previous achievement. All the above influences are summarized in Table 9 below.

Table 9 here

In general, the above model can be considered as highly satisfactory (in statistical, as well as in theoretical terms) regarding the achievement of students in the national HE-entrance examinations, since it explains 88.1% of the variance of the particular (dependent) variable.

Discussion

Our research is the latest and most updated attempt to construct a multivariate model that could highlight *direct* and *indirect* influences on student achievement in Greece at the dawn of the 21st century. It is the first study in years (Kontogiannopoulos-Polydorides, 1995a,b, 1996), where a nationally representative sample of upper-secondary school students was examined, regarding the influence that certain family characteristics might have on their performance in the Greek HE-entrance examinations.

Once again it becomes evident that, despite numerous attempts for educational reforms of the Greek education system in the last 30 years, especially those focusing on the transition between upper-secondary school and Higher Education (e.g. see changes in 1985, 1990-91, 1997-98 and 2006), inequalities among students, based on family background still exist.

As past research has already documented, at national (Kontogiannopoulos-Polydorides, 1995a,b, 1996) or local level (Gouvias, 1998a,b), the most significant variables related to the scoring level in the aforementioned examinations are the ones representing *previous achievement* in the upper-secondary school, but the latter is directly influenced by various *personal*, *school* and *family characteristics*.

The 'educational level' and 'occupational status' of parents represent two of the major factors affecting student performance in the HE-entrance examinations. In other words, it has been documented that children of parents with better educational

qualifications and occupational background are far more likely to succeed in tertiary education examinations than students from lower socio-economic strata.

As far as the interrelation between SES and 'cultural capital' is concerned, this study has shown that parents from advantageous social backgrounds often possess the kind of resources that may provide their offspring with those real and symbolic resources that influence their life chances in the social arena (see Ball et al. 1995; Bodovski, 2010; Flere et al., 2010; Gewirtz et al., 1995; Kao and Rutherford, 2007; Reay et al., 2005, Sullivan, 2001; Zarycki, 2007). It has also documented that the interplay between 'economic', 'cultural' and 'social capital' in shaping one's own educational and occupational 'path' is still an immensely important dimension in sociological studies of education.

The data on which this paper is based, is still under investigation and further elaboration in order to highlight more 'covert' dimensions of inequality is pending, through the use of more complex models, a reclassification of occupational strata, student groups and school locations, or even through the inclusion of more personal variables, such as 'gender' in the explanatory models. We must also bear in mind that high scoring does not necessarily imply a better place in higher education. The most important thing is *how* the students are going to be distributed in the various faculties and departments (see discussion earlier in this paper).

Lastly, the paper did not touch issues concerning the future educational trajectories of the upper-secondary school graduates, nor did it attempt to forecast their occupational prospects, something that only a large-scale longitudinal national study could achieve. However, it drew attention to a relatively sensitive issue of contemporary Greek society, which has not been examined thoroughly in the last decade in academic research, and it seems not to attract any attention (that is, funding) from national and international agencies.

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APPENDIX

Graph 1: Box plots for the GPA variables

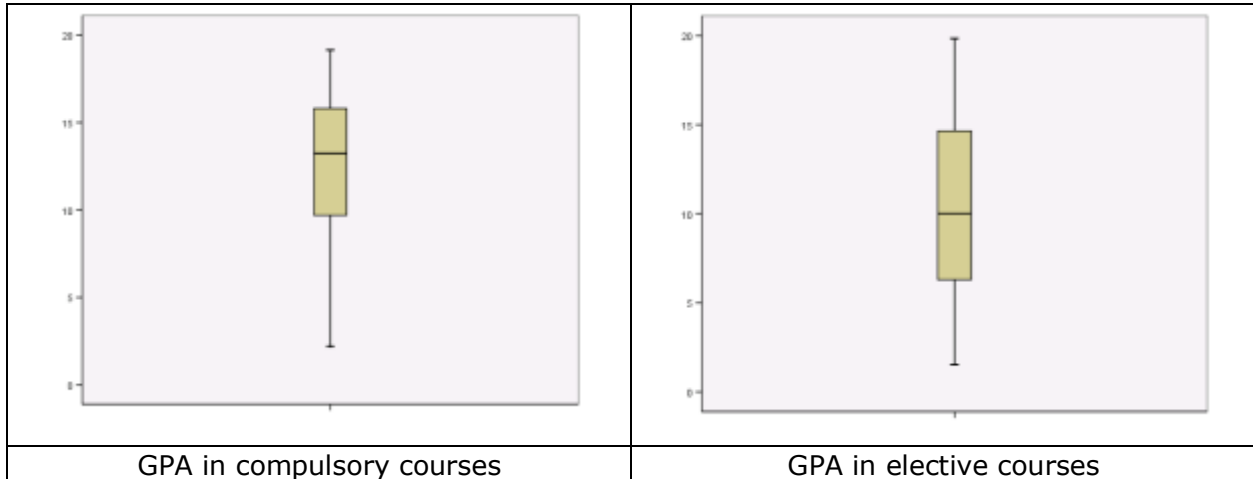


Table 1a: Descriptive statistics of student achievement at the final year of lyceum

