

Factors and Processes of Educational and Social Stratification in Greece: The Role of Shadow Education

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To my Father.

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Abstract

This study examines the role of Shadow Education (SE) in the process of educational achievement in Greece, within an educational and social reproduction framework. It examines SE participation alongside a number of other SE characteristics both separately and within a series of models. The models address questions of SE's relationship to both students' background characteristics and their later achievement; their modal strategies for participating in SE, the overall role played by SE as a mechanism of educational and thus social reproduction, and the homogeneity of the effect of SE participation on students' educational achievement. In order to do so, data was collected from 1508 students in the final year of Greek Upper Secondary school students using a single stage stratified cluster sampling technique, using a mail questionnaire.

The analyses suggested that SE Participation, and Group SE Participation in particular, mediate a portion of the significant effect of differential background characteristics on students' Educational Achievement. Indeed, these effects were entirely mediated by students' SE Quality and Student Effort.

Students' modal strategies for SE participation appear to depend on what point in their academic careers they are examined. They go from mixed (i.e., both enhancement and remediation) in primary or early-secondary to purely enhancement oriented by upper-secondary education. Non-ethnically Greek students do not appear to benefit from SE participation; they also differ significantly in regards to the gender achievement gap and returns to student effort. In general, however, all students, from those most to those least

likely to participate in SE seem to reap the same benefits from participation. Further evaluation of the models examined herein, including replication, measurement modification and use of longitudinal data is recommended to further elucidate the role of SE in the educational achievement process.

1. Introduction and Statement of the Problem

A long-standing debate in Sociology and, more specifically, in Social Stratification revolves around the structure and processes of social and economic inequality. Some emphasize social mobility while others focus on social reproduction and attempt to delineate the structures and processes that lead to mobility or reproduction. All, however, emphasize the importance of education as a mechanism of social stratification.

Educational attainment (i.e., the highest level of education achieved by an individual) is among the most widely accepted criteria of social allocation. Probably for this same reason, it is among the strongest predictors of later status attainment (Blau & Duncan, 1967; Sewell, Haller, & Portes, 1969). Though generally highly valued, the importance of educational attainment as a mechanism of social selection increases as societies strive for greater efficiency and meritocracy.

In many societies, Educational Attainment depends heavily on Educational Achievement. Educational Achievement is usually defined as “performance in school”, an evaluation of the extent to which individuals are capable of reproducing the knowledge, behaviors, and codes (linguistic or otherwise) that educational institutions expect of them, and it is most often measured using students’ grades. Using this definition and measurement, educational achievement has been found to be among the strongest predictors of later educational attainment (Hurn, 1993) which, in turn, has persistently been found to be among the most important criteria for later socioeconomic attainment (Blau & Duncan, 1967; Jenks et al., 1972; Sewell et al., 1969). It is this perceived relationship which lends educational

achievement its importance in the examination of educational and social stratification: achievement dictates attainment, which in turn dictates access to higher levels of education, thereby affecting later occupational and social status.

However accurate and consistent these measurements of achievement may have been in predicting later educational attainment other measures exist. These measures, which include national entrance examination scores, may be perceived as being more closely related to educational attainment in determining access to higher education. These scores may determine not simply access to higher education, but also the school and the department a student may attend. Indeed, in many cases higher education choice is legally bound to these Examination scores.

Access to higher education in many contemporary societies is, to some extent, structured around a limited number of centrally administered critical examinations. The United States (US) has Scholastic Aptitude Tests (SATs), the United Kingdom (UK) has the General Certificate of Secondary Education (GCSE) and Advanced Levels (A Levels), Japan has Nyūgaku Shiken (Entrance Examinations), and Greece has Panhellenic National Entrance Examinations (hereafter Panhellenic Examinations), to name but a few (for a more extensive list, see Bray, 2020). Secondary educational attainment in these countries remains a question of sufficient scholastic achievement and receipt of a corresponding secondary education diploma. Entering higher education, however, depends to a far greater extent, or even exclusively in some cases, on students' performance on the aforementioned examinations. Students' eligibility to sit these examinations and/or later employ their results for applications to Higher Educational Institutions (HEI) is, of course, dependent upon successful completion of

secondary education. However, it is students' examination performance, rather than their secondary education Grade Point Averages (GPAs), which is often the primary or even sole determinant of if, and to which, HEI they will gain access. Thus, these examinations are critical factors in the determination of students' later educational, occupational and overall social positioning.

Adaptation theory proposes that the more critical these examinations become, the more both parents and students invest greater proportions of their efforts and resources on maximizing students' performance on these examinations (Alon, 2014). As the number of these critical transition points decreases, they become more crucial while the impetus to ensure higher performance increases inversely, culminating in the ultimate importance of a single set of critical transition examinations. It could be argued that, as an integral part of the educational system, preparation for these exams should be the explicit purview of schools and curricula. However, whether because schools are found (or at least perceived to be) lacking in this regard, or as a personal enhancement or remedial strategy, it is often the case that students' families turn to extracurricular assistance to enhance their children's likelihood of success.

One of the most prevalent forms of assistance employed by students and their families, especially in systems with centrally administered formal examinations, is shadow education (Baker & LeTendre, 2005; Dang & Rogers, 2008; Stevenson & Baker, 1992). Shadow education (SE) refers to the "set of educational activities outside formal schooling that are designed to improve a student's chances of successfully moving through the allocation process" (Stevenson & Baker, 1992, p. 1640). It is a remunerated, private sector initiative, conducted

outside regular school hours (Bray & Kwok, 2008). At the time, Stevenson and Baker, whose 1992 article is arguably one of the seminal works on SE (Gyori, 2020) considered it to be little more than "an exotic Japanese cultural oddity" (Baker, 2020). Nearly thirty years later, Baker (2020, p. 311) speaking to the state of SE and its future posits that "[t]he big story is, simple, if unexpected: *shadow education is inevitable, universal, and will likely continue to intensify into the foreseeable future*" (emphasis in the original).[1]

The nature of the examinations dictating entrance to HEI in the countries discussed above has remained largely unchanged over the last several decades. They are centrally administered, adhere to what Turner (1960) referred to as "contest" rules of social mobility, and are situated in societies where secondary educational outcomes affect later status attainment (through access to these examinations, if nothing else). The association between this set of characteristics of educational processes and the proliferation of SE was presented more than three decades ago by Stevenson and Baker (1992). SE nevertheless remained largely unexamined in Western contexts until recently.

Initial examinations of the phenomenon encountered a number of difficulties. Prior to the turn of the century, discourse and research regarding SE in any context were rare, as Ministries of Education and academic faculties alike eschewed dealing with the phenomenon, primarily justifying this based on their focus on formal schooling (Bray et al., 2013). This seeming institutional indifference is further exacerbated by the field's relative infancy.

[1] It is interesting to note that former Greek Minister of Education, E. Papanoutsos (1972), posited a similar future for SE, proposing that SE institutions would "multiply, as the sands in the sea, and would enter even unto the smallest settlements and the most remote of villages". This statement came shortly after a 1965 educational reform, limiting critical transition point examinations to the end of secondary education and a commensurate jump in SE participation.

Multiple definitions of what exactly constituted SE were employed, resulting in confusion over both specific terms and parameters used to study the phenomenon (Bray, 2010). SE research has been, and often still is, obstructed by the sources of data most directly related to it, which is to say students, their parents and/or families, and the SE institutions themselves -whether in the form of private tutors or SE education institutions (Bray, 2010). Students and families are often reticent in reporting SE participation, whether due to shame at employing it as a remedial strategy, or guilt for the perceived unfair advantage offered by employing it as an enhancement strategy. This perception of SE as an illegitimate or even shameful undertaking can even extend to countries where the phenomenon is ubiquitous (Dierkes, 2010). Institutions are often reluctant to report on SE practices, especially in the case of private instructors, where relevant teaching is largely unregulated and, as a result, untaxed. There is also a significant historical problem with the instruments employed to collect data on SE participation. Previous studies of SE participation and its effects have alternatively made use of instruments which only collected data on SE participation (in a binary format), only contained marginal questions regarding the phenomenon, or even struggled with the incorporation of "questions that are sufficiently precise and easily understood by the respondents" (Dierkes, 2010, p.7). The largest impediment in attempting to secure a more comprehensive understanding of SE's role in the educational process, however, may be the classical (Bray, 2006) and largely persistent (see Southgate, 2009) association of the phenomenon with Far-East Asian locales.

Studies examining the characteristics of SE and its effect on students' likelihood to attend tertiary education are prolific and persistent in East-Asia (e.g., Bray & Kwok, 2003; Kuan,

2011; Roesgaard, 2006; Stevenson & Baker, 1992; Zhang & Bray, 2015). This is largely due to the phenomenon's proliferation in the region (Southgate, 2009), broadly attributed to a common Confucian cultural heritage lauding effort and work ethic (Bray & Silova, 2006). Hong Kong is considered to be a valuable source of information for the examination of SE in western countries, since it shares Confucian values and the influence of western culture gained as a British territory (Bray & Kwok, 2003). It is only relatively recently that increasing levels of SE participation in western countries (Southgate, 2009) has led to concern for its growing proliferation and the potential ramifications thereof (Alon, 2009; Alon, 2010; Alon, 2014; Alon & Tienda, 2007; Buchmann et al., 2010a; Bray, Kobakhidze, & Suter, 2020). These concerns are exacerbated by the fact that SE appears to be among the fastest growing industries in many such western locales (Baker & LeTendre, 2005; Bray, 2007; Bray, 2020; Buchmann et al., 2010a).

The real or perceived relative novelty of SE as a subject of study impedes our understanding of both its long-term effects and their implications. The case of Greece may be useful in this respect due to its uninterrupted, historically well-established system of SE, posited to go back as far as the early 1900s (Bouzakis, 2005; see also Kassotakis & Verdis, 2013), and because it is itself a western, European society, rather than simply a receptacle of past western influence. In other words, the study of SE in Greece holds the potential to provide a significantly more socially and culturally relevant understanding of the role played by SE in western society.

The study of SE in Greece may also benefit from certain other peculiarities of the Greek educational system, including the fact that Greece lacks tuition fees for higher education.

Thus, one might expect the influence of family socioeconomic status on educational achievement and attainment in Greece to be comparatively lower than in other countries where this is not the case. However, regardless of the form it takes, SE represents a significant monetary investment on the part of students' families (Liodakis, 2010; Zambeta & Kolofusi, 2014), potentially surpassing college/university tuition in other countries. Posited to be employed primarily as an enhancement strategy (Polychronaki, 2004; see also Kassotakis & Verdis, 2013) and generally understood to provide higher returns to investment, SE seems to serve as a means of socioeconomic reproduction similar, if not more important, to that of college tuition.

There are some studies of aspects of SE in Greece (see Kassotakis & Verdis, 2013). However, the few studies that have attempted to examine it within an educational achievement context are, to various degrees, outdated, and have returned, at best, conflicting results (e.g., Kontogiannopoulou-Polydoridi, 1996; Verdis, 2002). However, percentages of students entering HEI in Greece are historically higher among students participating in SE than otherwise (Kassotakis & Verdis, 2013), and academic achievement is the sole criterion for admission to HEI in Greece. Thus, it seems that a comprehensive study of the process and factors of educational achievement, including SE, using current data, is vital to assess the role of SE as both a determinant of achievement and as a transformative mechanism of social and economic inequalities into academic difference in Greece.

2. Purpose and Significance of the Study

This study aims to examine SE's relationships with family background characteristics, previous and later achievement and, overall, its role in the educational achievement process as a factor of educational and, by extension, social, reproduction. The educational achievement process refers to a series of interconnected relationships, representing the transformation of different background characteristics into differential educational achievement, through a series of intervening personal and institutional characteristics.

The study will examine the role of SE within a comprehensive model of educational achievement, using new data collected through contemporary research. It will attempt to improve upon existing models by including variables that may have assumed importance in recent years, including several regarding SE, and by employing advanced measurement and analytical techniques. The basic research question guiding the endeavor will be "What is the role of Shadow Education in the high school educational achievement process in Greece?"

2.1 Primary Questions Examined in this Study

An examination of the role of SE within the educational achievement process brings up multiple questions. Some of the most relevant are listed below, followed by a brief exposition of some of the specific issues that may be conceptually connected to the central examination and which would be examinable within the parameters of the study.

I. What is the role of Shadow Education in the educational achievement process?

University education in Greece is tuition free, at the undergraduate and, for the most part, graduate levels. However, entering a university requires a great deal of effort from students and a significant monetary investment in SE, on the part of their families. In fact, family investment in SE in Greece is one of the highest in the EU (Zambeta & Kolofusi, 2014). Official statistics (Greek Statistics Service, 2012) placed it at approximately 3.5% of monthly household expenditures, although it has at times reached as high as 30% (Patrinos, 1992). In other words, securing a position in a university represents an investment almost equivalent to tuition in other countries. Given the perceived importance of SE for entering tertiary education and assuming that families from different socioeconomic strata are not equally willing or able to make this investment, it may be argued that SE may serve as a mechanism of educational and, thereby, social reproduction.

In order to function as a mechanism of educational reproduction SE must depend on students' background characteristics and influence students' educational achievement. To assess this, we examine the following questions:

a. Does family socioeconomic background affect SE and does SE also significantly affect educational achievement?

b. Does a major portion of the effect of social background on educational achievement go through SE?

c. Is the model in which this is examined reasonably comprehensive (i.e., does it take into account the most important factors known to affect educational achievement)?

II. What aspects of Shadow Education are required to provide a valid/reliable measure?

a. What Aspects Are Required

There is a question as to the appropriate measurement of SE participation. Previous studies have employed inconsistent measures of length of participation (Polydorides, 1981; Kontogiannopoulou-Polydoridi, 1995; 1996) or limited themselves to partial measures of the form SE took (Verdis, 2002). However, SE participation is highly nuanced and presents many finer-grained aspects, even within the same vein as those examined previously, which may offer significantly better insights to its nature. For example, Verdis (Verdis, 2002) limited his examination to a distinction between private (home) tutoring and group classes. However, there are more distinctions to be made, which may play a significant role in better describing the phenomenon. Students may take part in at least two different types of private tutoring (both referred to by the common name "*ιδιαίτερα*" [idiaitera] in Greek): private, one-to-one tutoring sessions and/or (very) small groups. These entail a difference in both cost and (at least perceived) quality of teaching. The issue of SE cohort size also arises in group classes, where there is, again, a perceived benefit to smaller class sizes.

SE participation may also differ quantitatively on at least three levels: Historical Duration, Hours per week and Number of Subjects. It may be that the effects of SE participation vary through prolonged interactions with SE practitioners. Such variations may represent significantly different monetary investments on the part of families, with some individuals participating only during the last year of high

school, while others throughout the course of secondary education. Additionally, individuals may further differentiate themselves by the number of hours per week spent in SE courses. Finally, it is important to note that not all courses offered in high school are examined in Greece's national university entrance examinations and not all students are examined on the same subjects (which is addressed later). As such, it may be important to specifically address which courses students participate in, not only as a proportion of the courses they will be examined on, but in order to assess the potential benefits of SE in one course over another (or longer participation, more hours per week etc. in a given course).

Finally, it may be important to examine whether students/families employ SE primarily as an enhancement or remedial strategy. Given how widespread the discussion on the issue seems to be, it is surprisingly difficult to locate studies that make any decisive claims on the subject. Previous studies, for example, limited to Greece (Kassotakis & Photiadou, 1996; Polychronaki, 2004) found the former to be *perceived* as true while others examining Greece in an international context (Baker et al., 2001) interpret their data to suggest the former to be true. However, the motive behind SE participation may inform its manner, extent and type, potentially altering its function. Choi (2014) presents competing theoretical models (of positive and negative selection) for interpreting patterns of treatment effect heterogeneity in SE participation.

b. Accuracy and Reliability of Measures

Shadow Education's name alone may result in the phenomenon being perceived as illegitimate or even shameful (Dierkes, 2010), leading to a certain trepidation in respondents to provide information on their participation in SE. Unlike most other countries, however, SE is an established institution in Greece. It is openly advertised, discussed and participated in. Indeed, the Greek government has, in the past, indicated its recognition of the role of SE in the educational process by making SE tuition largely tax exempt (Ta NEA, 2013). Kassotakis and Verdis (2013) even go so far as to posit that SE participation may satisfy social and psychological needs in Greek families and children.

Taking these factors into consideration, it seems likely that survey respondents will have little, if any, difficulty in providing reliable answers to questions related to SE participation. This has, in fact, been the case in previous studies of SE. Neither Polydorides (1981; Kontogiannopoulou-Polydoridi 1995; 1996), nor Katsillis (1987) reported any issues of non-response or false response in collecting information on SE's historical duration. Verdis (2002) only encountered lower response rates when asking students to specifically name the SE institutes they were attending, and even then, non-response only reached 23%. By comparison, 100% of the sample examined replied regarding the attendance of one-to-one and/or group SE (Verdis, 2002). Psacharopoulos and Papakonstantinou (2005), encountered no problem gathering data on the nature (private vs. group) and historical duration (in years) of SE, although they presented somewhat lower figures regarding its cost. Their

population consisted of university students, which is to say individuals who had successfully made the transition to tertiary education and might thus be more prone to discuss these matters with greater alacrity. Nonetheless, the difficulty they encounter regarding information on the costs of SE is not entirely unexpected, since private one-to-one tutoring income is often undeclared (and thus untaxed and therefore, strictly speaking, illegal) in Greece, resulting in a certain amount of caution in its discussion at large. This could be further exacerbated by concerns that divulging such information in a public forum could reasonably result in tutors expressing disfavor or even abandoning students.

Common knowledge places the cost of one-to-one tutoring above that of group SE, in general. However, it may be that issues of cost can still be assessed in greater detail, albeit somewhat less than ideally, through the employment of relative measures. Alongside questions directly asking respondents about the cost of their SE participation, the study's questionnaire also employs Likert-type items, asking students participating in private SE if they believe the amount of money they are paying their tutor is Exceptionally Low, Low, Below Average, Average, Above Average, High, or Exceptionally High, for their area. This approach potentially introduces issues of respondent perception and understanding of local rates, as well as being necessarily relative to local realities. At the same time, however, it could bypass concerns regarding the sensitivity of this information, especially in light of the ongoing severe fiscal crisis, during which all discussions of monetary concerns entail a certain amount of understandable tension.

Ensuring the collection of valid and reliable SE measures hasn't always been easy. Traditional measures of historical duration (see Katsillis, 1987), functioned more or less as expected, although they were judged as insufficient to comprehensively describe SE participation. Verdis' (2002) distinction between one-to-one and group tutoring, apart from being a rather coarse measure of the nature of SE, appears to have produced some unexpected results, which will be discussed at greater length later on. Nonetheless, there are other studies which have measured and examined issues of SE, both in Greece and abroad. Those presented here, with the exception of Psacharopoulos and Papakonstantinou's (2005), collected data from high-school students, in Greece, via surveys specifically geared toward the examination of educational achievement and/or attainment. They were largely successful in both the measurement of SE (to the respectively constrained extents they measured it), and its incorporation into their models. Thus, so long as care is given when addressing historically (e.g., specific SE institution names) or contextually (e.g., expenditures in light of the fiscal crisis and the particular nature of one-to-one tutoring) sensitive variables, measuring SE in Greece does not seem to present insurmountable or unsolvable problems.

III. Who gets what in Shadow Education

Secondary education in Greece is compulsory, to the end of lower secondary education (usually completed at age 15), but very nearly universal to the end of upper secondary, with high school dropout rates presently reported at between around 4.5% in the country's largest

cities and 8% in the highest risk areas, Rhodope and the Dodecanese Islands (Polychroniou, 2016). Following the Effectively Maintained Inequality hypothesis (Lucas, 2001), it would seem that families attempting to secure the best possible outcomes for their children would turn to the most readily available quantitative or qualitative advantages available to them. Participating in SE may be such an advantage, but in light of the fact that SE participation reaches between 87.4% in the 11th and 95.6% by the 12th grade (ASEFOA, 2008), such differences may be found within participation itself. Qualitative differences (real or perceived) may be secured monetarily in the form of increasingly more privatized SE, as well as in a higher ratio of more privatized to more group oriented SE. Quantitative differences may be found in the number of discrete SE courses students participate in, the number of hours of SE per week, and the overall duration of SE participation.

If some families do use SE to improve their offspring's chances, what are the characteristics of those families? Does family socioeconomic background significantly affect a comprehensively measured SE participation. In other words, does family background determine the extent of family's investment in qualitatively and quantitatively differential educational advantages for their children? If such a relationship is indicated, it may be important to examine the manner in which this occurs. Is it simply enough to examine the effect of Social Class/Socioeconomic Status on SE? Could the role of discrete indicators of social background such as parental education be more significant than occupational status, or even family income (in other words, does the perception of education as the primary mechanism of social mobility in Greece potentially overcome fiscal considerations in the necessary cost-benefit analysis leading to such an investment)? Furthermore, what is the

primary means of securing advantage? It may also be of interest to examine what families appear to perceive as the preferred advantage: qualitative or quantitative? And, within each of those, which particular track is their preferred course (e.g., longer hours, greater long-term preparation, etc.).

IV. Is Shadow Education employed primarily as an Enhancement or Remediation Strategy, in Greece?

All variables included in the examination of the educational achievement process in this study are based on previous research findings suggesting such a relationship. With rare exceptions, the roles of most of these variables are fairly well specified. There is, however, an ongoing debate as to the remedial or enhancing nature of SE within this context (see e.g., Bray Kobakhidze & Suter, 2020). This debate will be examined in this study to determine whether SE functions mainly as a mechanism of remediation or enhancement in contemporary Greece. Finally, the study examines the relationship between the various measures of SE participation and students' contemporary and future Educational Achievement.

V. Are the effects of Shadow Education participation homogeneous?

Conventional regression analyses generally estimate the average association/effect of a given characteristic (i.e., an independent variable) with a condition of interest (i.e., a dependent variable) across a sample. Such estimations are made under the assumption that the effect/association of interest is relatively homogenous (i.e., consistent) across the sample.

This assumption, however, does not always hold. Indeed, as Brand and Xie (2010, p.16) point out, “heterogeneity in response to a common treatment is a norm rather than an exception”. SE participation can be conceptualized as a treatment, that is, something which a given member of the population does or does not receive. In this light, we will estimate the average treatment effect, average treatment among the treated (i.e., those who participated in SE), and average treatment among the untreated (i.e., those who did not) to examine whether or not the effect of SE participation varies across the subsamples of those who received the treatment and the untreated (or conceptual controls). These results can also cast light on the relative effectiveness of SE participation, both established (i.e., on the treated) and theoretical (i.e., on the untreated, were they to receive treatment) and, in turn, provide useful information for educational and social policy makers.

There are, of course, many more, secondary questions which I hope to address within the bounds of this study. To properly assess the role of SE in the educational process, and the manner in and extent to which it translates background inequalities into differential academic awards, it will be included in a structural model of educational achievement. Path analysis, used to estimate and evaluate such models, is, by definition, a series of interconnected hypotheses, each of which is its own research question. Above and beyond this, there remain overarching questions of the roles of gender and ethnicity in the educational achievement process. Gender is a persistent issue in the study of Sociology of Education, including issues such as the effect of family composition, and educational levels (Buchmann & DiPrete, 2006) and, presumably, issues such as track selection, as a precursor to later gender segregation in higher education noted by Barone (2011). Ethnicity, largely unavailable for any study in

Greece until the mid-to-late 1990s, recently presented tentative indications of being a significant factor in defining an individual's educational experience, establishing the need for further, more rigorous research (Katsillis, 2015). Furthermore, Buchmann et al. (2008) propose examining these two variables together, positing that gender inequalities may enhance other forms of inequality, including though not limited to, ethnic.

In short, the quality, and by extension effectiveness, of SE largely depends on the family's ability and willingness to invest in it. Thus, greater understanding of its role in the educational achievement process enhances our theoretical understanding of the roles both it and education play in the social selection process, and the overall state of social stratification and inequality in Greece. From a practical standpoint, it may be of great import to educational practitioners, curriculum developers and educational and social policy makers.

3. Review of Literature

3.1 Introduction

This chapter contains a review of the relevant literature. It begins with a definition of the concept/construct, moves on to establish the significance of the general field of study, and then to identify its relevance. The bulk of the chapter attempts to critically present the chronological thematic development of relevant international Shadow Education (SE) research. It then moves on to examine the SE research within the specific case of Greece, where it also briefly presents historic and contemporary information regarding relevant Greek educational and social realities. The chapter closes with an examination of the viability of SE as a major mechanism of social and educational reproduction, and as an expression of Effectively Maintained Inequality.

3.2 Defining Shadow Education

Shadow Education (SE) is a theoretical construct, initially defined as "set of educational activities outside formal schooling that are designed to improve a student's chances of successfully moving through the allocation process" (Stevenson & Baker, 1992, p. 1640). This initial definition was later amended by Bray (1999) to specifically emphasize its nature as a private sector initiative, and later further revised by Bray and Kwok (2003) as one conducted outside of the regular hours of formal education and predominantly outside of school grounds. Bray (2010) further argued for the need to disambiguate unremunerated tutoring (e.g., extra support from teachers or relatives) from that of SE. This was done, among other

reasons, in order to coincide more strictly with Stevenson and Baker's (1992) firm rooting of SE in the private sector. Buchmann et al. (2010a) argued that the definition of SE should remain in the spirit of Stevenson and Baker's (1992), but also recognize and incorporate the specific context in which it is being studied. Thus, based on the blurring boundaries between public and private sector educational institutions in the U.S. (which their study dealt with), they broadened the definition to allow for certain forms of test preparation undertaken by schools outside of regular school hours (Buchmann et al., 2010a).

In response to this effort to broaden its scope, Grodsky (2010) proposed a stricter adherence to initial definitions of SE, arguing that this expansion fundamentally changes the construct. Buchmann et al. (2010b) in turn, discuss the recognition and incorporation of two potential types of test preparation that may take place within school grounds: remunerated preparation offered by private companies which have secured the use of school facilities, and extracurricular but school-regulated tutorials. Conceptually, they agreed, there seems to be little difference between remunerated, private tutoring conducted within and outside of school premises. School-regulated tutorials, however, likely bear notable differences both conceptual and practical from both of these and, more importantly, from Stevenson and Baker's (1992) initial definition.

There is obvious appeal in their goal to "extend the utility of a general theoretical concept developed in other national contexts" (Buchmann et al., 2010b, p. 484), and generally in broadening definitions to suit specific contexts, but in practice this can introduce a series of issues. Definitional standardization offers greater ease of both comparison (Bray, 2006) and discourse in general. Both forms of extracurricular tutoring discussed by Buchmann et al.

(2010b) may be seen as a tacit acceptance of a failure on the part of the official educational system to explicitly provide what it implicitly demands of all students - in this case, the substantive knowledge or methodological understanding to successfully maneuver through the educational selection and allocation process. However, it is entirely possible that they function in distinct manners within the educational process (see Kuan, 2011), and although both should be examined, it is predominantly the unregulated role of for-profit private endeavors that we are interested in. The latter, with its stricter, more classical definition, also coincides with the generally accepted perception of SE in Greece. By remaining largely contextually insensitive, it may also provide grounds for extrapolation to a much broader set of locales.

In short, the most functional definition of SE appears to be very close to the original definition proposed by Stevenson and Baker (1992) as it was later fine-tuned by Bray (1999, 2010) and Bray and Kwok (2003). This would make SE *the set of remunerated, private sector, extracurricular activities specifically aimed at helping students successfully maneuver the educational allocation process*.

There are, historically, a number of issues that have arisen surrounding several key terms relating to and employed for the definition of SE (Zhang & Bray, 2020). This is true not only in cross-national comparisons but also within the English speaking world. In this context, it seems prudent to explicitly limit the meaning of certain expressions used both within and without the above definition. The term “private” is employed to specifically mean *not conducted in the public space* and supplemented through the inclusion of the phrase “remunerated” to clarify its for-profit character. The related term “supplementary”, when

employed in this study, attempts to convey both the additional tutelage and expanded nature (in regard to content, curriculum, and focus) of the undertaking. Finally, the term "tutoring" is used to refer to *teaching*, albeit with the general understanding of nearly universally smaller cohort/class sizes than students would expect to encounter in schools.

With this definition extracurricular activities involving sports activities, or in-school study groups and test preparation are not considered SE, which was one of Grodsky's (2010) main concerns. These undertakings may retain aspects of differential access and rewards. However, by virtue of contributing indirectly, if at all, to helping students successfully maneuver the educational allocation process, and being neither academic nor supplementary in nature (Bray, 2010), they seem to fall outside the initial concept proposed and described by Stevenson and Baker (1992). It may be, as Buchmann et al. (2010b) argue that this broader definition is necessary in the U.S., in order to capture the nuances of educational realities such as privately funded, largely unregulated charter schools, private schools themselves, or even where schools allow private firms to conduct classes for a fee.

3.3 A Brief History of the International Study of Shadow Education

Any historical review necessarily touches on issues of where, when and why. Since the inception of the formalized concept of systematic, private, extracurricular tutoring, the study of SE stretches almost uninterruptedly from the early 1990s to the present day. For the majority of this period, research on SE heavily favors East-Asian locales[2], where studies

[2] Bray (1999) notably bucks this trend, expanding his research to examine locales including, though not limited to Egypt, Mauritius, Malta, and Bangladesh.

examining the characteristics of SE and its effect on students' likelihood to attend tertiary education are prolific and persistent. This tendency towards regional exclusivity is somewhat ameliorated in recent years, as researchers and others have begun to recognize the phenomenon's proliferation in and potential impact on Western societies but also on a global stage (Gyori, 2020). The question of why is somewhat more complex; it arguably requires a deeper understanding of the characteristics of SE participation, participants' personal characteristics, the social context in which participation takes place, the reasoning behind participation, and its perceived (and recorded) results.

3.3.1 Aspects of Shadow Education

Prior to 2006, operational definitions of SE typologies in the Far-East remained almost universally basic, with the rare exception[3], at best differentiating between one-to-one and group tuition. Roesgaard (2006) argued that this approach was insufficient, placing specific emphasis on the heterogeneous nature of group SE classes (for which the Japanese term is: *juku*) and the need for clarification and classification. As such, she emphasized the need for greater discussion and study of the phenomenon, proposing internal differentiation based on SE nature (competitive vs. nurturing), whether it focused on entrance exams vs. schoolwork, by the strength of correspondence to regular schooling, students' academic grouping, the teaching materials employed, and various administrative characteristics (including admission policies and means of advertising). Roesgaard's work also included a limited number of case

[3] One of the more noteworthy deviations from this trend can be found in Bray's (1999) discussion of full-class teaching in Cambodia and other models.

studies within *juku* (Roesgaard, 2006) and a discussion of both the role of group SE in educational policy and the effect of educational policy on group SE. Dierkes (2006) criticized the former for largely reproducing the institutions' perceptions of themselves. He was generally a proponent of Roesgaard's classification scheme, however, arguing that, simply by virtue of contributing to the limited academic discourse dealing with the subject, Roesgaard made a significant contribution to the field (Dierkes, 2006). Finally, throughout her work on the subject, Roesgaard (2006) makes a strong case for focusing on/studying the monetary costs associated with SE attendance and their role in social stratification in Japan. In short, Roesgaard (2006) presented a compelling case for the importance of finer nuance in the examination of SE institutions, their role in social stratification, and their interactions with educational policy.

Despite this, SE is still largely operationalized in only the simplest terms (i.e., whether one participates or not) and usually no more comprehensively than whether one undertakes one-to-one or group tutoring, if that. These findings, however, indicate significant heterogeneity within SE. Thus, we can argue that ignoring SE's internal variety may impede not only our understanding of the phenomenon itself but also of both the determinants and results of participation therein.

3.3.2 Who Attends Shadow Education?

The most commonly examined aspect of SE to date is the set of factors associated with the likelihood of participation, inextricably linking who attends with why someone participates. These factors must be seen through the various settings in and perspectives from which they

were examined to attempt to comprehend SE's complexity. Therefore, while it appears that Marimuthu et al. (1991) coined the term "shadow educational system" (p. iv) to describe the extensive system of out-of-school private tutoring in Malaysia, it was Stevenson and Baker (1992) who presented what is considered to be the seminal work in the field, defining and undertaking a fairly exhaustive examination of the role of SE in students' transition to university in Japan[4]. They proposed a set of three distinct characteristics of processes of educational allocation, which should result in the propagation of SE:

> "First, and most important, is the use of formal examinations-particularly centrally administered examinations. Second, shadow education flourishes if schooling uses "contest rules" instead of "sponsorship rules" (Turner, 1960). And third, shadow education is prevalent when there are tight linkages between the outcomes of educational allocation in elementary and secondary schooling and future educational opportunities, occupations, or general social status." (Stevenson & Baker, 1992, p. 1640)

This is significant, not only because it provides a fundamental set of conditions to predispose researchers to the reasons for the existence of SE in a given country, but also because these three conditions in fact did exist not only in Greece, but also in a number of other Western countries. Stevenson and Baker's (1992) description of Japan's educational system, formal and informal, also indicated several other commonalities with those of Greece in relation to the 'who' and 'why' of SE. These include students' extensive use of both private (one-to-one) tutors (*kateikyōshi,* 家庭教師) and (group) after-school classes (*gakushū juku,* 学習塾 or more commonly simply *juku,* 塾) as well as the extensive "variation in the atmosphere and

[4] This is in no way meant to minimize the work of Marimuthu et al. (1991). Their extensive research coined descriptive and engaging terminology and primed a new field of study. While the "seminal" nature of Stevenson and Baker's (1992) work is largely undeniable, it is worth remembering that it may also be largely due to the vehicle of its distribution providing substantially wider availability, especially before the internet significantly enhanced availability from all sources and in all locales.

demands" (p. 1644) placed on the latter. Private tutoring firms conducted practice (literally mock) examinations (*mogi shinken,* 模擬 真剣), which in Greece are administered by both one-to-one and group tutors. They also described the practice of students who had not succeeded in procuring a position in a HEI (*ronin,* ロニン) to undertake full-time preparation for entrance examinations following high school. This practice is also employed by Greek students who have either failed to procure a position at their university/department of choice or at any at all but is admittedly somewhat ameliorated by the fact that students re-applying for a position in higher education could, depending on the educational policy in place at the time, retain their Panhellenic Examination grades on one or more courses. Finally, the phenomenon of SE in Japan (as in Greece) was not hidden but rather is a large, open and institutionalized enterprise.

Stevenson and Baker's (1992) study also indicated that, *ceteris paribus*, students with higher family income, higher parental education, and who lived in cities were more likely to attend SE. Male students were more likely to attend group tutorials, while female students were more likely to receive one-to-one tutoring. Participation in SE, on the other hand, seemed to succeed in its task by significantly increasing students' odds of attending university, net of background factors. In later expositions on the nature, scale, determinants and potential results of SE participation in Far-Eastern locales, Bray (2001; see also Salili, 2005) cited cultural, educational and economic factors as being among the most important determinants of the SE's scale, nature and geographic spread. He placed special emphasis, for example, on the influence of Confucian traditions on effort and work ethic as a fundamental explanation for the proliferation of SE in the region (Bray, 2001), while in Western (i.e., European and

North American) countries, more emphasis is placed on ability (Stevenson & Stigler, 1992; Rohlen & LeTendre, 1996; Salili, 1999).

It is worth noting that this distinction is, to some extent, an over-simplification. Both "Far-East" and "Western" contexts ignore a degree of internal heterogeneity. A case could be made for broader Confucian values influencing Chinese and Korean population (Zhang & Bray, 2020). Japanese culture and, by extension, the local motivation for SE participation, could be argued to be more strongly motivated by effort alone –as evidenced, for example, by a belief in the causal relationship between effort and educational achievement instilled in Japanese students (Takeuchi, 1997). Bray et al. (2015), moreover, divide Europe into four quadrants (North, South, East, and West), each of which has differing levels of development and acceptance of SE. These are also not the only regions where SE manifests as a phenomenon[5]. They are, however, the most extensively researched (East-Asian locales substantially moreso than European or American) and arguably represent the most common division for contrast or comparison. And, while there is an emerging bibliography expanding our knowledge of the phenomenon into other countries and regions, it remains functionally nascent. As such, this study perpetuates these broad groupings, with hopes that future comparisons can be made on a more granular level, across a richer range of locales.

Baker et al. (2001) went on to emphasize the importance of understanding the SE phenomenon in terms of participation, by proposing that "the global use of outside-schooling learning activities represents a deeper theoretical issue concerning the incorporation of

[5] Foondun (2002, as cited in Bray et al, 2015), for example, provides evidence of the existence of SE in Mauritius as early as 1901.

schooling into the social structure of modern societies throughout the world" (p.1). Their study indicated that the decision to participate in SE was informed by student characteristics such as family SES and gender. However, the mode and likelihood of SE participation was largely affected by previous achievement, with low achieving students employing what they defined as remedial SE to a much higher extent than high achievers who generally employed SE as an enhancement strategy (Baker et al., 2001).

Davies (2004; as cited in Bray, 2006) points out that for many parents investing in SE is a form of 'intensive parenting', which is generally observed in high-income societies. In low-income societies (e.g., Cambodia) the educational mechanism places unavoidable demands on parents, with teachers providing private tutoring above and beyond their official teaching. Both high- and low-income families, however, often engage in cost estimations, in order to determine whether or not their children can and will participate in SE.

In one of the small number of studies of SE in a Western locale, Ireson and Rushforth (2004, see also Ireson & Rushforth, 2011) examined the case of the UK. They found that, by the end of compulsory secondary education, on average, almost one in three British students had, at some point, a private tutor. It is important to note that the prevalence of SE participation varied greatly between schools, ranging from 0% to 59% in primary and 6% to 65% in secondary schools (Ireson & Rushforth, 2004). Not surprisingly (see Ireson, 2004), Ireson and Rushforth (2005) found that SE participation in the UK was dependent on family socioeconomic background, with less disadvantaged, highly educated parents, and parents with high occupational status more likely to invest in private tutoring. Interestingly, Ireson and Rushforth (2014) later reported that economic considerations were among the most

prevalent factors prohibiting British parents procuring SE, reinforcing their earlier finding. They also (Ireson & Rushforth, 2005) found significant differences in the likelihood of SE participation based on ethnicity. Pupils identifying as "White" outnumbered all other ethnicities combined by a better than a two-to-one ratio. Interestingly, prior academic ability seemingly made no difference in the decision to secure tutoring. Remarkably, when asked about their perception of SE, UK parents responded that they had "fully accepted that private tutoring was part of their parental role and duty" (Ireson & Rushforth 2005, p. 8). They saw it as a necessary and natural part of the educational process (see also Ireson and Rushforth, 2011). Students' responses in relation to SE, although varying by age and grade, were generally positive, and, while pupils were aware of drawbacks of SE, including eating into spare time and generating more work for them to do, still weighed in favor of the benefits.

Southgate (2009) focused her research on an examination of the determinants of Shadow Education participation, in a cross-national framework. She found that in most countries, higher family SES and social class resulted in a greater likelihood of SE participation. Despite Greece having the highest participation in SE, measured in number of hours per week, of all countries examined, there were marked commonalities with other nations, including the UK. In both countries, female students with higher personal and/or parental educational expectations and more "cultural" possessions, showed better than even odds of participating in SE. Higher SES families were 2.5 and almost 3.2 times as likely to participate in SE in Greece and the UK, respectively.

Southgate (2009) goes on to present the strong regional nature of SE study, which is also persistent and prolific in East-Asia and is largely attributed to the phenomenon's abundance

in the region. However, SE participation has recently grown in Western countries, leading to concern for the phenomenon's growing proliferation there and its potential ramifications. Alon (2009) noted that socially privileged groups in the U.S. attempt to shape post-secondary admissions criteria in their favor through heavy involvement in their children's tracking placement (see also Lareau & Horvat, 1999 and Massey et al., 2000) but also through the use of private classes and tutors. The latter, she argues, by virtue of their fiscally exclusive nature are differentially accessible depending on social class background and thus act as a mechanism for the transmission of privilege (Alon, 2010). This is further exacerbated by the extensive reliance of HEIs on Standardized Achievement Test (SAT) scores in the educational transition from secondary to tertiary education in the U.S. (Alon, 2009; Alon & Tienda, 2007), resulting in parents, who could afford to, investing in better preparation strategies for their children (Alon, 2014).

Looking at participation related difference between East and West, Zhang and Bray (2015) suggested that there is a systemic difference in the demand for SE between East-Asian and Western countries, with the prior stressing effort more than ability, and the latter depending on increased social competition and the existence of high-stakes examinations. However, despite these cultural differences, it is important to note that the latter conditions also exist in most East-Asian locales, as well. They point out that China, for example, has both senior high school entrance examinations (*Zhongkao,* 中考) and national college entrance examinations (*Gaokao,* 高考), and *de facto* societal competition based on population density. As a result, while emphasis on effort may enhance SE's significance, it seems unclear to what extent the societal level motives for SE participation can truly be differentiated between East

and West. Regardless, on the individual level, they found that high-achieving students were more likely to employ SE as an enhancement strategy, to maintain a competitive advantage against their classmates or even to supplement their formal education with knowledge not available from mainstream curricula. Low-achievers, on the other hand, were more likely to employ SE as a remedial strategy, in an attempt to keep up with their peers. Zhang and Bray (2015) posited that this conceptual differentiation in participation strategies may indicate SE's role in the perpetuation and increase of achievement inequalities between the two groups.

Within China, Zhang and Bray (2015) dealt extensively with issues of regional participation differences. They found that, although participation was widespread in both prosperous and less developed areas, there was a quantitative difference between various areas, which they attributed to interactions between location and family socioeconomic backgrounds. Gender, family SES (primarily income), and peer/societal influences/expectations affected the likelihood of SE participation via their effect on students' educational and occupational expectations.

Choi and Park (2016) took this consideration one step further, eschewing the general perception that the effects of SE remain consistent across the student body. Their analysis showed significant heterogeneity in the effect of participation intensity and indicated the potential for even stronger differentiation when also taking into account qualitative variations. Likelihood for SE participation was dictated by a number of well-established factors, including family socioeconomic background, demographic characteristics (e.g., gender and sibling density), social-psychological (including students' and parents' educational

expectations), educational (previous achievement) and institutional factors (including school locations and composition). As one might expect, students more advantaged in these respects showed a higher propensity for SE participation. However, students with a lower propensity for SE participation showed a much greater benefit from intensive SE than their more-likely-to-participate counterparts, indicating that SE can apparently also function to reduce educational inequality (Choi & Park, 2016). In short, it seems that, on the individual level, SE participation is largely dictated by much the same set of characteristics and factors classically associated with the study of educational achievement and attainment.

3.3.3 Societal Level Determinants of Shadow Education

While examining broader patterns of SE participation, Bray and Silova (2006) re-emphasized and reaffirmed the importance of societal level determinants, that is, the cultural, economic and educational factors in SE participation and proliferation. From an economic standpoint, they stressed the role of salary differentials between well- and poorly-educated individuals in SE participation. They propose several ways in which characteristics of educational systems may affect SE participation, but argue most strongly in favor of the existence of high-stake decision points, usually in the form of examinations (see also Baker & LeTendre, 2005; Bray & Kwok, 2003; Stevenson & Baker, 1992; Tansel & Bircan, 2006).

Buchmann et al. (2010a) argued that these strategies result in a higher demand for shadow education (see also Byun & Park, 2012). The importance of SE, they posited, was founded on its ability to provide a competitive edge in entrance to tertiary education, through increasing SAT scores, which, while only one factor, are potentially the most significant of the criteria

for admission to HEI in the US (see also Stevenson & Baker, 1992; Buchmann, 2002; Bray & Kwok, 2003). Based on reasoning originally proposed by Buchmann (2002), Buchmann et al. (2010a) suggest that SE activities in the U.S. depend both separately and conjointly (Buchmann et al., 2010b) on parental income and education (see also Bray & Silova, 2006). They argue strongly for the differential nature of the associations of resources and knowledge with SE participation, going so far as to separately include both of these "overlapping and reinforcing" (Buchmann et al., 2010a, p. 438) predictors, in hopes of disentangling their effects, thus better clarifying the pertinent processes of social stratification dependent on them. This is somewhat borne out, insofar as their findings indicate that, although family SES does affect SE participation, the roles of parental income and education differ, with the latter differentially affecting SE participation based on students' previous achievement. Their examination indicated that SE helps delineate the role of family socioeconomic background both inside and outside the school. Between the findings of Buchmann et al. (2010a; 2010b) and Alon (2010), it appears that students and their parents may undertake a form of cost-benefit analysis when determining which test preparation strategies to use and to what extent, in order to maximize their potential test successes. Alon (2010) also alludes to the possibility that underlying parental and student attitudes toward SE may significantly affect both access to it and its later effects. This belief is further supported by Dierkes' (2010) proposition that social pressure also influences parent and student decisions to attend SE. Perhaps more interestingly, as Dierkes (2010) argues, the effects of parental education and income differ by group characteristics in such a way as to propagate the persistent racial gap in SE participation strategies. In a similar vein, Alon (2010) finds great racial disparity in SE

method selection, and specifically points to the interaction of socioeconomic and racial characteristics as defining SE participation strategies.

In examining societal determinants of SE, Byun and Park (2012) expanded on Buchmann et al.'s (2010a) research by addressing the potential disparities that ethnic variety within studied groups may introduce into the effect of shadow education on achievement. Byun and Park (2012) specifically focused on the differences, cultural or otherwise, between the various component groups making up "East Asian American" students in terms of both the prevalence and effect of SE. However, even when accounting for a number of variables regularly associated with race/ethnicity, they found a persistent, significant, positive effect of commercial test preparation on achievement. They posited that efforts to collect details of SE activities could be useful in investigating the manner in which it mediates racial/ethnic and socioeconomic inequalities in educational outcomes (Byun & Park, 2012).

Notwithstanding the aforementioned, Mori and Baker (2010) examine the existence and perpetuation of SE as an extension of the premise that "formal education as a social institution *constructs* significant portions of modern society" (p. 40 emphasis in original). They argue that the "education culture of a schooled society" is fundamentally to blame for the production of SE, while this culture's globalization and intensification is responsible for its spread towards universality. Following trends set by other resources and practices that significantly affected educational achievement, Mori and Baker go on to posit that SE will likely also be absorbed into educational culture. In short, they believed it was only a matter of time before mass SE became "a legitimate part of education itself" (Mori & Baker, 2010, p. 46).

3.3.4 Types of Shadow Education

The typology of SE is another facet of the construct that provides insight into the phenomenon. Initially, Bray (1999) noted that the most prolific and important forms of SE seemed to be those coinciding with and regarding the transition between secondary and tertiary education. In fact, this work inspired Baker et al. (2001) to point out the need to "appreciate the dimensions and potential impact on formal instruction and management of students and curricula (see also Bray, 1999)" (p. 12). More importantly, though, Bray (1999) noted that different groups of students made use of SE for different reasons, that is, low-achieving students may employ SE for remedial purposes, while high-achieving students may do so for enhancement purposes[6].

Expanding upon this finding, Southgate (2009) proposed two discrete theories to explain SE participation: one modal and one based on governmental educational expenditures. The modal theory is decomposed into the previously presented enrichment and remediation approaches. Both modal uses are based on Becker's (1964, cited in Southgate, 2009) human capital theory and the contemporary importance of secondary education. Southgate's interpretation of enhancement theory postulates that parents of high-achieving students perceive schools as failing to provide sufficient resources to compete with other, like, students. Thus, SE is employed to provide such students with an advantage. Remedial use suggests that the human capital required by "failing or struggling students" (Southgate, 2009,

[6] Later studies (e.g., Bray, 2001; Bray & Kwok, 2003; Bray, Kobakhidze & Kwo, 2020) presented further, context specific reasoning behind students' motivations for electing to attend SE, which include various forms of school inefficiency, their more extensive coverage of relevant material, greater repetition of subject matter, the perceived beneficial nature of excess pressure to excel, and specifically to prepare for critical transition point examinations.

p. 84) to succeed in the public educational system is not provided internally, forcing students to seek external support. The national educational expenditure theory, arguably a specific expression of the remedial modal theory, proposes that SE participation is inversely proportional to national expenditures on education (see also Baker et al., 2001). Southgate (2009), puts forward the argument that, "Nations with low educational expenditures have limited resources which are distributed across schools leaving some students requiring more resources than schools can offer" (p. 85)[7]. As a result, she maintains that SE participation increases as students seek education outside formal channels, differentiating this from the modal theories by positing that demand, in these cases, is driven not only by students but also by educators.

Bray and Kobakhidze (2014) argue that by catering to ever-increasing societal needs for higher achievement, SE maintains both its remedial and enhancement roles. In addition, they point to the apparent emergence of a tertiary function, where SE transitions from supplementary to formal education to being an outright substitute of it as, for example, in Turkey, Azerbaijan, and a few other countries. Interestingly, on the face of things, there does not appear to be any significant conceptual departure from the norm in the Turkish definition of SE. Erbas, Ince and Kaya (2015) briefly discuss SE participation in Turkey in a broader study of Mathematics education, noting that SE courses in Turkey consist primarily of cram schools, called *dershanes*. These cram schools attempt to prepare students for standardized tests and

[7] One could also argue that this is not solely the purview of countries with low (or at least lower than average) educational expenditures, but rather the perception that the educational resources allotted to a given child are insufficient. This interpretation places the burden of decision on the level of the student or, more likely, the family –although from a quantitative standpoint, an examination of how widespread such beliefs are, across a number of locales could lend credence to (or remove credibility from) its continued validity on a national level.

focus on the solution of multiple-choice questions, with subjects depending on their intended field of study, including Turkish language, various mathematical disciplines, history, geography and philosophy (Erbas et al., 2015). As one might expect, based on proximity alone, there are both commonalities and differences between the cases of Turkey and Greece which, while undoubtedly interesting, are arguably beyond the purview of this study.

3.3.5 Gender and Shadow Education

Regardless of the educational system in which SE manifests itself, estimations of both the determinants and results of SE participation are also commonly dependent considerations other than measures of socioeconomic status, the most common historical example of which is student gender (see Stevenson & Baker, 1992; Buchmann, 2002), possibly as a result of persistent gender stereotypes regarding job prospects or household roles. Interestingly, the effects of gender on students' proclivity towards SE appear to be highly contextual. Stevenson and Baker (1992), for instance, find that gender influences the type (one-to-one or group) of SE students are more likely to select, while Ireson and Rushforth (2005), who examined its effect on only one type (one-to-one tutoring) found that it played no role whatsoever. It is possibly for these reasons that Buchmann et al. (2008) approach SE participation through the lens of gender related educational inequalities, in the form of longstanding stereotypes and norms and their influence on the achievement gap. They argue, for example, that female students generally show higher achievement in secondary education (Buchmann et al., 2008), a fact which shows few if any returns, until they enter tertiary education, where its benefits manifest as a significant positive relationship with the likelihood of college completion

(Buchmann & DiPrete, 2006). However, historical data indicates that, despite their higher overall achievement (i.e., grades) in secondary education, female students lag behind their male counterparts in test scores (Duckworth & Seligman, 2006). In fact, Buchmann et al. (2008) posited that the growing emphasis on standardized testing in the US could result in a generally increased demand for SE, which could in turn widen the country's existing socioeconomic achievement gap.

On the other hand, since SE is widely employed in order to secure better test results, it may act as a viable means of closing the gender achievement gap (see also Southgate, 2009). This could in turn alter gender specific considerations (see also Bray, 2006; Buchmann, 2002) affecting parental and student educational and occupational expectations (see Barone, 2011) and, by extension, the steps they elect to take to realize them, including greater SE participation.

3.3.6 The Effects of Shadow Education

Dang and Rodgers (2008) warn that only equating SE with increasing inequality may be shortsighted. They argue that, while SE is employed as a means of securing student performance advantages, removing it from the educational process would likely only result in a redirection of the related funds to other means. Furthermore, since it is not restricted to wealthier households, it may act as a means of mobility as well, allowing students from less affluent backgrounds to compete with their more well-to-do counterparts (Dang & Rodgers, 2008). In fact, under relatively ideal circumstances, they found that SE could increase the welfare of both individual households and society at large.

Interestingly, despite finding no association between national levels of SE use and national mathematics achievement levels, Baker et al. (2001) propose that, in systems with heavy, systematic use of SE, a family's ability to invest in large amounts of SE could exacerbate achievement outcomes (see also Stevenson & Baker, 1992). In a study of SE in Hong Kong, Bray and Kwok (2003) found indications that it propagated or in fact even exacerbated existing social inequalities, and could even "interfere in educational processes in mainstream classes" (p. 611). They found that social pressure often resulted in parents feeling pressured to send their children to SE, to avoid the resulting deficit they would otherwise incur, relevant to classmates attending such courses. Despite this, as many as 11% of Hong Kong students did not participate in SE, because they said it was unaffordable (Bray & Kwok, 2003).

Bray and Kwok (2003) argued that the differences between Eastern and Western philosophies explain many of the variations in the perceived role of SE in educational success. Thus, despite, or perhaps because of, its near-universality, (with some studies placing student participation anywhere from approximately 73% to 96% in parts of East Asia), SE often had negative side-effects. They included, but were not limited to, decreases in student motivation, the distortion of school curricula, and even potential impacts on social stability, with the latter evident in strongly polarized economies.

Kuan (2011) examined the effect of group SE on Mathematics performance in Taiwan, noting the importance of factors such as personal effort, study habits, and family background. He proposed that the extended structured environment offered by SE should universally benefit participating students. Based on the findings of Dominique and Briggs (2009), Kuan (2011) posited that benefits might differ based on students' previous achievement and family

socioeconomic background. Within this framework, he stressed the reasonable expectation of SE participation across the entire achievement gamut, since even the potentially minimal returns to top-achievers could mean the difference between acceptance and rejection to a university or academic program of their choice. Examining the case of Hong Kong, Bray (2013) found that SE represented a significant time investment and a financial burden for the majority of students across secondary education. However, these same students also felt that SE had a positive effect on their examination grades, revision skills, school performance, learning strategies and testing confidence.

3.3.7 The Global Spread of Shadow Education

One of the most noteworthy contributions to the international study of SE may be found in the argument for employing Hong Kong as a valuable source for the examination of SE in Western countries, due to past British social and cultural influence (Bray & Kwok, 2003). Despite general Western inaction in the study of SE at the time, Bray argued that, where it wasn't already a widespread phenomenon, SE was, even then, gaining ground as a result of "a worldwide shift towards the marketization of education and reduced government control" (2001, p. 365). Indications of its fast growth persisted in other regions of the world, including Africa, Europe and North America (Bray, 2006). Bray (2006), in his continued examination of the phenomenon, eventually confirmed his earlier hypothesis that SE resonates with high and low achievers alike, offering a competitive edge to the former and a greater likelihood of success to the latter. He would also expand upon Stevenson and Baker's (1992) earlier finding

to indicate that family background characteristics affected not only participation in SE, but also in both its quality and quantity.

Bray (2013) suggests that the existence of SE is likely as old as formal schooling. Initially, he argues, it was almost exclusively the province of prosperous families but that in recent years the phenomenon has become so common in certain areas "that it is perceived as a natural element of the lives of students and their families" (Bray, 2013, p. 27). In fact, it has become a widespread practice across most of the modern world, including South Asia, Southern Europe, and North Africa and, to a lesser, though growing, extent, in Sub-Saharan Africa, Western and Northern Europe and both North and South America. Commonly referred to as "private tutoring" in countries where English is the official language, SE and some of its typologies appear and are known by many names around the world; "repetitorsvo" in Russia for tutoring in general, "hagwon" in South Korea and "buxiban" in Taiwan for Group SE (or frontistiria) (Kobakidze & Suter, 2020)[8] to name but a few. Bray and Kobakhidze (2014), examining the effects of SE's global spread on the educational process, note that, although there is a global trend for the increase of SE participation, it is not necessarily uniform. For example, in southern European countries such as Greece and Cyprus, the phenomenon has long reached the saturation point where it is accepted as a fact of life for students and families alike. Western Europe, on the other hand, presents a long tradition of small-scale SE that has increased dramatically since the turn of the century, reflecting increasing societal competitiveness and the more socially acceptable marketization of education (Bray &

[8] It should be noted that the name of the author is presented here as it appears in the journal, as opposed to its correct spelling of "Kobakhidze".

Kobakhidze, 2014) and is currently on the rise in Northern Europe as well (Bray, 2020). This variety can be explained, at least in part, by the unregulated nature of SE. According to Bray and Kobakhidze (2014), one of its greatest strengths lies in the flexibility this characteristic grants it, allowing it to tailor itself to the needs of specific individuals or groups of students.

The above review of SE presents the research history of SE over the last two and a half decades, since Marimuthu et al. (1991) coined the phrase and expanded the topic of interest from singular cases of private tutoring to the existence of systemic parallel education. Many of the issues presented and positions expressed by various researchers have repeated themselves across the years, in many different contexts and, although studied far less in a Western context, these positions are not new. They are, in fact, fairly consistently outlined in previous studies of SE. Research in the field has also repeatedly indicated that it benefits from the existence of high-stakes testing in educational transitions (Buchmann et al., 2010a; see also Stevenson & Baker, 1992; Buchmann, 2002; Bray & Kwok, 2003; Yamamoto & Brinton, 2010). And, while the latter does not seem to be a requirement[9], it appears to substantively increase students' propensity for SE participation, which thereby increases demand and subsequent provision (and proliferation) of SE. As such, one would expect that countries such as the U.S., the U.K. and Greece, which employ SATs, GCSE and A-Levels, and Panhellenic Examinations respectively, appear to be prime candidates for the sustained growth of SE.

[9] As indicated by the case of Canada, where SE participation grew substantially despite a lack of university entrance exams or a steep hierarchy of HEI (Aurini & Davies, 2004). This growth was somewhere in the region of 200-500% in the 30 years preceding Aurini and Davies (2004) study.

3.4 The Case of Greece

The relative novelty of SE in most western countries limits our understanding of both its long-term effects and their implications. The case of Greece may be helpful here. SE participation levels in Greece reach or even exceed those in the Far-East, ranking among the top countries in the world in incidence of private tutoring and in the top three, specifically, for number of hours spent every week on SE by 15-year-olds (OECD, 2010). Specifically, Greek studies report 87.4% of students claimed at least some use of SE by the second to last year of secondary education and 95.6% in the final year (ASEFOA, 2008). SE professionals estimated a 10-20% drop in student participation between 2008-2012, largely due to the ongoing severe fiscal crisis, although this drop is thought to be much higher before the last two years of secondary education and only marginal in the last year (Zambeta & Kolofusi, 2014). This is in part due to the fact that, historically, the SE system in Greece is extremely well established. Institutional SE was formally established in Greece by Compulsory Law 2545/40 “On private schools, tuition centers and boarding schools” (Hellenic Democracy, 1940). It should be noted, however, that several of the conditions for its function were already laid out in Compulsory Law 818/37 “on the amendment and supplementation of law 3578 "on private schools etc.” (Hellenic Democracy, 1937). According to this law, which expanded on Compulsory Law 3578/28 regarding the function of private schools (Hellenic Democracy, 1928), each SE institution must be licensed by the Ministry of Education and its practitioners (referred to as teachers) must possess such qualifications as would be otherwise necessary for their appointment to an equivalent public educational position (i.e., not otherwise appointed, degree holding teachers) (Hellenic Democracy, 1937).

Bouzakis (2005; see also Kassotakis & Verdis, 2013) suggests that the roots of SE in Greece should be traced as far back as the Greek-Turkish war (1912-1922), culminating in the Asia-Minor Catastrophe, which flooded Greece with an abundance of refugees for which it was sorely unprepared. This, amongst other things, overtaxed the existing secondary education system leading to a degradation in its quality of teaching. The state of affairs was further exacerbated in the mid-twentieth century when, following the Greek Civil War, left-wing teachers, forced to resign from their schools because of their political beliefs, turned instead to work as private tutors; the same phenomenon was repeated during the seven-year dictatorship (1967-1974) by teachers opposed to the regime (Bouzakis, 2005).

3.5 The relationship between Education, Examinations and Shadow Education in Greece

This chapter contains a brief overview of the political, social, historical, and geographic framework in which SE was developed and evolved into its present form in Greece.

The Greek educational system has gone through numerous reforms that have affected many aspects of education in Greece, some subtly and others radically. Almost all of the educational reforms in Greece in the last 100 years attempted to provide enhanced educational opportunities to the less privileged strata of society mainly by lifting one or more of the structural impediments that prevented their educational success. They range from affording every Greek child the right to go to school, to building enough schools, to building schools in remote areas, to making all levels of education free for all Greek children. Indeed, until the

early 1960s, those able to attend state secondary schools and Higher Education Institutions, were charged fees (Traianou, 2013, p. 90). Today the Greek educational system provides free education at all levels, as set forth by Article 16 of the Greek Constitution (Syntagma, 1975).

By eliminating the structural limitations or neutralizing their effect on educational success, individual attributes and achievements assume increased importance for students' educational success. Structures and processes that may enhance those individual achievements, such as SE, also assume increased importance. In short, it can be argued that democratic and egalitarian nature of the Greek educational system may have helped the development of the SE system in Greece.

There are a number of other factors which may contribute to Greece's extensive and persistent history of SE. Gouvias (1998) notes that the centralized nature of the Greek educational system, in concert with local and national level inertia accompanying major attempts at educational reform, have stymied school level evolution of the system. Social and political inertia, however, are not the sole societal level confounders of substantial educational reform and evolution in Greece. It is worth noting that the majority of the 20th century found Greece moving from one major historical event to another. Greece took part in the Balkan Wars, from 1912-1913, World War I, from 1914-1918, and the Greco-Turkish War from 1918-1920. 1921 marked the Asia Minor catastrophe and the influx of millions of refugees of high socioeconomic status and with expectations of higher education (Bouzakis, 2005) to mainland Greece. Greece entered World War II from 1940 to 1945, fell into a civil war from 1946-1949, and was under the control of a military junta from 1967-1974. These conflicts were accompanied by a series of territorial shifts. Clogg (2013), for example, includes

Greece securing much of Macedonia, Epirus, and Crete in 1913, with the Treaty of London; Eastern Macedonia (as far as the city of Kavala) with the Treaty of Bucharest in 1913; the islands of the Eastern Aegean (excluding the Italian-occupied Dodecanese) in 1914, with the Protocol of Florence; Western Thrace with the Treaty of Neuilly in 1919; Eastern Thrace and (for 5 years) the Smyrna Zone, under the Treaty of Sèvres, which was annulled by the Treaty of Lausanne. As a nation, Greece did not even take its current form until after the end of the second World War, with the liberation of the Dodecanese, in 1947, under the Treaty of Paris (Clogg, 2013). Each of these phenomena impeded, to varying extents, the evolution and reform of the educational system. The military junta, in particular, stonewalled all contemporary reform attempts, and indeed rolled back changes made by the preceding government (Gouvias, 1998)[10]. Throughout this time (and inclusive of the 7 year-junta) the demand for and existence of SE was affected superficially, if at all.

The results of both the social inertia and repeated political upheaval are apparent in, among other things, the fundamental persistence of the Panhellenic Examinations, which have changed very nearly in name only, since their inception in 1964. This provides a singular opportunity for SE practitioners and institutions, insofar as they are not required to make drastic efforts to update their teaching material, develop new strategies, or adapt their syllabi.

Similar geographic, political, and social changes took place across several other European countries, during this time. The persistent demand for and limited availability of higher education in Greece, however, have resulted in the establishment and maintenance of high levels of SE.

[10] For more information on the political turmoil characterizing the last century in Greece, see Hatzis (2019).

3.5.1 The Current Greek Educational System

At present, the highly centralized education system is divided into the following three cycles which are also sometimes referred to as levels or stages; primary, secondary and tertiary, with each of these having further subdivisions (see Figure 1) (Eurydice, 2019).

Primary Education (Greek: *Δημοτική Εκπαίδευση* or Demotiki Ekpadefsi) is made up of two levels: the 6-year Primary School (Greek: *Δημοτικό Σχολείο* or Demotiko Scholeio), serving pupils aged 6 through 12 and the 2-year Pre-primary School (Greek: *Νηπιαγωγείο* or Nipiagogeio), for pupils aged 4 through 5). Early Childhood care for children 2 months old through 4 years old is offered by Municipal Authorities.

Secondary Education spans 6 years and is made up of two cycles of study. It includes the 3-year Lower Secondary (ages 12-15) and the 3-year Upper Secondary (customarily ages 15-18). The former is known as the Gymnasio (or Gymnasium; Greek: *Γυμνάσιο*) and the latter the Lykeio (or Lyceum; Greek: *Λύκειο*). Lower Secondary School provides general education and its successful completion is a prerequisite for enrolling in the General or Vocational Upper Secondary Schools. Education is compulsory for children aged 6 through 15. Completion of Gymnasium closes the cycle of compulsory education in Greece. The optional 3-year Upper Secondary School is also divided into two formats. These are the General (Greek: *Γενικό Λύκειο* or Geniko Lykeio) Lyceum and the Vocational (Greek: *Επαγγελματικό Λύκειο* or Epaggelmatiko Lykeio – *ΕΠΑΛ*/EPAL for short) Lyceum. The former includes common core subjects and optional specialized subjects (educational tracks) focused on subject matter related to their higher education choices. The EPAL offers the secondary cycle after which there is an optional "Apprenticeship Class". Working pupils can attend an Evening

Gymnasium or Lyceum if they are at least age 14 and 16, respectively. An in-depth presentation of the Greek upper secondary educational system can be found in the Official Gazette of the Greek Democracy (Hellenic Democracy, 2016) but for brevity's sake, the most salient details (i.e., those pertinent to the General Lyceum, whose students constitute the population of this study) are presented in Figure 1 below.

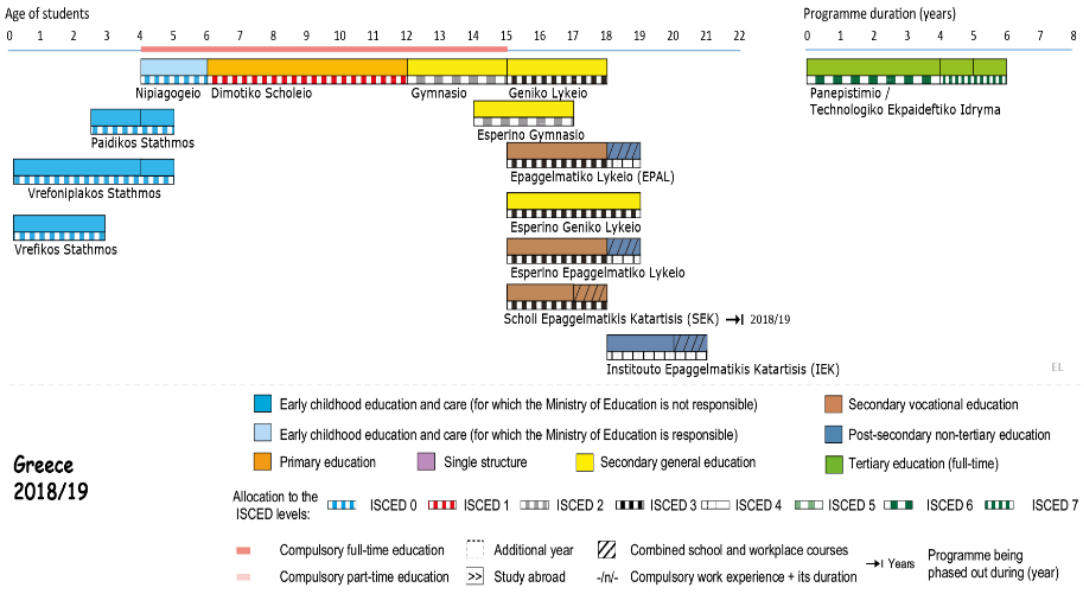


Figure 1. Structure of the Greek National Educational System 2018/2019

Source: Eurydice 2018/19

3.5.1.1 Upper Secondary Education in Greece: The General Lyceum

Lyceum academic years are divided into two (2) semesters, from 1 September to 10 January, and 21 January to an end date in May to be determined annually by the Ministry of Education, Research and Religions, respectively (Article 2, Hellenic Democracy, 2016). The structure of students' school syllabi maintains a relatively consistent core structure, across all three years of Lyceum. In each year, students are

presented with a common core of modules, referred to as "General Education" (Greek: *Γενικής Παιδείας* or Yenikis Pedias) and whose achievement is evaluated by written exams. These are supplemented by Physical Education, Computer Sciences, and (in the first year of Lyceum) Fine Arts and School Vocational Guidance, (in the second and third years of Lyceum) Software Applications and Multimedia Networks, and elective (Greek: *Επιλογής* or Epilogis) courses in the first and third years of Lyceum, which are not evaluated through written exams. The final two years of Lyceum also introduce Educational Tracks and their respective courses (Article 3, Hellenic Democracy, 2016).

Educational tracks are introduced in the second year of lyceum in a somewhat general format, divided into a "Natural Sciences" (Greek: *Θετικών Σπουδών* or Thetikon Spoodon) track and a "Humanities Studies" (Greek: *Θεωρητικών Σπουδών* or Theoritikon Spoodon) track, comprising five (5) out of 35 hours of taught schooling per week (Hellenic Democracy, 2013). In the third and final year of lyceum, the educational tracks become somewhat more specialized and are divided into three categories: "Humanities Studies" (Greek: *Ανθρωπιστικών Σπουδών* or Anthropistikon Spoodon), "Natural Sciences" (Greek: *Θετικών Σπουδών*), and "Economic and Informatics Studies" (Greek: *Σπουδών Οικονομίας και Πληροφορικής* or Economikon Spoodon) and comprise fifteen (15) out of 35 hours of taught schooling per week (Hellenic Democracy, 2013). The third-year educational tracks are further broken down into five (5) "Scientific Fields" (Greek: *Επιστημονικά Πεδία* or Epistimonika Pedia) comprised of:

1. 2 (two) core course modules (indicated in italics in each educational track in Table 1) in each educational track
2. *Modern Greek Language* and
3. Either:
    a. 1 (one) of the remaining three educational track courses or
    b. Certain common core courses (Hellenic Democracy, 2015a; 2015b).

The hourly breakdown of these courses on a weekly basis changes little from year to year but, for specificity's sake, a breakdown from the 2017-2018 academic year is presented below in

Table 2. Since the educational tracks correspond to the set of tests students will sit in the Panhellenic Examinations, this hourly breakdown should impress upon the reader the increased focus Greek schools and, by extension, students place on those specific courses.

Final examinations for each academic year take place almost exclusively within students' lyceum, after the end of the second semester of the third year of Lyceum, and last two (2) hours apiece (Article 11, Hellenic Democracy, 2016). Each final examination covers subject matter drawn from their respective course modules' curriculum in a given year and is marked by the teacher who taught the module (Hellenic Democracy, 2016).

3.5.1.2 Panhellenic Examinations and the Transition from Secondary to Tertiary Education

Access to tertiary education in Greece, dictated by a set of national university entrance examinations (Panhellenic Examinations), is open to students graduating from any form of upper secondary school (Eurydice, 2019). Examinations for entrance to tertiary education in Greece were first introduced by parliamentary decree in 1964 (Lambos, et al., 2016). These were exchanged for (high school) Academic Diplomas (Greek: *Ακαδημαϊκό Απολυτήριο*) from 1965 to 1966, which were in turn supplanted by national university entrance examinations (Lambos, et al., 2016). Prior to 1964, in order to participate in Panhellenic Examinations students were required to travel to Athens or Thessaloniki (Bouzakis, 2005). With slight variations in name and form, from 1964 onwards, these exams were offered in more major Greek cities until 1999, when students were allowed to sit the exams in their own (local) schools (Bouzakis, 2005), which has been the norm to the present day. A daunting endeavor at the best of times, the process of sitting Panhellenic Examinations, seen by many as the only gateway to greater social mobility, became more accessible with each such change by removing the economic, geographical and psychological barriers of extended travel and lodging on top of the already daunting prospect of sitting critical examinations.

It is worth noting that Panhellenic Examinations have been distinctly and almost exclusively employed to dictate entrance into tertiary, rather than graduation from secondary education (Lambos, et al., 2016). Their present form of national university

entrance examinations was established in 2015, for Higher Education Institution (HEI) application starting in the 2016-17 academic year (Hellenic Democracy, 2015a).

Students in the third year of Lyceum can, and almost universally *do*, elect to participate in Panhellenic Examinations, which take place after final school examinations, to compete for a position in one of the country's HEI. This presupposes that students submit the relevant application to do so by the Ministry's appointed deadline[11], including their educational track and Scientific Field of choice and, of course, successfully graduate from Lyceum. Panhellenic Examinations take place after the completion of the school year (inclusive of final school examinations). Students' scores on Panhellenic examinations are released at some point in the summer (in recent years by early July). At this point, students must select their HEI and departmental choices in up to two (2) Scientific Fields (Hellenic Democracy, 2015a), list them in numerical order of preference, and submit these on a machine-readable form (Greek: *Μηχανογραφικό Δελτίο*) (Hellenic Democracy, 2015b). At the time the forms are submitted, students do not know the minimum Panhellenic Examination score requirement for admission into any given HEI department. These requirements depend on (a) the number of students each department will accept in a given year, (b) the number of applicants to each department, and (c) the average performance of said applicants. Baseline score requirements and average institutional and departmental application rates from previous years are widely employed to predict

[11] Precisely when this deadline falls varies somewhat from year to year but is generally an approximately 10-day window, sometime in March (FoititikaNea, 2019; Ipaidia.gr, 2020; Hellenic Democracy, 2018a; Mastoras, 2017).

these figures by media outlets, SE institutions, and private practitioners, giving students a good idea of their chances for admission to a given department.

Students sit Panhellenic Examinations based on their Educational Track and Scientific Field (Hellenic Democracy, 2015a). Students are allowed a certain amount of flexibility in their selection of Scientific Field and can elect to sit exams in fields deemed either "similar" or "related" to their core Field (Lambos et al., 2016). These choices are not undertaken lightly, however, as students who elect to sit exams in only their core Field or core and similar fields suffer no penalty in the calculation of the Panhellenic Examination scores, whereas students who elect to sit the Examinations in "related" fields have their scores penalized, to a certain extent (Lambos, et al., 2016). Panhellenic Examination scores are currently calculated according to the following formula:

$$Panhellenic\ Examination\ Score = [(A + B + C + D) * 2 + (A * 1.3) + (B * 0.7)] * 100$$

Where A,B,C and D represent students' scores in each of the four courses they sit Examinations in. Students' scores in each course are further weighted depending on the Scientific Field they elect to sit exams in, such that A and B represent the courses with special weights in each Scientific Field (see Table 2).

From the formula presented above, it becomes apparent that, while student's educational achievement is historically among the strongest predictors of their Panhellenic Examination scores (Psacharopoulos, 1979; Papas & Psacharopoulos,

1993)[12], they play no direct role in determining if and to what HEI Greek students gain access.

Table 1. Hourly breakdown of course modules in Greek Upper Secondary Education

1st Year		2nd Year		3rd Year	
Module	hrs/ wk	Module	hrs/ wk	Module	hrs/ wk
Common Core		*Common Core*		*Common Core*	
Greek Language		**Greek Language**			
Ancient Greek Language and Literature	5	Ancient Greek Language and Literature	2	**Mathematics and Aspects of Statistics**	2
Modern Greek Language	2	Modern Greek Language	2	**Modern Greek Language**	2
Modern Greek Literature	2	Modern Greek Literature	2	**Modern Greek Literature**	1
Mathematics		**Mathematics**		**History**	2
Algebra	3	Algebra	3	**Religion**	1
Geometry	2	Geometry	2	**Biology**	2
Natural Sciences		**Natural Sciences**		**History of the Social Sciences**	1
Physics	2	Physics	2	**Foreign Language**	
Chemistry	2	Chemistry	2	*English, French, or German*	2
Biology	2	Biology	2	**Physical Education**	2
History	2	**History**	2		
Civic Studies		**Civic Studies**			
Incl. Economics, Political Institutions and Principles of Law, and Sociology	3	*Incl. Economics, Political Institutions and Principles of Law, and Sociology*	2	*Humanities Studies Educational Track*	
Religion	2	**Religion**	2	*Ancient Greek Language*	5
Foreign Language		**Foreign Language**		*History*	3
English, French, or German	2	*English, French, or German*	2	*Latin*	3
Physical Education	2	**Physical Education**	1	Literature	2
		Research Project	1	Sociology	*2*
*Electives (students select **one**)*		**Philosophy**	2		
Computer Sciences		**Introduction to Computer Sciences**	1	*Positive Studies Educational Track*	
Geology	2			*Mathematics*	5
Fine Arts				*Physics*	3
Greek and European Culture				*Chemistry*	3
		Humanities Studies Educational Track		Biology	2
		Ancient Greek Language and Literature	3	Software Development in a Programming Environment	2
		Fundamentals of the Social Sciences (Sociology, Economics, and Political Sciences)	2		

Table cont'd on following page.

[12] It should be noted that, although the calculations of Panhellenic Examination scores were undertaken in a slightly different manner at the time, this was also the case when Psacharopoulos (1979) and Papas and Psacharopoulos (1993) came to this conclusion.

Table 1 cont'd

1st Year		2nd Year		3rd Year	
Module	hrs/ wk	Module	hrs/ wk	Module	hrs/ wk
Common Core		*Common Core*		*Common Core*	
				Economic and Informatics Studies Educational Track	
				Mathematics	5
		Positive Studies Educational Track[13]		*Principles of Economics Theory (PoET)*	3
		Physics	3	*History*	3
		Mathematics	2	Sociology	2
				Software Development in Programming Environments	2
				*Electives (students select **one**)*	
				Second Foreign Language Freehand Drawing Linear Drawing History of Art	2
				Principles of Business and Service Management and Organization (PoBSMaO)	

Source: Hellenic Democracy (2015a)

It should be noted that, while the fundamental role of the Panhellenic Examinations has not changed substantially in the last half century, their composition and overall grade calculation strategy (including e.g., the inclusion or exclusion of one or more secondary school grade GPAs) has changed repeatedly (Gouvias, 2006). While parental uncertainties resulting from curriculum changes are arguably not the central reason behind the proliferation of the phenomenon, it has been argued (Aurini & Davies, 2004; Bray & Silova, 2006) that the spread of SE benefits from the existence of parental concerns.

[13] It should be noted here that this title represents the most rigorous transliteration of the Greek language title for this Educational Track. Going forward, however, we have elected to substitute "Natural Sciences" for "Positive Studies". This substitution represents to a closer conceptual correspondence to the Educational Track's Greek title, content, and orientation.

Table 2. Possible Choices of Scientific Fields and Special Weights for Courses by Educational Track

Scientific Field		Educational Tracks: *Humanities*			*Natural Sciences*			*Economic and Computational*		
1st	*Humanities, Legal and Social Sciences*	I. II. III. IV.	Ancient Greek History Modern Greek Latin	(1.3) (0.7)						
2nd	*Natural and Technological Sciences*				I. II. III. IV.	Physics Chemistry Modern Greek Mathematics	(0.7) (1.3)			
3rd	*Health and Life Sciences*	I. II. III. IV.	Ancient Greek History Modern Greek Biology[1]	 (0.4) (0.9)	I. II. III. IV.	Physics Chemistry Modern Greek Biology	 (0.7) (1.3)	I. II. III. IV.	Mathematics PoET Modern Greek Biology[1]	(1.0) (1.0)
4th	*Educational Sciences*	I. II. III. IV.	Ancient Greek History Modern Greek Mathematics[1]	 (1.3) (0.7)	I. II. III. IV.	Physics Chemistry Modern Greek History[1]	 (1.3) (0.7)	I. II. III. IV.	Mathematics PoET Modern Greek History[1]	 (1.3) (0.7)
5th	*Economics and Computer Sciences*							I. II. III. IV.	Mathematics PoET Modern Greek PoBSMaO	(1.3) (0.7)

[1]. Common Core course.

3.5.1.3 Tertiary Education in Greece (In Brief)

Although there are both public and private primary and secondary schools in Greece, tertiary Education is only provided by State Universities; private in-country universities are not recognized.

Tertiary Education is open to all who sit for the competitive Panhellenic exams and achieve a qualifying score relative to their choice of university department's exam score threshold. With respect to Tertiary Education, all undergraduate, and in most instances postgraduate, studies are tuition free (Papadopoulou, 2013), whereas textbooks are free at the undergraduate level. Undergraduate degrees are on a 4-year cycle, although certain specializations (engineering, computer sciences, etc.) are on 5- or even (as in the case of medicine) 6-year cycle. Postgraduate programs are offered

in one-and-a-half-year and 2-year programs. Doctoral study duration is for a minimum of 3 years and may extend to up to 6 years.

However, despite entrance examinations having become more accessible over the last half century, Greek tertiary education still functions under a *numerus clausus* status (Psacharopoulos & Soumelis, 1979) and as such *only* provides places for a limited number of applicants in any given year. The proportion of prospective students to tertiary education positions has dropped from 4.1:1 in 1975 to approximately 1.6:1 in 2001 and stayed relatively stable through 2011 (Kassotakis & Papagueli-Vouliouri, 2009, cited in Kassotakis & Verdis, 2013). This disproportion of applicants to positions is not consistent across schools or departments; it is significantly more pronounced in higher prestige (and by extension demand) schools (Kassotakis & Papagueli-Vouliouri, 2009). Such higher prestige/demand schools have almost two applicants for each position in higher education under the best of circumstances.

The summary of the Greek educational system outlined above appears to be straightforward, affording access to all, unburdened by economic and social constraints. However, while this appears to be the case on paper, underlying issues such as continuous reforms to both the structure of the levels, subject matter and course load in terms of the cycles, mechanisms for promotion, university entrance exams (National Exams Organization, 2016) and ultimate successful enrollment to higher education, are numerous. It is important to note that Greeks have historically expressed a strong and popular demand for higher education (Georgiadis, 2005).

Greek formal education boasts highly centralized administration, formal and highly competitive entrance examinations, a perceived tight linkage between education and later social and occupational outcomes, and adherence to Turner's (1960) Contest rules[14]. All of these are highly conducive to the proliferation of SE. However, it is not simply the fact that SE is well established in Greece, nor that it presents several characteristics commonly associated with flourishing SE that make it an important case study. Greece is, itself, a Western, European society, rather than a receptacle of past Western influence. In other words, the study of SE in Greece holds the potential to provide a significantly more socially and culturally relevant understanding of the role played by SE in Western society.

Even beyond these considerations, there are other reasons for considering Greece to be of singular interest. The role of SE in the process of educational achievement and attainment in Greece is also peculiar, in that the bachelor's degrees are offered free of tuition charges at public universities, an idealistic and egalitarian reality so central to Greek reality that it is protected in the Greek constitution (Ziguras & McBurnie, 2006). Because of this, one may expect the influence of family socioeconomic status on educational achievement and attainment in Greece to be comparatively lower. However, its influences may be channeled through SE. Attendance of SE in Greece habitually spans several years, with the average duration for secondary education students sitting at approximately 4 years (Alevizaki, 2009). Furthermore, private expenditure on education in Greece makes up 3.5% of monthly

[14] Since each student/aspirant's success is dependent on their own efforts or successful manipulation of the contest's rules (e.g., seeking external supplementary support for formal teachings which, while not disallowed, is also certainly not part of any official curriculum).

household expenditures (Hellenic Statistical Authority 2015)[15], which, although among the highest in the EU (Zambeta & Kolofusi, 2014), nonetheless represents an approximate 20% relative drop compared to 2008 (Hellenic Statistical Authority, 2015). When coupled with the average duration of SE participation in Greece, it becomes apparent that the cost of SE represents a significant monetary investment on the part of students' families (Liodakis, 2010; Zambeta & Kolofusi, 2014), potentially surpassing college tuition in other countries.

This has not stopped Greek families from pursuing SE, though. In fact, Kassotakis and Verdis (2013) posit that SE in Greece may not simply supplement formal education but rather that it may also satisfy social and psychological needs of students and their families. Despite the substantial costs incurred to ensure a position in HEIs, returns to these positions have remained even greater (Psacharopoulos, 1988), with greatest returns accrued by staying in education as long as possible (Psacharopoulos & Patrinos, 2004). Thus, posited to be employed primarily as an enhancement strategy (Polychronaki, 2004; Kassotakis & Verdis, 2013) and generally understood to provide higher returns to investment, SE seems to serve as a means of socioeconomic reproduction similar, if not more important, to that of college tuition in other countries.

Several aspects of SE have been studied in Greece (see Kassotakis & Verdis, 2013). However, the few studies that have attempted to examine it within an educational achievement context are, to various degrees, dated, and have returned, at best, conflicting results. Previous studies have employed seemingly arbitrary measures of duration (Polydorides, 1981;

[15] Historically, this figure has reached as high as 30% of family monthly income (Patrinos, 1992).

Kontogiannopoulou-Polydorides, 1995; 1996)[16] or limited themselves to partial measures of the forms SE took (Verdis, 2002). However, SE participation is highly nuanced and presents many finer-grained aspects, which may offer significantly better insights to its nature. Verdis (2002), for example, limited his examination to a distinction between private (home) tutoring and group classes[17]. This, however, disregards finer distinctions that may play a significant role in better describing the phenomenon. The various types of private tutoring entail different costs and (at least perceived) quality of teaching. This is compounded by considerations of SE cohort size in group classes, generally perceived to benefit from smaller class sizes. Regardless of these and many other considerations, which will be discussed at greater length later in the study, percentages of students entering HEIs in Greece are historically higher among students participating in SE (Kassotakis & Verdis, 2013), while academic achievement remains the only criterion for admission to Greek HEIs. Taken in conjunction with the severe fiscal crisis plaguing the country, the importance of SE's role as a means of stratification in an already economically unbalanced society is understandably enhanced. Finally, it is worth noting that Greece was considered largely ethnically homogeneous until the early-to-mid 1990s. The last three decades have brought to a shift from mono- to multicultural society, making the issue of ethnic differences in SE of special interest. It seems, in other words, that a comprehensive re-examination of the process and factors of educational achievement, including SE, and using current data, is warranted. This will enable us to assess the role of SE as both a determinant of achievement and a

[16] Both the paper and the two books made use of the same data set and operationalization of shadow education duration.

[17] These two forms of SE were presented as mutually exclusive options for students in his instrument and analysed as such in his study.

transformative mechanism of social and economic inequalities into academic differences, in Greece.

3.6 Family and Educational Effects on Social Mobility: Greece and Other OECD Countries

The relationship between education and inequality is strong in Greece, with education seemingly the single most important factor to later income and social class destination –or, in other words, social mobility and/or reproduction (Tsakloglou & Cholezas, 2005). Kandylis et al. (2012) also point out educational attainment's role as a strong indicator of social mobility in Greece. Sianou-Kyrgiou and Tsiplakidis (2010) noted that, while higher education did not necessarily lead to increased social mobility, in the first decade of the 21st century, the belief in the relationship between higher education and upward social mobility remained strong in Greece. According to Symeonaki et al. (2016), though, Greece has seen a persistent, substantial increase in education, individual level educational outcomes, raw numbers of higher education graduates, and educational mobility in recent years. Indeed, between 2008 and 2018, Greece has seen the share of 25-34 year olds holding higher educational degrees rise from 28% to 43% (OECD, 2019a). This increase was even more marked (32%-51%) among women, who also had a higher degree completion rate on the bachelor's level (81% compared to 74% for men) (OECD, 2019a).

Greece forms the most notable exception in EU or OECD countries regarding the high unemployment rates of young graduates (Liagouras et al., 2011; OECD, 2018a). While

employment rates among Greek adults age 25-64 increase with the level of educational attainment, they remain lower than both the OECD and EU averages regardless of educational attainment, ranging from 50% for adults with less than upper secondary education to 90% for doctorate holders (OECD, 2019a). Liagouras et al. (2011) attribute this to the gap between Greece's strong demand for higher education and the Greek economy's limited demand for highly educated personnel (see also OECD, 2018a).

However, intergenerational wage persistence is lower in Greece than in most OECD countries (Causa & Johansson, 2010). This, in turn, corresponds to higher than average levels of intergenerational earnings mobility (OECD, 2018b). It is estimated that it would take approximately 4 generations for a child born into a low-income family to approach the mean income in Greek society (OECD, 2018b). This level of income mobility puts Greece on par with Japan, and ahead of the OECD average (of 4.5 generations), Korea (5), and China (7) (OECD, 2018b). It is worth noting, however, that, while Southern Europe is, general speaking, characterized by lower levels of social-class mobility, Eurofound (2017) found that social fluidity (or relative social class mobility) in Greece increased persistently across all cohorts it examined and has remained high (for both sexes) over the last decades. Examined by gender, downward mobility has stayed the same for men while declining for women, whereas women's upward mobility has increased and men's has decreased (Eurofound, 2017).

In recent decades, Greece has presented some of the most striking changes in class structure among OECD countries, beaten out only by Cyprus and followed by Poland, Finland, the Netherlands, and Luxemburg (Eurofound, 2017). However, Greece also spent better than a decade in the throes of what was arguably the worst recession in modern history. Taking a

more focused approach, Giakoumatos and Loukas (2019) found that this particularly impacted the social mobility of immigrants, lower educated, and younger individuals.

Despite this, Greece, like several East-Asian countries (including Japan, Korea, Macao, Hong Kong and Singapore), saw no significant change in the socioeconomic reading gap between 2009 and 2018 (OECD, 2019b). This is not to say that student performance was equivalent in all of these countries. Indeed, a persistent gap simply means the relationship between advantaged and disadvantaged students[18] remained relatively constant. This, however, could correspond to no significant shift in either group (as was, e.g., the case in Hong Kong), both groups could have improved significantly (as in Greece, Japan, and Korea), or performance in both groups could have declined significantly (as was the case in Macao and Singapore) (OECD, 2019b).

3.7 Shadow Education as a Major Mechanism of Educational and Social Reproduction

Ample evidence has already been presented for the association between the likelihood of participation in SE and students' family SES. On the other hand, previous studies have found varying effects of SE participation on educational achievement, depending on the country examined, the researcher's interpretation of SE, the aspect researchers selected for examination (Bray, 2006), and their methodological proclivities (Bray, 2014). When

[18] Students who are within the top quartile of PISA's index of economic, social and cultural status (ESCS) are considered socioeconomically advantaged, while those in the bottom quartile are considered disadvantaged.

considered together these two general findings raise an important question: When we say that family SES affects SE and SE affects achievement, do we all mean the same thing by SE? Is it the nature, intensity, overall duration, number of courses attended or some composite of all these and more? One-to-one tutoring, for example, is more expensive than group tutoring but is also considered and expected to produce better results. More intense participation and participation in more courses both represent greater investments on the part of families, but also correspond to greater student effort and the accumulation of greater knowledge on the part of students, both of which should, in turn correspond to higher achievement. In other words, each of these, both separately and together, may depend on family SES but are also likely to provide differential returns.

Either relationship, whether between family SES and some aspect(s) of SE or between one or more aspects and achievement, provides valuable insight into the role of SE in the educational process. However, for SE to act as a mechanism of social reproduction, it must mediate the effect of family socioeconomic background on educational achievement. For this to be true, neither relationship is sufficient on its own. If there is a significant and substantive effect of family SES on some aspect of SE, there must also be a concurrently significant and substantive effect of that aspect on achievement.

Mediation alone may also not be sufficient. In order to characterize SE as a major transformative mechanism of any kind, it must mediate a substantive portion of the effect of students' background characteristics on their educational achievement. This is not an unreasonable expectation. Shadow education has been found to be more flexible and adaptive than its formal counterpart both internationally (e.g., Roesgaard, 2006) and within

Greece (Liodakis, 2010). By virtue of focusing on the limited subject matter directly tied to university entrance examinations, it has also been proposed that SE in Greece is also better organized and thus more functional than formal education (Liodakis, 2010). In fact, Liodakis (2010) has gone so far as to propose that SE in Greece has become a more important factor for the translation of background characteristics into differential educational achievement than the balance of the public educational system. However, it can be argued that in order to examine this realistically, the role of SE should be examined in a comprehensive model of educational achievement. SE has been found to be affected by a number of variables classically associated with educational achievement, including, though not necessarily limited to, gender, area of residence, and significant others' influence. As a result, models of educational achievement that do not take these factors into consideration run the risk of overestimating the effect of SE on educational achievement.

These considerations hinge upon the assumption that the role of SE is constant across socioeconomic strata, previous achievement bands and employment strategies. It is possible, however, that students/families from differential backgrounds use SE for different reasons, employing different strategies, expecting different results (see also Alon, 2010) and that these strategies and expectations may affect the effect of SE on achievement. Greece, widely acknowledged for its production of enrichment-oriented SE, has nonetheless been construed to show high levels of remedial use (Baker et al., 2001; Southgate, 2009). It may be the case that high SES families employ SE in order to facilitate social reproduction, while lower SES families view SE as a pathway to the social mobility offered by higher educational achievement and, by extension, attainment. Alternatively, it may be that students from lower

socioeconomic strata, who are traditionally less likely to participate in SE, simply have more to gain from this participation (see also Choi & Park, 2016).