Variable	N	Minimum	Maximum	Mean	Standard deviation	Percentiles		
						1	2	3
GPA in compulsory courses	874	2,20	19,15	12,68	3,77	9,70	13,25	15,80
GPA in elective courses	874	1,53	19,85	10,50	4,79	6,30	10,00	14,65

Table 1b: Descriptive statistics of student achievement at grades 10 and 11

Variable	N	Minimum	Maximum	Mean	Standard deviation	Percentiles		
						1	2	3
GPA in grade 10	874	9,50	20,00	15,99	2,29	14,40	16,20	17,80
GPA in grade 11	874	9,50	19,90	15,58	2,55	14,00	16,00	17,60

Table 2: Possession of resources within the home environment

Variable	Frequency (N)	Percent (%)
Internet-connection	425	48.6
Own room	473	54.1
Place to study	776	88.8
PC used for study	545	62.4
Literature books	653	74.7
Poetry books	420	48.1
Books assisting with school work	759	86.8

Table 3: Cultural activities

Activities	Never-Almost never	Rarely	Once a month	Once a week	Daily
	%	%	%	%	%
Reading literature books	33.4	37.6	16.4	7.4	5.1
Watching documentary programs in TV	16.6	34.0	20.1	24.1	5.1
Listening radio broadcasting	6.9	12.4	4.9	21.7	54.1
Meeting friends	1.1	3.3	4.9	42.1	48.5
Listening music	1.0	2.4	1.3	8.7	86.6

Table 4: Parental educational level

Parental educational level	Father		Mother	
	N	%	N	%
Some classes of elementary school	22	2.5	19	2.2
Elementary school	116	13.3	73	8.4
Junior high school (up to 9 th grade)	100	11.4	103	11.8
Lyceum (general or vocational)	215	24.6	326	37.3
Post secondary, non tertiary vocational education	129	14.8	97	11.1
Tertiary education	240	27.5	215	24.6
Postgraduate level (Master or PhD)	52	5.9	41	4.7

Table 5: Item loadings on orthogonally rotated factors (Ordinal Factor Analysis)

Variable name	Factors						
	1	2	3	4	5	6	7
GPA in compulsory courses	0,592						
GPA in elective courses	0,634						
Mother's occupation							-0,459
Books assisting with school work				0,220			
Own room				0,974			
Place to study				0,791			
PC used for study		0,903					
Internet connection		0,821					
Poetry books			0,910				
Literature books			0,799				
Number of available PC's		0,825					
Reading literature books						0,992	
Watching documentary programs in TV						0,234	
Listening radio broadcasting					0,465		
Meeting friends					0,369		
Listening music					0,734		
GPA in grade 10	0,847						
GPA in grade 11	0,996						
Father's education							0,563
Mother's education							0,868
Father's occupation							-0,022

Table 6: Items corresponding to each latent variable

Performance	GPA in compulsory courses
	GPA in elective courses
Past performance	GPA in grade 10
	GPA in grade 11
Wealth	PC used for study
	Internet connection
	Number of available PC's
Cultposs	Literature books
	Poetry books

Hedres	Own room
	Place to study
	Books assisting with school work
Hobby	Listening radio broadcasting
	Meeting friends
	Listening music
Cultuse	Reading literature books
	Watching documentary programs in TV
Parents	Father's education
	Mother's education
	Father's occupation
	Mother's occupation

Table 7: Groups of variables

Group of variables	Name of variables
Exogenous variables	Wealth
	Hedres
	Cultposs
	Cultuse
	Hobby
	Parents
Endogenous variables	Performance
	Past performance
Mediators	Study help
	Study hours
	Past performance

Graph 2: Path diagram showing the direct and indirect influences on achievement in HE-entrance examinations