In short, all things being equal, SE seems to present all the characteristics necessary to be considered a major mechanism of educational and social reproduction. It is dependent on family socioeconomic status and it is generally perceived to not only affect educational achievement but also to be one of the most important determinants thereof. However, the effect of SE, and by extension its function within the educational mechanism, may not be consistent across subgroups of the population, an issue which should be addressed, when examining the phenomenon, overall.

3.8 Shadow Education and the Effectively Maintained Inequality Hypothesis

The differential procurement of the various types, durations and intensities of SE seem to indicate that the division of SE strategies into remedial and enhancement may be somewhat restrictive. It may be that students and parents adapt their SE strategies from a much broader gamut of composite measures. An examination of this hypothesis may have been hindered, thus far, by a lack of relevant measures regarding SE participation. The relatively few publicly available sources that examine extracurricular tutoring in any form (e.g., PISA) almost universally limit themselves to questions of participation and the reasoning behind it (and then to Mathematics and Language courses).

The question of SE participation is far more complex than a simple yes or no question. It may be that not all of the characteristics alluded to previously are present in all cases. Well

established, publicly accessible, group SE courses, for example, are not a universal characteristic of the phenomenon internationally. However, wherever it exists, private tutoring, by its nature, can universally be characterized by its duration, intensity, cost, and the courses it is procured to teach. Each of these characteristics may be differentially available to families, based on their income and location, and provides arguably differential returns to a level of investment.

One possible explanation for the variety of options elected by students and their families lies within the Effectively Maintained Inequality (EMI) hypothesis, which "posits that socioeconomically advantaged actors secure for themselves and their children some degree of advantage wherever such advantages are commonly possible" (Lucas, 2001 p. 1652). This has two broad interpretations:

1. If a level of education is not universally available, higher SES families will attempt to procure it for their children; if/when it becomes universally available, these families will strive to procure the highest quality thereof.

2. If both qualitative and quantitative differences are commonly available, higher SES families will attempt to secure both.

Following educational reforms in the 1980s, dropout rates in Greece are exceedingly low (Zambeta & Kolofusi, 2014). As previously noted, they remain under 8%, after compulsory education (age 15) even in the highest risk regions, which are generally rural/border regions of the country (Polychroniou, 2016). In other words, secondary education is, essentially, universal, in Greece.

SE functions as a parallel, 'informal' educational system. Its "common availability" may at first glance seem somewhat more questionable, based on the numerous studies discussed previously, which have indicated the association between the propensity to attend SE and students' family socioeconomic status around the world. However, as SE becomes more and more commonplace as an educational strategy, both internationally (Bray, 2006; Ireson & Rushforth, 2005; Bray & Silova, 2006; Rushforth, 2005; etc.) and in Greece (ASEFOA, 2008; Alevizaki, 2009; Liodakis, 2010; Zambeta & Kolofusi, 2014) what becomes more important may be not its availability and procurement but its quality and quantity.

SE offers an entire gamut of qualitative and quantitative advantages for parents who are able (i.e., those who possess the means or understanding to do so), to differentially secure for their children. With SE participation rates in Greece exceeding 90% (Alevizaki, 2009), it would seem that SE may be one of the main strategies employed to secure differential advantage by Greek families. In other words, SE appears to function as an expression of EMI, at least within Greece. The actual existence of EMI, however, is predicated upon the actors who attempt to secure these advantages actually obtaining differential outcomes (Byrne & McCoy, 2017). This, along with considerations of which aspects of SE EMI utilizes, will be discussed in later chapters, along with the analyses of the relevant data.

3.9 Conclusions

The purpose of this review was to examine the relevant literature related to SE over the course of the last two and a half decades and to analyze its determinants and role during this

time period. The review thematically presented the results of various international studies which establish that the SE construct represents a phenomenon that has had and continues to have significance and relevance in today's discourse. Looking at the specific case of Greece, strengths and weakness of SE research were discussed within the framework of the historic and contemporary information regarding relevant Greek educational and social realities. The examination of the of SE's role within social and educational reproduction appears to lead to the fact that SE presents all the characteristics needed to function as a major mechanism of education and social reproduction. However, simply possessing these qualities does not ensure that this is the case and, even if it is, it seems likely that its role may not be consistent across social strata. In any case, but especially when the latter is true, as the EMI hypothesis indicates, it is incumbent upon us to not only study the phenomenon in greater depth, but also to examine the specific aspects of SE which may play these roles. In other words, it may not be sufficient to examine whether SE, as a broad, encompassing phenomenon, reproduces inequalities; it may be necessary to examine which specific facets of SE participation, and to what varying extents, are employed by various strata in order to procure or maintain educational and social advantage.

4. Methodology

4.1 Introduction and Organization of the Chapter

This chapter discusses the considerations and procedures employed to collect and analyze data for the estimation and testing of the study's models. Specifically, the chapter describes:

a. the population and sample of the study
b. how the data was collected
c. a discussion and theoretical justification of the models employed at various points in the study
d. the operationalization of SE
e. the operationalization of the background and educational achievement process variables

4.2 Population and Sample Selection

The population of the study consists of all third (i.e., final) year students in the Greek General Lyceum in the 2017-2018 academic year, which is comprised of 70348 students, across 984 schools. Students in the Greek General Lyceum comprise the most populous group in secondary educations, with their overall student population making up 71.74% (ELSTAT, 2019a, 2019b) of the overall public upper secondary education body. The balance is comprised of the Ecclesiastic Lyceum (0.16%), Second Chance Schools (for adults returning to education -0.74%), and Vocational Lyceum (*ΕΠΑΛ* [EPAL] -38,13%). The Vocational Lyceum,

which makes up the bulk of the remaining public upper secondary education students, was excluded for a number of reasons.

Greek Vocational Schools function in a distinctly different manner to the General Lyceum. Their syllabi and curricula, although still dictated by the Greek Ministry for Education, Religions and Research, is fundamentally different to that of the General Lyceum. Their students largely elect to follow vocational paths and, for those who do elect to sit Panhellenic Examinations, the number of positions in HEI is severely limited. While the specific percentage of HEI positions varies from year to year, in the 2017-2018 academic year, students of the Vocational Lyceum were restricted to 20% of the university (AEI) and higher educational (ATEI) institutional positions (Hellenic Democracy, 2018c) –which was dropped to 5% of university positions, while retaining 20% of higher educational institutional positions in 2019 (Hellenic Democracy, 2019b). They have access to a limited number of departments, depending on their vocational track, and their exam scores are calculated with notably different weights attributed to each course (in the region of 1.5-3.5x) than those used for students of the General Lyceum (Hellenic Democracy, 2018c). It can be argued that they, along with the Ecclesiastic and Second Chance Schools differ significantly enough from the General Lyceum to require their own, distinct, models of educational achievement. Taking all this into consideration, it seemed that Vocational, Ecclesiastic, and Second Chance Schools fall into categories distinctly their own, and were excluded from study based on the logically unavoidable sample heterogeneity and practical problems discussed above.

The data for these and the following analyses were collected from a proportional stratified single stage clustered random sample selected from all students in the final year of secondary

education in Greece. A catalogue of all of the Lyceums in Greece was divided into three strata, based on the type of city in which each lyceum was situated, as:

1. Large Metropolitan Centers (i.e., Athens, Piraeus, and Thessaloniki (APT)).
2. Prefecture Capitals (PC) and
3. Other Cities and Villages

These three strata largely coincide with city population categories, with APT being by far the largest, followed by Prefecture Capitals, and then Other cities and villages. Admittedly, certain prefectures may contain cities larger than their capitals –although this is an exceedingly rare occurrence. It is worth noting that the categories also largely correspond with levels of availability and variety of SE, since both characteristics depend heavily on local and contextual demand.

From data provided by the Ministry of Education, Religions and Research, it was estimated that 44.54% of students (or 31334 students) in the final year of upper secondary education were located in 375 schools in the first strata, 28.83% (20279) in 206 schools in the second strata, and 26.63% (18735) in 403 schools in the third strata. The average cohort size, for final year classes was comprised of approximately 84 students for the first stratum, 98 for the second, and 46 for the third[19].

Sample size is predominantly determined by the statistical techniques used to analyze study findings and the nature of the inferences to be made. It is generally calculated as a function of

[19] Cohort sizes and class sizes are not equivalent since, by law, class sizes in the final year of Lyceum cannot exceed 25 students (Hellenic Democracy, 2019a).

the desired level of significance, confidence interval width and certain parameters of the study's population (the latter being defined by previous studies or expert opinions) (Brewer, 1978).

From a statistical standpoint, the most significant considerations regarding sample size dealt with statistical power and sampling error (specifically, as the latter related to the relative and absolute size of the sample) (Katsillis, 1998; Babbie, 2007; Wolf et al., 2013). Since absolute sample size arguably plays a much bigger role in minimizing sampling error (Katsillis, 1998), more weight was placed on this than the size of the sample, relative to the overall student population. Sudman (1978) proposed that a sample size of greater than 1000 respondents would be sufficient to meet the needs of most social science research. Milton (1986) even went so far as to explicate a formula for sample size calculation in linear regression, including guidelines for increasing sample size for clustered samples. Structural Equation Modelling (SEM), which will be employed in this study, is also affected by solution propriety, which is to say whether the sample contains "a sufficient number of cases for the model to converge without improper solutions or impossible parameter estimates" (Wolf et al., 2013, p.913). Larger samples are less likely to suffer from solution impropriety. Wolf et al. (2013) also notes that more complex mediation models with larger effect sizes tend to achieve adequate statistical power with smaller sample sizes than those with smaller effects. Conversely, parameter bias estimates in models with larger effect sizes necessitated larger sample sizes, likely reflecting the larger standard errors as the true value of regressive path estimates becomes more extreme (Wolf et al., 2013).

It is, in any case, generally accepted that SEM, which usually examines relatively complex relationships, benefits from larger sample sizes. What this means precisely is a subject of

ongoing debate. Comrey and Lee (2013) propose a sample size of 300 (see also Tabachnick & Fidell, 2013). Wolf et al. (2013) propose samples as large as 460. A large body of research ascribes to rule of thumb sample size estimations. Bentler and Chou (1987) propose a 5:1 ratio of cases to parameters estimated in the model, Schreiber et al. (2006) accept ratios as low as 10:1, while Kline (2005) proposes a 20:1 ratio[20]. The majority of these ratios (and rules of thumb) refer to very specific subsets of SEM -usually some form of confirmatory factor analysis (e.g., Wolf et al., 2013; Westland, 2012). However, even using the most conservative rule of thumb, proposed by Kline (2005), and the most complex SEM estimated in this study results in a sample size of 1160 cases (including latent error terms, correlations between exogenous variables, regressive paths and so forth).

Of course, this figure represents a minimum proposed sample size. There are several reasons to select a larger target size than that dictated by theory. Larger samples minimize sampling error (Babbie, 2007). They also offset the increase in standard error caused by cluster sampling (Milton, 1986) and allow greater leeway for non-response. With these considerations in mind, an initial sample of 2000 students (or approximately 3% of the population) was proposed.

Apart from concerns regarding statistical power and sampling error, sample size was also dictated by a series of substantive considerations, including:

a. The logistics involved in producing questionnaires

[20] Kline (2005) goes so far as to point out that, as the ratio decreases from his proposed rule of thumb, "so does the trustworthiness of the results" (p. 12).

b. The time component involved in distributing questionnaires to a nationally representative sample of students, located in schools spread across the entire country (including a number of schools on remote/island locales)
c. Allowing a reasonable amount of time for schools to administer questionnaires, within the constraints of their regular working schedule
d. The time remaining in the academic year, following approval of the study by the Greek Ministry of Education, Research and Religions.

Previous studies with similar sampling and administration techniques showed exceedingly high response rates from Lyceums in Greece[21]. Ministry approval to conduct data collection was received on January 5th 2017. Given the projected time requirements production, packaging, and securing means of distribution, (final dispatch of questionnaires to schools took place on 28 Feb, 2018), and the fact that Lyceum classes traditionally stop for two weeks over Easter and end sometime in May, it seemed reasonable to expect a higher than average amount of schools to opt-out of the survey. This concern was further exacerbated by a well-established trend in Greek schools of students in the last year of secondary education saving up justified absences until the end of the academic year, at which point many would take them *en masse*, to focus on Panhellenic Examination preparation. To place this in context, until the 2017-2018 academic year, absences from school in Greece were divided into *justified* (Greek: Dikeologimenes or *Διακιολογημένες*) and *unjustified* (Greek: Adikeologettes or *Αδικαιολόγητες*). Greek students could not successfully complete a given grade if they

[21] Moustairas (2004), for example, had a response rate somewhat in excess of 81.5% from a sample size of 1310 students.

surpassed 64 unjustified absences; 114 total absences, with those exceeding 64 being justified (through doctor's notes or, in certain limited cases, directly by students' guardians); or 164 absences, no more than 64 of which could be unjustified and a corresponding GPA of no less than 15 (Hellenic Democracy, 2018d). This prioritization of SE over school in the final grades of secondary education is not unique to Greece (see, e.g., Bray, Kobakhidze, & Kwo, 2020).

To account for this, a final sample size of approximately 4.5% was selected. This figure corresponded to 3151 students in 41 schools[22]. 17 schools (with 1324 students) were randomly selected from the first strata, 9 (with 1025 students) from the second, and 16 (with 653 students) from the third. Oversampling in this manner also allowed for potentially lower response rates within schools and otherwise unforeseeable factors (including though not limited to illness or other factors leading to incapacity to participate).

In total, 8 schools declined to take part in the survey –most citing time constraints or an overabundance of surveys inundating the school. 33 schools elected to take part in the study; 9 schools with 497 respondents from the first stratum, 9 schools with 602 respondents from the second, and 15 schools with 424 respondents from the third. This resulted in a final sample of 1508 students. Although characterized by all of the difficulties discussed above, the final sample collected nonetheless corresponds to 2.14%, surpassing by very nearly half a percent that proposed by Kline's (2005) rule.

[22] A sample of 4% was initially selected but the irregularities associated with cohort sizes made the results of the random selection process rather unpredictable. Selection was carried out with the aim of a *minimum* of 4% of the population, based on average cohort size in each stratum.

4.3 Data Collection

The data employed in the study was collected via mailed self-completed questionnaires, administered to students in the second (i.e., spring) semester of the 2017-2018 academic year. After receiving permission to conduct the survey from the Ministry of Education, Religions and Research, printing and postage (both ways) were negotiated with a national courier service, and school principals were contacted via an email containing a brief description of the study and a copy of the Ministerial Clearance granting said permission. Following printing and preparation, each school in the sample received a package containing:

a. Questionnaires (see Appendices A and B[23] for the English Translation and original, Greek Language versions thereof) for each student, packaged in blank, individual, self-sealing envelopes.
b. An envelope addressed to the principal containing a letter (see Appendix C) outlining the research in somewhat more detail than the original correspondence, reiterating the Ministerial and Central University Research Ethics Committee (CUREC) approval of the survey, and the role of the principal, teachers, and students in the survey.
c. Envelopes containing a letter for the teacher of each class (see Appendix D), delineating their role in the administration and collection of questionnaires from students, as well as a comment form for reporting problems, special needs, and other comments stemming from the process of administration.

[23] The questionnaire appended to this document is included in-line, to facilitate its incorporation in digital form. It is worth noting, however, that in print form, it was presented to students as a booklet comprised of 3 (three) single fold sheets of A3 paper, bound by a stapled spine. This was done both for purposes of paper economy but also because the smaller overall profile it presented encouraged greater response rates.

d. A printed return address label to affix to the package for its return.

No postage was incurred by schools; collection and return postage of the questionnaire packages were negotiated as part of the overall payment agreement with the national courier service, which was communicated in the letters to principals.

Principals were asked to select a teacher or teachers (as appropriate) to administer the questionnaires as soon as possible after receipt of the questionnaires, leaving the precise time and date to their best discretion. A note in the letter requested that, where possible, all classes comprising their school's cohort should complete the questionnaire concurrently. According to the instructions delineated in the letter to principals and in the questionnaire's cover letter, students were instructed to place their completed questionnaire in the included envelope and seal it, placing it in the original packaging, for return shipping. Teachers were invited to take a few minutes to complete the brief comment form following administration of the questionnaire, if they believed it was beneficial to do so. Principals were asked to return the completed, sealed questionnaires and (where applicable) teacher comment form as soon as possible following administration to all of the school cohort's class(es).

The process outlined above (and presented in greater detail in Appendices A, B, and C) was selected for several reasons. It facilitated reasonably concurrent collection of information from the entire sample, while allowing principals and teachers enough freedom to administer the questionnaires in the manner least disruptive to the regular routine of their schools. In one form or another, the most significant aspects had been tested and found to function efficiently in the Greek context (Katsillis, 1986; Moustairas, 2004).

Convention and past success are arguably among the better indicators of continued design viability. This in not to say, however, that they should be relied on exclusively, in the face of emerging empirical data on confounding factors in the field. For example, schools in Greece are increasingly burdened by what Arani (2015) termed “researcher traffic” –the increasing volume of which can influence principals’ proclivity to participate in the study. This phenomenon is not unheard of in Greece and indeed was grounds for one school withdrawing from the study. This school was later replaced with one of the back-ups (included in the extended sample for just this purpose). It should be noted that the letter to principals, included with the questionnaires was formatted specifically to circumvent this and other issues that might lead to principals electing to opt-out. In the particular case of the school that opted-out, the questionnaires and accompanying materials (including the letter to principals) were returned unopened.

Arani (2015) also raised several potential concerns regarding employing teachers in the administration process, including excessive workloads, potential conflicts of interest (if they were working as/with private tutors), and status concerns (an expectation that the researcher themselves be present for the collection of the data). Our study, however, did not appear to run into any such issues in either its piloting or final administration. Teachers were selected by principals, who had, in effect, been “courted” through the letter to principals –presumably such that the appropriation of one of their teaching hours represented a minimal impact to students’ learning experience and their own syllabi. The questionnaire’s items were selected and later worded in such a way as to alleviate (or at least minimize) potential issues that might arise from implicating SE practitioners or providing feedback that could be construed as

derogatory or privileged in nature[24]. Finally, like their principal counterparts, teachers too were, in effect, courted in the letters addressed to them, through the reinforcement of the significance of their roles in the process of data collection, their roles as points of reference for their students, and the dependence of the study's success on their cooperation and contribution.

Bray and Kwo (2015, p.157) also present a series of concerns related to allowing teachers to administer the questionnaires within schools, focusing on the multiple tasks they would be required to undertake, including "handing out and collecting questionnaires, answering queries and negotiating interviews" along with a concern that they could present intrusive behavior. While negotiating interviews was not a concern for this study, the other points were salient. Previous commensurate data collection (e.g., Katsillis, 1987[25]; Moustairas, 2004), showed no indications of such behaviors on the part of teachers. Nevertheless, some care was given to these considerations in the course of piloting the study's instrument. By virtue of its smaller size and more localized character, the process of piloting allowed more intimate scrutiny of both the instrument and the method of its application. Neither this scrutiny, nor later reports from principals, teachers, or students indicated any such irregularities. This was likely due, in part, to the fact that the majority of the questions employed in the instrument had been previously used, successfully, to collect data from equivalent student cohorts in the past, minimizing otherwise unforeseeable confusion on the part of students. Teachers also had an opportunity to read the questionnaire prior to its administration. As discussed above,

[24] For example, by excluding questions regarding which private SE practitioners students were taught by, following Verdis' (2002) problems collecting relevant data.

[25] It should be noted that Katsillis (1987) also asked students about the duration of their SE participation.

its wording was selected to return maximal information while avoiding incrimination or defamation, thus giving teachers little (if any) cause for concern.

Insofar as students themselves were concerned, Arani (2015) notes the comparative lack of enthusiasm presented by students in the final grade of upper-secondary education to complete questionnaires, due to the pressures of impending national university entrance examinations. While this factor is indeed a concern in Greece, it is one that arguably comes into play very late in the academic year –usually following the Spring/Easter academic break. It was in part for this reason that questionnaires were delivered to schools as early as possible within the calendar year, following the study's approval and accompanied by documentation instructing principals to administer the questionnaire as soon as possible.

The self-completion questionnaire, which this study employed, has proven itself an effective instrument of data collection in a number of relevant studies in education (e.g., Jenks, Crouse, & Mueser, 1983; Katsillis & Rubinson, 1990; Moustairas, 2004, to name but a few) and is, arguably, the norm for data collection to date. Given the clustering actively designed into the sample, the process seemed both efficient and, relatively speaking, cost efficient, without posing any serious additional threat to the reliability of the information. This position was corroborated by the approval of the university's central research ethics committee (see Appendix E and for the CUREC application; CUREC letters of approval are available upon request).

At the same time, however, there is an increasing uptake in online questionnaires in the both the Social Sciences and in general. Indeed, if this were a viable option, it would have saved substantial amounts of both time and money; instrument dissemination and data collection would have been, for all intents and purposes, instantaneous, transcription would have been

unnecessary and, with proper forethought, coding could have represented a negligible investiture. Fundamental concerns regarding equal access and network infrastructure in Greece made it impossible.

In 2018, 89% of students reported having access to ta computer they could use for school work (OECD, 2020). Furthermore, a study by the Hellenic Statistical Authority including 5111 private households placed internet coverage at 80.4% of Greek households –a marked increase from previous years (CNN, 2020). Indeed, the corresponding figure was 76% in 2018, when this study's instrument was administered and just 69% in 2016, when it was being planned (Statista Research Group, 2019). A portion of the study's sample lacking the means to access the instrument itself alone is grounds for the introduction of sufficient bias to make this option infeasible. Of course, a personal computer is not the only means of accessing the internet. One could, for example, argue that the possession of a smart-phone, at least, is very nearly universal. There is, however, a strong argument to be made for making the experience of instrument access and presentation as equal as possible, thus eliminating any biases that could arise from being exposed to the questionnaire in different formats (as this could, e.g., lead to respondents using different platforms associating different levels of attention or care to detail).

By 2016, when this study's instrument was in its initial design stages, all Greek high schools were equipped with computer labs (Nikolopoulou & Gialamas, 2016). In theory, this means that they can provide their students with internet access, through school computer labs. Despite this, computer equipment issues remain a perceived barrier for teachers (Nikolopoulou & Gialamas, 2016). In most cases the ICT labs are of insufficient size to enable

entire school cohorts to complete the questionnaire concurrently. Indeed, Karagiannidis et al. (2020) report that the ratio of students to computers in upper secondary education was 19:1 in Greece in 2019. Less computers than students in a given school would necessarily result in non-concurrent questionnaire completion. This, in turn, increases the risk of student-respondents discussing the questionnaire with their contemporaries and inadvertently introducing biases to their answers.

While there was no guarantee that principals would, in fact, direct all of the classes in a given cohort to respond to the questionnaires concurrently, it was *possible* to do so and there was no reason to assume they would not. Indeed, in such cases as feedback was provided, it was indicated that they had attempted to organize questionnaire completion concurrently -in some cases, going so far as to delay instrument administration slightly to ensure that this was possible.

4.4 Instrument Construction and a brief note on Variable Operationalization

Approximately half of the conceptual variables examined in the course of this study (and somewhat more than half of those incorporated in the study's structural models) were not directly measurable. To this end, a series of measurable (operational) variables were employed for the operationalization of each of these. One of the core concerns of this study regards the valid and reliable measurement of SE. This is largely predicated on the nearly ubiquitous operationalization of SE as a form of Boolean black box. A thing one either receives/participates in or does not. However, to examine the various aspects of SE, one must

first have some, ideally extensive, measures of them, which is to say some data regarding them. When this study was initially proposed and finally undertaken, a comprehensive set of such data did not exist, necessitating the selection and/or creation of an instrument for its collection.

In principle, data could be collected using either interviews or questionnaires. Indeed, an interview process could provide fundamental insights into core aspects of SE and, undertaken *in situ* (i.e., in Greece), it could provide a set of questions singularly tailored to the context under examination. Of course, interviews bring with them the potential for inadvertent (Williams, 1964) or intentional (Boyd & Westfall, 1955) interviewer bias. It is however, the monumental investment of time, manpower, and monetary resources required to conduct, transcribe, interpret and code the answers of several hundred if not a thousand interviews which seemingly far outweigh the potential gains of such a strategy.

Questionnaires require a significant investment of time for their construction, to ensure their validity, appeal, and the highest possible return rates. This investment includes a rough outline of thematic content, finding or, where necessary, drafting specific, representative questions to collect the necessary data, selecting question format, selecting a general format, layout, and ordering of the questions (Babbie, 2007; McFarland, 1981). Questionnaires also require some form of piloting, adjustment to account for unavoidable error during their question development (Babbie, 2007), a process which may require iterative repetition. This expenditure of time and effort, however, is not required after the, effectively one time, *a priori* investment.

There are several issues which must be taken into account when developing a questionnaire. The length (Herzog & Bachman, 1981), overall order and structure (Babbie, 2007) of the questionnaire are substantially significant. Overlong questionnaires can confuse, deject, and bore respondents, potentially introducing a series of reliability issues (Babbie, 2007). For example, the inclusion of open-ended questions in a questionnaire offers many of the same benefits as the interview process, while concurrently allowing for the collection of information from a much broader audience, with a significantly lower investment of time and effort. On the other hand, open-ended questions also present many of the same problems as interviews, including the increased probability of vague, misleading, or off-topic responses and significant *ex post facto* time invested in coding and analysis. Closed-ended questions, which present respondents with a predetermined set of respondents offer greater uniformity of response, ease of interpretation and encoding (Babbie, 2007), but potentially lack much of the exploratory power inherent in open-ended inquiries.

Ideally, every measure employed, and their specific relationship with the unmeasurable variables, would be clearly described or defined by substantive theory. Realistically, even a cursory examination of the relevant literature indicates multiple measurements for almost every variable. A viable method to associate the study's operational and conceptual variables appears to be that of "common agreement" (Boslaugh, 2012; see also Blalock, 1979).

To address most of these concerns, it is prudent to use variables and procedures utilized by previous research. As such, many of the variables used in this study are justified based on earlier research both in the Greek context and internationally (see Katsillis, 1987; Moustairas, 2004).

It is important to reiterate that there is a common issue surrounding the study of SE regarding a general lack of familiarity with core characteristics of SE. This is not necessarily an unfounded concern, given the taboo surrounding extracurricular private education, which can be associated with the phenomenon in many countries. Greece yet again offers a distinct advantage, in this respect, since the widespread nature of SE and the open, public discourse regarding it make the phenomenon in general and the characteristics of its inner workings specifically subjects that students (past and present) and their families are intimately familiar with. This familiarity and openness regarding the subject provide a unique opportunity for the in-depth measurement of a phenomenon, which could otherwise require extensive preliminary study elsewhere. Nevertheless, despite (or perhaps because of) the broad scale familiarity with the characteristics of the phenomenon, very little can be found in the academic literature regarding the measurement of specific aspects of SE, in Greece or elsewhere, necessitating the construction of original survey questions to measure them.

The construction of a survey question is a daunting task. Questions must be reliable, valid, clear, and concise. They must offer respondents a clear understanding of what they are being asked and (where applicable) what their pre-determined responses/categories mean. Closed-ended questions, specifically, must contain both exhaustive and mutually exclusive response categories (Babbie, 2007). In a more niche concern of this study, questions are frequently presented to respondents in a language (i.e., Greek) other than that in which they were initially developed, piloted and tested in (i.e., by and large English). One reason for selecting the particular wording and format of questions taken from previous research (i.e., Moustairas, 2004) employed in this study's questionnaire is that it had been previously

submitted to a process of iterative back translation. In other words, those questions not originally formatted in the Greek language were translated from English to Greek, then back into English, reviewed, revised, translated again, and so on, until no further significant conceptual deviation was found. The same process was carried out for those questions regarding SE which were developed for this study's questionnaire. This is a laborious, though contextually necessary process but one that Brislin (1970) points out can minimize, or even alleviate concerns of consistency across languages altogether.

The questionnaire used in this study was constructed between late 2016 and early 2017. During the spring academic 2016-2017 semester and following CUREC approval from the University of Oxford, it was piloted on a limited sample of students from four upper secondary schools, in the greater metropolitan area of Patras, the capital of the prefecture of Achaia, on the western coast of the Peloponnese peninsula in Greece. Despite their limited number, the schools covered a gamut of socioeconomic strata, and were situated in locales ranging from small, semi-rural suburbs, to some of the most densely populated areas of the central metropolitan area of the city. These schools were subsequently excluded from the administration of the final questionnaire.

Test design brings with it a very real concern that the designer's intended meanings may not completely match the respondents' interpretations (Karabenick et al., 2007; Koretz, 2008; see also Bray, Kobakhidze, & Suter, 2020). Individual questions regarding SE were vetted by Group and Private SE practitioners, who found them to be clear, concise, and easily understandable. Piloting also gave no indication that students had any difficulty

understanding or responding to these questions, which was further supported by the pilot classes Teachers' comment forms.

The finalized version of the questionnaire was administered to students in the final year of secondary education in 2017. Following format streamlining and minor alterations, renewed Central University Research Ethics Council (CUREC) clearance (available upon request), and the approval of the Greek Ministry of Education, Research and Religions, administered by mail in early 2018.

A justification and brief discussion of the study's primary variables of interest and the models they will be incorporated into are presented in the following chapter. This is followed by a discussion of their operationalization, followed by a description of the data collected and the results of analyses of the study's models.

4.5 Discussion and Theoretical Justification of the Study's Models

Educational Achievement is examined by many disciplines and has been modelled in varied ways, according to the specific needs and interest of each. The majority of these, however, can be collected into three general categories: Psychological, Economic, and Sociological, wherein psychology largely concerns itself with the learning process, economy with student productivity, and sociology with the creation and transmission of inequalities (Katsillis, 1987). The differences between the concerns of each category also make apparent the shortcomings of each, when attempting to create a realistic approximation of educational reality. Their commonalities provide fertile grounds for their integration into one, comprehensive model.

Several models are employed in the course of this study. Included among them are models examining the enhancing or remedial nature of SE participation by analyzing the relationship between students' Previous Achievement and SE, models examining the relationship between SE and later educational achievement to assess the impact of its various measures on students' achievement, and a series of structural models examining the role of SE in the educational achievement process. Each of these models examines the relationships between background characteristics, SE, and later achievement in similar but distinct ways. More specifically, the variables included in the models are as follows: SE participation, SE Quality, Family Socioeconomic Status, Area of Residence/Urbanicity, Gender, Ethnicity, Cultural Capital, Significant Others' Influence, Educational Expectations, Previous Achievement, Student Effort, Wealth, and Dominant Home Language.

The relationship between Previous Achievement and SE participation, discussed in the examination of the employment of SE as a strategy of enhancement or remediation, is modelled controlling for a number of variables prescribed by previous research (Stevenson & Baker, 1992; Baker et al., 2001). These include students' Family Socioeconomic Status, Gender, Area of Residence, Ethnicity and the dominant language spoken in their homes. The relationship, if any, between students' participation in and/or the characteristics of SE and their educational achievement controls for characteristics known to affect educational achievement. These expand on the previous set to include familial wealth, students' previous achievement, their school academic composition, significant others' influences, and students' educational expectations. The structural model includes the majority of these variables

couched in a unidirectional chain of regressions, allowing the examination of specific relationships between variables and the overall process of educational achievement.

4.5.1 A Working Model to Examine the Role of Shadow Education in the Educational Achievement Process

The working model of educational achievement of high school students in Greece employed in this study was initially developed by Katsillis (1987, see Figure 2).

Aspects of this model were adapted and expanded upon by Moustairas (2004) and Moustairas and Katsillis (2006) within a framework examining the relationships between students' educational expectations and their Human, Social and Cultural Capitals, while the overall model was reassessed and revised by Katsillis (2015). The model posits the educational achievement process as a unidirectional chain of variables from psychological, economic, and sociological approaches and processes.

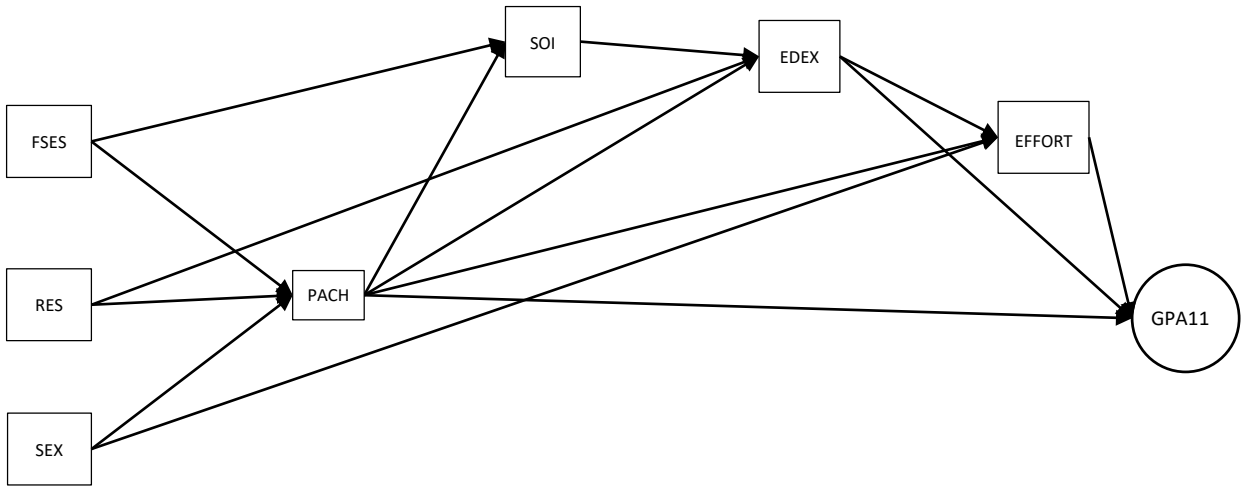


Figure 2. Original Model of Educational Achievement Process for Greece – Statistically Significant Paths (Katsillis, 1987)

In its most current iteration, Katsillis (2015) posited a model with four exogenous variables, Family Socioeconomic Status (FSES), Urbanicity (RES), Gender (SEX), and Ethnicity (ETHN), and five intervening variables: Cultural Capital (CULCAP), Previous Achievement (PACH), School Academic Composition (SCHCOMP), Parental Educational Expectations (PAREDEX)[26], and Educational Expectations (EDEX). With the exception of Cultural Capital, all of these were variables that played a significant role in the translation of background characteristics into differential educational achievement (resulting in a Revised model containing 4 exogenous and 4 intervening variables, depicted in Figure 3). Shadow Education, initially in the form of simple participation (in High School), is added to this chain following students' Educational Expectations and preceding Student Effort.

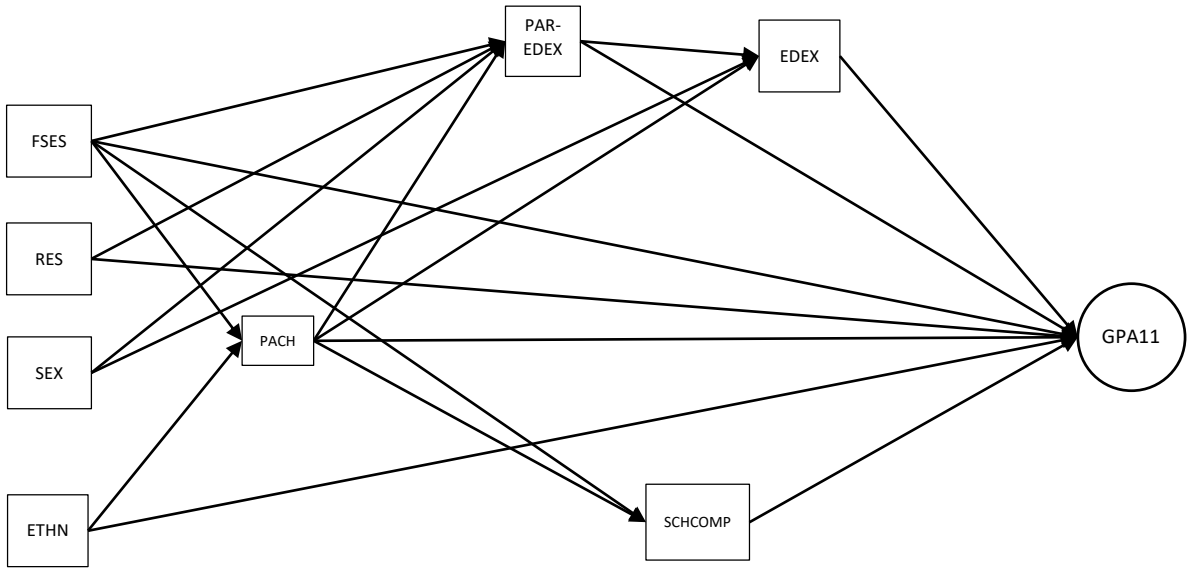


Figure 3. Revised Model of Educational Achievement Process for Greece – Statistically Significant Paths (Katsillis, 2015)

[26] Parental Educational Expectations, the most important part of Significant Other's Influence according to Katsillis (1987), were employed in this model as a proxy for Significant Others' Influence, since neither a composite measure nor the component parts to estimate one were present in the dataset employed by Katsillis (2015).

The model incorporates theories from both functional/status attainment (Alexander, Eckland, & Griffin, 1975; Blau & Duncan, 1967; Sewell et al., 1969; Sewell & Shah, 1968) and conflict perspectives (Bourdieu, 1977; Bourdieu, 1984; Bourdieu & Passeron, 1977; Bourdieu & Wacquant, 1992; Bowles & Gintis, 1976). Although these theories represent two opposing sides of an ongoing and heated debate, there is arguably substantive worth to employing both the commonalities shared and the differences between the two in one model. For example, both theories recognize that Family Socioeconomic status and various combinations of other background characteristics influence student achievement and both have been argued to draw from the same sources (Karabel & Halsey, 1977). Their fundamental difference regards the process through which this influence occurs. Functional Theory sees education as a vessel for individual mobility (Karabel & Halsey, 1977), in which education is treated as an achievement process, where this influence is expressed through the transformation of background inequalities into social and social-psychological characteristics, which, in turn, are rewarded by differential educational achievement and/or attainment (Sewell et al., 1969). Conflict Theory argues that society maintains a system of structured inequality (Collins, 1977) by placing structural impediments on individuals or groups, thus curtailing their educational achievement and later attainment (Bourdieu, 1977; Crane, 1969). In other words, Functional Theorists see education as a process of achievement, while Conflict Theorists as one of ascription (Ganzeboom & Treiman, 2007).

Couched in these terms, the argument becomes one of “achievement” which argues that success is based on personal characteristics and skills, while “ascription” argues that success

depends on characteristics which are ascribed to students and over which they have no control, such as gender, race, socioeconomic background etc. The assumption motivating this distinction seems to be that achievement leads to mobility and ascription to reproduction. It has been argued, however, that this is likely a false distinction and one that is, in any case, not particularly useful (Katsillis & Rubinson, 1990). Insofar, for example, as students' individual characteristics and skills are defined by their social origins and background characteristics, their achievement can also contribute to the propagation of social reproduction (Katsillis & Rubinson, 1990). In this sense, "educational systems can promote not only personal social reproduction and personal achievement but also reproduction *through* achievement" (Katsillis & Armer, 2000 p. 758, emphasis in original).

The model employed in this study provides at least four significant advantages: It provides us with the primary determinants of educational achievement, it delineates the mechanisms through which said determinants affect achievement, it was specifically estimated using data from Greece (see Katsillis, 1987), and the relationships it proposed largely held up to scrutiny using Greek data from a much later time point (see Moustairas & Katsillis, 2006; Katsillis, 2015). It is important to note that none of the studies listed above found Cultural Capital to have a significant effect on educational achievement. It is nonetheless retained in the final model due to both the persistent theoretical support it finds in the literature and the dynamic nature of the relationships involved in the educational achievement process, which may have changed, over time.

4.5.2 Variables in the Model: Justification and Explanation

4.5.2.1 The Dependent Variable

Educational Achievement

Admission to Higher Education and courses of study in Greece is dictated mainly by students' performance on Panhellenic national university entrance examinations, which are administered at the end of upper secondary education. As a result, these scores are the most appropriate measure of educational achievement in Greece. However, recent changes in Greek legislature and practices regarding the format and means of dissemination of these scores has rendered their collection impossible. In lieu of these scores, this study employs Greek students' 11th Grade GPA, which are historically highly correlated with (Papas & Psacharopoulos, 1991) and amongst the strongest predictors of students' Panhellenic exam scores (Psacharopoulos, 1979; Papas & Psacharopoulos, 1993).

4.5.2.2 Exogenous Variables

Family Socioeconomic Status (FSES)

FSES, classically measured by Parental Educational Attainment, Occupational Status, and Income, has a long history of strongly influencing school performance. This is evident in both classical (Alexander et al., 1978; Burstein et al., 1980; Coleman et al., 1966; Fotheringham & Creal, 1980; Henderson et al., 1976; Levin, 1970; Michelson, 1970) and more contemporary literature (Agidrag et al., 2012; Entwisle & Alexander, 1992; Legewie & DiPrete, 2012; Levels et al., 2008; Lurdes & Veiga, 2010; Portes, 2000; Van Laar & Sidanius, 2001). The strong relationship between FSES measures and

educational achievement also seems to hold true in Greece (Flouris et al., 1994; Giamouridis & Bagley, 2006; Giouvalas & Vitsilakis-Soroniatis, 2012; Psacharopoulos & Soumelis, 1979; Psacharopoulos, 1991), whether it is examined directly or indirectly.

In the case of Greece, Psacharopoulos and Soumelis (1979) found parental education and family income (both component parts of FSES) to be the strongest predictors of students' educational achievement. In a later study, Papas and Psacharopoulos (1991) found that compound socioeconomic status and private school attendance were both significant predictors of students' educational achievement, with the latter having a more substantial effect. It is worth noting, however, that they also found private school attendance was predominantly the purview of higher socioeconomic strata (Papas & Psacharopoulos, 1991), lending further support to the role of FSES as a determinant of students' educational achievement, than the schools themselves. Flouris et al. (1994) also found FSES to be a significant determinant of students' educational achievement. Giamouridis and Bagely (2006) found a significant association between paternal occupation (another component of students' FSES) and students' achievement, while Gouvias and Vitsilaki-Soroniatis (2012) found significant effects of parental education and occupation on students' educational achievement directly and mediated by their previous achievement.

Urbanicity

Urbanicity is a simplified version of students' Area of Residence, which is a measure of where students live. It is simplified in the sense that it is derived from a more comprehensive measure of students' area of residence and reclassifies it to represent the most historically significant differentiation between such locales, that of Urban and Rural. Students' area of residence has been repeatedly found to affect students' educational attainment both in Greece (Flouris, 1994; Mylonas, 1979; Katsillis & Rubinson, 1990; Katsillis, 2015) and abroad (Jenks et al., 1979; Borland & Howsen, 1999). Despite this, many studies of educational achievement in Greece do not universally include students' Urbanicity (or Area of Residence), with many being localized (e.g., Papas & Psacharopoulos, 1993; Antonopoulou et al., 2011; Couvias & Vitsilakis-Soroniatis, 2005; Sianou-Kyrgiou, 2010), presumably due to the logistical difficulties in collecting a representative sample from the entire country, or even one of its prefectures. Interestingly, even the Greek studies that do not directly examine area of residence as a variable of interest, recognize the importance of its role (Gouvias et al., 2012; Hopf & Hatzichristou, 1999). In the Greek context, the historical significance of Area of Residence was founded on the existence of inaccessible mountain or remote island villages (Katsillis, 1987), many of which were characterized by understaffed primary and limited secondary schools. The percentage of understaffed schools has persistently declined over the last half century, going from 58% in the early eighties (Katsillis, 1987) to approximately 32% by 2007 (Katsillis, 2015). While limited access to many remote villages and islands remains an issue in

many cases, it is nonetheless of interest to see if the differences historically associated with students' living in such locales persist in the modern information age.

This differential access to educational resources, though somewhat ameliorated, leads us to assume that Urbanicity affects students' educational achievement through their achievement in primary and lower secondary education. Katsillis (1987) found Urbanicity to affect students' educational achievement through the socioeconomic composition of their schools and the Significant Others' Influence (discussed later in this study). Katsillis (2015) corroborated these findings using data from the 2003-2004 academic year, although his study employed Parents' Educational Expectations (a component part of students' Significant Others' Influence) in lieu of Significant Others' Influence.

Gender

Student Gender is a largely persistent characteristic of studies of the educational achievement and attainment processes both abroad (e.g., Gorard et al., 2001; Mickelson, 1990; Smith, 1984; Legewie & DiPrete, 2012) and in Greece (Barkatsas et al., 2009; Flouris et al., 1994; Katsillis & Rubinson, 1990; Katsillis, 2015; Moustairas, 2004; Lourdes & Veiga, 2010; Psacharopoulos & Soumelis, 1979). Whom the gender gap favors seems to be a subject of ongoing debate and likely one dependent on where, at what point in time, and with what measure of achievement the gap is examined (for a more in-depth discussion of the subject, see Katsillis, 2015). Its

persistent existence, however, mandates the inclusion of gender as a variable in the study of educational achievement.

From a functional standpoint, Katsillis (1987; see also Katsillis & Rubinson, 1990) found that Gender affected students' educational achievement through their previous achievement –a relationship also posited by Mare and Chang (2006)– and student effort. Flouris et al. (1994) found a different effect of Gender on achievement by students' Area of Residence (although no formal test for an interaction effect was carried out)[27]. Katsillis (2015) found gender to affect students' educational achievement both directly and through their Parents' Educational Expectations for them and their Educational Expectations for themselves.

Ethnicity

There is a broad range of literature examining the educational achievement of ethnic and other racial minorities. There is evidence suggesting that the effect of ethnicity on students' achievement can be both direct (Azzolini et al., 2012; Sewell & Shah, 1977; Williams & Clancey, 1991) and indirect (Portes, 2000; Van Laar & Sidanius, 2001) or both (Katsillis, 2015). If one expands the definition of ethnicity to include aspects of race, the evidence for such associations grows noticeably (e.g., Bowles & Gintis, 2002; Condron, 2009; Downey, 1995; Mickelson, 1990; Persell et al., 1992). While the two concepts are, of course, not synonymous, the arguments supporting the use of

[27] It is worth noting that neither Katsillis (1987) nor Katsillis (2015) found a significant interaction between Gender and Area of Residence, in Greece.

both are largely focused on differences from the majority population, rather than any specific characteristic intrinsic to the concept of either race or ethnicity. The inclusion of ethnicity in the model of educational achievement presents particular interest in the case of Greece, which was a largely ethnically homogeneous society until the early 1990s. An examination of its role using data collected early in the previous decade, while the government was still adapting to the introduction of ethnic heterogeneity in the classroom indicated that the educational achievement process functioned in a fundamentally different manner for students of non-Greek ethnicity (Katsillis, 2015, see Figure 4). It is, thus, interesting to see if the intervening period has allowed the Greek educational system to adapt to what is, fundamentally, still a new state of affairs.

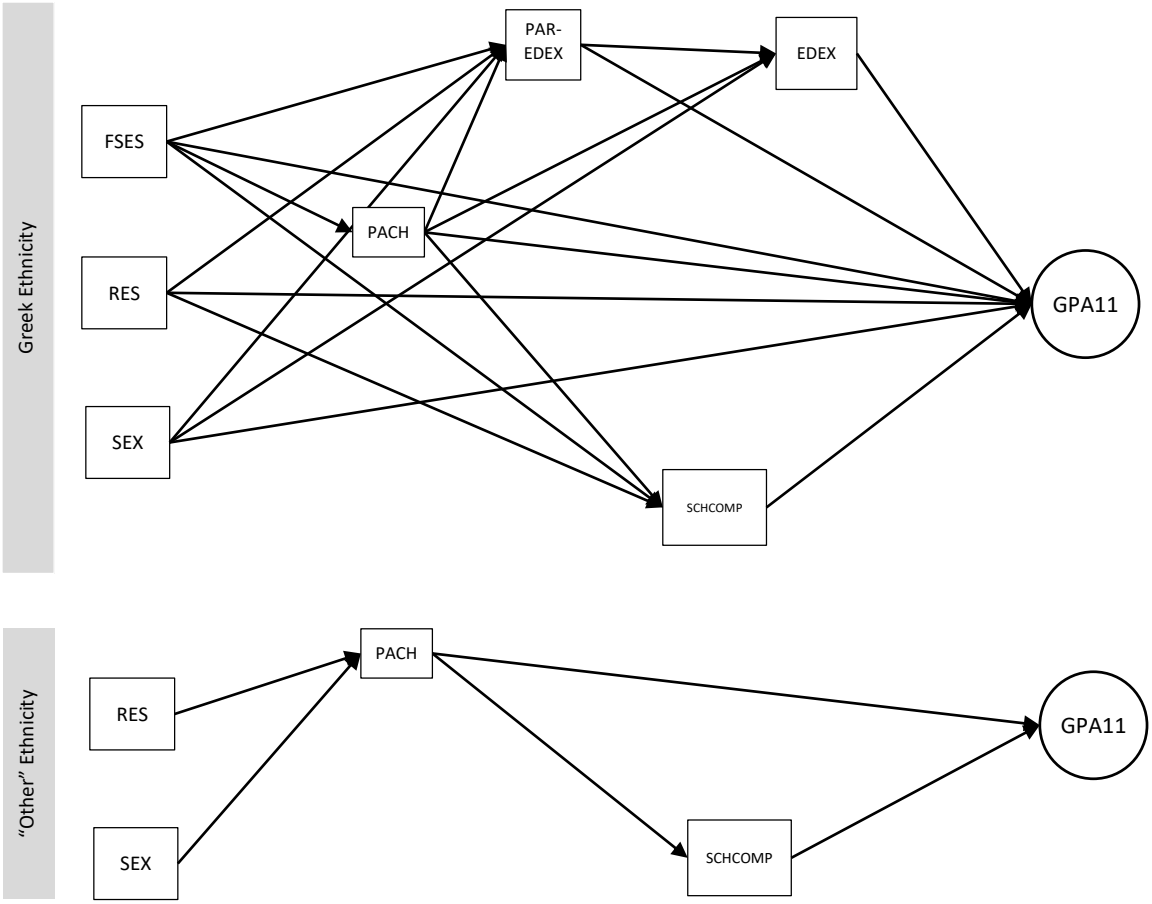


Figure 4. Revised Model of Educational Achievement Process for Greece by Ethnicity – Statistically Significant Paths (Katsillis, 2015)

Examining students' educational achievement for his complete sample (i.e., including students of both Greek and "Other" ethnicity) in Greece, Katsillis (2015) found Ethnicity to affect educational achievement both directly and through students' previous achievement. Ethnicity, however, can also function as an indicator of minority status, and as such, is expected to affect educational achievement through effort (Mickelson, 1990) and directly (Clifton et al., 1991).

4.5.2.3 Intervening Variables

Cultural Capital

According to the Cultural Capital hypothesis (Bourdieu, 1977; Bourdieuu & Passeron, 1977), Cultural Capital mediates the effect of family background on educational achievement. While previous studies in Greece have failed to indicate any such transformative relationship (Katsillis & Rubinson, 1990; Katsillis, 2015; Moustairas, 2004) there are arguments in favor of the retention of Cultural Capital. Bourdieu (1977) proposed that modernization and higher levels of democracy would increase the influence of Cultural Capital. Contemporary literature also continues to support the influence of cultural factors on educational achievement (Lourdes & Veiga, 2010) and certain relationships within the educational achievement process. Jæger and Breen (2016) found that students' Cultural Capital affected their educational achievement. Legewie and DiPrete (2012), for example, found that sensitivity to Cultural Capital played a role in explaining the gender achievement gap, while Moustairas and Katsillis (2006) found that Cultural Capital affected students' educational achievement through their educational expectations for themselves. Regardless, there have also been a number of changes in the social makeup of the Greek classroom in the intervening period, with an increased ethnically non-Greek population and the continued governmental efforts to better integrate its now socioculturally heterogeneous elements.

It is worth remembering the considerations presented previously, regarding the remote nature of many rural areas in Greece. Such regions would likely also have limited (if any) direct access to some or all of the classical high-culture indicators of Cultural Capital (which are discussed in greater detail later in this study). It is also possible that the relatively novel ethnic heterogeneity of contemporary Greek society may extend to differential levels of Cultural Capital within subgroups of the population.

Previous Achievement

Previous Achievement (PACH) acts as something of a proxy for aptitude. The primary motivation for this substitution is the lack of aptitude measures from Greek schools. However, Jenks et al. (1983) considered Previous Achievement, which encompassed grades from a variety of schools and teachers, more likely to capture underlying, stable, and general ability. Previous Achievement has been found to significantly affect educational achievement both directly and indirectly, through the influence of Significant Others and students' own Educational Expectations in both international and Greek studies (Agidrag et al., 2012; Flouris et al., 1994; Katsillis, 1987; Katsillis, 2015; Katsillis & Rubinson, 1990; Papas & Psacharopoulos, 1991; Sewell & Shah, 1977; Smith, 1993). The inclusion of Previous Achievement has been argued to be necessary in any model of educational achievement, to avoid overestimating the effects of variables preceding it (Singh, 1998). In our model, these are the exogenous variables and Cultural Capital.

Significant Others' Influence

Significant Others' Influence is a mainstay component of the Wisconsin Model and its Replications (Sewell et al., 1969; Sewell et al., 1970; Hauser et al., 1980). It is a composite measure, including Parents and Teachers Educational Expectations for the Student, their best friends' Educational Expectations for themselves and the Educational of Students' highest educated Relatives and Acquaintances. Even outside of replications of the Wisconsin model, the influences of Significant Others, whether separate or together, have been repeatedly found to affect students' achievement (Davis-Keane, 2005; Moustairas, 2004; Pearce, 2006) and mediate the effects of students' background characteristics (i.e., FSES, Area of Residence, and Gender and, later, Ethnicity) on said achievement (Katsillis, 1987; Katsillis, 2015).

School Academic Composition

Bowles (1977) proposed that differences in school quality and internal structure are defining characteristics of schooling inequalities and thus educational outcomes. This position was largely borne out by Leiter (1983), who found that classroom academic composition affected students' achievement, and Dumay and Dupriez (2008), who found that it explained a significant portion of between-school variance in student performance, controlling for students' previous achievement and socio-cultural background. Following the "differential peers" and "differential instruction" hypotheses (Rowan & Miracle Jr, 1983), School Academic Composition (SCHCOMP) would affect their peer groups' average expectations (partially represented here in

the students' best friend's educational expectations component of Significant Others' Influence) to affect students' Educational Expectations. Since students' allocations to specific public schools in Greece is largely determined by their place of residence, and following the arguments presented regarding access to sufficient and high quality education for more remote regions, SCHCOMP is also assumed to be dependent on students' Area of Residence. Finally, following Bourdieu's proposed theory of Cultural Capital, students' achievement should differ based on their cultural capital, with classes with students possessing, on average, higher levels of Cultural Capital showing higher achievement (arguably at all points in the educational process). As such, SCHCOMP is also assumed to depend on Cultural Capital.

Educational Expectations

Students' Educational Expectations for themselves (EDEX) are affected by family background characteristics (Moustairas & Katsillis, 2006; Katsillis, 2015) and are, in turn, among the strongest predictors of later success (Carpenter et al., 1980; Coleman et al., 1966; Katsillis & Rubinson, 1990; Marjoribanks, 1984; Sewell et al., 1970; Sewell & Shah, 1977; Wilson & Wilson, 1992). This functionality persists in contemporary research, as Moustairas and Katsillis (2006) found that Gender indirectly affected Educational Achievement through Educational Expectations. Moreover, Agidrag et al. (2012) found that "futility culture", which amounted to student educational expectations, mediated the effect of ethnicity and Family Socioeconomic Status on Achievement. Katsillis (1987) further proposed that higher educational expectations

would logically result in higher student effort, which, in turn, would result in higher educational achievement.

Shadow Education

Secondary education in Greece culminates with a set of centrally administered critical examinations dictating access to higher education. Alon (2014) argues that parents and students invest great proportions of effort and resources maximizing students' performance on critical transition point examinations. SE is one of the most prevalent forms of assistance employed by students and their families, especially in systems with centrally administered formal examinations (Baker & LeTendre, 2005; Dang & Rogers, 2008; Stevenson & Baker, 1992). Stevenson and Baker (1992) further present a series of determinants, which they propose influence students' participation in SE, including FSES, Area of Residence, Gender, and Previous Achievement. Thus, SE is incorporated near the end of the structural model of Educational Achievement and is hypothesized to depend on these factors as well as Significant Others' Influence and Students' own Educational Expectations and influence their resultant Effort. Although the study lacked a measure of SE participation, Katsillis (2015) found that the educational achievement process functioned in different ways for students of Greek and "Other" ethnicity. As a result, it is assumed that SE participation too could depend on students' Ethnicity. Finally, since SE can arguably offer an advantage to any given student, the decision to participate in SE should, logically, depend on the average

academic ability characterizing students' educational setting, leading us to assume that SE participation is dependent upon SCHCOMP.

Student Effort

Student Effort is an important determinant of educational achievement most commonly observed in psychological models and has been previously found to be affected by both Gender (Katsillis & Rubinson, 1990) and ethnicity (Mickelson, 1990). Its inclusion in the model is logical on several levels. While, for example, Educational Expectations and Significant Others' Influence (which are largely comprised of the expectations of students and their closest social surroundings respectively) are well-established and sound predictors of later educational achievement, assuming that they directly influence achievement makes little sense. Rather, Students' Expectations and the influence of their social surroundings motivate students to invest differential levels of Effort, which are in turn rewarded by differential levels of achievement. In conjunction with the adaptation theory approach proposed by Alon (2014), student effort is hypothesized to depend on both student Educational Expectations, Significant Others' Influence, and SE participation and be the primary vessel for the transmission of their effects to Educational Achievement.

The relationships between these variables are formally presented and discussed later in the study. A path model offering a visual representation of the relationships discussed above is

presented as the Working Model in Figure 5. It is worth noting that the Working Model is noticeably more complex than those presented in Figures 1 through 4. This is, however, to be expected; the previous models present only the end-results of a series of analyses (i.e., the statistically significant paths), having previously examined several potential relationships suggested by theory and failing to find evidence for their existence in each analysis' specific context. However, evidence for the persistence, direction, or character of many of these relationships can surface between analyses, dictating their reassessment (e.g., the relationship between Gender and Achievement, Previous or otherwise). Other relationships (e.g., those proposed by Cultural Capital theory) lend themselves to a dynamic reassessment of their validity. As a result, they are retained and reassessed in the Working Model (Figure 5).

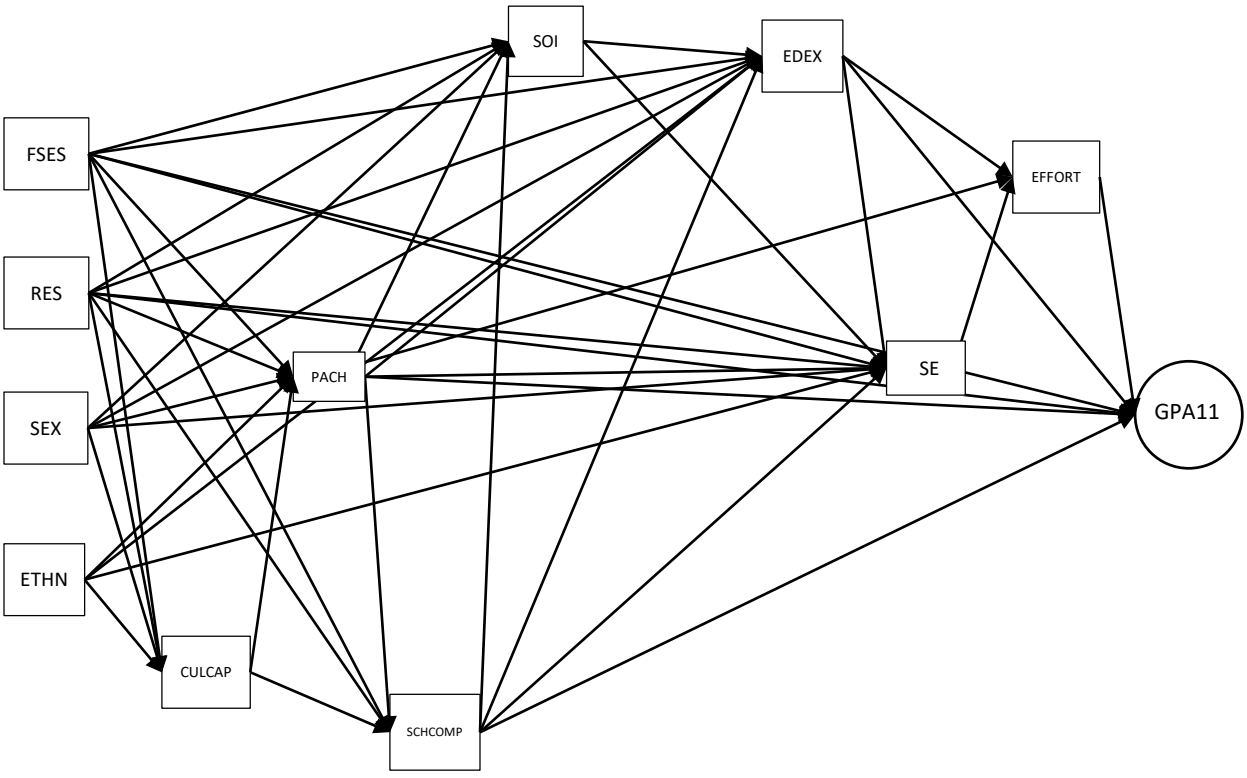


Figure 5. The Working Model

4.5.3 Modelling the effects of Shadow Education on Educational Achievement

The relationship between SE participation and Educational Achievement was examined by regressing Educational Achievement on SE and all control variables using Ordinary Least Squares (OLS) regression analysis. The regression was carried out controlling for a series of variables known or anticipated to affect SE participation. These include all of the models preceding SE in the structural model discussed above, which also heavily overlap with those proposed by Stevenson and Baker (1992) as predictors of SE participation, as well as two additional measures of family background: Family (Marxist) Class, employed as a proxy for wealth, and Family Income, in light of the significant cost aspect associated with SE participation.

4.5.4 Modelling the Modal Strategy of Shadow Education Participation

The examination of student motivation behind participating in SE is modelled as closely as possible to that employed by Baker et al. (2001). They calculated a propensity score for the likelihood of participation of SE logit regressing a binary SE participation indicator on Previous Achievement while controlling for a series of characteristics proposed in Stevenson and Baker's (1992) seminal work on the subject. These included Family Socioeconomic Status, Area of Residence, Gender, and Dominant Home Language. Due to the significant role Ethnicity had been previously found to play in the process of Educational Achievement in Greece and both the commonalities and differences between the Dominant Home Language and students' Ethnicity, it was also considered as a control. Ultimately, however, Ethnicity was excluded due to its significant association with students' Dominant Home Language.

Several models were estimated in the course of this particular examination, employing various measures of both Previous Achievement and SE participation. The rationale behind employing more than one measure as well as the specific choices themselves are discussed in greater detail directly prior to the estimation of the relevant models.

A discussion of the various measures of SE and their operationalization follows this section directly and may predispose the reader to some of the considerations that went into the selection and employment of more than one measure in the estimation of both the modal strategy of SE participation and SE's role in the Educational Achievement process.

4.5.5 Examining Heterogeneity of Treatment in the effect of Shadow Education Participation on Educational Achievement

To this point in the study, the effect of SE Participation on Educational Achievement is modelled under the assumption of homogeneity of effects –that is, that the effect is equal for those who participate (or receive "Treatment") and do not (i.e., the "Controls"). This assumption is evaluated using weighted least squares regression, employing inverse propensity scores obtained in the examination of the modal strategy of SE participation, applied to the relevant models for the estimation of total effects implied in the estimation of the study's SEM.

The examination of heterogeneity of treatment can function, after a fashion, as a means of approximating a randomized control trial. Indeed, weighting the data by propensity scores can remove subpopulation biases which in turn brings us closer to identifying true causal

effects in non-randomized observational studies (Rosenbaum & Rubin, 1983, 1985; see also Dehejia & Wahba, 1999). This is especially useful in such cases, where the random assignment of students to receive or not receive extended educational resources would present, at the very least, a serious ethical dilemma.

It should be noted that the models estimated in the examination of heterogeneity of treatment in SE participation will, functionally, be estimated for different (i.e., weighted and thus synthetic) samples to those employed previously in this study. Thus, although the models under examination will be identical to previously presented reduced form equations, the magnitude and statistical significance of the association may vary substantially from estimations in directly preceding chapters. On the one hand, heterogeneity of treatment would mean that the significance of the association between SE participation and students' educational achievement varied across sub-groups of the study's sample. Homogeneity of treatment, on the other hand, is by no means guaranteed to retain the same magnitude of association.

The examination of heterogeneity of treatment holds the potential to return rich and interesting information. It delves deeper into the existence (or lack thereof) of causal linkages between SE participation and students' educational achievement, it can help provide a more reliable measure of the association between the two, and it can provide invaluable information for educational and social policy makers.

4.5.6 Modelling Educational Achievement and Shadow Education Participation by Ethnicity

The function of the educational achievement process and the role played by SE within it is further examined by student ethnicity. Due to the limitations imposed by the ethnicity sub-sample size this examination is limited to the estimation of a series of Reduced Form Equations to estimate the total effects of each of the exogenous and intervening variables proposed in the study's SEM by student Ethnicity.

4.6 Operationalization of Shadow Education

One of the more salient deficiencies in previous studies focused on or including SE is the lack of a comprehensive measurement and operationalization of the phenomenon. Roesgaard (2006) pointed out the significance of heterogeneity within specific types of SE, as well as the monetary costs associated with participation. Dierkes (2006) contends that even this expansion on the aspects examined is insufficient. However, in the words of perhaps the most prolific author on the subject of SE:

> Of particular importance are data not only on the numbers of students who receive tutoring in particular subjects and grades, but also on how much this costs and on what the service is like in terms of orientation and quality. These questions would provide important insights into the hidden social inequalities that are exacerbated by tutoring. (Bray, 2011, p.54)

This has not stopped ongoing research from overwhelmingly employing attendance/non-attendance as the measure of SE (e.g., Alon & Tienda, 2007; Alon, 2009; Southgate, 2009; Buchmann et al., 2010a; Ireson & Rushforth, 2011; Alon, 2014, etc.). The limited operationalization of SE hampers our better understanding of the phenomenon. This, in turn,

contributes to difficulties in the development of functional measures that can be applied in a cross-national context. The Programme for International Student Assessment (PISA) is one of the main sources for data regarding SE (Bray, 2020). The limited scope of these measures, however, presents "significant definitional challenges in assessing the nature and contributions of OST education, especially in cross-national settings" (Bray, 2020, p. 2).

The operationalization of SE is a key task of this undertaking, as many aspects of SE can be explored. In addition, the terminology surrounding SE may be confusing to the casual reader. Therefore, the first portion of this section addresses the operationalization of SE, briefly explaining each aspect measured and then providing the actual questions employed to collect data on it. Sample frequency distributions or other descriptive measures are provided to enhance the picture of each aspect.

Respondents were asked a series of ten questions on aspects of SE including duration, intensity, SE class size, SE provider quality, and costs for each course they participated in. These questions represent the bulk of the common discourse surrounding aspects of SE in Greece and were formatted using the specific vernacular surrounding each[28].

The questionnaires administered to students were, by necessity, in Greek; the questions presented below are provided in English. Certain linguistic substitutions have been made between the two languages, since the Greek language contains specific terms relating to

[28] Readers conversant with the realities of SE in Greece will note the conspicuous lack of questions regarding specific SE institutions and private tutors. This information is commonly discussed, as word of mouth and personal experience makes up a significant portion of the information regarding the selection of SE practitioners. However, considering, for example the realities of Private SE, which often represents a source of undeclared profits for the practitioner, it is not hard to see how providing this specific level of information could be daunting, as for example, in the case of Verdis (2002), warranting the exclusion of these questions from the study's questionnaire.

various types of SE which do not have direct counterparts in the English language. The most substantial of such cases rests firmly on the common misconception regarding private tutoring, that "while [it] implies to many people one-to-one instruction, it can also mean small group or even large class provision" (Bray, Kobakhidze, & Suter, 2020, p.89). This expanded meaning is a core component of SE in many countries but also in Greece. Thus, "Group SE" is used in the place of "Frontistirio" (Greek: *Φροντιστήριο)*, which carries with its connotations of group sizes larger than three students and an organized extracurricular classroom setting. "Private SE" is used in the place of "Idiaitera Mathimata" (Greek: *Ιδιαίτερα Μαθήματα*), which correspond primarily to one-to-one tutoring (although tutoring can include, in rare cases, as many as three students), and a more informal setting, usually, although not exclusively, taking place in the student's home.

It should be noted that, in the past, the term "Idiaitera Mathimata" (literally "private lessons") has caused consternation to Greek translators of relevant PISA questions, since it can be interpreted as both fee-based tutoring and classes received out of school or other public venues (Bray, Kobakhidze, & Suter, 2020). The inclusion and specific juxtaposition of questions asking students to report on their "Frontistirio" classes, the inclusion of a field for students to report the cost of their lessons and the wording and ordering of the SE related questions was specifically selected to distinguish between these meanings and provide students with the ability to respond separately for each aspect.

4.6.1 Shadow Education Participation

SE in Greece is available in two forms: Group and Private. Bray, Kwo, and Jokić (2015) propose that, in many instances, online tutoring is becoming the norm. Although seemingly counterintuitive in the information age, specialists, researchers, and practitioners consulted in the construction of this study's instrument concurred that these courses were (for all intents and purposes) conducted exclusively in person; either in homes or SE institutions. This held at least until the global paradigm shift in early 2020. Students, teachers, and principals gave no indication during either piloting or administration of the instrument that this was unrepresentative of the Greek reality. Students can employ Group or Private SE exclusively or concurrently. To assess their SE participation, students were presented with a two-part multiple-choice question, with four mutually exclusive and exhaustive response categories (Q.27, Figure 6). This format incorporates both questions employed by Verdis (2002, p. 363) with some necessary alterations.

27. A. Have you ever attended SE classes (apart from foreign language/music)?

Tick only one box.

a.	In Group SE	
b.	In Private SE	
c.	Both of the above	
d.	None of the above	

B. If you have attended neither Group, nor Private SE, write why:

_____

Figure 6. Operationalization of Student Participation in SE

Since the definition of SE excludes courses not specifically aimed at helping students successfully maneuver through the educational allocation process, students were asked to specifically exclude foreign languages and music-related courses from their consideration. There is, of course, an argument to be made that some foreign languages can play a substantial role in the educational allocation process. This is not the case in Greece –at least through the completion of undergraduate education- since language credentials play no role in securing a position in higher education. Indeed, it is only in recent years that some graduate study programs have taken such credentials into consideration in their student selection processes.

In a later question, students were asked to report separately on each course which they had attended Group and Private SE (see Q.30 through Q.35 in Appendices A/B). The responses were then collated to produce an alternative measure of SE participation (see Table 3). The use of the two measures serves two purposes. Students, while not disinclined to discuss SE in a general context, may be reticent to go into specifics about the courses in which they have been tutored (e.g., duration or cost). The latter measure is derived not from students' self-binning into mutually exclusive categories but comes as a consequence of a series of component questions and thus may eliminate potential attempts on students' part to portray themselves in a certain light.

Table 3. Alternative SE Participation Operationalizations

Original Operationalization	N	Alternative Operationalization	N
In Group SE	454	Student reported only Group SE courses on Q.30 and no Private SE courses on Q.33[1].	484
In Private SE	305	Student reported only Private SE courses on Q.33 and no Group SE courses on Q.30[1].	257
Both Group and Private SE	596	Student reported Group SE courses on Q.30 and Private SE courses on Q.33[1].	548
Neither Group nor Private SE	146	Student reported no courses on Q.30 or Q.33[1].	219
Total	1501		1508

[1]. *see Appendices A/B.*

The results of the two operationalizations are presented in Table 3. As it can be surmised the two measures are closely related. The Alternative Operationalization showed more students receiving exclusively Group SE and less receiving both exclusively Private and Concurrent Group and Private SE. Direct comparisons between the two measures are less straightforward, as at least 75 more students provided no specific information regarding their SE participation than reported no SE participation when directly asked. The two measures are juxtaposed in Table 4; despite inconsistencies, it is worth noting that almost four fifths (78.95%) of the cases coincided between the two measures (i.e., were located on the table's main diagonal).

*Table 4. Crosstabulation SE Participation: Original Operationalization (Direct Report) * Alternative Operationalization (Individual Course Reports)*

		Alternative Operationalization				Total
		Group SE	Private SE	Both Group and Private SE	Neither Group nor Private SE	
Original Operationalization	Group SE	378	7	50	19	454
	Private SE	11	223	47	24	305
	Both Group and Private SE	91	24	447	34	596
	Neither Group nor Private SE	4	2	3	137	146
Total		484	256	547	214	1501

4.6.2 Shadow Education Motivation

The second part of question 27 was incorporated as part of a compound strategy to more comprehensively assess the reasoning behind student participation in SE, in conjunction with Q.29 (see Figure 7).

29. What is the primary reason you attended/attend SE lessons (in the Third Year of Lyceum)?
Tick only one box.

a.	To cover knowledge gaps	
b.	To better prepare for Panhellenic examinations	
c.	To better prepare for school examinations	
d.	To better consolidate subjects I have been taught at school	
e.	To pass a course	
f.	My parents made me	
g.	Other:	

Figure 7. Operationalization of motivation for SE participation

4.6.3 Shadow Education Duration

The overall duration of students' participation in SE was measured per course and in regards to all of their time spend in SE. Students were asked "When did you begin participating in SE for the first time". Although this question may seem vague, analysis of the pilot survey data showed that students almost universally responded providing the grade they were in when they first undertook extracurricular tutoring, which was also borne out in the final survey. In line with Katsillis (1987) and Polydorides (1986), who both employed variations on the overall number of months students invested in extracurricular tutoring, students were also asked to separately report the "TOTAL number of Months of Attendance" in each of the courses they participated in Group and Private SE. This question was presented as part of a block layout, incorporating the specific classes they participated in, their duration and intensity, group size, quality, and cost (see Q.30 through Q.35 in Appendices A/B).

4.6.4 Shadow Education Intensity

SE Intensity has two component parts: the number of courses in which a student participates and the number of hours per week spent on these courses.

Number of Classes Attended

During data entry, a separate variable was created for each course in which students reported receiving SE, coded 1 for attendance and 0 for non-attendance. The sum of all of these variables was calculated for each student as the number of Group, Private, and Overall (i.e., both Group and Private) SE courses they attended.

Hours per week

When reporting on SE participation (see Appendices A/B, Q.30), students were also asked to provide the number of hours per week spent in each SE course. The sum of all hours spent in each course was calculated for Group SE courses, Private SE courses and the sum of these as overall (group, private, or both) SE. For the overall hours spent in SE per week, the summation was such that abstinence from either was included as zero (0) hours per week. Thus, for example, a student who participated exclusively in Group SE, for 15 hours a week, would be considered to spend 15 hours a week in SE, tallied overall.

Previous studies, including the 2015 PISA survey, have often grouped hours per week spent in shadow education with other outside school-time activities, including homework and private study (beyond that required by the school). Bray, Kobakhidze, and Suter (2020, p.4) lament the inclusion of homework, which "obstructed analysis of forms of additional instruction". We argue that the inclusion of both of the latter categories is problematic. Both

are arguably measures of student effort, one (homework) invested in school and the other (private study) in SE, as we discuss at greater length below. Their inclusion introduces difficulties assessing both the actual time invested in SE, its relationship with other factors in the educational process and its disentanglement from the role of student effort.

4.6.5 Shadow Education Quality

Presumably, the true measure of SE Quality lies in its ability to make good on its primary promise of helping students secure a position in a Higher Educational Institution (HEI). Group SE institutions pride themselves on and attract clientele through such records, advertising them in print, on local radio, television, and the internet. Private SE practitioners' livelihood also depends on such numbers, although the latter advertise almost exclusively through word of mouth, enhancing their significance. Ideally, SE Quality would be measured directly from the practitioners. Historically, however, students have been reluctant to report the names of their SE practitioners (see Verdis, 2002), making such an assessment virtually impossible for a large portion of the sample. This is not completely unexpected; information on less visible forms of SE, where tutoring is provided by unlicensed or unregistered individuals or companies can be harder to obtain (Kobakidze & Suter, 2020). Students' extensive personal investment of time and effort, and their families' monetary investment, makes it unlikely that their perception of the quality of their SE would be inaccurate. Thus, students were asked to directly assess the quality of their Group SE institutions and Private SE practitioners for each course in which they participated. Quality was reported on a five-point scale, with possible answers ranging from "Average" to "Perfect" (see Appendices A/B, Questions 31 and 34),

based on considerations that no student would willingly take part in sub-par tutoring and, if forced to by circumstances, would still be more amicable to reporting it as “Average” than “Poor”.

4.6.6 Shadow Education Cost

The potential impact of SE costs on the role of SE as an expression of social inequality and as a mechanism of educational and social reproduction is relatively self-explanatory. It is perhaps a peculiarity of the Greek SE reality that Group SE costs are generally discussed in terms of cost per month, while Private SE costs in terms of cost per hour. To this end, students were posed two similar but distinct questions, regarding the costs for Group and Private SE (see Appendices A/B. Questions 32 and 35). While it may be debated to what extent students would be able to reliably report on the costs of their private tuition, which would be handled by their families, it remains important to remember the significance of SE in Greece and the extent to which it is a *de facto* reality of the student experience. The quality, intensity, and number of courses in which a student can participate depend directly on their family’s ability to meet the monetary demands of SE. Students are generally included in such discourse and are, at times, aware of the costs involved. In fact, nearly 47% of respondents who did not participate in SE in the final year of secondary education cited costs as their reason for abstention.

4.6.7 Shadow Education and Parental Communication

Parent-child communication is an aspect of intra-familial social capital which has often been found to affect various aspects of the educational achievement process both in Greece (Moustairas, 2004) and abroad (Coleman, 1997; Sun, 1999). To examine this aspect of students' lives, an addendum was made to the question traditionally used to measure this communication, as employed for Greece by Moustairas (2004), regarding the frequency of parent-student discussions regarding SE (see Figure 8, Option d *emphasis added*).

36. How often do you discuss each of the following with one of your parents?
Tick only one box in each row.

		Rarely	Almost once a month	Almost once a week	Almost every day
a.	School related subjects				
b.	School activities				
c.	Preparation for Panhellenic examinations				
d.	**Shadow Education related issues**				
e.	Your chosen object of study				
f.	Your chosen future occupation				
g.	Topics you learned about from newspapers, magazines, on the radio, television or internet				

Figure 8. Operationalization of Parent-Student Communication

The frequency of parent-student communication regarding SE remains of central interest to this study, if only to better describe the phenomenon. In fact, students reported discussing SE related issues with their parents daily just over 49% of the time –on par with school-related subjects (discussed daily 50.9% of the time) and the impending critical (Panhellenic) national university entrance examinations (discussed daily 52.3% of the time). The remaining four options were universally discussed with parents daily by less than one third of respondents.

4.6.8 Student Effort and Shadow Education Effort

Student Effort is a well-established factor in the educational achievement process. In Greece, measuring student effort is a convoluted process. Traditionally, measuring effort would be as simple as asking students to report the amount of time invested in school dictated homework/studying. However, although SE covers the same subject matter as schools, SE is commonly perceived as being separate from studying for school. In this study Student Effort was measured using three separate questions. Students were asked to report, on average, how many hours a week they spent studying for Group SE, Private SE, and School (see Figure 9).

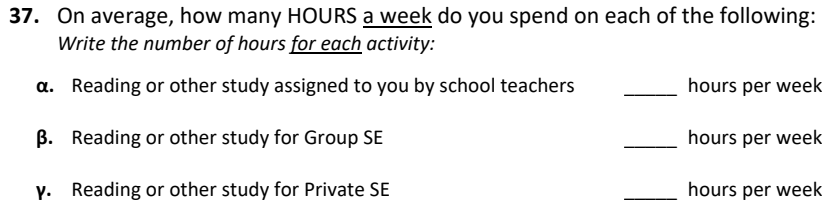


Figure 9. Operationalization of Student Effort and Shadow Education Effort

4.7 Operationalization of Background Variables

Family Socioeconomic Status

To better examine and understand the differences in SE participation between students from varied backgrounds, Family Socioeconomic Status (FSES) was calculated, according to long-

standing theoretical tradition, as a combination of parental education, occupation and income.

Component Variables

Parental Educational Attainment

There are several ways to measure educational attainment. Common operationalizations include years of education and completed levels of education. Both of these, however, are conceptually problematic when employing the education in analyses. Years of education seem to be an ideal interval scale variable. Numerically speaking, this is true. Conceptually, however, the difference between any two, consecutive years is remarkably inconsistent. The difference between four and five years of primary education, for example, is remarkably different to the difference between five and six (the latter of which would correspond to obtaining a primary education diploma). Completed levels of formal education, on the other hand, present, to varying degrees, a coarse measure, which is, at best, ordinal in nature. An individual who has only completed some years of, per se, university, is fundamentally a high school graduate. Partial completion of the various levels of education, however, brings with it different levels of social recognition, which can correspond to differential opportunities. The inclusion of intermediate levels, representing some years invested in a given level of educational attainment arguably better represents the real differences in educational attainment. It is also a more granular measure and, although not strictly speaking interval, is much closer than an operationalization

limited to completed levels. As a result, Educational Attainment was measured on an eleven-point scale previously employed in Greece (Moustairas, 2004), using the following categories:

01. Some Grades of Primary Education
02. Graduated from Primary Education
03. Some Middle School Grades
04. Graduated from Middle School
05. Some High School Grades
06. Graduated from High School
07. Graduated from a Vocational or Technical School after High School
08. Graduated from Higher Educational Institution (TEI)
09. Some years at University
10. Graduated from University
11. Postgraduate Studies

Parental Income

Students initially had the option to report parental income in euros or by €500 categories. Ultimately, raw responses were recoded by category, to incorporate the maximum number of responses when examining income.

Parental Occupational Status

Students were asked to report their parents' occupations, in as great detail as possible. Family Socioeconomic Status's effect on students' educational achievement is theorized to affect students beginning in their early development. Greece's persistent economic crisis at the time of this study has had significant effects on

employment[29], so students were also asked to report on whether their parents had a different occupation before the onset of the crisis and, if so, what that occupation was (see Figure 10).

11. A. What is or (if she is not presently employed or is deceased) your mother's occupation?
Describe this profession with as much detail as possible (e.g. local bus driver or bank cashier):

_____

[ ] Don't Know [ ] Prefer not to say

B. Did she have a different occupation before the economic/debt crisis?

Yes	No	Don't Know	Prefer not to say

C. If so, what was your mother's occupation before the economic/debt crisis?
Describe this profession with as much detail as possible (e.g. local bus driver or bank cashier):

_____

[ ] Don't Know [ ] Prefer not to say

Figure 10. Operationalization of Parental Occupational Status

The responses to the pre- and post-crisis occupation questions (sub-questions A and C in Figure 10) were recoded according to the International Standard Classification of Occupations 08 structure (ISCO08).

181 students reported that their fathers had a different occupation pre-crisis and 150 that the same was true for their mothers. Both maternal and paternal occupational status dropped significantly following the onset of the fiscal crisis ($t(149)=2.852$, $p=.005$ and $t(180)=2.633$, $p=0.019$, respectively). To better capture parental status in students' early life, the higher of the two statuses was selected to represent each parent's occupational status.

[29] Unemployment rates in Greece spiked from 7.8% (just above the European average of 7%) in 2008 to a peak of more than 27.5% in 2013, stood at 19.3% in 2018, when data was collected and remained higher than 17.6% (nearly triple the EU average of 6.3%) in 2019 (Unemployment Statistics, 2019).

A final consideration in assessing parental occupational status comes in the form of mothers whose occupation was either not reported at all, reported as “unemployed” or “housewife”/ “home-maker”, none of which are represented in established scales of occupational prestige. Regardless, in such cases, only the working/measurable occupation would contribute to FSES. Considering this and to avoid significantly curtailing the number of individuals for which family socioeconomic status could be calculated, the measurement from the parent with highest occupational status was employed to represent both.

There is also a relatively large proportion of missing data regarding parental income for one or both parents. There are at least two ways of addressing this issue. Separate Parental Incomes can be summed into Family Income, providing a measure of income for respondents who reported income for only one or the other parent. However, while this would provide some information regarding family income for a greater number of cases, it does not ensure that these measures accurately represent overall family income. Alternatively, income may be dropped entirely from the estimation of Family socioeconomic status.

The variables discussed above all showed significant weak to moderate correlations among themselves (see Table 5). The sample sizes associated with the correlations presented in Table 5 also provide a clearer indication of the problems associated with estimating FSES using separate parental incomes.

Parental Occupational Status was measured on the ISCO08, which is structured counterintuitively, with higher status occupations corresponding to lower numerical

values. To avoid the cognitive dissonance that could result from the interpretation of these negative values (and the intuitively corresponding negative relationships) the ISCO08 scale was inverted, such that higher values corresponded to higher occupational status, to facilitate easier interpretation of analysis results.

Table 5. FSES Component Variable Correlations

		Mother's Educational Attainment	Father's Educational Attainment	Mother's Income	Father's Income	Family Income	Highest Occ. Status (ISCO08)
Mother's Educational Attainment	*r*	1					
	p						
	N	1486					
Father's Educational Attainment	*r*	.553**	1				
	p	0					
	N	1474	1482				
Mother's Income	*r*	.327**	.214**	1			
	p	0	0				
	N	887	884	897			
Father's Income	*r*	.179**	.265**	.448**	1		
	p	0	0	0			
	N	1028	1027	799	1041		
Family Income	*r*	.296**	.287**	.732**	.757**	1	
	p	0	0	0	0		
	N	1126	1121	897	1041	1139	
Highest Occupational Status	*r*	.345**	.383**	.302**	.232**	.253**	1
	p	0	0	0	0	0	
	N	1281	1279	792	916	1011	1297

*** Correlation is significant at the 0.01 level (2-tailed).*

Two measures of Family Socioeconomic Status were estimated as the result of Principal Component Analyses, in order to examine the substantive significance of excluding family income, one which included it as a component measure and one that did not. The two single resulting components are presented in Table 6.

Table 6. FSES Component Matrices

	$FSES_1$	$FSES_2$
Mother's Educational Attainment	.797	.815
Father's Educational Attainment	.789	.831
Family Income	.605	
Highest Occupational Status (ISCO08)	.672*	.706
Explained Variance	51.9%	61.7%

Income is both here and historically the weakest loading component in the estimation of FSES in Greece (see Katsillis, 1987; Moustairas, 2004; Katsillis, 2015). Moreover, the measure of FSES which resulted from the exclusion of Family Income is so strongly correlated with the measure that includes it as to be nearly identical (r=.962, p=.000). As a result of all of the above, the latter measure, excluding Family Income, was employed as the measure of Family Socioeconomic Status in this study (see Table 7).

Table 7. Descriptive Statistics for Family Socioeconomic Status

Mean	s.d.	Min	Max
-.018426	.94624	-2.649	2.255

Area of Residence/Urbanicity

Students were given four options regarding their permanent place of residence (see Figure 11).

6. Your permanent place of residence is located:
Tick only one box.

	In a geographically isolated area
	In a village or agrarian area
	In a suburban area
	In a metropolitan/city area

Figure 11. Operationalization of Area of Residence

Responses were primarily employed following recoding into a dummy variable, representing "urbanicity" or whether students primarily resided in urban or rural locales. Geographically isolated and village or agrarian areas were considered to be rural, while suburban and metropolitan/city areas were considered to be urban. The inclusion of urbanicity as a background characteristic would seem to imply that students should be asked where their place of residence was located in their formative years. There is, however, a significant benefit to having a current reckoning of students' area of residence, as it should directly relate to the availability of SE options available to them. Because of the theoretical underpinnings connected to the formative nature of area of residence on the educational achievement process, however, it is important to note that, when asked "how many times they had changed schools, because of family moves since the first grade of Primary School", better than 4 out of 5 students (83.6%) had never moved/changed schools.

Gender

Students were asked to report their gender in a classical, binary format. While the Greek government has passed legislature regarding the legal recognition of gender identity other than that assigned at birth in (N.4491/2017), it passed in October of 2017, following both piloting and finalization of the study's questionnaire structure. Despite some concerns regarding an allowance of comprehensive gender representation in the sample, the relative infancy of the new measures likely means that significant deviations from established societal norms would be marginal, at most. This seems to have been borne out, as only two, out of 1508 students (.1%) did not respond

when asked about their gender in this fashion and none of the teachers, who were offered the opportunity to report on difficulties, reported anything in regard to the question.

Ethnicity

Ethnicity is a complex subject, whose comprehensive measurement could arguably overshadow the scope and intent of this study. Ethnicity is not limited to place of birth or, necessarily, race but rather a common, characteristic identity, passed through generations (Zenner, 1996). Ethnic identity refers to identification with, and perceived acceptance into, a group with shared heritage and culture (Collier & Thomas, 1988). This definition, however, highlights one of the core issues surrounding the inclusion of respondent Ethnicity in any such study. How does one quantify a heritage? What are the bounds of any given culture? How do we deal with the inevitable overlap between related but (self-defining) distinct heritage or culture groups? The question of Ethnicity and its comprehensive measurement is complex and could arguably be the central focus of its own study, if not a series of studies, attempting to pin it down in a manner at once comprehensive enough to satisfy the majority of relevant parties but general enough to be applicable across multiple settings.

Thus, as discussed previously (in Chapter 4.5 Discussion and Theoretical Justification of the Study's Models) this study elected to approach the concept of ethnicity as one addressing conformity and differences from the majority population. "Ethnic Otherness" is employed as a proxy for the broad and somewhat nebulously defined concept of Ethnicity, arguing that it is the shared sense of group and accompanying characteristics or lack thereof, which respectively benefit or detract from students' ability to successfully navigate the educational

allocation process (see Katsillis, 2015). As a result, Ethnic Otherness, as a measure of Ethnicity, was coded 0 (Ethnically Greek) if both students and (where applicable) both their parents were born in Greece, and 1 (Ethnically Other) if students and/or either of their parents were born elsewhere.

One consideration of interest, employing this operationalization, would be into what category a student either themselves born in or with at least one parent born in Southern Cyprus, would be placed. *Prima facie*, the answer to this would seem to be that such a student would be categorized as "Ethnically Other" –a counterintuitive conclusion to anyone who had ever met a Southern Cypriot. However, while Southern Cyprus is not a part of Greece, it is in large part populated by a culturally and ethnically Greek people, who speak a dialect of modern Greek (with differences primarily lexical and phonological, where they exist). As a result, a large number of Cypriots are, for all intents and purposes, considered to be Greeks, by other Greeks.

While no such students were found among the study's sample, it arguably represents a clear exception to the operationalization presented above. Thus, a more comprehensive definition of this study's measure of Ethnic Otherness is required; one which could forestall confusion in readers less familiar with the realities of the relationship between Greeks and Southern Cypriots. In this light, Ethnic Otherness would be coded as 0 (Ethnically Greek) if both students and (where applicable) both their parents were born in Greece or Southern Cyprus, and 1 (Ethnically Other) if students and/or either of their parents were born elsewhere.

The argument regarding Southern Cyprus could, of course, be extended to almost any Greek diaspora. What if, in other words, a child or their parents were born in a given community in

the Greek diaspora, spent some time under its influence and then returned to Greece. At this point, however, it could also be counter-argued that, while a diaspora community would indeed instill some measure of Greek socio-cultural heritage in an individual (or, at the very least, expose them to it), it would also invariably expose them to the heterogeneous influence of the host community at large, setting them apart from the Greek majority population.

This is not to say that there is no merit in making this distinction. Indeed, if students' Ethnic Otherness does affect the role (if any) played by SE in the educational achievement process in Greece, then there may be great interest in a more granular measure of Ethnic Otherness, or even a more comprehensive measure of Ethnicity. Such considerations, however, while dependent upon the outcome of this inquiry are also arguably beyond its scope.

4.8 Operationalization of Educational Achievement Process Variables

Cultural Capital

Cultural Capital is a latent construct, classically indicated by the frequency of students' Theater, Museum/Art Gallery, Concert and Lecture attendance, and Non-Academic Literature consumption (see Bourdieu, 1977 and DiMaggio, 1982, respectively). Bourdieu (1977) further proposed the inclusion of Cinema attendance frequency as an indicator of Cultural Capital. DiMaggio (1982) argued that measures of Cultural Capital are based on the observed behaviors of a given society's dominant cultural groups. Following Katsillis' (1987) argument, that Greece adheres to European values and culture in regards to "high" culture (see also Katsillis & Rubinson, 1990), these measures are employed here, as well. Thus, Cultural Capital

is estimated as a latent variable, using the indicators discussed above. The correlations between the six indicators are presented in **Error! Not a valid bookmark self-reference.**.