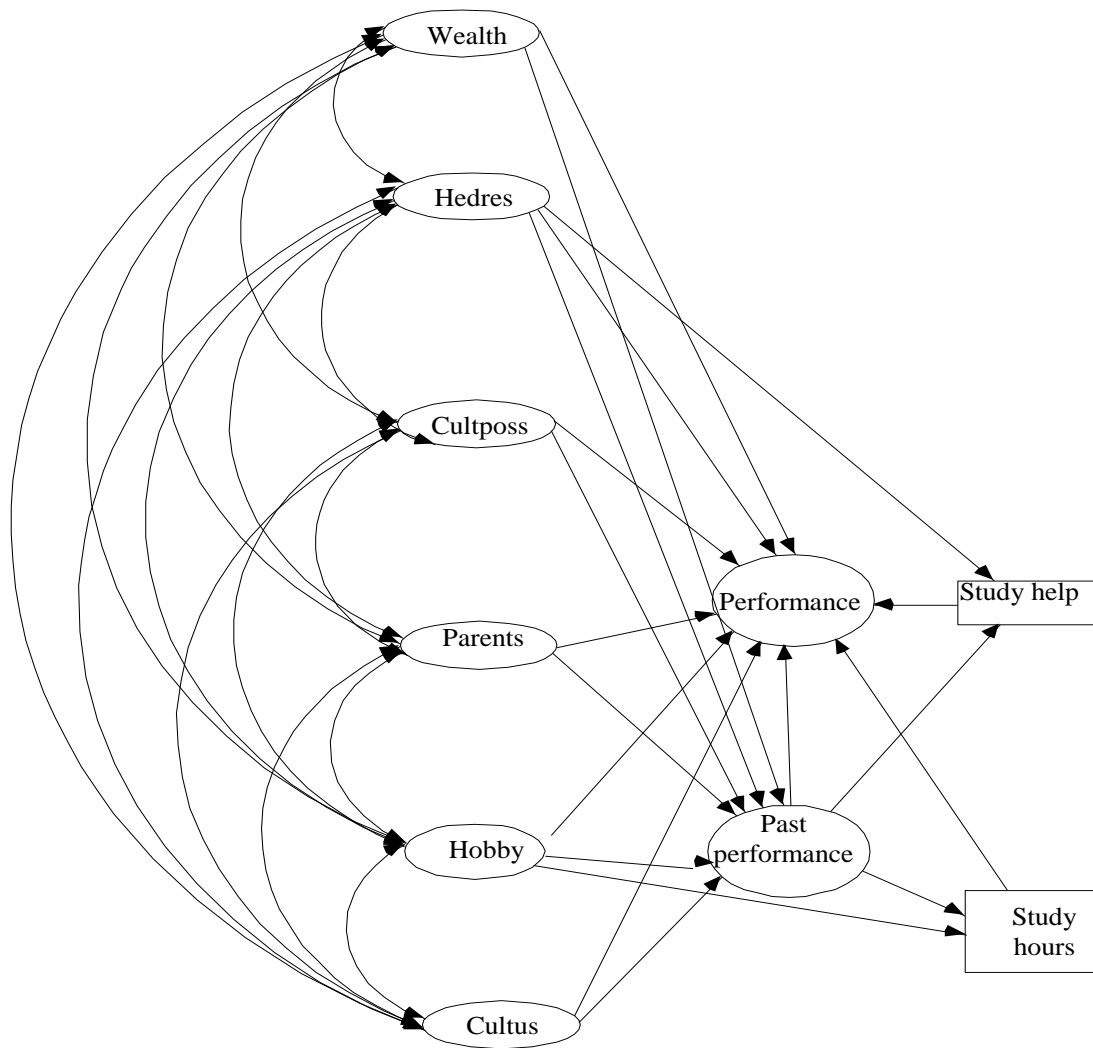


Table 8: Effects of the 'exogenous variables' on the 'mediators' of the model

			(Loadings) Estimate	p-value
Past performance	←	Cultposs	0.180	0.059
Past performance	←	Hedres	0.167	0.002
Past performance	←	Parents	0.218	0.000
Past performance	←	Wealth	-0.012	0.803
Past performance	←	Cultuse	0.111	0.245
Past performance	←	Hobby	-0.241	0.000
Study help	←	Hedres	0.195	0.000
Study help	←	Past performance	0.221	0.000
Study hours	←	Hobby	-0.222	0.000
Study hours	←	Past performance	0.367	0.000

* With bold letters are the statistically significant effects.

Table 9: Direct and Indirect effects of the 'exogenous variables' and the 'mediators' on the dependent variable (*Performance*)

			Direct	Indirect	Total#
Performance	←	Wealth	-0.057	-0.010	-0.067
Performance	←	Hedres	-0.019	0.164	0.145
Performance	←	Cultposs	0.166	0.153	0.318
Performance	←	Parents	0.091	0.186	0.276
Performance	←	Hobby	-0.214	-0.185	-0.399
Performance	←	Cultuse	-0.285	0.095	-0.190
Performance	←	Past performance	0.858	-0.009	0.849
Performance	←	Study hours	-0.093		-0.093
Performance	←	Study help	0.114		0.114

* With bold letters are the statistically significant effects.