Table 8. Cultural Capital Indicator Variable Correlations

		Non-Academic Literature	*Museum/Art Gallery Visits*	*Concerts*	*Theatre*	*Cinema*	*Lectures*
Non-Academic Literature	r	1					
	P						
	N	1455					
Museum/Art Gallery Visits	r	.254**	1				
	P	.000					
	N	1429	1435				
Concerts	r	.106**	.380**	1			
	p	.000	.000				
	N	1427	1428	1434			
Theater	r	.171**	.462**	.401**	1		
	p	.000	.000	.000			
	N	1429	1432	1430	1434		
Cinema	r	.138**	.269**	.277**	.308**	1	
	p	.000	.000	.000	.000		
	N	1434	1430	1427	1430	1459	
Lectures	r	.165**	.378**	.248**	.357**	.183**	1
	p	.000	.000	.000	.000	.000	
	N	1427	1429	1426	1429	1429	1431

** Correlation is significant at the 0.001 level (2-tailed).

A single factor that was extracted from these indicator variables (see Table 9) explained 40.7% of their variance. It is worth noting that reading Non-Academic Literature showed noticeably lower factor loadings than the other five Cultural Capital indicators. This is not unprecedented in previous research (see Katsillis, 2015). In fact, De Graaf et al. (2000) went so far as to treat book reading and elite/high culture as disparate indications of cultural capital and found book reading to be not exclusively or even at all indicative of cultural capital. However, book reading was retained for its theoretical significance as a core aspect of the latent variable.

Table 9. Cultural Capital Component Matrix

	Factor Loadings
Non-Academic Literature	.292
Museum/Art Gallery Visits	.703
Concerts	.544
Theater	.699
Cinema	.424
Lectures	.510

The characteristics of the resulting measure of Cultural Capital (see Table 10) might give rise to concerns of non-normality. Indeed, Cultural Capital is both leptokyrtotic and positively skewed. This is, to an extent, to be expected, as the majority of respondents reported low levels of participation in most of the activities used to estimate the measure. However, 90.1% of cases had estimated values of Cultural Capital within one standard deviation of the mean and only 1.3% (or 20 respondents) had estimated values greater than 3 standard deviations above the mean.

Table 10. Descriptive Statistics for Cultural Capital

Mean	s.d.	Min	Max
.004	.842	-.829	7.614

Significant Others' Influence (SOI) and Educational Expectations

SOI was constructed in a manner very similar to that used by Sewell et al. (1969) and later Sewell et al. (1970) in the Wisconsin Model of Socioeconomic Attainment. More specifically, it was estimated as the first principal component of Parental Educational Expectations for their children, Best Friends' Educational Expectations for themselves, Teachers' Expectations for the student, Highest Educated Relative's and Acquaintance's Educational Attainments. The incorporation of the overall measure, rather than its component parts is the result of several considerations. Sewell et al. (1969) argued that it was overall interpersonal influence,

rather than any particular segment of it, which affected aspirations and mediated the effect of socioeconomic status on variables later in the attainment process. Hauser, Tsai, and Sewell (1983) later found that model fit indeed did not benefit from a separate incorporation of the composite measures of SOI and that, furthermore, SOI functioned better as a composite of its component parts rather than as a latent factor indicated by them. Finally, following the initial incorporation of SOI in the Wisconsin Model, most of the studies employing SOI have found significant effects on expectations and achievement or attainment (Sewell & Hauser, 1976; Hauser et al., 1983; Katsillis, 1987).

For Highest Educated Relatives and Acquaintances, Educational Attainment was measured on the same 11-point scale used for parents, while Educational Expectations were measured on a five-point scale, with possible responses ranging from "Graduate from High School" to "Postgraduate Education" (see also Q.16 in Appendices A/B):

01. Graduated from High School
02. Graduated from a Vocational or Technical School after High School
03. Graduated from Higher Educational Institution (TEI)
04. Graduated from University
05. Postgraduate Studies

In actual fact, the operationalization of these component measures of SOI employed students' perceptions of their parents', best friends', and teachers' educational expectations.

There has been a great deal of debate regarding whether these perceptions or the actual measures of these expectations, obtained directly from their respective sources, is a better measure for inclusion in the estimation of SOI (e.g., Reitzes & Mutran, 1980; Davies & Kandel, 1981; Gottfredson, 1981; Hoelter, 1984, etc.). As their name would suggest, significant

others' expectations are expected to influence students' own expectations. Even if we were to assume a divergence between students' perception of these expectations and their actual measures, it seems highly unlikely that a measure other than that which they understand would inform their decisions. However, Hauser, Tsai, and Sewell (1983), addressing serious concerns regarding the measurement of SOI "expected to find evidence of the projection of own goals on perceived expectations of others in the correlations between errors in reports of aspirations and encouragement by significant others" (p.42) but found, at best, weak indications of this. It is, moreover, important to remember that social psychological variables, of which SOI is a prime example, generally involve reported values and attitudes, which Kohn (1969, p.18; cited in Looker & Pineo, 1983) referred to as respondents' "views of social reality" and whose common characteristic is that they are subjective reports.

Table 11. Component Matrix for SOI

Parental Educational Expectations	.821
Best Friend's Educational Expectations	.705
Teacher's Educational Expectations	.742
Highest Educated Relative's Ed. Attainment	.547
Highest Educated Acquaintance's Ed. Attainment	.526

The questions employed in these operationalizations (see Q.17, Q.18, Q.19, & Q.23 in Appendices A/B) requested the relevant information from students and are, as a result, students' perceptions of their significant others' expectations for them. The single component extracted from these five measures (see Table 11) explained 45.9% of their variance. The resulting measure of SOI (see Table 12) was negatively skewed, although just 1.1% of respondents (or 17 cases) had estimated SOI values of less than 3 standard deviations.

Table 12. Descriptive Statistics for Significant Others' Influence

Mean	s.d.	Min	Max
-.047	.993	-5.317	2.976

School Achievement Composition

Differences in school quality and structure (Bowles, 1977) and, more specifically, classroom ability composition (Leiter, 1983) have been found to significantly affect educational achievement. Dumay and Dupriez (2008) found that school composition, operationalized as average previous achievement, accounted for a significant portion of between-schools variance, controlling for previous achievement and sociocultural backgrounds. Katsillis (2015) found that they affected students' educational achievement both directly and through their educational expectations, likewise controlling for individual previous achievement, background characteristics, and parental educational expectations. School Academic Composition was operationalized as average student previous achievement by school (see Table 13).

Table 13. Descriptive Statistics for School Achievement Composition

Mean	s.d.	Min	Max
18.606	.297	17.070	19.138

Measures of Academic Achievement, Past and Present

Aptitude measures are not directly available from Greek schools. However, students' Previous Achievement, which incorporates grades from various schools and teachers, has been proposed to be more likely to capture stable underlying general ability (Jenks, Crouse & Meuser, 1983). Students provided information on several measures of academic achievement, including their Primary and Lower Secondary school GPAs and a comprehensive list of marks in the 11th grade. From these a Previous Achievement score was calculated as

the average of adjusted Primary and Secondary School GPAs, and 11th Grade GPA was calculated as the average of their individual subject grades. The basic statistics of these achievements are presented in Table 14.

The reported values are not unexpected, taking into account the realities of the Greek educational system, which tends to inflate student grades in primary and secondary education. Previous studies have also found that Greek students' self-reported grades coincide with actual achievement (e.g., Katsillis (1987) found a correlation between the two of r=.915). The hard grade floor is also expected, given the fact that all of the study's participants had successfully reached the final year of secondary education, necessarily meaning they had achieved at least a passing grade in all previous years (5.0 in Primary and 10.0 in Lower Secondary Education).

Table 14. Basic Descriptive Statistics of Achievement Variables

	Min.	**Max.**	**Mean**	**Mdn.**	**s.d.**
Primary School GPA	5.00	10.00	9.79	10	0.52
Lower Secondary School GPA	10.00	20.00	17.62	18.00	1.75
Previous Achievement	10.00	20.00	18.61	18.95	1.19
11th Grade GPA	10.28	20.00	17.48	17.67	1.63

Although expected, the clustering of grades in the upper end of the value range could give rise to concerns of a "ceiling effect". As Terwee et al. (2005, p. 37) note:

> Floor or ceiling effects are considered to be present if more than 15% of respondents achieved the lowest or highest possible score, respectively [41]. If floor or ceiling effects are present, it is likely that extreme items are missing in the lower or upper end of the scale, indicating limited content validity. As a consequence, patients with the lowest or highest possible score cannot be distinguished from each other, thus reliability is reduced.

McHorney and Tarlov (1995, p. 295) further distinguish surveys with 1%-15% of respondents achieving the maximum score on a scale as showing "small" ceiling effects and those with more than 15% as showing "moderate" ceiling effects. McHorney and Tarlov (1995) proposed that surveys with small ceiling effects met measurement standards pertaining to score distributions, while those with no ceiling effects (<1%) exceeded them. The percentages of respondents reporting the highest possible scores are 0.46% for 11th Grade GPA, 2.72% for Previous Achievement, 2.99% for Lower Secondary School GPA, and 81.83% Primary School GPA. The large percentage in Primary School GPA was, indeed, one of the primary reasons it was not employed as the study's measure of previous achievement. Lower Secondary School GPA was considered potentially too close (chronologically) to the final achievement measure employed to capture meaningful variance in students' performance, resulting in its averaging their adjusted Primary School GPA. Regardless, the final measure of Previous Achievement shows small ceiling effects, while their 11th Grade GPA shows almost no evidence thereof.

Although little to no ceiling effect is apparent in the data, the distribution of the achievement measures remains quite heavily skewed. This, in conjunction with the hard grade ceiling clearly shows their resulting diminished variance (see Table 14). It is, thus, still conceivably possible that some measure of ceiling-like effect in the relationship between previous and present achievement may exist, weakening other intervening relationships between them. If, for example, students' overall achievement indeed depends on their SE participation and their SE

participation depends on students' previous achievement, such a relationship could be attenuated, if a ceiling effect were at work. This potentiality is examined in later chapters[30].

Collecting comprehensive marks in the 11th grade also provides the opportunity for direct comparison with widely established international measures of achievement in student Literacy, Numeracy, and Science[31]. All three of these concepts have corresponding courses, which are core modules of the educational curriculum. Literacy corresponds to Modern Greek Language, which is both a core module and a common component of all educational tracks. This is true in both the 2nd and 3rd years of Lyceum, which are divided into two educational tracks, a Humanities Studies Educational Track (HSET) and a Natural Sciences Educational Track (NSET), and then expanded to include an Economic and Informatics Studies Educational Track, respectively. Science has two discrete measures: one core module and one specific to the NSET, while Mathematics have three: two common core modules (Algebra and Geometry) and one specific to the Natural Sciences educational track. The basic descriptive statistics of these courses are presented in Table 15.

Table 15. Literacy, Numeracy, and Science

	Min.	Max.	Mean	Mdn.	s.d.
Literacy					
Modern Greek Language	7.50	20.00	16.87	17.00	2.11
Numeracy					
Core Mathematics					
Algebra	7.00	20.00	16.18	17.00	3.06
Geometry	3.00	20.00	15.94	16.00	3.16
Ed. Track Mathematics	5.00	20.00	17.02	18.00	2.71
Science					
Core Science	2.00	20.00	16.00	16.00	3.08
Ed. Track Science	7.50	20.00	16.87	17.00	2.80

[30] Although it appears that such concerns are, indeed, unfounded, as evidence, for example, in Table 46, where the relationship is examined sans Previous Achievement, and Chapter 8.2.3 The Decomposition of Effects in the Expanded Model.

[31] For example, TIMSS covers Mathematics and Science, PISA covers Reading, Mathematics, and Science, IALS covers Document, Prose and Quantitative Literacy and PIRLS covers Reading (Brown & Micklewright, 2004; Brown et al., 2007).

It is worth noting that, according to the most recent relevant legislature (Hellenic Democracy, 2018b), students could successfully pass a grade in upper secondary education, so long as their GPA was greater than 9.5, regardless of component course marks (inclusive of those relevant to their chosen educational track). It also seems important to point out that students generally invest more effort in classes within their educational track, often to the detriment of core modules, since only the prior are critical to their access to higher education.

A Brief Note on National University Entrance Exam Grades

National university entrance exams, colloquially referred to as "Panhellenies" (Greek: "*Πανελλήνιες"*) are, arguably, the best measure of academic achievement at the end of Greek Secondary Education. Students sit these critical transition point examinations based on their choice of educational track, which also dictates to which university departments they can apply. Each educational track is divided into two "Scientific Fields", comprised of four courses each. Students are allowed to sit exams in both the primary and secondary Scientific Field in their chosen educational track, allowing them to apply to a broader range of universities, with the caveat that they are required to sit exams in more courses. Final marks for individual exams are awarded on the same 20-point scale as Secondary Education grades.

Due to changes in Greek governmental policy regarding circulation of and access to Panhellenic exam grades, retrieval of students' marks on these examinations was not possible for the study's sample. However, high school GPAs, the most commonly employed measure of Educational Achievement in Greece, have previously been

found to be highly correlated with (Papas & Psacharopoulos, 1991) and the strongest predictor of (Psacharopoulos & Soumelis, 1979; Papas & Psacharopoulos, 1993) National University Entrance Exam scores. It is also worth noting that, while exam grades could not be collected for the study's sample, pilot data, collected from a limited sample of schools from the Achaia prefecture of Greece in the directly preceding year, bears out these findings, showing a strong correlation between GPAs and Panhellenic exam grades (r=.675 p=.000). These exam grades are provided by two independent markers (teachers) from other schools, submitted to the Greek Ministry of Education, Research and Religions, and later returned to schools where they were, until that point, posted publicly. As a result of both previous findings and the strong relationship evident from the pilot data, high school GPAs are used in lieu of exam grades as the measure of Educational Achievement for this study.

4.9 Other Variables Employed in the Study

Apart from the measures discussed above, certain analyses conducted in line with this study include measures of Marxist Class and Dominant Home Language. Some conflict theories (e.g., Bourdieu, 1977) argue Marxist classes are reproduced by the educational system and therefore expected to influence the educational selection process. In addition, measures of Marxist class can be employed as a proxy for wealth, given that the main distinguishing criterion of class, the possession of the means of production, refers essentially to the possession of wealth. Dominant Home Language, and specifically whether it is that used in the country's educational institutions, has a number of social ramifications for students, not

least of which as a determinant of the likelihood to participate in SE (Stevenson & Baker, 1992).

Operationalizing Marxist Class

Wright and Perrone's (1977) classification scale was used to measure Marxist class. More specifically, students were asked to report on the characteristics of their Mother's and Father's primary class position. They were given 6 options:

01. Employer (self-employed with own employees)
02. Self-employed without employees
03. Waged Employee in the public sector or in a service which depends on the public sector (e.g., United Utilities, BT, etc.)
04. Waged Employee
05. Don't Know
06. Prefer not to say

The first option represents the Bourgeoisie, the second the Petite Bourgeoisie (who own means of production but not to a sufficient extent to purchase labor power) and the last two categories to the Proletariat. Due to the tenuous nature of the definition of the Petite Bourgeoisie provided by Marx (Wright & Perrone, 1977), the variable was employed following recoding into a bivariate dummy as Bourgeoisie Mother and Bourgeoisie Father coded 1 if students reported the relevant parent was self-employed with their own employees and 0 if they responded 2, 3 or 4.

Operationalizing Dominant Home Language

Students were also asked to report on the frequency of Greek language use at home. They were given four options:

01. Never
02. Sometimes
03. Almost Always
04. Always

These options were recoded to reflect whether the dominant language at home was that of the educational system (here Greek) or not. Specifically, responses of 3 and 4 were recoded to represent Greek as the dominant home language, while 1 and 2 represented a language other than Greek being dominant in the home.

5. Results of the Analysis

The previous four chapters described, explained, and justified the theoretical and empirical choices made herein for the study of the role of SE in Greece. They presented the procedures used in the collection of the appropriate data and proposed statistical and other techniques to be used in analyzing these data.

This and the following three chapters present and discuss the pertinent results of these analyses. They start with a brief description of "Who Gets What" in SE, that is, a description of the distribution of SE by type and most of the variables examined (Ch. 5). This is followed by the findings that may provide an answer as to whether SE is predominantly a vehicle of educational enhancement or one of remediation (Ch. 6). The influence of SE on later educational achievement is presented next (Ch. 7). The last chapter in the discussion of the findings (Ch. 8) presents a detailed examination of the role SE in the process of educational achievement, including modeling and statistical issues involved in the analysis of causal processes. The goal is to highlight whether SE serves as means of educational mobility or as a medium of educational and social reproduction.

5.1 Shadow Education: Who Gets What

The first section of this chapter presents the distribution of all aspects of SE taking into account the main background and educational characteristics of the students. More specifically, it attempts to highlight which students get what in terms of SE and which of the individual, background or educational characteristics are related to the amount, type, quality,

and quantity of SE received by each student. However, in order to facilitate this, we will begin with the presentation of the descriptive statistics of SE, including the different measures that were employed for its operationalization.

5.1.1 Shadow Education Participation

90.2% of students reported participating in some form of SE. Questioned directly, 30.25% of these reported exclusively participating in Group SE, 20.32% exclusively in Private SE, and 39.71% in concurrent Group and Private SE. Because of the differences inherent in each type of SE and their possible differential effects, it seems worthwhile to note that, ignoring exclusive or concurrent participation, 1050 of 1508 sampled students reported participating in Group SE, while 901 reported participating in Private SE. This number is somewhat lower than the highest figures reported in Greece in previous years but it is worth noting that many of the studies reporting these figures are basing their findings on measurements taken after students complete secondary education (see Kassotakis & Verdis, 2013; Tsipalkides, 2018). While comparatively rare, it is not unheard of for students to put off SE until the very end of the final year of secondary education, placing such participation just beyond the reach of this study's data collection.

Table 16. Independent Samples t-tests for Average Family SES by SE Participation

	Mean Diff. (SE)	t	*dof*	p
Family Socioeconomic Status	.689 (.067)	10.307	1506	.000
Mother's Ed. Attainment	1.381 (.173)	7.969	1484	.000
Father's Ed. Attainment	1.320 (.183)	7.221	1480	.000
Maternal Occ. Status	1221.303 (209.240)	5.837	1044	.000
Paternal Occ. Status	1067.813 (222.269)	4.804	1299	.000
Highest Parental Occ. Status	922.615 (199.515)	4.624	1295	.000
Family Income	.684 (.157)	4.372	1137	.000

Students who participate in SE are, on average, from significantly higher Socioeconomic backgrounds (see Table 16). This was reflected in both their mothers' and fathers' educational attainment and occupational status (taken both separately and as the higher of the two parents' occupational status) and family income[32]. Students who participated in SE had parents who had, on average, completed some level of post-secondary education while the parents of those who did not participate completed, on average, only some years of high school. Students who participated in SE came from households where parents were service and sale workers, while those who did not had parents who were craft and related trade workers. Finally, those students who participated in SE came from households with nearly 350 euros more familial income per month than those who did not. These are only some of the significant differences between the two populations.

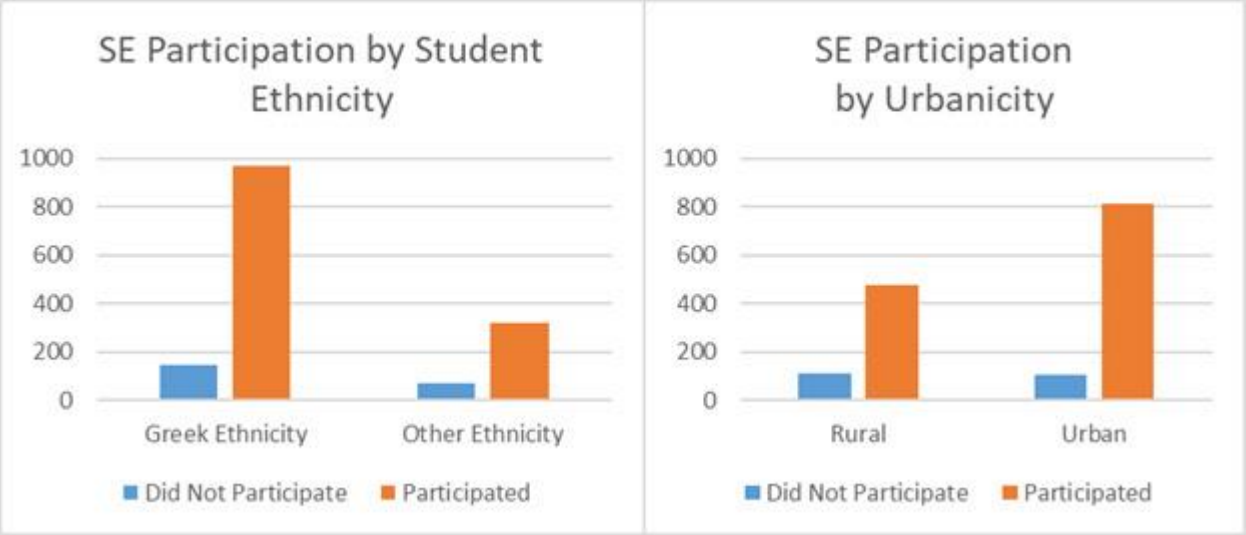


Figure 12. SE Participation by Student Ethnicity and Urbanicity

SE participants are more likely to be from urban locales and are more often of "Greek"

[32] The reader is reminded that family income was measured in bands of €500.

Ethnicity (see Figure 12)[33]. They are students with higher average Previous Achievement, that is, those who do better in Primary and Secondary education and attend high schools with somewhat higher Academic Composition (see Table 17). They are also the recipients of higher levels of Significant Others' Influence (see Table 17). This translates to all of the separate aspects of their S.O.I. In other words, their parents and teachers have higher educational expectations for them, their best friends expect to proceed farther in their own educations, and they are surrounded by more highly educated adult relatives and acquaintances (Table 17).

Table 17. Independent Samples t-tests for SE Participation by Educational Achievement Process Characteristics

	Mean Diff. (SE)	**t**	***dof***	**p**
Previous Achievement	1.173 (.080)	113.752	259	.000
School Academic Composition	.141 (.141)	5.966	277	.000
Significant Others' Influence	1.225 (.081)	15.191	260	.000
Parental Educational Expectations	1.233 (.098)	12.538	241	.000
Teachers' Educational Expectations	1.295 (.109)	11.866	249	.000
Best Friends' Educational Expectations	1.007 (.104)	9.711	247	.000
Highest Educated Relative's Ed. Attainment	.661 (.161)	4.097	229	.000
Highest Educated Acquaintance's Ed. Attainment	.731 (.162)	4.502	194	.000

SE participants are also more likely to not only aspire to higher education but also, on average, expect to proceed farther in it (see Figure 13)[33]. Specifically, students who participate in SE expect, on average, to complete a university or graduate level degree, while those who do not participate expect to attain a degree from a post-secondary education vocational or technical school or higher (but not university) level education degree.

[33] Differences are significant at the .001 level.

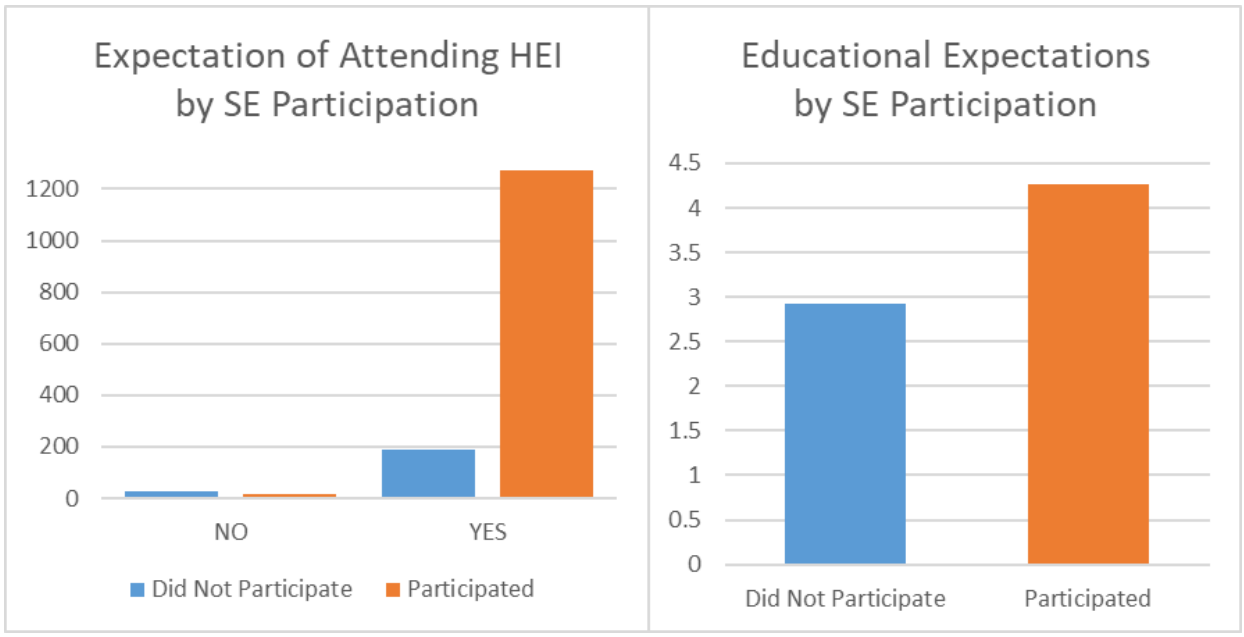


Figure 13. SE Participation by Educational Expectations

There is no significant difference in the amount of Effort (measured in hours per week) invested in school related homework between students who do and do not participate in SE. Both groups invest between 4 and 5 hours per week (see Table 18). Students who participate in SE invest just over 19 hours more on SE related studying (i.e., Effort) and 16 and one third hours more in overall effort than those who do not. Finally, students who participate in SE had, on average, almost two grade-points higher 11th Grade GPAs than their counterparts who did not (t=16.002, df=269, p=.000, Mean Diff.=1.762).

Table 18. Independent Samples t-tests for Average Family SES by SE Participation

	Mean Diff. (SE)	**t**	***dof***	**p**
Homework related Effort	.970 (.725)	1.338	208	.182
SE related Effort	19.255 (.746)	25.779	1484	.000
Overall Effort	16.331 (.718)	22.717	1480	.000

5.1.2 Shadow Education Classes Attended

It is reasonable to expect the majority of respondents to have received tutoring in up to four courses, since this is the minimum number of exams students are required to sit in the National University Entrance Examinations. We would also expect a reasonable number of respondents to have received tutoring in five courses, allowing them to sit one alternative exam, providing access to University departments traditionally reserved for other educational tracks. Respondents who reported more than five courses should make up a diminishingly small percentage of the sample (e.g., students preparing for exams corresponding to more than one HEI departments and to at least two educational tracks).

Indeed, irrespective of the format of SE received, the highest percentage of the respondents (39.1% or 589) reported receiving tutoring in four courses (see Figure 14). This was more than twice as many as those who received tutoring in five courses (18% or N=271), the next most popular number of courses. Furthermore, students participated in 1 to 10 private/small group SE courses. Most of them (17% or 257 students) participated in one course, closely followed (14.3% or 215 respondents) by those who reported 4 courses. In relation to group SE courses, students reported participating in one to eight courses, with most of them (31% or 467 respondents) receiving tutoring in 4 courses. Finally, about 20% of the respondents concurrently receiving group and private/small group SE reported being tutored in either four (9.9% or 149) or five (10.3% or 156) courses.

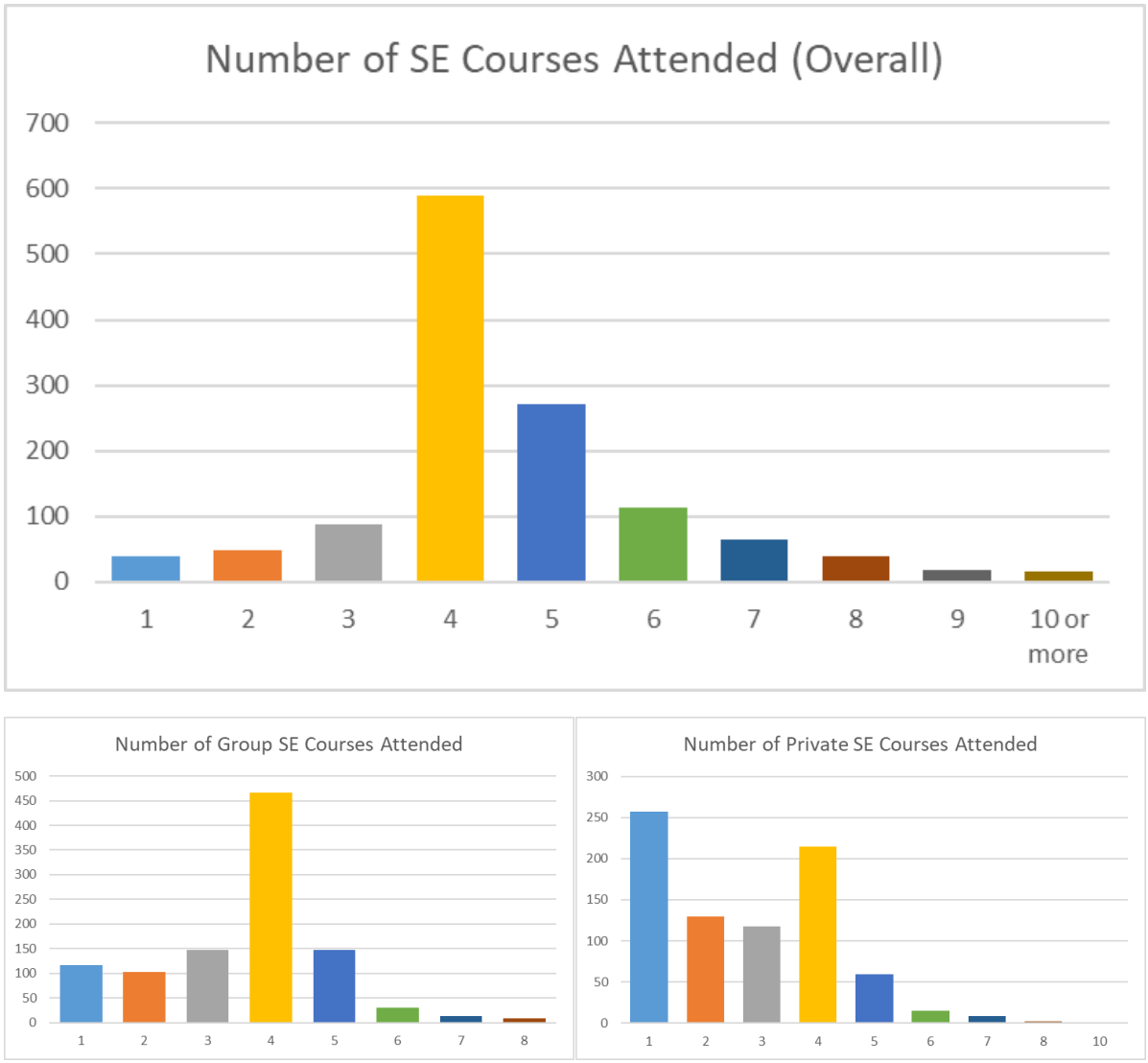


Figure 14. Number of SE Courses Attended

A little over a third of the respondents (548 or 36.3% of the sample) reported participating in both Group and Private/Small Group SE concurrently. The majority of 62% (N=340) received more Group than Private SE.

5.1.3 Shadow Education Duration

A little over 10% of the students who participated in SE (11.7% or 153) reported starting tutoring at some point in primary education. About 30% (28.9%) started during lower secondary education (grades 7-9). The rest (59.4%) of the students reported starting in high school (grades 10-12). Table 19 presents a more detailed picture of the grades in which students started SE.

Table 19. Overall Duration of SE Participation (Grade of first SE Participation)

	Grade	Freq.	%	Valid %	Cum. %
	1	14	.9	1.1	1.1
	2	30	2.0	2.3	3.4
	3	43	2.9	3.3	6.7
	4	23	1.5	1.8	8.4
	5	18	1.2	1.4	9.8
	6	25	1.7	1.9	11.7
	7	129	8.6	9.9	21.6
	8	116	7.7	8.9	30.5
	9	132	8.8	10.1	40.6
	10	332	22.0	25.4	66.0
	11	306	20.3	23.4	89.4
	12	138	9.2	10.6	100.0
	Total	1306	86.6	100.0	
Missing		202	13.4		
Total		1508	100.0		

Group SE tends to start later than private SE. Close to 8 out of ten (78%) of the students who reported receiving only Group SE started in high school, with a further 15.1% (60) having started sometime in lower secondary education. In comparison, only half of those who received only private SE reported starting in high school.

5.1.4 Shadow Education Intensity (Hours per week)

Table 20 shows SE intensity in students' final year of secondary education. As it can be seen, students attended on average 7.5 hours of Private SE and 11.5 of Group SE. However, there

are students who reported participating in more than 40 hours in either type and as many as 50 hours per week in any type of SE.

Table 20. SE Intensity (in hours per week)

	N	Min	Max	Mean	Mdn.
Private SE	767	1	45	7.403	7
Group SE	988	1	48	11.498	11
Group & Private SE	524	2	50	15.4465	14
Any SE	1238	2	50	13.752	13

Even taking into account the emphasis placed on securing a place in higher education in Greece, these upper figures appear (and likely are) excessive. It should be noted, however,

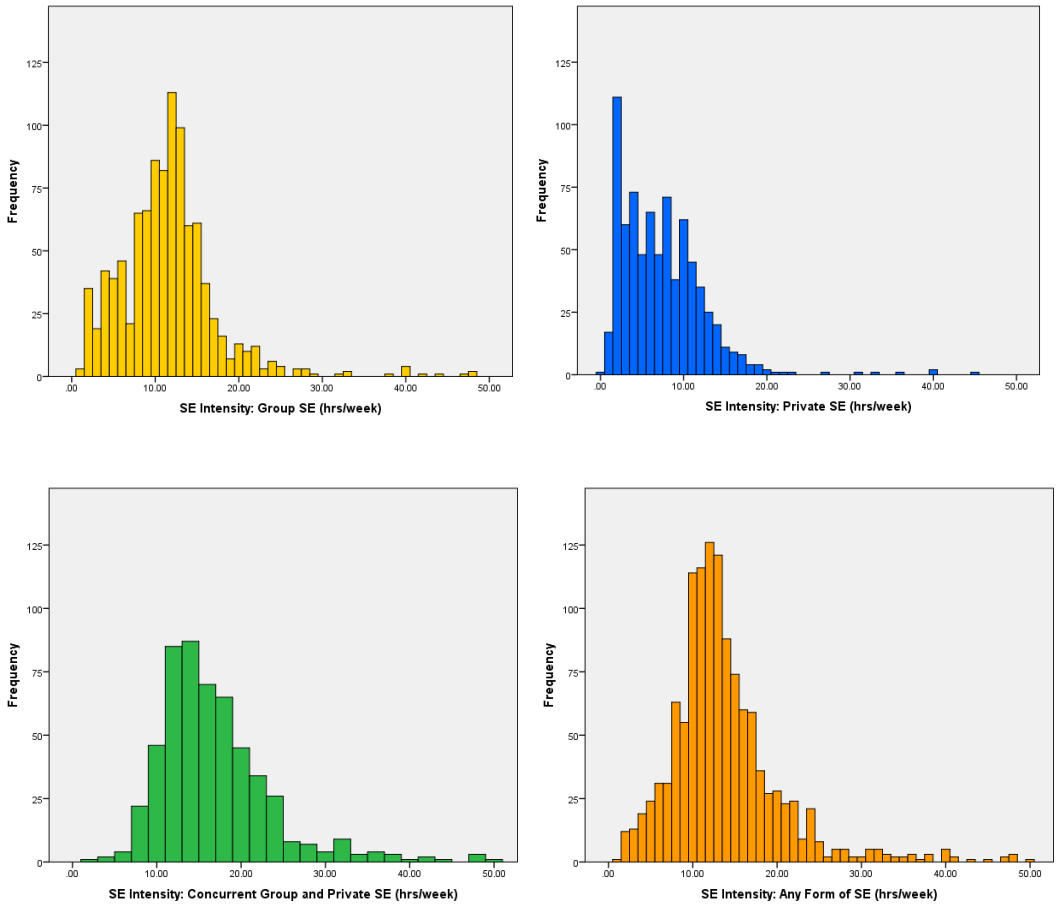


Figure 15. SE Intensity (in hrs/week) by SE Type

that only 39 students (2.7% of the sample) reported more than 30 hours of SE per week, while just 10 students (.6%) claimed more than 40hrs per week in any type of SE (see Figure 15). Substantially fewer respondents reported such high levels when examining intensity by SE type. Nevertheless, it bears examining if these individuals were significantly different to those students who reported lower levels of SE intensity.

Indeed, students who reported more than 30 hours of SE per week attended, on average, between 1 and 2.5 more SE courses a week more than those who reported 30 or less hours per week (see Table 21). Students who reported high SE intensity reported significantly lower average SE quality. They also attended schools with statistically significantly higher academic composition, where, although statistically significant, the difference in academic composition was substantively marginal. Students who reported high Private SE intensity came from families with significantly higher overall income and had, on average, lower average 11th grade marks (Table 21).

Table 21. Differences in Respondent Characteristics by high (>30hr per week) vs <30hr per week SE Intensity

	Mean Diff.	**t**	***dof***	**Sig**
	Any SE			
No. of SE Courses Overall	2.429	5.986	29	.000
No. of Group SE Courses	1.412	6.047	992	.000
Average SE Quality	-.245	-2.073	1236	.038
School Academic Composition	.082	2.471	45	.017
	Private SE			
No. of Private SE Courses	1.470	8.379	6	.000
Family Income	2.164	2.345	594	.019
11th Grade GPA	-1.231	-2.081	765	.038
	Group SE			
No. of Group SE Courses	.963	2.508	986	.012

These differences largely persisted when examining reports of extreme SE intensity (i.e., over 40hr per week –see Table 22). By and large, the small number of students who reported high or extreme SE intensity appear to be receiving tuition in one or more courses than those who report lower levels of intensity. The most extreme cases were reported by an even more limited number of students with significantly lower achievement. Although these differences in achievement may seem small, it is important to remember that they are the strongest predictor of later Panhellenic Examination marks (Psacharopoulos, 1979; Papas & Psacharopoulos, 1993). If one also bears in mind that differences of much less than 1 point on said Examinations can mean the difference between achieving entry to a student's HEI of choice or not securing a position in higher education, it is reasonable to expect a certain increased emphasis placed on lower achievement. It is, thus, logical to surmise that this subsample consists of students who are working harder (i.e., longer hours) to offset lower scholastic performance.

Table 22. Differences in Respondent Characteristics by extreme (>40hr per week) vs <40hr per week SE Intensity

	Mean Diff.	**t**	***dof***	**Sig**
	Any SE			
No. of SE Courses Overall	.971	2.289	1236	.022
No. of Group SE Courses	1.015	2.538	992	.011
	Private SE			
No. of Private SE Courses	1.632	4.831	2	.036
Family Income	2.244	2.106	594	.036
11th Grade GPA	-1.638	-1.961	765	.050
	Group SE			
No. of Group SE Courses	.528	2.573	9	.031
11th Grade GPA	-1.064	-2.260	986	.024

In any case, SE Intensity varied significantly (F=16.165, p=.000), according to the type students participated in. Students who reported exclusively participating in Group SE spent

approximately four and a half (Mean Diff.=4.384, p=.000) more hours of SE per week than those receiving Private, and almost 2 (Mean Diff.=1.926, p=.000) hours more than those receiving both Private and Group SE on average. Students who exclusively participated in Private SE spent on average almost two and a half (Mean Diff.=2.45, p=0.018) more hours than those who participated in both. This difference becomes even more stark, when considering that students participating in Private SE spent almost four more hours (F=34.978, p=.000; Mean Diff.=3.965, p=.000), and just over one-and-a-half more courses (F=83.083, p=.000; Mean Diff.=1.550, p=.000) in Private SE than those who participated in both types of SE concurrently.

5.1.5 Shadow Education Quality

Minimum, maximum and overall SE Quality ranged from about 3.5 to 4.5 out of 5 for students who exclusively attended Group or Private SE, and for SE participation overall (see Table 23). Students who attended a combination of Group and Private SE reported slightly higher average maximum quality (4.57).

Table 23. SE Quality

	Exclusively Group SE *Mean (Mdn)*	**Exclusively Private SE** *Mean (Mdn)*	**Both Group & Private SE** *Mean (Mdn)*	**Any SE** *Mean (Mdn)*
Min. Quality	3.68 (4)	3.85 (4)	3.48 (4)	3.56 (4)
Max. Quality	4.32 (4)	4.28 (4)	4.57 (5)	4.45 (5)
Overall Quality	4.02 (4)	4.08 (4)	4.10 (4.11)	4.05 (4)

It is worth noting that there were slight but statistically significant differences between students who exclusively attended Group or Private SE and those who attended a

combination of the two. Specifically, there was a smaller variation in the perceived Quality of SE for those who attended one or the other form exclusively. This lends credence to the supposition that students who participated in both may be making strategic choices when employing different forms of SE, selecting higher quality tutors in those subjects which are more critical to them, either because of a greater need for remediation or because of a higher weight on Panhellenic examinations.

5.1.6 Shadow Education Cost

Students who participated in SE reported an average expenditure of €264 per month (or €3168 per annum), in the final year of secondary education. This may not seem like a significant sum, initially. However, when one takes into account that the average NET salary in Greece for 2018 which was €917 ("Average Salary in European Union 2018", 2018) the average expenditure becomes more than one quarter of the average net national salary. For those students who reported family income in absolute numbers, the average salary reported was approximately €1393 per month. This would put the average expenditure closer to 1/5th (18.95%) of reported salaries. However, students were not explicitly requested to provide NET or GROSS salaries, and even then, less than one third of respondents reported parental income in hard numbers, rather than by income category, making a direct comparison very difficult.

Regardless, further analysis suggests that the proportion of family income devoted to SE is unreasonably high. More specifically, 26.2% of respondents reported spending more than 25% of their family income on SE, 7.6% spent more than three quarters, and 1.5% reported

spending more on SE than their parents earned monthly. In terms of cost outlays, students reported spending as much as €1200 a month (or €14.400 per annum) on SE. Some of these figures are particularly noteworthy, representing more than the total reported parental household income. These figures become even more remarkable, if one takes into account the average salary breakdown produced by the Work Institute of the General Confederation of Greek Workers (IN.E Γ.Σ.E.E.) (see Table 24), which shows 60% of the Greek population earning less than €908 per month in 2018.

Table 24. Workforce Distribution by Net Monthly Income (Greece, 2018:2)

Earnings (€)	%	Cum. %
≤450	10.3	10.3
451-590	9.7	20.0
591-650	10.1	30.1
561-750	11.3	41.4
751-830	8.8	50.1
831-907	9.9	60.0
908-1000	12.8	72.8
1001-1100	7.3	80.2
1101-1300	10.6	90.8
1301+	9.2	100.0

Source: *Vima Online, 2018: Salaries in the Greece of 2018 – 3 in 4 with a salary under 1000 euros [in Greek]*

There are a number of potential explanations for this phenomenon. Students may be misreporting parental income in light of the protracted fiscal crisis, intentionally or otherwise. Increased parental focus on issues surrounding ongoing pay cuts coupled with increased taxation may have skewed students' perception and understanding of their earnings. Students may also have purposefully underrepresented parental income, to avoid potential social exclusion, due to a perception of privilege in a generally insolvent environment. Alternatively, students may have misrepresented SE costs. SE costs have historically

corresponded to significant portions of family income (Liodakis, 2010; Patrinos, 1992; Psacharopoulos & Papakonstantinou, 2005; Zambeta & Kolofusi, 2014) which, in conjunction with the protracted recession, may be perceived and presented inflated, relative to actual costs. On the other hand, some students may be presenting decreased costs, according to their decreased household incomes. The most likely explanation, however, may be found in a sociocultural idiosyncrasy of Greek family life –cohabitation with extended family. There is a longstanding and persistent tradition of children taking on their elderly parents to live with them. As a result, living with anywhere from one to all four grandparents is relatively commonplace. These family members often contribute to the families living costs (Stamouli, 2018) as well as to SE costs (Liodaki & Liodakis, 2016), which, while not measured in this study, could provide a reasonable explanation for SE costs exceeding nuclear family income.

5.1.7 Student Effort and SE Effort

Students reported separately on three targeted forms of effort (measured in hours per week): effort related to school assigned homework, effort related to Group SE, and effort related to Private SE. This distinction, which may at first glance appear superfluous, may, in fact, be quite important. Previous research, which only incorporated classical measures of school-related effort, failed to find a significant association between it and educational achievement in the Greek context (Katsillis & Rubinson, 1990). It is noteworthy that in this study students reported substantially and significantly more hours of effort invested in SE than in school related work (Table 25). Of particular note are the maximum reported raw hours invested in SE, which exceed realistic estimates, although what constitutes a realistic estimate of effort

invested in SE may not be immediately apparent to readers not intimately familiar with the Greek educational system. While it is clearly impossible for students to invest more hours studying than there are in the week, it is quite common for the upper end of the spectrum to include more hours spent studying for SE than in school over the course of a week. This becomes easier to understand when taking into account the fact that students and their families primarily claim to invest in SE for the purpose of enhancing performance on national university entrance.

It is, furthermore, worth reinforcing the fact that Shadow Education in Greece is pervasive almost to the point of universality and can (and often does) represent an investment of time and effort rivaling or even surpassing traditional education. Late-night and protracted weekend study sessions are common among students studying for SE in the final years of secondary education. However, these patently unrealistic investments of effort must be addressed. Rather than simply disregard them, it seemed more reasonable to treat them as equivalent to the maximum realistic time investment reported. With better than 90% of respondents having quoted up to 40 hours of total study investment for SE, final tallies of Student effort were capped at 40 hours. It is worth noting that this new measure was very nearly identical to the original, which included unrealistic effort reports (r=.918, p=.000). Final tallies of student effort are presented in Table 25.

Table 25. Student Effort (in hours per week)

	N	Min	Max	Mean	Mdn.	St. Dev.
School Related Effort	1440	0	42	24.1415	22	6.44
SE Effort						
Group SE Effort	1426	0	80	12.139	8	13.96
Private SE Effort	1420	0	100	8.134	14	12.83
Overall Effort	1442	0	178	24.1415	22	17.33
Overall Effort (Capped)	1442	0	40	21.8972	22	12.91

5.2 Shadow Education Differences between Background Characteristics

One of the central and ongoing questions regarding SE centers on appropriate measurement (Bray, 2006; Bray, 2010; Dierkes, 2010). Bray, Kobakhidze, and Suter (2020) in particular expound upon the difficulties in measuring such outside-school activities, especially in a cross-national context. Of course, in the initial stages of consolidating the measurement of aspects of SE, many facets may be examined which are not directly comparable on an international level. Finding the appropriate and equivalent measurements and corresponding questions in each context, which would enable the extrapolation of more universal operationalizations first requires a comprehensive measurement in each context. Previous studies (e.g., Kassotakis & Photiadou, 1996; Polychronaki, 2004; Polydorides, 1981; Kontogiannopoulou-Polydoridi, 1995; 1996; Psacharopoulos & Papakonstantinou, 2005; Verdis, 2002 etc.) have almost exclusively employed whether or not a student receives SE as a measure of the duration of SE participation. A primary concern of this study is to examine the various measures and determine which are the most substantively important measures of SE. Put differently, in the first instance it needs to identify the measure or measures of SE that have the strongest association with educational achievement, but also with the exogenous variables of the educational achievement process. Having done this, it must then examine their relationship with the process' intervening variables.

Given the variety and breadth of SE aspects measured, it is not at all unexpected that the various aspects and measures of SE do not share one, common relationship with the primary exogenous factors known to influence educational achievement.

5.2.1 Differences by Family Socioeconomic Status

In general, students that participate in SE come from higher SES families -a finding consistent across types of SE (see Table 26). This is not very difficult to explain. All students aspiring to higher education are expected to attend some kind of tutoring and their parents, irrespective of their SES, are expected to help them as much as they can. Of course, while participation in any form or combination of forms of SE corresponds to higher FSES, the average *difference* in Family SES between those that do and do not participate in a given type of SE is not consistent (Table 26).

Table 26. Independent Samples t-tests for Average Family SES by SE Participation

	Mean Diff. (SE)	**t**	***dof***	**Sig.**
Any SE	.689 (.067)	10.307	1506	.000
Group SE	.193 (.054)	3.555	840	.000
Private SE	.432 (.047)	9.078	1506	.000
Concurrent Group and Private SE	.275 (.050)	5.485	1506	.000

The greatest difference overall is apparent in participation in any SE (regardless of form or combination of forms). This is a result of the particular measure employed here. Using this measurement, those who do not participate in "Any SE" participate in no form(s) of shadow education; for Group, Private, and Concurrent Group and Private SE, the omitted category of respondents employed in forming the dummy variable may be participating in another form. For example, the Group SE measure's omitted category respondents could still participate in Private SE (but not both forms concurrently), with equivalent considerations for the Group SE measure, while the Concurrent Group and Private SE measure does not consider students who may have participated in one of the two types exclusively. This makes the results no less interesting or substantive, however, as participation in any form (or combination of forms)

still has distinct characteristics worth examining. The tradeoff of a slightly less discriminating measure (and arguably underestimated differences), in this instance, is the ability to examine the entire sample, as opposed to what could be a significantly smaller portion of it, overall.

As expected, the biggest FSES difference for a specific type is apparent in Private SE participation, followed by Concurrent Group and Private SE and finally Group SE. This is reasonable, when one considers the higher perceived efficacy and measurable costs associated with Private SE participation. Concurrent Group and Private SE is a middle ground, likely populated by students unable or unwilling to shoulder the financial burden of an exclusively Private SE regime, but still able/willing to supplement Group SE with limited Private SE in search of optimal returns on investment. Group SE demands the least investment in both money and time; it is the least expensive.

5.2.2 Differences by Gender

The number of courses in which students receive SE varies by gender, with female students participating in more courses and investing more effort, and in higher quality SE than male students (see Figure 16)[34].

There are a number of potential explanations for this discrepancy. Male students had significantly lower occupational and educational expectations than their female counterparts (see Table 27). Their parents expected them to achieve significantly lower status occupations

[34] Differences are significant on the .05, .001, and .001 levels, respectively.

and both parents and teachers held significantly lower educational expectations for them (Table 27).

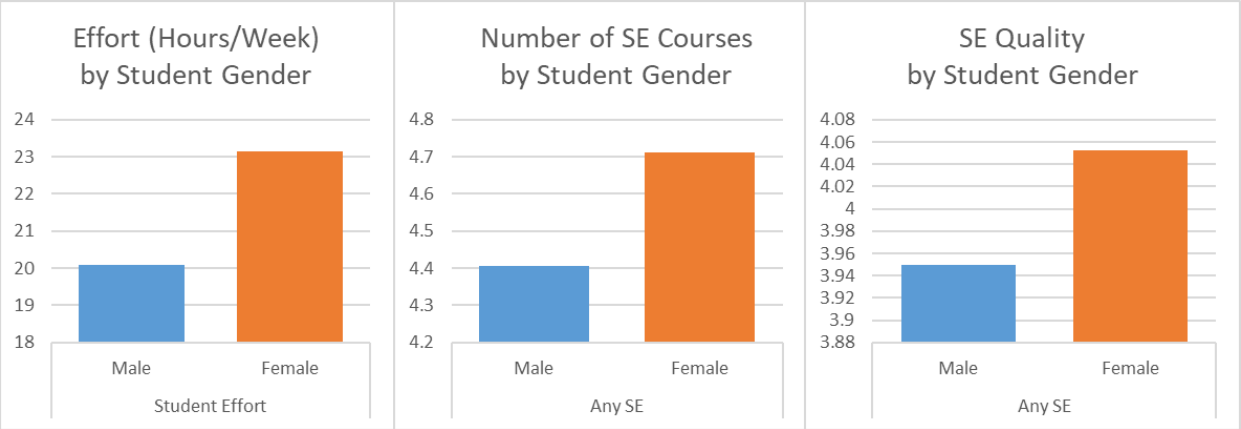


Figure 16. SE Characteristics by Gender

As a result, male students may be investing in the normative 4 SE courses, corresponding to the four courses examined in the Panhellenic Examinations, and little if anything else. Female students, on the other hand, may be investing in fifth or sixth courses, in order to open up options for access to different Higher Education Institutions (HEI) and/or departments, not otherwise available to their educational track. They may also be less concerned about the marking penalties corresponding to subject combinations outside their educational track. Such actions could constitute early steps in the process of slowly overturning traditional expectations for male students to apply to higher prestige, and thus more difficult to access, schools or colleges. This hypothetical scenario could not be measured reliably for the purposes of this study, however, as students do not finalize their HEI/Departmental selections until after sitting Panhellenic examinations in the summer (and even then, only if they have

successfully received their high school diploma), while the study's data was collected earlier during the academic year in late winter/early spring.

Table 27. Independent Samples t-tests for Expectations by Gender

	Mean Diff. (SE)	t	dof	Sig.
Students' Occupational Expectations	-775.753 (114.715)	6.490	914	.000
Students' Educational Expectations	.296 (.056)	5.270	1504	.000
Parental Occupational Expectations	-739.834 (124.813)	9.078	1506	.000
Parental Educational Expectations	.214 (.056)	3.838	1489	.000
Teachers' Educational Expectations	.381 (.069)	5.383	1178	.000

5.2.3 Differences by Area of Residence

Students in urban locales (metropolitan/city and suburban areas) participated in significantly more SE courses on average (see Figure 17) than their rural (Village/Agrarian or geographically isolated areas) counterparts. There were no differences in Private or Concurrent Group and Private SE participation courses between the two locales but it is likely that the difference in overall participation was due to the number of Group SE courses attended (Figure 17)[35].

These differences become more interesting (and granular) when examining the raw Area of Residence categories (see Figure 18). Students in Villages or Agrarian Areas participate in significantly fewer SE courses (Group or Private) than their Suburban[36] or City dwelling counterparts[35].

[35] Differences are significant at the .001 level.
[36] Significant at the .01 level.

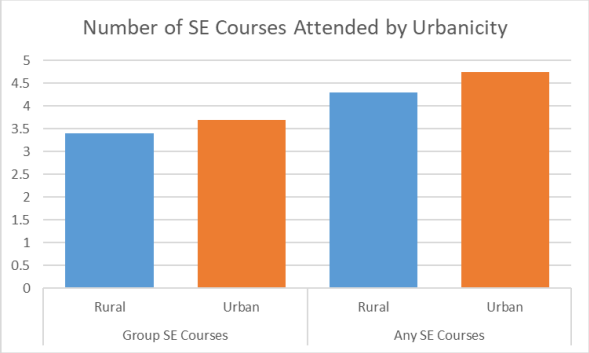


Figure 17. Number of SE Courses Attended by Student Urbanicity

Suburban students participate in significantly more Group SE than their Villages or Agrarian Area dwelling counterparts[38]. Finally, students in Village/Agrarian and City areas participate in significantly more Private SE courses than their Suburban counterparts[37]. The last finding would seem to be the most confounding, contradicting the general trend for more SE in urban locales. However, it is likely due to intrinsic differences in the supply of available SE institutions in each case. The sheer number of students seeking SE in urban and suburban locales means that they play host to a much larger number of organized SE franchises, offering greater access to Group SE courses. Students in Geographically isolated areas will likely have access to a much more constrained market, often only to those courses offered outside of regular working hours by teachers in their local schools. Metropolitan/city areas represent the other extreme, with an overabundance of SE practitioners, Group or Private. These students may be seeking an edge, through the perceived benefits of Private or small group tutelage.

[37] Significant at the .05 level.

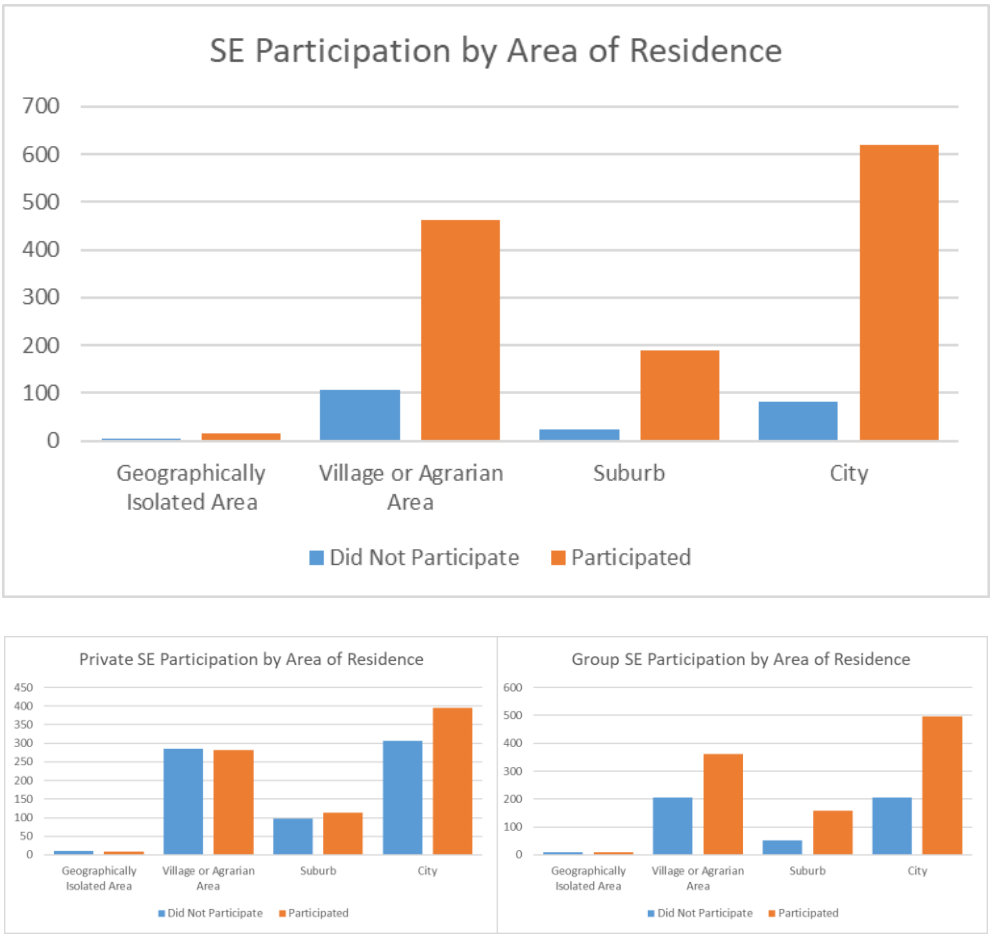


Figure 18. SE Participation by Area of Residence

Students in Urban locales spend more hours in SE than their rural counterparts (see Figure 18)[38]. Examined by raw Area of Residence, this represents a difference between Suburbs and Villages (Mean Diff.=1.519, p=.050). Students in Urban locales also participated in higher Quality Private and Overall SE, and reported significantly higher investments in Monthly SE Expenditures and Group and Overall SE Effort (see Figure 19)[39].

[38] Difference is significant at the .01 level
[39] Significant at the .05 level.

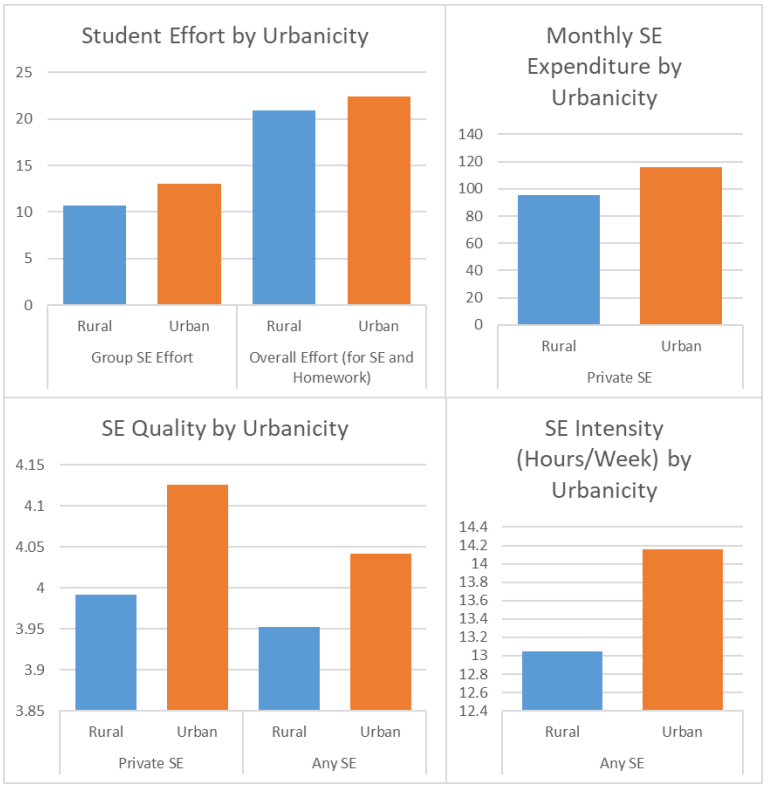


Figure 19. SE Characteristics by Student Urbanicity

5.2.4 Differences by Ethnicity

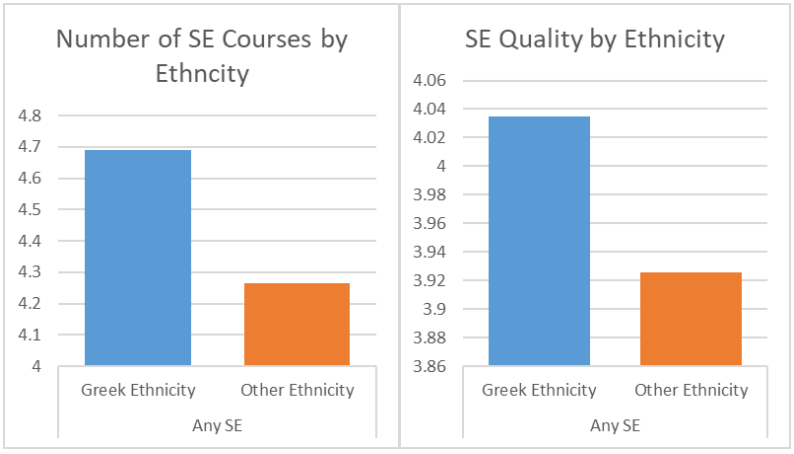


Figure 20. SE Quality and Courses by Student Ethnicity

Ethnically "Other" students participate in significantly less[40] and lower average Quality SE[41] than their Ethnically Greek counterparts (see Figure 20). They also participate in SE for significantly fewer years (t(1236)=2.360, p=.018; Mean Diff.=.398) and spend significantly fewer hours each week in SE[39], spend less money[39] and invest less effort in both Group and Overall SE[40] than their ethnically Greek counterparts (see Figure 21). In short, ethnically other students show significantly less investment in SE across the board.

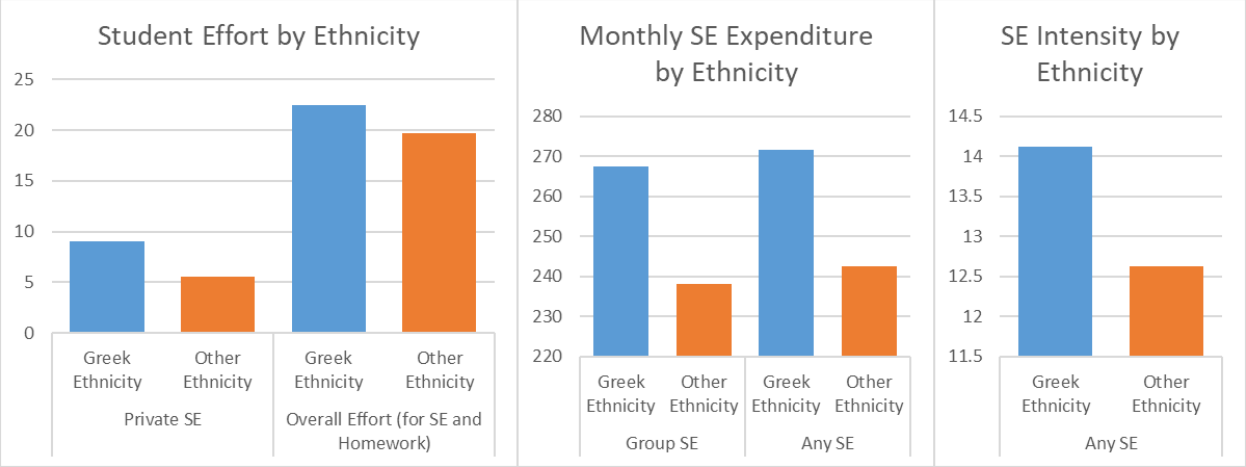


Figure 21. SE Investment by Student Ethnicity

5.3 Conclusion

The significant differences and relationships described in this chapter paint a largely consistent picture. Slight differences aside, all of the measures of SE participation are significantly positively associated with family background characteristics, in one way or another. In other words, higher-level family background characteristics generally correspond

[40] Significant at the .001 level.
[41] Significant at the .01 level.

to higher investment in SE, across all measures (i.e., Family Socioeconomic Status, Gender, Area of Residence, and Ethnicity)[42].

This consistency gave rise to an interesting methodological question: would it be more beneficial to employ a summary measure of SE? We used Principal Component Analysis to construct just such a composite measure of SE, including all of the measures described in this chapter. Indeed, when used in subsequent models in the place of the distinct measures discussed above, it displayed much the same characteristics as the simple SE participation measure. There are, however, two important considerations to bear in mind. On the one hand, there are conceptual problems with the construction of a single index from such a diverse set of measures (not all of which share common associations with the rest of the controls or variables of interest in the study). On the other hand, there is a strong argument for the implementation of separate measures in the search for comparable measures in cross- and inter-national examinations of the nature and contributions of extracurricular education in general and SE in particular (see Bray, Kobakhidze, & Suter, 2020). As a result, we employed these separate measures when examining more complex relationships between SE and student/school characteristics in future chapters.

[42] It is worth noting here that "higher-level" is a relative term, in regards to binary or nominal variables. In this instance, higher levels of Area of Residence generally coincide with higher population density, for Gender "Female" students and for Ethnicity students of "Greek" Ethnicity.

6. Shadow Education: Enhancement or Remediation

One intriguing question related to SE is whether it is mainly a vehicle of enhancement or remediation. Of course, by the end of upper secondary education, 90.2% of students reported having participated in some form of SE, making a finding of predominantly remedial modal strategies conceptually problematic, at best. Remediation and enhancement, however, are not always mutually exclusive; the differentiation is not always easy or clear-cut. Nor is the end of secondary education necessarily the only time-point of interest to examine students' modal strategies. In any case, one may argue that, if lower achievements lead to more or higher quality SE, we have a case of remediation and when higher achievements lead to more or better SE, we have a case of enhancement. The relationship between the various measures of SE and students' previous achievement are examined first on a bivariate, descriptive level. This is expanded upon by a more rigorous examination of the relationship between previous achievement and the modal strategy of SE employment both comparing to and expanding upon previous findings.

It is important to note that, with the exception of a weak positive correlation between participating in Private SE in Primary or Lower Secondary Education (ρ=.069, p=.010), there appears to be no correlation between SE participation before high school and students' previous achievement. This may be attributed partly to the limited variation of primary school GPAs but is likely mainly due to the fact that most students do participate in SE irrespective of their previous achievement. Any relationships or differences are more likely to be found in the specifics of SE participation.

6.1 Previous Achievement and Shadow Education Participation

There are weak to average, significant correlations between all three measures of Previous Achievement and Participation in Group, Private, concurrent Group and Private, and Any (Group or Private) SE. There are also weak but significant correlations between all four types of SE participation and the measures of Literacy and Numeracy presented above. Students are almost 1.4 times as likely (exp(B)=1.382, p=.000) to participate in some form of SE in high school, for each 1 point higher in their Previous Achievement score, all other things being equal. This figure is roughly consistent for Group (exp(B)=1.399 p=.000), Private (exp(B)=1.327 p=.000) and concurrent Group and Private SE (exp(B)=1.367, p=.000), for each 1 additional point in their Previous Achievement score, all other things being equal. It is important to note that the figures for Group and Private SE participation do not refer to exclusive participation in one of the other. Exclusive Group participation is approximately one-and-a-quarter times more likely (exp(B)=1.241 p=.000) for each 1 point higher in Previous Achievement, while exclusive Private SE participation has no significant association with previous achievement.

6.2 Previous Achievement and Number of Shadow Education Courses Participated In

There are weak but significant positive correlations between Previous Achievement and the number of courses in which a student receives SE in high school. In other words, higher achieving students participate in more SE than their lower achieving counterparts, in high

school. These differences generally persist, for Group, Private, concurrent Group and Private, and Overall SE participation. Distinction (Greek: *Αριστείον* [Excellent] –with grades of 19-20 on a 20-point scale) level students universally participate in more SE than their 2.1 (Greek: *Λίαν Καλώς* [Very Good] –with grades of 16-18) level counterparts and those students more than their 2.2 (Greek: *Καλώς* [Good] –with grades of 13-15) peers. Comparisons to students with Pass-level Previous Achievement could not be made, as there was only one such respondent.

The differences in the number of SE courses in which students participated by their level of previous achievement are presented in Table 28. Distinction level students participated in significantly more SE courses overall than their 2.1 and 2.2 counterparts. Compared to their 2.1 level counterparts, this corresponded to more concurrent Group and Private SE; compared to their 2.2 level counterparts, this corresponded to more Private SE courses. 2.2 level students also participated in more SE courses overall than their 2.2 level counterparts, which corresponded to a higher number of Private SE courses.

Table 28. Independent Samples t-tests for Number of SE Courses by Category of Previous Achievement

	Mean Diff.	**t**	***dof***	**Sig**
Distinction vs 2.1				
Group SE Courses	.277	1.870	402	.062
Private SE Courses	.193	.969	284	.333
Concurrent Group and Private SE Courses	.534	2.079	195	.039
Any SE Courses (Group or Private)	.370	2.578	491	.010
Distinction vs 2.2				
Group SE Courses	.186	.559	333	.577
Private SE Courses	.974	3.481	9	.007
Concurrent Group and Private SE Courses	.618	.835	157	.405
Any SE Courses (Group or Private)	1.100	3.431	404	.001
2.1 vs 2.2				
Group SE Courses	-.091	-.254	93	.800
Private SE Courses	.781	2.511	13	.026
Concurrent Group and Private SE Courses	.083	.105	44	.917
Any SE Courses (Group or Private)	.730	2.100	119	.038

6.3 Previous Achievement and Overall Shadow Education Duration

There is no significant correlation between students' Previous Achievement and the duration of SE they participated in up to the end of lower secondary education. There is, however, a weak but significant positive correlation between students' Previous Achievement and the duration of their SE in high school (ρ=0.113, p=.003), among those who start SE at some point in high school. This does not seem to correspond to any significant difference in time spent in SE in high school between distinction and 2.1 level students. Both distinction and 2.1 level students start SE approximately half a year earlier (Mean Dif.=.522, t=2.490, df=18, p=.023 and Mean Dif.=.459, t=2.341, df=130, p=.021 respectively) than their 2.2 counterparts, however.

6.4 Previous Achievement and Shadow Education Intensity

Students who received distinction level Secondary Education GPA participated in, on average, 1.204 hours more SE overall (t=2.506, df=733, p=.012) and 1.026 more hours of Private SE (t=2.095, df=219, p=.037) than those who received a 2.1. There were no significant differences between those 2.1, 2.2, and Pass.

6.5 Previous Achievement and Shadow Education Quality

There are significant, if weak, correlations between Primary and Lower Secondary achievement, the composite PACH measure, and average perceived quality of Group, Private and Overall SE. An Analysis of Variance (ANOVA) showed that these correlations corresponded to significant differences in Overall, Group and Private SE Quality by Secondary

Education Achievement categories (see Table 29). However, ANOVA examines differences between groups -not which groups differed. A Bonferroni test was run *post-hoc* to examine these specific differences (see Table 29). Its results indicated that students who received a Distinction participated in, on average, higher quality overall SE, compared to students with lower levels of Lower Secondary Educational Achievement (i.e., those who received a 2.1, 2.2, and a Pass). Distinction level students also received higher quality Private SE and Groups SE specifically than their 2.1 and 2.2 counterparts did.

Table 29. ANOVA for SE Quality by Lower Secondary Education Achievement Category

		Sum of Squares	*dof*	Mean Square	F	Sig.
Group SE Quality	Between	18.165	3	6.055	9.561	.000
	Within	479.407	757	.633		
	Total	497.572	760			
Private SE Quality	Between	24.896	3	8.299	10.913	.000
	Within	431.938	568	.760		
	Total	456.833	571			
Overall SE Quality	Between	28.644	3	9.548	16.927	.000
	Within	526.272	933	.564		
	Total	554.916	936			

Bonferroni Post-Hoc Test

Dependent Variable	(I) Lower Sec. Ed. Ach. Category	(J) Lower Sec. Ed. Ach. Category	Mean Diff. (I-J)	S.E.	Sig.
Group SE Quality	Pass	2.2	-.551	.404	1.000
		2.1	-.630	.400	.698
		Distinction	-.896	.400	.153
	2.2	Pass	.551	.406	1.000
		2.1	-.078	.081	1.000
		Distinction	-.345	.081	.000
	2.1	Pass	.630	.400	.698
		2.2	.078	.081	1.000
		Distinction	-.266	.064	.000
	Distinction	Pass	.896	.400	.153
		2.2	.345	.081	.000
		2.1	.266	.064	.000
Private SE Quality	Pass	2.2	.256	.510	1.000
		2.1	.026	.507	1.000
		Distinction	-.282	.506	1.000
	2.2	Pass	-.256	.510	1.000
		2.1	-.230	.103	.155
		Distinction	-.537	.100	.000

Table cont'd on following page.

Table 29 cont'd

Dependent Variable	(I) Lower Sec. Ed. Ach. Category	(J) Lower Sec. Ed. Ach. Category	Mean Diff. (I-J)	S.E.	Sig.
	2.1	Pass	-.026	.507	1.000
		2.2	.230	.103	.155
		Distinction	-.307	.082	.001
	Distinction	Pass	.282	.506	1.000
		2.2	.537	.100	.000
		2.1	.307	.082	.001
Overall SE Quality	Pass	2.2	-.735	.340	.186
		2.1	-.841	.338	.078
		Distinction	-1.126*	.338	.005
	2.2	Pass	.735	.340	.186
		2.1	-.106	.068	.724
		Distinction	-.390*	.068	.000
	2.1	Pass	.841	.338	.078
		2.2	.106	.068	.724
		Distinction	-.284*	.055	.000
	Distinction	Pass	1.126*	.338	.005
		2.2	.390*	.068	.000
		2.1	.284*	.055	.000

These differences were somewhat subdued but persisted for Overall, Group and Private SE Quality when using the joint Previous Achievement measure. The Bonferroni test showed that distinction level students received higher quality Overall SE than their 2.1 and 2.2 level counterparts did. This difference persisted in Private SE, compared to both 2.1 and 2.2 students. They also received higher quality Group SE than their 2.2 level counterparts did.

Table 30. ANOVA for SE Quality by Previous Achievement Category

		Sum of Squares	*dof*	Mean Square	F	Sig.
Group SE Quality	Between	9.242	2	4.621	7.205	.001
	Within	444.468	693	.641		
	Total	453.71	695			
Private SE Quality	Between	17.714	2	8.857	13.339	.000
	Within	363.207	547	.664		
	Total	380.921	549			
Overall SE Quality	Between	17.998	2	8.999	16.545	.000
	Within	466.675	858	.544		
	Total	484.673	860			

Table cont'd on following page.

Table 30 cont'd.

Bonferroni Post-Hoc Test

Dependent Variable	(I) Prev. Ach. Category	(J) Prev. Ach. Category	Mean Diff. (I-J)	S.E.	Sig.
Group SE Quality	2.2	2.1	-.408	.176	.061
		Distinction	-.561	.167	.002
	2.1	2.2	.408	.176	.061
		Distinction	-.154	.073	.107
	Distinction	2.2	.561	.167	.002
		2.1	.154	.073	.107
Private SE Quality	2.2	2.1	-.473	.211	.076
		Distinction	-.786	.202	.000
	2.1	2.2	.473	.211	.076
		Distinction	-.314	.084	.001
	Distinction	2.2	.786	.202	.000
		2.1	.314	.084	.001
Dependent Variable	(I) Prev. Ach. Category	(J) Prev. Ach. Category	Mean Diff. (I-J)	S.E.	Sig.
Overall SE Quality	2.2	2.1	-.474	.145	.003
		Distinction	-.681	.138	.000
	2.1	2.2	.474	.145	.003
		Distinction	-.207	.060	.002
	Distinction	2.2	.681	.138	.000
		2.1	.207	.060	.002

6.6 Previous Achievement and Shadow Education Type

There appears to be no relationship between any of the measures of Previous Achievement (Primary School GPA, Secondary School GPA or the joint Previous Achievement measure) and the Ratio of Group/Private SE courses overall or by grading category (distinction, 2.1, 2.2, pass). This is particularly interesting, given Baker et al.'s (2001) and Southgate's (2009) position that that SE shows high levels of remedial use in Greece. Since Private SE is, all things being equal, broadly perceived as more effective, than Group SE, one would expect that students seeking remediation would invest more heavily in Private SE to the detriment or, where fiscally viable, exclusion, of Group SE –which does not appear to be the case.

6.7 Enhancement or Remediation: An Initial Deduction

Summarizing the previous findings, it could be argued that higher achievement generally corresponds to greater investment in SE. Higher achieving students participate in more SE courses, spend more years in SE, more hours per week in SE courses and invested in higher quality SE (Group, Private or some combination of the two). All of the associations and differences above seem to indicate that students employ SE as an enhancement, rather than remediation strategy. They consist, however, of rather simple differences and generally bivariate relationships. A more in-depth examination these same relationships presented below may provide clearer answers.

6.8 Modelling Enhancement Vs Remediation in SE participation

Beyond the primary motivation behind participating in SE, students were not questioned regarding their reasons for participation. Baker et al. (2001), examined the issue of enhancement vs remediation by regressing a dichotomous indicator of math related SE participation on students' math performance, controlling for a series of relevant student characteristics. Following and expanding upon this logic, possessing both more extensive measures of previous achievement and SE participation, this study examines the modal strategy of SE participation as the logit regression coefficient of SE Participation, which is estimated as a function of students' Previous Achievement. Four sets of models will be estimated to this end. The first set will attempt to match the model of SE participation presented in Baker et al. (2001). This set of models examines SE participation beginning at

any point up to lower secondary education, since the only distinction made in Baker et al. (2001) is that students are participating in SE at the time. This set of models also uses lower secondary education GPAs as the measure of achievement, as the closest equivalent to the contemporary math test score used in Baker et al. (2001). This estimation is supplemented by separate examinations of Group and Private SE participation. Since the estimation used by Baker et al (2001) includes limitations necessitated by the format of the data they had at their disposal, the first set of models are juxtaposed against a set of models which take advantage of the broader set of measures of achievement and SE participation contained in the data collected for this study. The third set examines Overall, Group and Private SE participation starting in high school using the compound Previous Achievement measure discussed earlier. The fourth model goes beyond this to examine the modal strategies behind participation in SE in high school, regardless of when it began.

In accordance with Baker et al. (2001) and Stevenson and Baker's (1992) findings regarding factors known to influence decisions to employ SE, a series of other characteristics are also controlled for in the model. These include Family Socioeconomic Status, Gender, Area of Residence (using Cities as the reference category), and dominant home language (ostensibly a measure of whether home language was different from the language of instruction at school). Baker et al. (2001) also included a measure of extra-curricular remedial lessons provided by schools but, as Greek schools provide no such service to their students, it is a constant characteristic for all students in the sample. Student Ethnicity was omitted, despite significant differences in overall SE participation and duration discussed previously, due to its significant association with students' dominant home language (Chi-Sq.=46.822 *dof*=32

p=.000). All of the models were estimated using SPSS' Complex Samples Logistic Regression function, to correct for bias due to clustering within schools built into the study design.

Table 31. Binary Logistic Regressions for Any SE Participation in Lower Secondary Education on Achievement

	Any SE Participation			
Predictor	**B(S.E.)**	**Wald(df)**	**Sig.**	**Exp(B)**
Constant	-1.685(.746)	7.171(1)	.031	.185
Middle School GPA	.039(.041)	.898(1)	.350	1.040
Family SES	.158(.072)	4.844(1)	.035	1.171
Gender	.118(.129)	.831(1)	.369	1.125
Area of Residence		2.999(3)		1.000
Geographically Isolated	-.602(.229)		.013	.548
Village/Agrarian	-.323(.171)		.068	.724
Suburb	-.287(.197)		.156	.751
Language	1.852(.543)	11.651(1)	.002	6.374

Pseudo R Squares		
Cox&Snell	**Nagelkerke**	**McFadden**
.025	.035	.020

The most striking difference between the results presented in Table 31 and Baker et al.'s (2001) findings is the fact that achievement does not appear to influence Greek students' decision to participate in SE. In other words, at the lower secondary education level, by which point approximately two thirds (66.3%) of students have participated in some form of SE, SE participation appears to be employed for neither enhancement nor remedial purposes. Baker et al. (2001) refer to such cases, where the coefficient for the achievement measure is non-significant, as a mixed modal strategy, that is, a system in which both enhancement and remediation are employed. The only factors influencing SE Participation at this level are Family Socioeconomic Status, dominant Language Spoken at home, and extreme differences in area of residence (Geographically Isolated locales vs Metropolitan City areas). Specifically, students from higher socioeconomic backgrounds are slightly more likely to participate in SE

in lower secondary education (Exp(B)=1.205, p=.017). Students residing in Geographically Isolated areas are just over half as likely to attend SE by lower secondary education than their counterparts in cities. More striking, though, is the difference between students whose families speak predominantly Greek, compared to those who primarily speak a different language at home, with Greek speaking families being more than six times as likely to participate in SE in lower secondary education (Exp(B)=6.374, p=.002).

Table 32. Binary Logistic Regressions for Group and Private SE Participation in Lower Secondary Education on Achievement

	Group SE Participation				Private SE Participation			
Predictor	**B(S.E.)**	**Wald(df)**	**Sig.**	**Exp(B)**	**B(S.E.)**	**Wald(df)**	**Sig.**	**Exp(B)**
Constant	-3.354(1.082)	11.986(1)	.004	.035	-3.945(1.304)	9.784(1)	.005	.019
Middle School GPA	-.007(.037)	.040(1)	.843	.993	.027(.049)	.298(1)	.589	1.027
Family SES	.094(.069)	1.848(1)	.184	1.098	.224(.085)	6.984(1)	.013	1.251
Gender	.133(.134)	.998(1)	.325	1.143	.220(.149)	2.182(1)	.149	1.246
Area of Residence		10.161(3)		1.000		.789(3)		
Geographically Isolated	-1.019(.190)		.000	.361	-.048(.194)		.806	.953
Village/Agrarian	-.401(.191)		.044	.669	-.248(.190)		.203	.781
Suburb	-.269(.188)		.162	.764	-.312(.232)		.188	.732
Language	2.538(1.010)	6.310(1)	.017	12.658	2.367(.980)	5.835(1)	.022	10.667

Pseudo R Squares					
Cox&Snell	**Nagelkerke**	**McFadden**	**Cox&Snell**	**Nagelkerke**	**McFadden**
.023	.035	.021	.028	.042	.026

Examined separately, Group and Private SE participation in lower secondary education continues to show indications of a mixed modal strategy (see Table 32). However, there are differences from overall SE participation. Family socioeconomic status does not affect students' probability of participating in Group SE in Lower Secondary Education. Speaking predominantly Greek in the household has a weaker effect on students' likelihood to participate in both Group and Private SE. Specifically, lower secondary education students who speak predominantly Greek at home are just over 12.5 times as likely to participate in Group SE (Exp(B)=12.658, p=.017) and 10.5 times as likely to participate in Private SE

(Exp(B)=10.667, p=.022), than their counterparts who predominantly speak other languages at home.

It is worth noting that in order to conform as closely as possible to the model employed by Baker et al. (2001), these models employ a measure of achievement contemporary to the SE participation under examination. While it is understood that this was the best model available to Baker et al. (2001) given the data they had access to, the data collected for this study offer a number of arguably more theoretically sound variations on the model in question which could have be employed. Secondary education (i.e., contemporary) achievement could, for example, be replaced with earlier academic achievement (i.e., in primary education) and SE participation which began at any point up to lower secondary education (inclusive) could be replaced by SE Participation which began *in* lower secondary, temporally following the measure of achievement employed to predict it.

Table 33. Binary Logistic Regressions for Any SE Participation Starting in Lower Secondary Education on Primary School Achievement

	Any SE Participation			
Predictor	**B(S.E.)**	**Wald(df)**	**Sig.**	**Exp(B)**
Constant	-3.995(1.381)	10.196(1)	.007	.018
Primary School GPA	.142(.114)	1.559 (1)	.221	1.152
Family SES	.138(.071)	3.781(1)	.061	1.148
Gender	.167(.124)	1.805(1)	.189	1.182
Area of Residence		2.640(3)		1.000
Geographically Isolated	-.541(.209)		.014	.593
Village/Agrarian	-.405(.187)		.038	.653
Suburb	-.386(.270)		.163	.693
Language	1.611(.734)	4.812(1)	.036	5.008

Pseudo R Squares		
Cox&Snell	**Nagelkerke**	**McFadden**
.023	.034	.021

The updated model, whose estimation is presented in Table 33, persists in showing no significant association between previous achievement and SE participation in lower secondary education (i.e., a mixed modal strategy for SE participation). The influence of dominant home language is somewhat decreased. Examined in this fashion, it appears that students in both Geographically Isolated and Village/Agrarian locales are significantly less likely to begin participating in SE in Lower Secondary Education than their metropolitan counterparts. Interestingly, there appears to be no significant effect of Family Socioeconomic Status and the propensity to begin SE in Lower Secondary Education.

Separately examining Group and Private SE Participation strategies according to the updated model produces distinct results by SE type. The estimation of these two models, presented in Table 34, indicates a mixed modal strategy for participation in each type of SE. Group SE participation depends solely on students' dominant Language spoken at home and Area of Residence. Contrary to overall SE participation, Private SE participation depends on students' Family SES while also showing a significant Suburban/Metropolitan divide. Specifically, students who speak predominantly Greek at home are somewhat more than 7 times more likely to begin participating in Group SE in lower secondary education than students who speak other languages predominantly at home (Exp(B)=7.155, p=.049). In contrast to this, students from higher socioeconomic status families are more likely to begin participating in Private SE in lower secondary education (Exp(B)=1.231, p=.019).

These models seem to indicate a rather significant deviation from Baker et al.'s (2001) interpretations regarding the driving motivation behind students' participation in SE in Greece. This deviation is apparent both when examining a model as closely equivalent as

possible to the one dictated by the limitations of their data and the modified versions discussed above. However, students' self-reported motivation for SE participation of better performance on Panhellenic examinations may help explain this seemingly incongruous finding. The courses examined in Panhellenic examinations only appear in the school curriculum during upper secondary education (i.e., high school). Participation in relevant SE courses also begins at roughly the same time they appear in the curriculum. Thus, an examination of the modal strategy for SE participation beginning in high school may present a clearer picture of the state of affairs in Greece. To this end, the models presented in Table 33 and Table 34 are modified, replacing Primary school GPAs with the compound measure of Previous Achievement, to examine SE participation in upper secondary education.

Table 34. Binary Logistic Regressions for Group and Private SE Participation Starting in Lower Secondary Education on Primary School Achievement

	Group SE Participation				Private SE Participation			
Predictor	**B(S.E.)**	**Wald(df)**	**Sig.**	**Exp(B)**	**B(S.E.)**	**Wald(df)**	**Sig.**	**Exp(B)**
Constant	-4.836(1.665)	9.685(1)	.004	.008	-5.828(2.064)	8.728(1)	.008	.003
Primary School GPA	-.147(.122)	1.460(1)	.236	1.159	.259(.162)	2.567(1)	.119	1.296
Family SES	.080(.068)	1.178(1)	.247	1.083	.208(.085)	6.059(1)	.019	1.231
Gender	.207(.128)	2.624(1)	.115	1.230	.180(.148)	1.491(1)	.231	1.198
Area of Residence		3.437(3)		1.000		1.971(3)		
Geographically Isolated	-.622(.199)		.004	.537	-.138(.181)		.452	.871
Village/Agrarian	-.483(.227)		.041	.617	-.355(.185)		.091	.725
Suburb	-.155(.220)		.489	.857	-.548(.239)		.029	.578
Language	1.986(.999)	4.198(1)	.049	7.155	1.861(.965)	3.717(1)	.063	6.431

Pseudo R Squares					
Cox&Snell	**Nagelkerke**	**McFadden**	**Cox&Snell**	**Nagelkerke**	**McFadden**
.018	.030	.020	.024	.040	.026

Examined in this context (see Table 35), there is a clear indication of the enhancement character of the modal strategy for SE participation in Greece. Previous Achievement is one of only two significant predictors of beginning participation in SE in Upper Secondary

Education (along with suburban/urban locale differences). Students are nearly 1.5 times as likely to participate in some form of SE in upper secondary education for each one point higher Previous Achievement (i.e., average adjusted Primary and Secondary School GPAs). This is surpassed only by the suburban/urban divide, with students living in the suburbs being better than 1.6 times as likely to begin SE in Upper Secondary Education than their metropolitan counterparts.

Table 35. Binary Logistic Regressions for Any SE Participation Starting in Upper Secondary Education on Previous Achievement

	Any SE Participation			
Predictor	**B(S.E.)**	**Wald(df)**	**Sig.**	**Exp(B)**
Constant	-6.926(1.369)	24.341(1)	.021	.093
Previous Achievement	.355(.067)	27.933(1)	.000	1.426
Family SES	.030(.079)	.147(1)	.703	1.031
Gender	-.040(.103)	.153(1)	.698	.960
Area of Residence		3.096(3)		1.000
Geographically Isolated	.171(.280)		.544	1.187
Village/Agrarian	.353(.174)		.051	1.423
Suburb	.509(.184)		.009	1.664
Language	.104(.418)	.062(1)	.804	1.110

Pseudo R Squares		
Cox&Snell	**Nagelkerke**	**McFadden**
.046	.061	.034

Table 36. Binary Logistic Regressions for Group and Private SE Participation Starting in Upper Secondary Education on Previous Achievement

	Group SE Participation				Private SE Participation			
Predictor	**B(S.E.)**	**Wald(df)**	**Sig.**	**Exp(B)**	**B(S.E.)**	**Wald(df)**	**Sig.**	**Exp(B)**
Constant	-8.111(1.277)	41.413(1)	.000	.000	-6.090(1.465)	15.517(1)	.000	.002
Previous Achievement	.402(.062)	41.986(1)	.000	1.495	.220(.068)	10.492(1)	.003	1.246
Family SES	-.080(.074)	1.170(1)	.288	.923	.239(.085)	7.925(1)	.008	1.269
Gender	-.011(.119)	.008(1)	.928	.989	.147(.150)	.964(1)	.334	1.158
Area of Residence		3.466(3)		1.000		3.223(3)		
Geographically Isolated	-.146(.468)		.758	.865	.277(.236)		.249	1.320
Village/Agrarian	.220(.191)		.256	1.246	.337(.163)		.047	1.401
Suburb	.618(.213)		.007	1.855	.391(.153)		.016	1.478
Language	.003(.412)	.000(1)	.994	1.003	.699(.454)	2.374(1)	.133	2.012

Pseudo R Squares					
Cox&Snell	**Nagelkerke**	**McFadden**	**Cox&Snell**	**Nagelkerke**	**McFadden**
.047	.064	.036	.034	.049	.030

The separate examination of the modal strategies behind Group and Private SE participation (see Table 36) are rather in line with the results of Overall SE participation, with a few noticeable differences. While both Group and Private SE present enhancement strategies, they do so to differing extents. For Group SE participation, higher Previous Achievement (Exp(B)=1.495, p=.000) and living in Suburban vs Metropolitan areas (Exp(B)=1.855, p=.007) are the sole substantively and statistically significant predictors of participation. Private SE participation, however, is more strongly dependent on students' Family Socioeconomic Status (Exp(B)=1.269, p=.008) than their Previous Achievement (Exp(B)=1.246, p=.003). They are, moreover, more likely to begin if they live in Suburban, rather than Metropolitan, locales (Exp(B)=1.478, p=.016).

The fourth and final set of models (see Table 37 and Table 38), examining the modal strategies behind students participation in SE in upper secondary education, regardless of when they began, differ notably from the previous model or even the two preceding it. These differences are both significant and substantive. While students may have varying reasons for beginning SE at any given point in their academic career, there is no guarantee that these motives are consistent across time. Nor is it the core purpose of this study to examine why students *begin* SE. Rather, the fundamental question is, arguably, what motivates them to participate in SE at any given time. Thus, the final models employ the overall measures of SE participation, including students who began SE participation at any point in their academic career, and assess their motives for participating (rather than beginning participation) near the end of upper secondary education.

The results presented in Table 37 indicate that, once students reach upper secondary education, their motivation for participating in SE is enhancement, rather than remediation or some combination of the two. As with beginning SE participation in high school, Previous Achievement (Exp(B)=1.794, p=0.000) and Family Socioeconomic Status (Exp(B)=1.713, p=0.000) are the strongest predictors of SE participation.

Table 37. Binary Logistic Regression for Any SE Participation during Upper Secondary Education on Previous Achievement

	Any SE Participation			
Predictor	**B(S.E.)**	**Wald(df)**	**Sig.**	**Exp(B)**
Constant	-9.358(1.342)	50.781(1)	.000	.000
Previous Achievement	.584(.069)	71.545(1)	.000	1.794
Family SES	.538(.120)	20.159(1)	.000	1.713
Gender	.430(.150)	8.182(1)	.007	1.537
Area of Residence		2.541(3)		1.000
Geographically Isolated	-.490(.707)		.493	.612
Village/Agrarian	-.212(.225)		.354	.809
Suburb	.315(.226)		.173	1.371
Language	.481(.383)	1.573(1)	.219	1.617

Pseudo R Squares		
Cox&Snell	**Nagelkerke**	**McFadden**
.130	.232	.169

Examining SE participation in this way, however, immediately casts light on another notable difference –the role of gender in the decision to participate. Female students are just over one and a half times more likely to participate in SE in upper secondary education (Exp(B)=1.537, p=.007) than their male counterparts.

Taken separately, however, Group and Private SE participation in high school is even more interesting (see Table 38). Both modal strategies are persistently enhancement oriented. Previous Achievement is the only significant predictor of students' propensity to attend Group SE (Exp(B)=1.468, p=.040). The factors influencings students' propensity to participate

in Private SE are more numerous and arguably more interesting. Female students are 1.320 (p=.017) times as likely as male students to participate in Private SE. Higher achieving students (Exp(B)=1.231 p=.000) and higher socioeconomic status students (Exp(B)=1.501 p=.000) are also more likely to participate in Private SE. Finally, students whose dominant home language is not Greek are over three times as likely (Exp(B)=3.330, p=.004) to participate in Private SE as those whose dominant language is Greek.

Table 38. Binary Logistic Regressions for Group and Private SE Participation during Upper Secondary Education on Previous Achievement

	Group SE Participation				Private SE Participation			
Predictor	**B(S.E.)**	**Wald(df)**	**Sig.**	**Exp(B)**	**B(S.E.)**	**Wald(df)**	**Sig.**	**Exp(B)**
Constant	-6.684(.964)	52.201(1)	.000	.001	-5.032(1.182)	17.865(1)	.000	.007
Previous Achievement	.384(.051)	57.018(1)	.000	1.468	.208(.050)	17.258(1)	.000	1.231
Family SES	-.010(.085)	.013(1)	.910	.990	.406(.057)	51.242(1)	.000	1.501
Gender	.096(.116)	.692(1)	.412	1.101	.278(.110)	6.395(1)	.017	1.320
Area of Residence		2.541(3)		1.000		.036(3)		
Geographically Isolated	-.146(.468)		.256	.494	-.108(.333)		.747	.898
Village/Agrarian	.220(.191)		.142	.775	-.031(.171)		.857	.969
Suburb	.618(.213)		.122	1.384	-.013(.174)		.942	.978
Language	.385(.360)	1.146(1)	.292	1.470	1.203(.387)	9.673(1)	.004	3.330

Pseudo R Squares					
Cox&Snell	**Nagelkerke**	**McFadden**	**Cox&Snell**	**Nagelkerke**	**McFadden**
.056	.079	.046	.078	.104	.059

6.9 Enhancement or Remediation: A Conclusion

The analyses presented above paint an interesting picture of the motivation behind students' participation in SE in Greece. The modal strategies employed for SE participation are not necessarily consistent throughout the educational process and indeed vary when examining participation in SE as a whole and separately by type (i.e., Group or Private lessons), respectively.

In lower secondary education, by which point approximately two thirds of respondents reported participation in some form of SE, the decision to participate seems to adhere to a mixed modal strategy (i.e., to not be predominantly employed for either enhancement or remediation purposes), with family socioeconomic background being the significant deciding factor. The mixed modal strategy persists for both Group and Private SE in lower secondary education. The influence of family socioeconomic status appears, however, to only be a deciding factor for Private SE. Group SE participation is also dependent on students' area of residence, with metropolitan residents more likely to attend than their Geographically Isolated or Village/Agrarian counterparts. This is likely indicative of the comparative scarcity of Group SE institutions in the latter regions. More interesting, perhaps, is the significant role played by students' dominant home language. Those whose dominant home language is Greek are many times more likely to participate in SE overall and by type (i.e., Group or Private).

This finding contradicts those in previous studies (e.g., Baker et al., 2001; Southgate, 2009). There are a number of possible explanations for this. Baker et al. (2001) based their results on a single instance of mathematics achievement and acknowledged that students' motivations could change as they approached critical transition point examinations near the end of secondary education. Indeed, the study's participants reported participating in SE being predominantly to enhance their performance on Panhellenic examinations. However, the courses examined in Panhellenic examinations only appear in upper secondary education and are dependent upon knowledge provided in earlier grades. Thus, SE participation before this point in time may well be less geared toward enhancing specific performance

characteristics and more toward adherence to the societal norm, with the specific decision to participate decided by other factors.

In upper secondary education, the case is much clearer: SE is employed in Greece as an enhancement strategy. Selection of a specific SE type is more complex. Group SE participation is motivated by Previous Achievement and, to a limited extent, area of residence. Private SE is also dependent on student family socioeconomic status. These SE-type-specific finding does not contradict the overall modal strategy indications. To the contrary, they provide a more in depth understanding of students' (or their families') motivations behind SE participation.

When ignoring the point of initiation and examining students' modal strategies regarding SE participation in SE, this statement becomes even more salient. Although still following an enhancement strategy, disregarding when they started, students' motivation to participate in SE appears to be dependent on their previous achievement, family socioeconomic background, and gender. Even this statement, however, is something of a generalization, since these factors vary by SE type. On the one hand, previous achievement appears to be the only motivator in regards to Group SE participation. On the other hand, Private SE participation seems to be motivated by previous achievement, family socioeconomic status, gender and dominant home language.

The question, moreover, of whether or not a student participates in SE for the purposes of remediation or enhancement may not be meaningfully answerable solely on the basis of quantitative analysis. It is worth noting that many of the definitions of remediation and

enhancement presented at the beginning of this chapter depend on interpretations of the observer which may or may not coincide with those of teachers, students, or their parents. Remediation, for example, is defined herein as the case of lower achievements resulting in more or higher quality SE. The definition of lower achievement, herein is a relative measure, compared to a mean value across the sample. A given student, comparing themselves to their classmates, cohort, or even nationwide counterparts, however, may have a substantially different definition of what constitutes "lower" achievement –and vice-versa. It may, in fact, have been better to supplement the quantitative data collected for this study with qualitative information. Concerns related to the necessary investment of time and money, however, limited the study to (relatively and comparatively speaking) "easily" obtainable quantitative data.

There is, in short, more to the question of enhancement or remediation than is commonly discussed. Closer examination of the phenomenon may provide more varied information and detail. Moreover, the variation in modal strategy between students who elected to begin SE in lower and upper secondary educations suggests that there may be merit to examining the phenomenon over time.

As shadow education becomes more prevalent in educational systems around the world, a better understanding of students' motivations regarding participation in the phenomenon across the course of their educational careers becomes progressively more important. Extensive SE use can result in curricular crises in public education (Stevenson & Baker, 1992) and has at times even influenced the ability of governments to enact effective educational policy change (LeTendre, 1994). A measure of control over students' education is necessarily

lost, when they undertake a substantial portion of their learning outside of formal educational institutions. A better understanding of their motivations may be a necessary first step towards informing social and educational policy makers hoping to adapt educational systems to students' needs and concurrently regain control of the educational process.

7. Shadow Education and Later Educational Achievement

Thus far, this study has examined the distribution of SE and its characteristics in the sample, as well as the modal strategies students employ in SE participation. The question, however, of what, if any, benefits students gain from this participation has only been examined superficially. In this section, we examine the relationships between SE and later educational achievements. We begin by presenting the bivariate correlations between the various aspects of SE and different educational achievements. We also examine mean achievement differences by SE participation. However, to better estimate effects of SE participation on students' educational achievement, said achievement is regressed on SE participation, controlling for a number of factors known to affect educational achievement. These include Family Socioeconomic Status, Parental Wealth, Family Income, Area of Residence, Gender, Ethnicity, School Academic Composition, Significant Others' Influence, and Students' Educational Expectations. The model is estimated for both Overall and separate Group and Private SE participation.

7.1 Shadow Education Participation and Measures of Academic Achievement

Table 39 shows the correlations between various measures of 11th Grade achievement and SE participation. As it can be seen, there is a positive relationship between all but one measure of 11th Grade achievements with in SE participation in general but also for Group SE, Private SE, and concurrent Group and Private SE.

Table 39. Bivariate Correlations between Type of SE and Measures of Achievement

		Group SE	Private SE	Any	Concurrent
11th Grade GPA	*r*	.198**	.187**	.332**	.158**
	p	.000	.000	.000	.000
	N	1326	1326	1326	1326
Algebra (11th Grade CC)	*r*	.234**	.147**	.290**	.175**
	p	.000	.000	.000	.000
	N	1339	1339	1339	1339
Geometry (11th Grade CC)	*r*	.193**	.132**	.242**	.154**
	p	.000	.000	.000	.000
	N	1326	1326	1326	1326
Mathematics (11th Grade NSET)	*r*	.131**	.189**	.239**	.166**
	p	.000	.000	.000	.000
	N	783	783	783	783
Physics (11th Grade CC)	*r*	.165**	.145**	.224**	.155**
	p	.000	.000	.000	.000
	N	1330	1330	1330	1330
Physics (11th Grade NSET)	*r*	.119**	.168**	.218**	.147**
	p	.001	.000	.000	.000
	N	772	772	772	772
Modern Greek Language	*r*	.153**	.183**	.302**	.132**
	p	.000	.000	.000	.000
	N	1331	1331	1331	1331
Ancient Greek Language & Lit. (11th Grade CC)	*r*	.122**	.171**	.270**	.110**
	p	.000	.000	.000	.000
	N	1306	1306	1306	1306
Ancient Greek Language & Lit. (11th Grade HSET)	*r*	.144**	.109**	.281**	.057
	p	.001	.010	.000	.175
	N	558	558	558	558
Basic Principals of Social Sciences (11th Grade HSET)	*r*	.136**	.101*	.234**	.073
	p	.001	.017	.000	.083
	N	562	562	562	562

*. Correlation is significant at the 0.05 level (2-tailed). **. Correlation is significant at the 0.01 level (2-tailed).

Significant positive relationships also exist between almost all of the measures of 11th Grade Achievement discussed previously and the number of overall SE courses a student participates in (see Table 26). Although seemingly incongruous, it is not unreasonable to suspect that simply participating in more intensive studies could introduce better academic practices, altering work ethic, study skills and so forth, to positively affect students' performance across the board.

Table 40. Bivariate Correlations between Number of SE Courses taken and Measures of Achievement

		Number of SE Courses			
		Group	**Private**	**Overall**	**Concurrent**
11th Grade GPA	*r*	.055	.069	.145**	.010
	p	.088	.061	.000	.828
	N	948	736	1174	510
Algebra (11th Grade CC)	*r*	-.002	-.003	.105**	-.068
	p	.945	.932	.000	.122
	N	955	741	1181	515
Geometry (11th Grade CC)	*r*	.013	-.011	.098**	-.067
	p	.692	.769	.001	.128
	N	947	735	1171	511
Mathematics (11th Grade NSET)	*r*	-.031	.068	.112**	-.065
	p	.448	.145	.003	.230
	N	598	457	716	339
Physics (11th Grade CC)	*r*	.041	.034	.144**	.015
	p	.202	.355	.000	.741
	N	950	738	1177	511
Physics (11th Grade NSET)	*r*	.051	.063	.155**	.019
	p	.213	.182	.000	.735
	N	592	451	708	335
Modern Greek Language	*r*	.071*	.090*	.141**	.023
	p	.030	.015	.000	.601
	N	949	740	1178	511
Ancient Greek Language & Lit. (11th Grade CC)	*r*	.081*	.089*	.129**	.064
	p	.013	.017	.000	.153
	N	930	722	1152	500
Ancient Greek Language & Lit. (11th Grade HSET)	*r*	.104*	.029	.057	-.023
	p	.048	.614	.213	.757
	N	363	309	483	189
Basic Principals of Social Sciences (11th Grade HSET)	*r*	.033	-.001	.029	-.107
	p	.528	.990	.531	.143
	N	362	310	484	188

*. significant at the .05 level (2-tailed). **. significant at the .01 level (2-tailed).

Group and Overall SE Intensity, measured in hours per week, positively correlate with all but the NSET Mathematics, while Private SE Intensity positively correlates with all but the HSET courses (see Table 41).

Table 41. Correlations between SE Intensity (in hours/week) and Measures of Achievement

		SE Intensity		
		Group	**Private**	**Overall**
11th Grade GPA	*r*	.121**	.100**	.114**
	p	.000	.000	.000
	N	1326	1326	1326
Algebra (11th Grade CC)	*r*	.137**	.076**	.124**
	p	.000	.005	.000
	N	1339	1339	1339
Geometry (11th Grade CC)	*r*	.129**	.070*	.122**
	p	.000	.011	.000
	N	1326	1326	1326
Mathematics (11th Grade NSET)	*r*	.057	.101**	0.049
	p	.113	.004	.172
	N	783	783	783
Physics (11th Grade CC)	*r*	.118**	.084**	.109**
	p	.000	.002	.000
	N	1330	1330	1330
Physics (11th Grade NSET)	*r*	.087*	.080*	.082*
	p	.015	.027	.023
	N	772	772	772
Modern Greek Language	*r*	.123**	.132**	.119**
	p	.000	.000	.000
	N	1331	1331	1331
Ancient Greek Language & Lit. (11th Grade CC)	*r*	.067*	.100**	.058*
	p	.015	.000	.038
	N	1306	1306	1306
Ancient Greek Language & Lit. (11th Grade HSET)	*r*	.135**	.048	.135**
	p	.001	.258	.001
	N	558	558	558
Basic Principals of Social Sciences (11th Grade HSET)	*r*	.109*	.016	.104*
	p	.010	.706	.014
	N	562	562	562

*. Significant at the .05 level (2-tailed). **. Significant at the .01 level (2-tailed).

Unsurprisingly, higher quality SE is, with very few exceptions, significantly related to higher achievement (see Table 42). This holds true for Private, Group, and Overall SE as well as Average, Minimum and Maximum reported SE Quality in each.

Table 42. Correlations between SE Quality and Measures of Achievement

		Group SE Quality			Private SE Quality			Overall SE Quality		
		Average	**Min.**	**Max.**	**Average**	**Min.**	**Max.**	**Average**	**Min.**	**Max.**
11th Grade GPA	*r*	.242**	.163**	.273**	.231**	.168**	.229**	.258**	.160**	.263**
	p	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	938	938	938	725	725	725	1162	1162	1162
Algebra (11th Grade CC)	*r*	.161**	.081*	.205**	.185**	.117**	.213**	.172**	.074*	.217**
	p	.000	.013	.000	.000	.002	.000	.000	.011	.000
	N	945	945	945	730	730	730	1169	1169	1169
Geometry (11th Grade CC)	*r*	.160**	.097**	.183**	.146**	.098**	.149**	.161**	.084**	.173**
	p	.000	.003	.000	.000	.008	.000	.000	.004	.000
	N	937	937	937	724	724	724	1159	1159	1159
Mathematics (11th Grade NSET)	*r*	.170**	.121**	.174**	.114*	.087	.099*	.182**	.107**	.168**
	p	.000	.003	.000	.016	.066	.036	.000	.004	.000
	N	594	594	594	450	450	450	710	710	710
Physics (11th Grade CC)	*r*	.140**	.059	.185**	.217**	.157**	.226**	.171**	.077**	.203**
	p	.000	.070	.000	.000	.000	.000	.000	.009	.000
	N	940	940	940	727	727	727	1165	1165	1165
Physics (11th Grade NSET)	*r*	.169**	.113**	.196**	.210**	.175**	.175**	.215**	.137**	.216**
	p	.000	.006	.000	.000	.000	.000	.000	.000	.000
	N	588	588	588	444	444	444	702	702	702
Modern Greek Language	*r*	.229**	.161**	.252**	.206**	.159**	.196**	.260**	.174**	.257**
	p	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	939	939	939	729	729	729	1166	1166	1166
Ancient Greek Language & Lit. (11th Grade CC)	*r*	.205**	.151**	.227**	.196**	.147**	.181**	.221**	.160**	.206**
	p	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	921	921	921	712	712	712	1142	1142	1142
Ancient Greek Language & Lit. (11th Grade HSET)	*r*	.196**	.127*	.240**	.198**	.158**	.197**	.217**	.164**	.210**
	p	.000	.016	.000	.001	.006	.001	.000	.000	.000
	N	360	360	360	304	304	304	477	477	477
Basic Principals of Social Sciences (11th Grade HSET)	*r*	.174**	.140**	.190**	.090	.057	.091	.152**	.093*	.167**
	p	.001	.008	.000	.117	.317	.113	.001	.041	.000
	N	359	359	359	305	305	305	478	478	478

*. significant at the 0.05 level (2-tailed). **. significant at the 0.01 level (2-tailed).

Significant associations between SE costs and achievement measures are sporadic and largely inconsistent (see Table 43). There are weak positive correlations between the costs of Group SE and performance in Algebra, Geometry, Physics (Common Core and NSET), and Modern Greek Language. There is no correlation between the costs of Private SE and any of the

achievement measures, while Overall SE costs are significantly (if weakly) correlated with Geometry, Common Core Physics, and Modern Greek Language.

Table 43. Correlations between Monthly SE Cost and Measures of Achievement

		SE Cost		
		Group	**Private**	**Overall**
11th Grade GPA	*r*	.071	.026	.057
	p	.064	.520	.130
	N	693	634	699
Algebra (11th Grade CC)	*r*	.079*	.005	.063
	p	.037	.899	.095
	N	697	638	703
Geometry (11th Grade CC)	*r*	.086*	.001	.075*
	p	.024	.976	.048
	N	692	635	698
Mathematics (11th Grade NSET)	*r*	-.004	.001	-.014
	p	.939	.980	.764
	N	432	392	434
Physics (11th Grade CC)	*r*	.107**	.033	.095*
	p	.005	.403	.012
	N	694	636	700
Physics (11th Grade NSET)	*r*	.099*	.001	.090
	p	.040	.986	.063
	N	429	388	430
Modern Greek Language	*r*	.090*	.078	.083*
	p	.018	.050	.029
	N	693	635	699
Ancient Greek Language & Lit. (11th Grade CC)	*r*	.021	.042	.004
	p	.585	.299	.924
	N	681	624	687
Ancient Greek Language & Lit. (11th Grade HSET)	*r*	.045	-.002	.038
	p	.463	.974	.534
	N	266	262	268
Basic Principals of Social Sciences (11th Grade HSET)	*r*	.034	-.090	.021
	p	.580	.149	.738
	N	262	261	265

*. Correlation is significant at the 0.05 level (2-tailed).

7.2 Measures of Achievement by Shadow Education Participation

A slightly more concrete but very similar picture is painted when we examine students' mean achievements by the various aspects of SE. Students who participated in SE (regardless of type) received significantly higher grades than those who did not. This relationship is consistent across all measures of achievement discussed above, including 11th grade GPA, all the measures of Numeracy, Literacy, Science, and the educational track specific courses (see Table 44).

Table 44. Independent Samples t-Tests for Achievement Differences by SE Participation

	t	df	Sig. (2-t)	Mean Diff	S.E. Diff
11th Grade GPA	11.264	224	.000	1.64939	.14643
Algebra (11th Grade Common Core)	11.070	1337	.000	2.74816	.24826
Geometry (11th Grade Common Core)	9.067	1324	.000	2.37774	.26225
Mathematics (11th Grade NSET)	5.593	73	.000	2.31266	.41351
Physics (11th Grade Common Core)	8.667	197	.000	2.16509	.24980
Physics (11th Grade NSET)	6.212	770	.000	2.22034	.35740
Modern Greek Language (11th Grade Common Core)	9.520	176	.000	1.99447	.20950
Ancient Greek Language & Lit. (11th Grade HSET)	6.902	556	.000	2.07863	.30117
Ancient Greek Language & Lit. (11th Grade Common Core)	8.650	180	.000	2.25270	.26043
Basic Principals of Social Sciences (11th Grade HSET)	5.161	96	.000	1.70997	.33133

7.3 Effective Investment in Shadow Education: An Initial Examination

Given the above results, in conjunction with findings from previous sections, we can investigate whether and to what extent students exploit the relationships between SE and educational achievement and are, thus, effectively investing in SE.

7.3.1 Number of Shadow Education Courses

Students participate in 4 SE courses (regardless of private or group format) more than twice as often (45.7%) as the next most common number of courses (5, at 21%) and 6 times more than the number following that (6 courses, at 8.8%). Based on the positive association between the number of SE courses a student participates in and their achievement, all other things being equal, one would expect students to participate in as many SE courses as possible, to achieve the highest GPA possible. However, students may not regard SE as a means to attain a generally greater scholastic achievement making it potentially ineffective to invest in more SE courses, in this respect.

When asked directly, more than three quarters (77% or 1046) of students reported the primary reason for participating in SE as “Preparation for Panhellenic Examinations”. If students primarily employ SE as an enhancement strategy for upcoming National University Entrance Examinations, they would reasonably be contained to the 4 core modules examined in their Educational Track, with a possible expansion to one or two alternatives, enabling them to apply to a broader gamut of university departments. Of course, it is also likely that the cost of participating in more courses, as both a financial and time commitment, may be a significant hampering factor.

7.3.2 Shadow Education Duration

59.4% of students started SE in high school, whereas 28.9% in middle school (or 88.3% in secondary education). The analysis showed that there is no significant correlation between

the duration of SE and educational achievement (i.e., no clear benefit from more years of increased cost and time-drain). Parents and students apparently know this and may opt to invest less on duration and more on other aspects of SE participation.

7.3.3 Shadow Education Quality

Average, Minimum, and Maximum SE Quality (Group, Private or a combination of the two) are all positively associated with all measures of achievement. The majority of students reported quality levels of >=3 (the midpoint of the scale) in all cases (Average Quality: 95.6%>=3; Minimum Quality: 86.9% >=3; Maximum Quality: 98.9%>=3). Maximum Quality has the strongest correlations with each measure of achievement discussed above, except NSET Maths, which, although significantly correlated with Maximum Quality, is more strongly correlated with Average Quality. However, average reported Maximum SE Quality is 4.02 on a scale of 1 to 5, with fully half of respondents reporting a score of 4 or better, which may indicate that students are investing in targeted Maximum Quality SE, where available, to receive optimal benefits from their investments.

Absolute numbers alone indicate that students and their families are investing in multiple different aspects of SE. Taken in conjunction with the relationships presented above, it would appear that this investment is generally based on a selection of the most efficient options.

7.4 Family Income and Shadow Education Participation

Students who participate in SE come from significantly more affluent families (see Table 45). Keeping in mind that each income category corresponds to €500, the table shows that students who reported participating in any form of SE had an average of €461 (0.922X500) higher Family income, than those who participated in none. Students participating exclusively in Group SE came from families where parents earned approximately €331.5 more than those who did not participate at all. The inclusion of Private SE, exclusive or in conjunction with Group, corresponded to the greatest differences. Students who participated exclusively in Private SE came from families with, on average, €506.5 higher monthly incomes and students who participated in concurrent Group and Private SE from families which earned, on average, €543 more per month. It is interesting to contrast this with the actual differences in cost of SE participation, which ranged from €49 to €89 per month, compared to not participating but were only significantly different *within* SE participants, as a €36 increase in average cost from Group to concurrent Group and Private SE (F=3.772, p=0.01; Mean Diff.=36.08, p=0.019).

Table 45. Independent Samples t-Tests for Family income by SE Participation Type

		t	df	Sig. (2-t)	Mean Diff	SE Diff
Family Income by:	*Any SE (Group or Private)*	5.288	1135	.000	.922	.17432
	Exclusively Group SE	3.579	466	.000	.663	.17637
	Exclusively Private SE	5.098	333	.000	1.013	.19867
	Concurrent Group & Private SE	5.782	185	.000	1.086	.17135

Participation in Private and concurrent Group and Private SE most commonly have the strongest associations with measures of achievement discussed above (the exceptions being GPA11 and Greek Language, which were most strongly associated with participation in ANY

kind of SE). There is, thus, a significant difference not only in the affluence of students who pursue SE in general but also those forms of SE which provide them with the greatest advantage, in regards to achievement. Given the actual differences in the costs of SE, this difference may be perceptual, rather than actual. Regardless of the actual or perceived differences in ability to undertake the more effective forms of SE, students from families with more money are participating in more SE, both generally and effectively.

7.5 The Effect of Shadow Education on Later Educational Achievement

To assess the net effect of Shadow Education on later educational achievement we estimate the effect of SE on Educational Achievement controlling for all variables that are known or suspected to be related with both Shadow Education and Educational Achievement. In other words, we regressed Educational Achievement on SE and all control variables.

The independent variables used and the estimates of the net effects are presented in Table 46. The effects are presented in the column under the heading B. Table 46 contains the results of two regression models, one that includes overall SE Participation as a single independent variable and one including Group and Private SE participation as separate independent variables. Since students were sampled within schools, the models were estimated using SPSS' complex samples General Linear Model function, to correct for the clustering at the school level.

Table 46. Shadow Education and Educational Achievement

	Educational Achievement			Educational Achievement		
	B	**SE[1]**	**p**	**B**	**SE[1]**	**p**
Constant	6.731	2.217	.005	6.612	2.356	.008
Family SES	.134	.055	.020	.145	.054	.011
Sex	.427	.096	.000	.431	.096	.000
Ethnicity	-.117	.069	.101	-.106	.071	.145
Urbanicity	-.056	.116	.630	-.066	.118	.580
Family Income	.016	.019	.407	.017	.018	.360
Family Class[2]	-.061	.079	.449	-.065	.079	.414
School Academic Composition	.502	.116	.000	.513	.125	.000
SOI	.730	.055	.000	.743	.055	.000
Educational Expectations	.208	.057	.001	.215	.060	.001
SE Participation	.366	.150	.020			
Group SE Participation				.270	.101	.012
Private SE Participation				.024	.077	.757
		R^2			**R^2**	
		.487			.488	

[1].*SE are robust to sample clustering*. [2].*Coded 1 for at least one Bourgeoisie Parent, 0 otherwise*.

It should be noted that, only in this case, both models include two family background variables, Family (Marxist) Class and Family Income, which are not used for the estimation of the models that will follow for different reasons that will be explain better in the appropriate sections. Suffice it to say here that neither Class nor Income have any significant effects on educational achievement beyond that of Family SES. They are included here because of the cost component involved in SE participation (Family Class is used mainly as a proxy of wealth).

Correcting for clustering within schools, it appears that SE Participation affects Educational Achievement, controlling for all family background variables as well as for Sex, Ethnicity, Urbanicity, School Composition, SOI, and Educational Expectations. When Group and Private SE Participation are entered separately, however, only Group SE Participation has a statistically significant effect. In both models, Family SES, Sex, School Composition, SOI and Educational Expectations have strong statistically significant effects on Educational

Achievement. Both models seem to fit the data well, explaining about 49% of the variance of Educational Achievement.

8. The Role of Shadow Education in the Process of Educational Achievement

An examination of the role of SE in the process of educational achievement necessarily presupposes a comprehensive model incorporating all important factors and processes determining educational achievement. Functionally speaking, this model must imply a structure of the covariance matrix of these factors, which is to say a set of directional pathways through which these determinations take place. Such directional association chains are often referred to as being "causal" in nature, although the term really refers to an assumption of the model they are a component of, rather than the property of their estimation. However, the strongest argument in favor of the employment of structural equation modeling to examine educational achievement is probably its ability to provide more granular information regarding the processes translating background differences into differential achievement.

The structural equations presented below, their ordering and the variables contained therein are based on decades of attainment and achievement related research. With the exception of SE, the variables selected for inclusion and their relative positioning within the overall model are supported by long term research efforts going as far back as the Wisconsin Model (Sewell et al., 1969), and adapted to the case of Greece by Katsillis (1987) and Moustairas (2004). Following recent research, SE was included in the initial model in its most basic form: whether or not students participate in SE.

There is a long history of attempts to replicate or challenge the Wisconsin Model and its derivatives from which this study's model of educational achievement emanates (see e.g., Alexander et al., 1975; Jenks et al., 1983, etc.). There are some concerns, however, that may challenge the model's contemporary validity. Questions, for example, of omitted variable bias, potential self-selection (e.g., students selecting themselves into SE participation or SE types), and other causes of endogeneity are serious concerns. Such concern generally manifest as significant correlations between a model's independent variables (in practice the latent error terms attached to the model's independent variables) and its disturbance term[43]. Classical analysis assumes that these correlations are nonexistent and estimates models accordingly (i.e., with the value of these correlations assumed to be zero). To examine the validity of this assumption, each of the models presented in this study was also estimated allowing each of its independent (i.e., endogenous) variables' latent error terms to correlate with the model's overall disturbance term. In no case were any of the correlations found to be significant[44]. Lacking indications of unexplained error correlation, which should result from the above concerns, the models presented below are assumed to be free from such concerns.

It is important to note that these model estimations are made under the assumption of homogeneity of effects. The validity of this claim remains to be evaluated using propensity

[43] The term disturbance here refers to the set of unspecified causes of the structural model's dependent variable and is roughly equivalent to an error or residual in a prediction equation.

[44] Model minimization and thus estimation was impossible for the corrected and final models, allowing for error correlation between Educational Achievement and Cultural Capital. While no estimate of significant correlation could be retrieved in these cases, failure to achieve minimization can be the result of either extremely poor model fit or insufficient sample size. Given the size of the sample examined here, the latter seems more likely.

scores (see Xie et al., 2012; Breen et al., 2015) obtained from the logit regressions employed to examine the modal strategies of SE participation, and is presented in a following chapter.

8.1 The Initial Model

The initial model is posited as a unidirectional chain with four exogenous and eight endogenous variables (seven of them intervening). Their functional relationships are presented in the form of a series of structural equations (see Table 47). Exogenous variables' residuals were allowed to correlate. The variables included in the model are explained in Table 48. The observant reader will note that the model presented below is more complex than that which is proposed by theory (see Figure 5). This is indeed the case. The model described in Table 47 and presented in Figure 22 represents the fully specified model. This is a more conservative model which trades the minimalism often encountered in experimental research for a decreased probability of specification error (and its resultant bias).

Table 47. Structural Equations for Educational Achievement Process (Initial Model)

a. $CULCAP = F(FSES, RES, SEX, ETHN)$
b. $PACH = F(FSES, RES, SEX, ETHN, CULCAP)$
c. $SCHCOMP = F(FSES, RES, SEX, ETHN, CULCAP, PACH)$
d. $SOI = F(FSES, RES, SEX, ETHN, CULCAP, PACH, SCHCOMP)$
e. $EDEX = F(FSES, RES, SEX, ETHN, CULCAP, PACH, SCHCOMP, SOI)$
f. $SE = F(FSES, RES, SEX, ETHN, CULCAP, PACH, SCHCOMP, SOI, EDEX)$
g. $EFFORT = F(FSES, RES, SEX, ETHN, CULCAP, PACH, SCHCOMP, SOI, EDEX, SE)$
h. $GPA11 = F(FSES, RES, SEX, ETHN, CULCAP, PACH, SCHCOMP, SOI, EDEX, SE, EFFORT)$

Since SE participation starts as early as primary education, it could have been placed at several points within the model. A series of considerations led to its inclusion both near the

end of the model and in the form in which it was included. Early SE participation -up to the end of lower secondary education- had little if any statistically or substantively significant association with students' Previous Achievement, Significant Others' Influence and Educational Expectations. This is not the case for SE participation starting during high school. Furthermore, SE is employed primarily as an enhancement strategy. It is, therefore, likely that said participation builds upon pre-existing expectations, rather than vice-versa. SE is also employed, almost universally, in order to better prepare students for national university entrance exams. The courses tested in these exams appear in high school and, as such, the effects of SE participation are likely to be both more salient and pronounced at that point in the educational process. Finally, as additional education, SE creates greater work-loads for students, requiring a greater investment of effort on their part. As a result of these considerations and the discussions of SE's relationship with the rest of the variables in the model discussed in this text, SE participation in high school is posited to depend upon all variables in the model except effort and 11th Grade GPA, which it influences.

Table 48. Variables employed in the study's Initial Model

Name	Variable Label	Measurement
FSES	Family Socioeconomic Status	Principal Component Score
RES	Urbanicity	0=Rural; 1=Urban
SEX	Gender	0=Male; 1=Female
ETHN	Ethnic Otherness	0=Greek Ethnicity; 1="Other" Ethnicity
CULCAP	Cultural Capital	Factor Score
PACH	Pervious Achievement	Average of Adjusted Primary and Secondary School GPAs
SOI	Significant Others' Influence	Principal Component Score
SCHCOMP	School Academic Composition	Average School L. Secondary Ed. GPA
EDEX	Students' Educational Expectations	1-5 as specified in the text
SE	SE Participation in High School	0=Does not start SE in High School
EFFORT	Student Effort	Hours Spent Studying per week
GPA11	Student Educational Achievement	11th Grade GPA (Grade Point Average)

It is worth acknowledging that the Initial Model, presented in Table 47, does not contain the Wealth proxy of Family (Marxist) Class or Family Income, discussed in the examination of the

effect of SE participation on students' educational achievement. However, their examination in reduced form equations showed that they had no significant total effect on Educational Achievement. This, in conjunction with the large number of missing cases of family income and significantly worse model fit resultant from their inclusion, led to their exclusion from the models under examination herein.

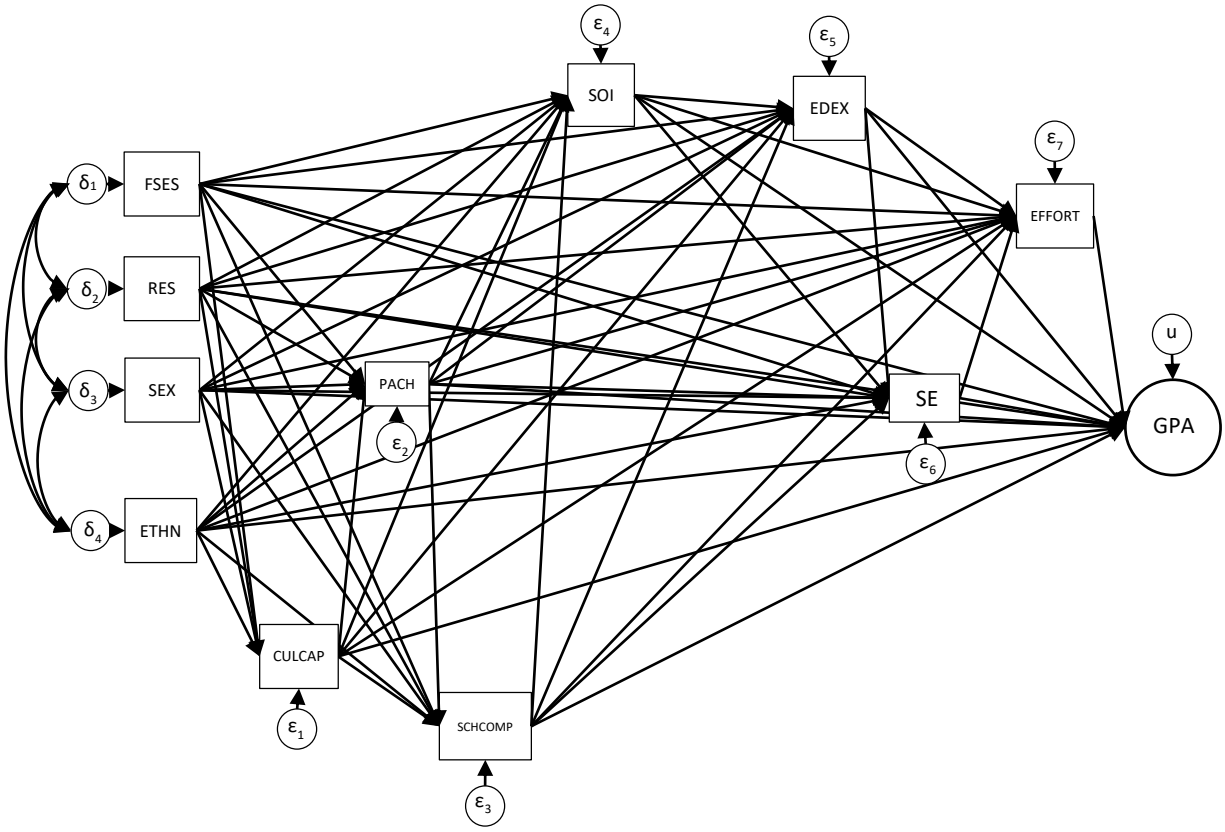


Figure 22. Initial Model

The Initial Model, as described in the equations presented above, is little more than a formal notation describing the Working Model presented in the beginning of this study. The model is presented with the inclusion of latent error terms, model disturbance and correlations, as estimated, in Figure 22.

8.1.1 Model Estimation

There are several ways to estimate structural equation models. Econometrists may argue that reduced form equations alone are sufficient. While very informative, this does not present a clear picture of the actual paths through which mediation takes place or, in other words, the processes through which background differences are translated into differential educational achievement. The present model was estimated using IBM Amos 22 as a whole. Dataset preparation, model estimation, fit, characteristics and total, direct, and indirect effects are presented below.

8.1.1.1 Dealing with Missing Data

As anyone who collected empirical data knows, not all respondents respond to all questions. However, the estimation of robust standard errors for the model requires a complete data set, necessitating one of two options: deletion of cases missing some information or some form of imputation. Listwise and pairwise deletion are "ad hoc and notorious for biased and/or inefficient estimates in most situations (Rubin, 1987; Schafer, 1997)" (Dong & Peng, 2013, p. 1). Ibrahim et al. (2005) found Full Information Maximum Likelihood (FIML) generally equivalently satisfactory to Bayesian Estimation, probability weighting and Multiple Imputation for Missing at Random (MAR) data (see also Arbuckle, 2013; Collins, Schafer, & Kam, 2011). Enders and Bandalos (2009) found that, for data MAR or Missing Completely at Random (MCAR),

FIML imputation was superior to listwise deletion, pairwise deletion and similar response pattern imputation, in regards to convergence failure, parameter estimate bias, parameter estimate efficiency and model goodness of fit, in the estimation of structural equation models.

Little's test of MCAR produced non-significant results for the majority of variables of interest. There is no way to distinguish between MAR and Missing Not at Random (MNAR) data other than measuring missing data. That is to say, *testing* whether data is MNAR is functionally impossible. However, in those cases where results of Little's test were significant, indicating data was not MCAR, there are reasonable relationships between observed data and the propensity for missing values such that there seem to be fairly straightforward justifications for the data being MAR (i.e., dependent on information we have already observed) rather than MNAR (i.e., dependent on unobserved information). For example, students were approximately half as likely (Exp(B)=0.541) to report their 11^{th} Grade GPA for each 1 point lower their Previous Achievement was and students from lower FSES families were less likely to report their Previous Achievement (Exp(B)=0.665). This is, we reiterate, by no means proof that the data is not MNAR but simply a plausible explanation for our belief in the assumption that it is, instead, MAR.

Finally, while, in most cases, missing data made up a relatively small portion of responses, parental occupational status showed particularly high levels of missing information (14%). In this case, the percentage of missing information exceeds both the soft (5%) and hard (10%) limits Little et al. (2014) proposed for the implementation

of inclusive FIML. Therefore, FIML was carried out in AMOS 22 on the data collected in this study, based on the fully specified model presented in Table 47.

8.1.1.2 Model Fit

There are multiple indicators of model fit, or a model's ability to reproduce the data reliably, for structural equation models. The debate regarding which best indicate model fit, what combination of them to report and, in many cases, even what constitutes "good fit" (see Katsillis, 2015, Appendix 1), is ongoing. Hooper, Coughlan, and Mullen (2008), propose reporting the model's Chi-square, Root Mean Square Error of Approximation (RMSEA), Standardized Root Mean-Square Residual (SRMR), Comparative Fit Index (CFI) and Parsimonious Normed Fit Index (PNFI) as being the "most insensitive to sample size, model misspecification and parameter estimates" (p. 56). A formal presentation of these fit indices is provided in Appendix H. The exception to this rule is, of course, the model Chi-square, which is, in fact, quite sensitive to sample size, nearly always rejecting the model in analyses with large sample sizes (Jöreskog & Sörbom, 1993; Kenny & McCoach, 2003). Schermelleh-Engel et al. (2003) and Vandenberg (2006) go so far as to propose that the Chi-square test should no longer even be relied upon as a basis for model acceptance or rejection. Its retention is largely based on its persistent popularity as a fit statistic and long history of use.

Model fit for the Initial Model was generally good, barring the Chi-Square statistic (χ^2=.043, df=1, p=.836). The Initial Model's RMSEA, which evaluates discrepancies between a hypothetical model with optimum parameter estimates and the population covariance matrix, was 0.000 (CI=[0.000, 0.004]), which falls below Hu and Bentler's (1999) proposed maximum threshold of 0.050 for acceptably small discrepancies. SRMR, calculated as the square root of the discrepancy between model and sample covariance matrices, was estimated at .0003, which also falls below Hu and Bentler's (1999) proposed threshold of 0.080 indicating good absolute model fit. CFI, which examines discrepancies between sample data and the hypothesized model, adjusted for sample size, was estimated at 1.000, surpassing both Hu and Bentler's (1999) proposed lower limit of .900 and Bentler's earlier, more conservative .950 threshold for acceptable model fit. The PNFI, which seriously penalizes for model complexity (Hooper et al., 2008) was estimated at .015. This estimate is lower than Mulaik et al.'s (1989) proposed region of around .050, but is to be expected when estimating the more conservative, fully specified model, which incorporates each variable, their error terms, correlations, and regression paths as separate parameters. The Initial Model's Residual Covariance Matrix (see Appendix G), whose absolute values are uniformly less than .002, also supports the goodness of fit.

8.1.1.3 Structural Equation Regression Coefficients

As noted above, SEMs permit the decomposition of the effects of exogenous and intervening variables on the model's dependent variable into direct and indirect

effects. However, the evaluation of these effects presupposes the estimation of robust standard errors, allowing for the assessment of said effects' statistical significance. To achieve this, we performed bootstrapping (again, in IBM AMOS 22). Apart from allowing the estimation of standard errors and the creation of confidence intervals, bootstrapping is important for the confirmation of mediation effects and acts as an aid to non-normal data (Cheng & Hu, 2010). While there appears to be much debate regarding the appropriate number of Bootstrap Samples to employ, Efron and Tibshirani (1994) propose that as few as 50 samples are often sufficient for the production of a good estimate of standard errors, with more than 200 rarely being necessary. Following extensive testing, Davidson and MacKinnon (2000) proposed that, for tests at the .05 level of statistical significance, 400 samples were sufficient. 500 samples were used in this study, as the resultant bootstrap distributions (see Appendix F) seem to bear out these positions, with little noticeable benefit to be had by using a greater number of samples. The estimation of the Initial Model is presented in Table 33. The table presents the regression coefficients, their standardized coefficients and the standard errors for each dependent variable included in a given equation, presented by columns indicated by the dependent variable, listed at the column top. Beta values, or standardized regression coefficients are the estimates from a regression that has been standardized such that the variances of dependent and independent variables take a value of 1. In other words, they represent the number of standard deviations a dependent variable will change, given on standard

deviation change in an independent variable, *ceteris paribus* and are employed for direct comparisons of effect sizes between variables measured on different scales.

Table 49. Structural Equation Regression Coefficients (Initial Model)

	Cultural Capital		*Previous Ach.*		*School Comp.*		*S.O.I.*	
	b(Beta)	**S.E.**	**b(Beta)**	**S.E.**	**b(Beta)**	**S.E.**	**b(Beta)**	**S.E.**
Family SES	.053(.060)*	.024	.461(.372)***	.030	.042(.134)***	.009	.256(.244)***	.024
Urbanicity	-.095(-.055)*	.046	-.076(-.031)	.058	.094(.155)***	.015	.043(.021)	.043
Gender	-.081(-.048)	.044	.455(.193)***	.055	-.025(-.041)	.015	.189(.095)***	.041
Ethnic Otherness	-.029(-.015)*	.050	-.347(-.130)***	.063	-.008(-.012)	.017	.027(.012)	.047
Cultural Capital			-.127(-.091)***	.032	-.021(-.060)*	.009	.025(.021)	.024
Previous Ach.					.048(.189)***	.007	.385(.456)***	.019
School Comp.							.170(.051)*	.072
S.O.I.								
Educational Exp.								
SE Participation								
Student Effort								
	R^2		**R^2**		**R^2**		**R^2**	
	.008		.194		.117		.390	

. Results significant at the .05 level* *. Results significant at the .01 level* ****. Results significant at the .001 level*

Table 49 cont'd

	Educational Expectations		*SE Participation*		*Student Effort*		*Educ. Achievement*	
	b(Beta)	**S.E.**	**b(Beta)**	**S.E.**	**b(Beta)**	**S.E.**	**b(Beta)**	**S.E.**
Family SES	.035(.031)	.023	.022(.060)**	.010	-.670(-.049)*	.331	.023(.013)	0.028
Urbanicity	.039(.017)	.039	.018(.025)	.017	-.343(-.013)	.574	.009(.003)	0.049
Gender	.027(.012)	.038	.022(.030)	.017	.198(.008)	.555	.143(.043)**	0.048
Ethnic Otherness	.059(.023)	.042	-.008(-.010)	.018	-.791(-.027)	.620	.091(.025)	0.053
Cultural Capital	-.004(-.003)	.022	-.028(-.067)**	.01	.169(.011)	.321	.081(.042)**	0.027
Previous Ach.	.100(.107)***	.020	.030(.100)***	.009	1.928(.174)***	.292	.809(.583)***	0.025
School Comp.	-.025(-.007)	.065	.048(.040)	.029	-.036(-.001)	.958	.096(.017)***	0.025
S.O.I.	.753(.683)***	.023	.061(.172)***	.013	2.899(.222)***	.448	.386(.235)***	0.038
Educational Exp.			.069(.214)***	.011	1.877(.158)***	.382	.042(.028)	0.033
SE Participation					8.452(.230)***	.864	.044(.009)	0.076
Student Effort							.013(.104)***	0.002
	R^2		**R^2**		**R^2**		**R^2**	
	.584		.237		.366		.704	

. Results significant at the .05 level* *. Results significant at the .01 level* ****. Results significant at the .001 level*

The significant regression coefficients presented above in Table 49 indicate significant pathways in the initial model. These alone, however, do not indicate which exogenous and endogenous variables contained in the model significantly affect students' educational achievement. To examine this, we must estimate the total, direct, and indirect effects of each variable.

8.1.2 The Decomposition of Effects in the Initial Model

Total Effects

Total Effects, the initial indicator of which exogenous and endogenous variables within the model are significantly associated with educational achievement, are presented below in Table 50.

Table 50. Total Effects for the Initial Model

	b(Beta)	S.E.	p
Family SES	.633(.368)	.043	.004
Ethnic Otherness	-.265(-.071)	.091	.005
Gender	.719(.219)	.076	.003
Urbanicity	-.026(-.008)	.082	.758
Cultural Capital	-.046(-.024)	.052	.423
Previous Achievement	1.045(.753)	.031	.004
School Academic Composition	.184(.034)	.055	.002
Significant Others' Influence	.491(.299)	.036	.006
Educational Expectations	.077(.052)	.040	.022
SE Participation	.154(.033)	.080	.043
Student Effort	.013(.104)	.002	.005

With the exception of Area of Residence and Cultural Capital all the variables included in the model have significant total effects on Educational Achievement. Traditionally, according to Baron and Kenny (1986), the lack of significant total effects for these two variables would be sufficient cause to disregard further examination of their effects on Educational Achievement. Although many researchers still ascribe to this school of thought, Hayes (2009; 2013) argues that a significant total effect is not necessary for significant mediation to exist and in support of the substantive significance of the examination of just such effects. Indeed, Preacher and Hayes (2004; 2008) propose an alternative approach estimating the effect of an independent variable on a dependent variable of interest, through a two-part estimation process, first without

and then with the presence of mediation. Even in such cases, however, if there is no significant effect in the direct path (i.e., the path examined excluding mediating variables), there is no mediating effect (Hair et al., 2014; Wong, 2015). In effect, the estimation of the models total effects (i.e., the effects of each exogenous and intervening variable excluding mediation) and then the separate estimation of the overall model, including potential mediations, fulfills this requirement. Thus, the evaluation of such mediation is examined below through the model's direct and indirect effects for those variables with significant total effects.

Direct and Indirect Effects

The direct and indirect effects of the exogenous and endogenous variables are presented in Table 51.

Table 51. Direct and Indirect Effects (Initial Model)

	Direct Effects			Indirect Effects		
	b(Beta)	**S.E.**	**p**	**b(Beta)**	**S.E.**	**p**
Family SES	.023(.013)	.029	.357	.610(.354)	.077	.003
Ethnic Otherness	.091(.025)	.056	.100	-.357(-.096)	.062	.006
Gender	.143(.043)	.048	.007	.576(.176)	.068	.729
Previous Achievement	.809(.583)	.033	.005	.235(.170)	.020	.007
School Academic Composition	.096(.017)	.033	.008	.088(.016)	.041	.016
Significant Others' Influence	.386(.235)	.044	.004	.105(.064)	.032	.002
Educational Expectations	.042(.028)	.039	.196	.035(.024)	.009	.004
SE Participation	.044(.009)	.078	.649	.110(.024)	.021	.004
Student Effort	.013(.104)	.002	.005	…	…	…

The majority of the effects presented in Table 51 persist through the rest of the structural models examined in this study. The most notable relationships of interest are arguably those which are exclusively either direct or indirect. Family Socioeconomic Status and Ethnicity

affect students' Achievement exclusively indirectly, i.e., through other characteristics, which follow them later in the model. Gender, however, appears to only affect student performance directly. Of particular interest, however, are the effect of SE participation and Educational Expectations, which are completely mediated by Student Effort. Students' Educational Expectations apparently lead them to invest more effort (hours studying) and participate in extracurricular instruction, which in turn motivates them to invest even more effort (i.e., spend more time on task), ultimately translating into higher Achievement in school.

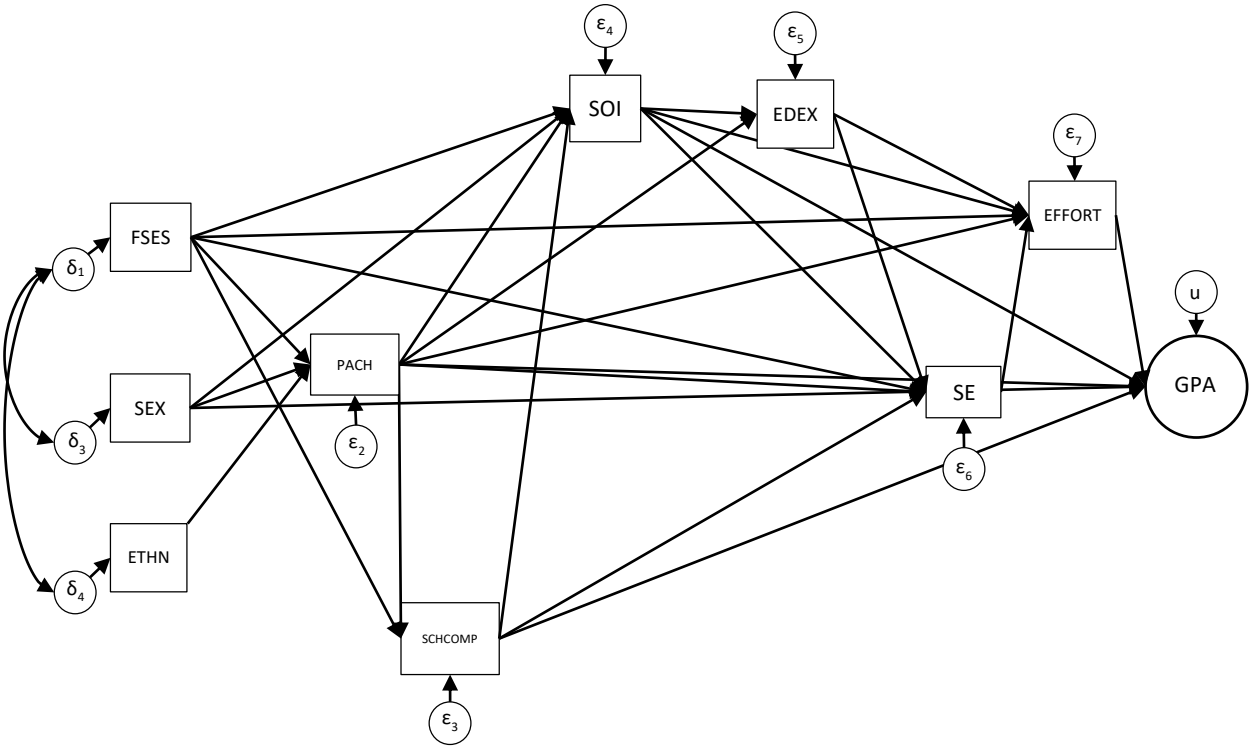


Figure 23. Initial Model (Statistically Significant Paths and Variables)

Based on the estimation of the structural equations (Table 49) in conjunction with the direct and indirect effects of the variables in the model (Table 50 and Table 51), a revised model,

one excluding non-significant paths and variables (i.e., variables with no statistically significant effect on achievement) is constructed and presented in Figure 23.

8.2 Expanding the Model

The Initial Model largely conforms to theoretical expectations. However, it leaves some granular aspects of SE inadequately examined. There are, for example, fine conceptual and practical differences between Group and Private SE participation. In the same vein, SE Participation by type functions in similar but distinct fashion for Group and Private SE –most notably in their relationships with other variables within the model. Also, the initial model does not address the compound nature of Student Effort, comprised of two distinct forms of student effort investment: school dictated study and work and SE dictated study and work.

The first step in addressing these concerns was to attempt to expand upon classical operationalizations; SE participation was broken into Group and Private SE participation and Student Effort into Effort focused on School mandated homework and Effort dictated by SE.

In relation to Student Effort and its role in the Educational Achievement process in Greece, it is worth noting that the vast majority of study hours were reported as dictated by SE. Moreover, when SE and School related effort were incorporated separately, only SE related effort had a significant Total Effect on Educational Achievement. This is not entirely unlike previous findings. Previous studies in Greece, which measured effort as the amount of time spent on school related activities (e.g., Katsillis, 1987; Katsillis & Rubinson, 1990), also found no significant effects of school dictated effort on achievement.

This distinction between the two efforts, however, is likely problematic. SE covers the same subject matter as schools, for all that it is more intensive, often introduces different strategies and techniques, and tends to cover subject matter somewhat in advance of the school curriculum. Inversely, students studying for school are, inadvertently, revising material previously covered in SE[45]. In short, students studying for SE are also indirectly studying for school, and vice-versa. In this light, disentangling the two forms of effort becomes difficult from both theoretical and practical standpoints. Furthermore, the separate inclusion of School and SE related effort was severely detrimental to model fit on all levels, further warranting retention of the original, joint measure of student effort. This, however, also means that effort acts as another measure of SE –the more so when one considers that participating in SE coincides with approximately 14 more hours' study per week, on average (t=37.165, df=1507, p=.000, Mean Diff.=13.980).

Table 52. Structural Equations for the Educational Achievement Process (Expanded Model)

a. $CULCAP = F(FSES, SEX, ETHN)$
b. $PACH = F(FSES, ETHN, SEX, CULCAP)$
c. $SCHCOMP = F(FSES, ETHN, SEX, CULCAP, PACH)$
d. $SOI = F(FSES, ETHN, SEX, CULCAP, PACH, SCHCOMP)$
e. $EDEX = F(FSES, ETHN, SEX, CULCAP, PACH, SCHCOMP, SOI)$
f. i. $GROUPSE = F(FSES, ETHN, SEX, CULCAP, PACH, SCHCOMP, SOI, EDEX)$
   ii. $PRIVATESE = F(FSES, ETHN, SEX, CULCAP, PACH, SCHCOMP, SOI, EDEX)$
g. $EFFORT = F(FSES, ETHN, SEX, CULCAP, PACH, SCHCOMP, SOI, EDEX, GROUPSE, PRIVATESE)$
h. $GPA11 = F\left(\begin{matrix} FSES, ETHN, SEX, CULCAP, PACH, SCHCOMP, SOI, EDEX, GROUPSE, PRIVATSE, SCHQ, \\ GROUPSE, PRIVATESE, EFFORT \end{matrix}\right)$

Due to the lack of significant total, direct, and indirect effects on students' educational achievement, Urbanicity was dropped from this model. Cultural Capital was retained in the

[45] The relationship between the two types of effort stems from the relationship(s) between school and SE curricula and is one which arguably merits more rigorous examination (see also Zhang & Bray, 2020).

model by virtue of the persistent theoretical interest in its role in the educational process and potentially differential function when SE is examined by type. Group ($GROUPSE$) and Private SE ($PRIVATESE$) participation were both operationalized according to overall SE participation (see Table 3). Since Group and Private SE participation both comprise aspects of SE participation, their residuals were allowed to correlate. The model estimated thusly, with the separate inclusion of SE participation by type, or "Expanded Model", is presented in Table 52.

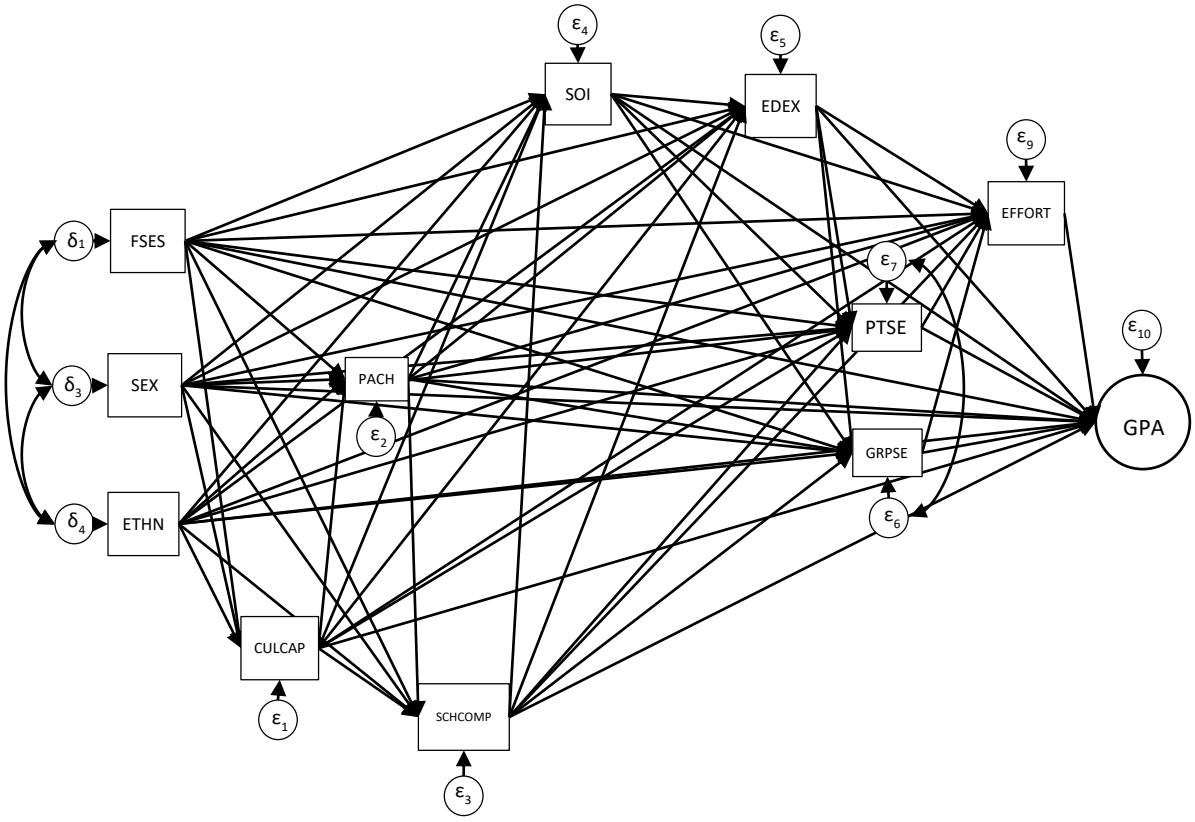


Figure 24. Expanded Model

The Expanded Model is presented with the inclusion of latent error terms, model disturbance and correlations, as estimated, in Figure 24.

8.2.1 Model Fit

Model fit for the Expanded Model was distinctly better than for the Initial Model (χ^2=.052, df=1, p=.820; RMSEA=.000, CI=[.000, .042]; SRMR=.0003; CFI=1.000; PNFI=.015). The Expanded Model's Residual Covariance Matrix (see Appendix G), whose absolute values are uniformly less than .003, also supports the goodness of fit.

8.2.2 Structural Equation Regression Estimates

Table 53. Structural Equation Regression Coefficients (Expanded Model)

	Cultural Capital		*Previous Ach.*		*School Comp.*		*S.O.I.*	
	b(Beta)	**S.E.**	**b(Beta)**	**S.E.**	**b(Beta)**	**S.E.**	**b(Beta)**	**S.E.**
Family SES	.041(.046)	.023	.451(.364)***	.029	.055(.175)***	.008	.261(.249)***	.023
Gender	-.083(-.049)	.044	.455(.192)***	.055	-.023(-.039)	.015	.190(.095)***	.041
Ethnic Otherness	-.028(-.015)	.050	-.346(-.129)***	.063	-.009(-.014)	.017	.027(.012)	.047
Cultural Capital			-.125(-.090)***	.032	-.024(-.068)**	.009	.024(.020)	.024
Previous Ach.					.046(.184)***	.007	.384(.454)***	.019
School Comp.							.181(.054)*	.071
S.O.I.								
Educational Exp.								
Group SE								
Private SE								
Student Effort								
	R^2		R^2		R^2		R^2	
	.005		.193		.095		.389	

. Results significant at the .05 level* *. Results significant at the .01 level* ****. Results significant at the .001 level*

Table 53 cont'd

	Educational Expectations		Group SE		*Private SE*		*Student Effort*	
	b(Beta)	**S.E.**	**b(Beta)**	**S.E.**	**b(Beta)**	**S.E.**	**b(Beta)**	**S.E.**
Family SES	.040(.035)	.022	-.020(-.040)	.014	.064(.121)***	.015	-.599(-.044)	.329
Gender	.028(.013)	.038	.001(.002)	.024	.056(.056)*	.025	.215(.008)	.561
Ethnic Otherness	.058(.023)	.042	-.031(-.029)	.027	-.040(-.036)	.028	-.619(-.021)	.627
Cultural Capital	-.005(-.004)	.022	-.021(-.038)	.014	-.014(-.024)	.015	.063(.004)	.323
Previous Ach.	.098(.106)***	.020	.038(.097)**	.013	.001(.001)	.013	2.027(.183)***	.294
School Comp.	-.014(-.004)	.065	.048(.031)	.041	.175(.104)***	.043	-.370(-.008)	.960
S.O.I.	.753(.684)***	.023	.051(.110)**	.019	.051(.102)*	.020	3.059(.234)***	.452
Educational Exp.			.053(.125)**	.016	.049(.107)**	.017	2.101(.177)***	.383
Group SE							4.163(.149)***	.607
Private SE							2.777(.107)***	.573
Student Effort								
	R^2		R^2		R^2		R^2	
	.583		.109		.084		.353	

. Results significant at the .05 level* *. Results significant at the .01 level* ****. Results significant at the .001 level*

Table cont'd on following page.

Table 53 cont'd	*Educational Achievement*	
	b(Beta)	**S.E.**
Family SES	.027(.015)	.028
Gender	.144(.044)**	.048
Ethnic Otherness	.092(.025)	.053
Cultural Capital	.081(.042)**	.027
Previous Ach.	.808(.583)***	.025
School Comp.	.098(.018)***	.025
S.O.I.	.386(.236)***	.038
Educational Exp.	.043(.029)	.033
Group SE	.059(.017)	.052
Private SE	-.008(-.002)	.049
Student Effort	.013(.103)***	.002
	R^2	
	.705	

*. *Results significant at the .05 level*
**. *Results significant at the .01 level*
***. *Results significant at the .001 level*

There are at least two interesting points of note regarding the two forms of SE participation apparent in the estimation of the expanded model (see Table 53): their determinants and their effect on students' Educational Achievement. Both Group and Private SE depend (in a similar manner) on students' Educational Expectations and the Influence of their Significant Others but that is where the similarities in their determinants end. Apart from these, Group SE participation depends only on students' Previous Achievement, while Private SE on students' Family SES, Gender, and the Academic Composition of their school. Moreover, since there appears to be no direct effect of either Group or Private SE on achievement, such effects must be sought out in the decomposition of the model's effects into it their component total, direct, and indirect parts.

8.2.3 The Decomposition of Effects in the Expanded Model

Total Effects

Total Effects, indicating which exogenous and endogenous variables within the Expanded Model are significantly associated with educational achievement, are presented in Table 54. The most striking departure from expected outcomes apparent in the estimation of the Expanded model is the seeming lack of any significant association between Private SE and Educational Achievement. Although Verdis (2002) touched upon this briefly, it arguably bears more than a passing acknowledgement. Private SE is more expensive, more intensively focused on students' personal needs and abilities and, as a result, generally perceived as being more effective, although the decomposition of SE into its component types seems to indicate the opposite.

Table 54. Total Effects (Expanded Model)

	b(Beta)	S.E.	p
Family SES	.629(.366)	.042	.004
Ethnicity	-.265(-.071)	.091	.005
Gender	.718(.219)	.076	.003
Cultural Capital	-.045(-.023)	.051	.436
Previous Achievement	1.044(.753)	.031	.004
School Academic Composition	.191(.035)	.055	.003
Significant Others' Influence	.491(.300)	.036	.005
Educational Expectations	.077(.052)	.040	.017
Private SE Participation	.028(.009)	.049	.617
Group SE Participation	.113(.032)	.053	.046
Student Effort	.013(.103)	.002	.005

Further consideration was, at this point, given to the possibility that a ceiling effect may have been at work, given the heavily skewed distributions of students' Previous and current Educational Achievement (i.e., students' 11th Grade GPA). In other words, the fact that the average 11th Grade GPA for participants in Private SE was significantly

higher than the overall sample average led to concerns that the impact of Private SE on students Educational Achievement may have been attenuated by controlling for their Previous Achievement. As a result, the expanded model was re-estimated excluding Previous Achievement. The re-estimated model still showed no statistically significant association between Private SE participation and students' Educational Achievement. Presentation of this model, which deviates from established theory as an exercise in rigor and caution, is eschewed. It is worth noting, however, that even omitting Previous Achievement, the final equation explains fully 50.54% of the variance in students' Educational Achievement.

Even accepting the lack of ceiling effect related attenuation to the and counterintuitive function of Private SE participation, it could be argued that there is some substantive conceptual worth to an examination of whether or not there is an interaction effect between Group and Private SE. The interaction effect was tested by estimating the effect of one separately for each level of the other. No statistically significant interaction effect on Achievement was found. The presentation of the model examining the inclusion of that particular relationship is eschewed, since there is no substantive differentiation from the Expanded Model. The lack, however, of even this differentiation casts significant doubt on the common perception of the benefits of Private SE, even in a limited capacity, as an enhancement to its less exclusive Group counterpart. In short, an examination of the total effects of the corrected model appears to indicate that Private SE, whether alone or in concert with Group SE, plays no significant role in the determination of students' Educational Achievement.

Direct and Indirect Effects

The direct and indirect effects of the exogenous and endogenous variables with significant total effects on educational achievement are presented in Table 55. There are clear similarities to the results of the estimation of the initial model. Notably, it appears that all of the effect of Group SE on Educational Achievement is indirect, through Student Effort. Indeed, it would appear, from the results of the previous analyses and the decomposition of effects presented below that it is, in fact, Group SE which accounts for the effect of overall SE participation on students' Educational Achievement in Greece. It is also worth noting that the discrete examination of Private and Group SE participation has cast more light on the role of Gender in the educational achievement process in Greece. The majority of its total effect on students' educational achievement can now be seen to be indirect, through a series of intervening variables, including their Previous Achievement and the Influence of their Significant Others.

Table 55. Direct and Indirect Effects (Expanded Model)

	Direct Effects			Indirect Effects		
	b(Beta)	**S.E.**	**p**	**b(Beta)**	**S.E.**	**p**
Family SES	.027(.015)	.028	.288	.603(.350)	.036	.003
Ethnicity	.092(.025)	.055	.100	-.357(-.096)	.077	.006
Gender	.144(.044)	.048	.008	.574(.175)	.061	.003
Previous Achievement	.808(.583)	.033	.006	.236(.170)	.019	.006
School Academic Composition	.098(.018)	.033	.008	.093(.017)	.041	.021
Significant Others' Influence	.386(.236)	.045	.005	.105(.064)	.032	.002
Educational Expectations	.043(.029)	.039	.206	.035(.023)	.009	.003
Group SE Participation	.059(.017)	.053	.253	.054(.015)	.012	.004
Student Effort	.013(.103)	.002	.005	…	…	…

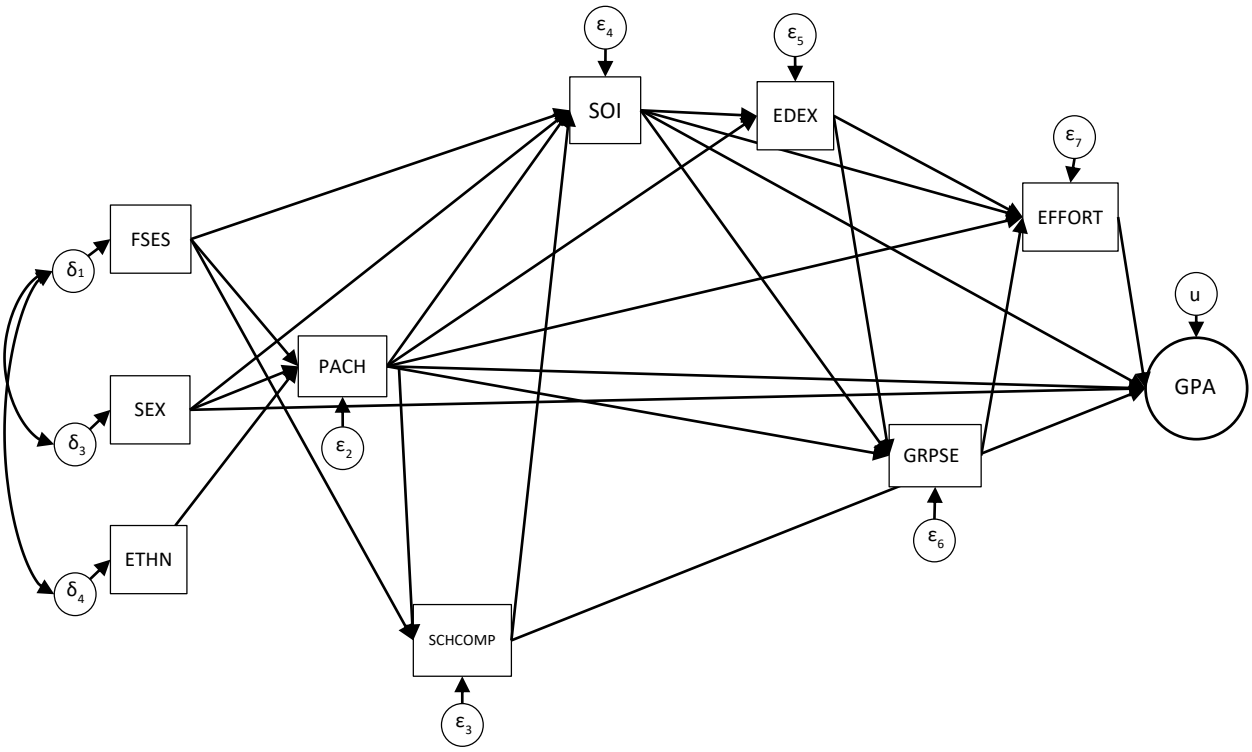


Figure 25. Expanded Model (Statistically Significant Paths and Variables)

Based on the estimation of the structural equations (Table 53) in conjunction with the direct and indirect effects of the variables in the model (Table 54 and Table 55), a revised model, excluding non-significant paths and variables (i.e., variables with no statistically significant effect on achievement)[46] is constructed and presented in Figure 25.

[46] Private SE is retained in the path model due to the central nature of the variable and interest regarding its relationship with further measures of SE which will be included in later iterations of the model.

8.3 Final Model

The Initial and Expanded Models represent the most commonly employed theoretical understanding of the placement of SE within the educational achievement process and a minor nod to the fact that, as both a concept and a process, SE may be more complex than commonly treated. Both models, however, adhere to the theoretical principle that it is simply participating in SE that affects Educational Achievement, eschewing any other characteristic property of SE and the role those might play. To address this, a series of models were estimated, introducing other aspects of SE following Group SE participation, including SE Intensity (both in hours per week and number of courses), SE Cost (both raw and as a ratio of family income), SE Duration, and SE Quality. Of these, only SE Quality (whether employed as Minimum, Maximum or Average SE Quality) had a statistically and substantively significant effect on Educational Achievement, controlling for SE Participation. Considering this, the Expanded Model is altered to include Average Group SE Quality (*SE_QUALITY*) after Group and Private SE Participation and preceding Student Effort (see Table 56).

Table 56. Structural Equations fort the Educational Achievement Process (Final Model)

a. $CULCAP = F(FSES, SEX, ETHN)$
b. $PACH = F(FSES, ETHN, SEX, CULCAP)$
c. $SCHCOMP = F(FSES, ETHN, SEX, CULCAP, PACH)$
d. $SOI = F(FSES, ETHN, SEX, CULCAP, PACH, SCHCOMP)$
e. $EDEX = F(FSES, ETHN, SEX, CULCAP, PACH, SCHCOMP, SOI)$
f.
   i. $GROUPSE = F(FSES, ETHN, SEX, CULCAP, PACH, SCHCOMP, SOI, EDEX)$
   ii. $PRIVATESE = F(FSES, ETHN, SEX, CULCAP, PACH, SCHCOMP, SOI, EDEX)$
g. $SE_{QUALITY} = F(FSES, ETHN, SEX, CULCAP, PACH, SCHCOMP, SOI, EDEX, GROUPSE, PRIVATESE)$
h. $EFFORT = F(FSES, ETHN, SEX, CULCAP, PACH, SCHCOMP, SOI, EDEX, GROUPSE, PRIVATESE, SE_{QUALITY})$
i. $GPA11 = F\begin{pmatrix} FSES, ETHN, SEX, CULCAP, PACH, SCHCOMP, SOI, EDEX, GROUPSE, PRIVATSE, \\ GROUPSE, PRIVATESE, SE_QUALITY, EFFORT \end{pmatrix}$

The Expanded Model is presented with the inclusion of latent error terms, model disturbance and correlations, as estimated, in Figure 26.

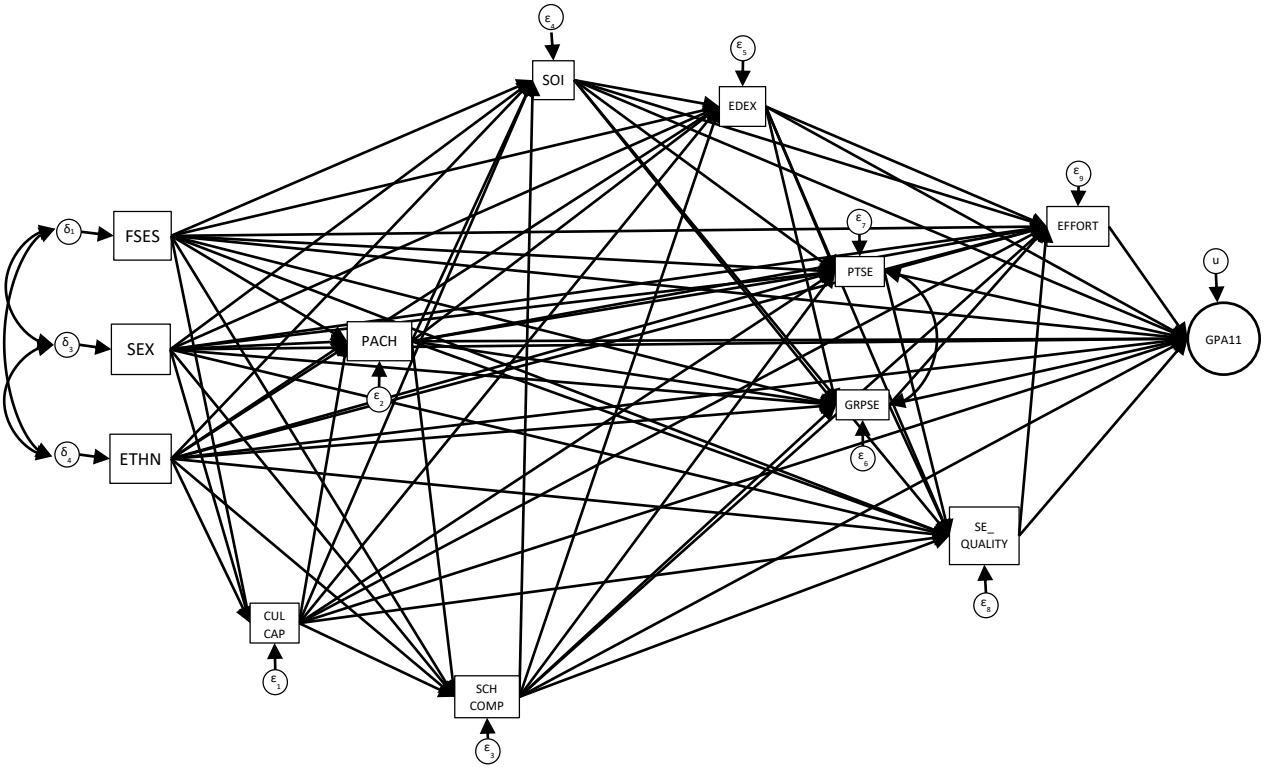


Figure 26. Final Model

8.3.1 Structural Equation Regression Estimates

A cursory examination of the estimated effects in the final model, presented in Table 57, may cause some consternation regarding the role of SE Quality in the educational achievement process. It is, for example, dependent upon the Group but not Private SE participation. Considering the lack of significant difference between average reported Group SE and Private SE quality, this was somewhat unexpected. SE Quality appears to play a mediating role for Previous Achievement and SOI effects on student effort and, by extension, Achievement,

although a formal examination of the significance of this effect will necessarily follow a decomposition of the model's effects and an estimation of the specific indirect effect pathways.

Table 57. Structural Equation Regression Coefficients (Final Model)

	Cultural Capital		*Previous Ach.*		*School Comp.*		*S.O.I.*	
	b(Beta)	**S.E.**	**b(Beta)**	**S.E.**	**b(Beta)**	**S.E.**	**b(Beta)**	**S.E.**
Family SES	.041(.046)	.023	.451(.364)***	.029	.055(.175)***	.008	.261(.249)***	.023
Gender	-.083(-.049)	.044	.455(.192)***	.055	-.023(-.039)	.015	.190(.095)***	.041
Ethnic Otherness	-.028(-.015)	.050	-.346(-.129)***	.063	-.009(-.014)	.017	.027(.012)	.047
Cultural Capital			-.125(-.090)***	.032	-.024(-.068)**	.009	.024(.020)	.024
Previous Ach.					.046(.184)***	.007	.384(.454)***	.019
School Comp.							.181(.054)*	.071
S.O.I.								
Educational Exp.								
Group SE								
Private SE								
SE Quality								
Student Effort								
	R^2		R^2		R^2		R^2	
	.005		.193		.095		.389	

Table 57 cont'd

	Educational Expectations		Group SE		*Private SE*		*SE Quality*	
	b(Beta)	**S.E.**	**b(Beta)**	**S.E.**	**b(Beta)**	**S.E.**	**b(Beta)**	**S.E.**
Family SES	.040(.035)	.022	-.020(-.040)	.014	.064(.121)***	.015	.025(.034)	.021
Gender	.028(.013)	.038	.001(.002)	.024	.056(.056)*	.025	.024(.017)	.035
Ethnic Otherness	.058(.023)	.042	-.031(-.029)	.027	-.040(-.036)	.028	-.037(-.023)	.039
Cultural Capital	-.005(-.004)	.022	-.021(-.038)	.014	-.014(-.024)	.015	.020(.024)	.020
Previous Ach.	.098(.106)***	.020	.038(.097)**	.013	.001(.001)	.013	.055(.092)**	.018
School Comp.	-.014(-.004)	.065	.048(.031)	.041	.175(.104)***	.043	.043(.018)	.060
S.O.I.	.753(.684)***	.023	.051(.110)**	.019	.051(.102)*	.020	.178(.250)***	.028
Educational Exp.			.053(.125)***	.016	.049(.107)**	.017	.047(.072)	.024
Group SE							-.007(-.005)	.036
Private SE							-.089(-.058)*	.038
SE Quality								
Student Effort								
	R^2		R^2		R^2		R^2	
	.583		.084		.109		.147	

Table 57 cont'd

	Student Effort		*Educational Achievement*	
	b(Beta)	**S.E.**	**b(Beta)**	**S.E.**
Family SES	-.646(-.047)*	.327	.025(.015)	.028
Gender	.170(.007)	.557	.143(.043)**	.048
Ethnic Otherness	-.550(-.019)	.623	.094(.025)	.053
Cultural Capital	.025(.002)	.321	.079(.041)**	.027
Previous Ach.	1.924(.174)***	.293	.805(.581)***	.025
School Comp.	-.450(-.010)	.954	.088(.016)***	.025
S.O.I.	2.727(.209)***	.455	.378(.230)***	.039
Educational Exp.	2.014(.170)***	.381	.041(.027)	.033
Group SE	4.329(.155)***	.604	.067(.019)	.052
Private SE	2.790(.107)***	.570	-.006(-.002)	.049
SE Quality	1.865(.102)***	.408	.060(.026)	.035
Student Effort			.013(.100)***	.002
	R^2		R^2	
	.362		.705	

. Results significant at the .05 level **. Results significant at the .01 level *. Results significant at the .001 level*

It is also interesting, although not necessarily unexpected, that Group SE participation is negatively associated with SE Quality, considering the prevailing perception that Private SE is more effective and thus, in a general sense, better (i.e., of a higher quality) than Group SE.

8.3.2 The Decomposition of Effects in the Final Model

Total Effects

Total Effects, indicating which exogenous and endogenous variables within the Final Model are significantly associated with educational achievement, are presented below in Table 58. Since the only differentiation between the Final and Expanded models is the introduction of SE Quality, which is introduced very near the end of the model's chain of variables, there is little of substantive interest to discuss, regarding the Final model's total effects. Notably, SE Quality has a significant total effect on educational achievement.

Table 58. Total Effects (Final Model)

	b(Beta)	SE	p
Family SES	.629(.366)	.042	.004
Ethnicity	-.265(-.071)	.091	.005
Gender	.718(.219)	.076	.003
Cultural Capital	-.045(-.023)	.051	.435
Previous Achievement	1.043(.752)	.031	.004
School Academic Composition	.184(.034)	.055	.003
Significant Others' Influence	.492(.300)	.036	.005
Educational Expectations	.077(.052)	.040	.018
Private SE Participation	.029(.009)	.049	.612
Group SE Participation	.114(.032)	.053	.045
SE Quality	.084(.036)	.036	.016
Student Effort	.013(.100)	.002	.006

Direct and Indirect Effects

The direct and indirect effects of the exogenous and endogenous variables with significant total effects on educational achievement are presented in Table 57.

Table 59. Direct and Indirect Effects (Final Model)

	Direct Effects			Indirect Effects		
	b(Beta)	**SE**	**p**	**b(Beta)**	**SE**	**p**
Family SES	.025(.015)	.028	.347	.604(.351)	.036	.003
Ethnicity	.094(.025)	.055	.085	-.359(-.097)	.077	.006
Gender	.143(.043)	.048	.009	.576(.176)	.061	.003
Previous Achievement	.805(.581)	.034	.006	.238(.172)	.020	.006
School Academic Composition	.088(.016)	.032	.015	.096(.018)	.042	.017
Significant Others' Influence	.378(.230)	.044	.005	.114(.070)	.033	.002
Educational Expectations	.041(.027)	.039	.237	.036(.025)	.009	.003
Group SE Participation	.067(.019)	.053	.220	.047(.013)	.013	.004
SE Quality	.060(.026)	.036	.097	.023(.010)	.007	.004
Student Effort	.013(.100)	.002	.006	…	…	…

There are a number of minute differences in the direct and indirect effects of the variables in the Final model, when compared to the expanded model it replaced. The most salient such difference is arguably the indirect effect of SE Quality, which also mediates a portion of the effects of Previous Achievement, SOI, and Group SE participation on educational achievement, through student effort.

It is worth noting that the estimation of the Final Model's Structural Equations indicates statistically significant direct or indirect paths from each of the SE measures (Group and Private SE participation, SE Quality, and Student Effort) to Educational Achievement. Nonetheless, from a substantive standpoint, since Private SE presents no significant total effect on Achievement, it is more appropriate to say that all manifestations of SE included in the model except Private SE significantly affect students' Educational Achievement.

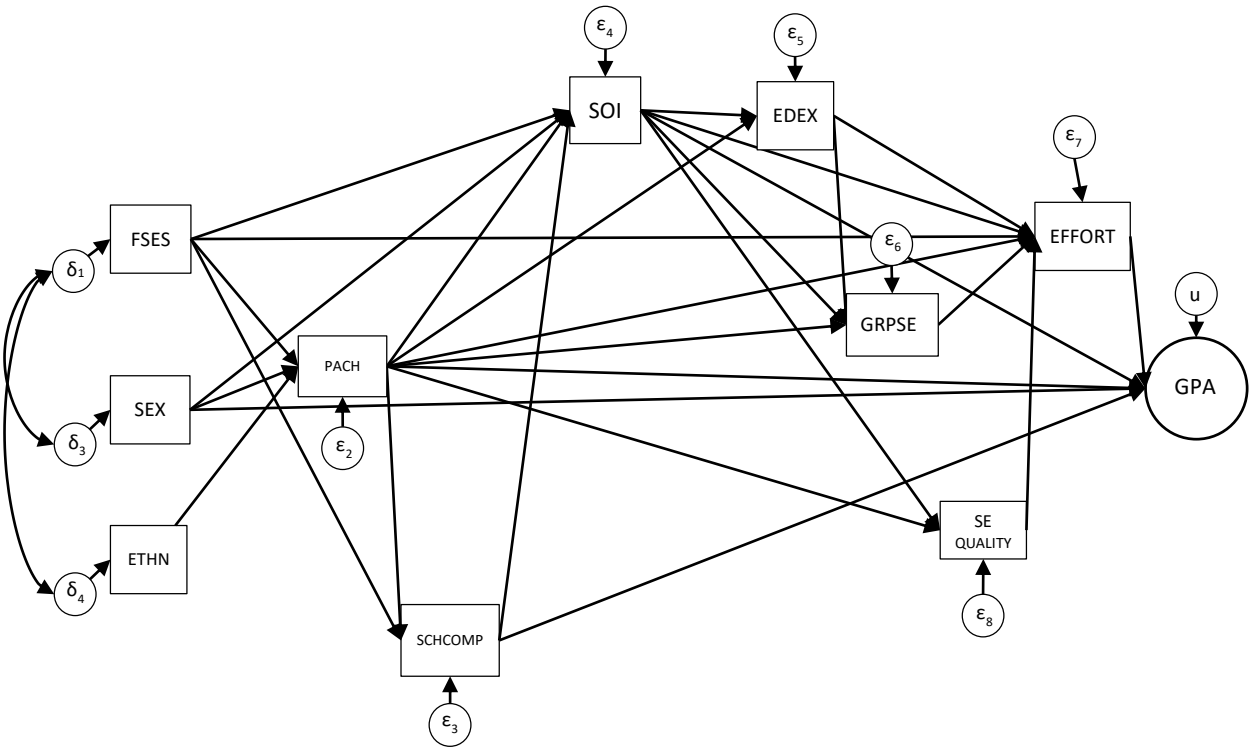


Figure 27. Final Model (Statistically Significant Paths and Variables)

Thus, eschewing the previous considerations of interesting relationships, the final model is presented in Figure 27 with the inclusion of only have significant total effects on Educational Achievement and the statistically significant paths from them to Educational Achievement.

8.4 The Translation of Background Differences into Differential Educational Achievement

Forgoing, for the moment, concerns of effect magnitude, there are readily apparent deviations between the model presented in Figure 27 and the working model proposed by

theory (see Figure 5). This is, in part, due to the differences imported by the revision (to include the two separate forms of SE participation) and expansion (to include SE Quality) of the model. Even taking these into account, though, there are variables theoretically purported to play a role in the educational achievement process whose effects are conspicuously absent from the estimated Final Model –specifically, Cultural Capital and Urbanicity. Much weight has already been placed on the debate surrounding the role of cultural capital as a mechanism of educational and thus social reproduction in this study. Suffice it to say that it does not appear to play the role cultural capital theory would indicate that it does, at least in Greece. This is not a novel deviation from theoretical tradition (Kingston, 2001), especially in the case of Greece (Katsillis, 1987; Katsillis & Rubinson, 1990; Katsillis & Kamarianos, 2006; Katsillis, 2015) and, given the time and space already devoted to it, arguably one that warrants little further discussion. The lack of Urbanicity as a significant factor in the educational achievement process is more interesting and, arguably, heartening.

This study attempted to provide contemporary information regarding the processes translating background differences into differential achievement. Here, these differences are embodied in Gender, Ethnicity, and Family Socioeconomic Status. The means by which these differences result in differential achievement are discussed below.

8.4.1 Family Socioeconomic Status and Educational Achievement

Family Socioeconomic Status has the strongest total effect of the Final Model's exogenous variables. Its effect (Beta=.366) is nearly double that of Gender (Beta=.219) and nearly five

times that of Ethnicity (Beta=-.071) in absolute terms. It is second in the model only to that of Previous Achievement (Beta=.742). Family Socioeconomic Status has significant direct effects on the majority of the Model's intervening variables (excluding only Educational Expectations, Group SE participation, SE Quality, and Educational Achievement) and, as one would expect, all of its effects on Educational Achievement are indirect. It does not, however, seem to directly influence SE Participation. The proposal of this path was based on the costs associated with SE Participation (tying the two together via the strong correlations between income and FSES), the educational benefits of SE (tying it to Parental Educational Attainment) and the increased prestige associated with Private SE (tying it to parental Occupational Status). Only the final association appears to have held true. Due, however, to the lack of significant total effect of Private SE Participation on students' Educational Achievement, this path is not included in the significant mechanisms presented in Figure 27. It should, nonetheless, be noted that FSES did, in fact, affect overall SE Participation directly (logically due to the inclusion of both Private and Group SE participation in the measure) and both overall and Group SE Participation indirectly, through both students' Previous Achievement and their Significant Others' Influences.

8.4.2 Urbanicity

Urbanicity, as a less granular representation of students' area of residence, was theorized to play a role in the educational achievement process as a result of differential access to educational resources (including, though not limited to schools) and SE. Although it did significantly affect the average academic composition of students' schools, in the initial

model tested, this did not translate into differential achievement. Nor did it affect students' Previous Achievement, participation in SE, or Effort. In effect, it would seem that the limiting role previously played by students' area of residence (Katsillis & Rubinson, 1990) in regards to their early achievement and educational expectations has ceased to be a significant factor in contemporary Greek society. Why this is the case is not inferable from this study. Logic, however, would suggest that the onset of the information era, bringing increased access to more and better sources of information, often literally in the palm of students' hands, might have played a significant role in this change of the status quo.

8.4.3 Student Gender and Educational Achievement

Gender did not, as proposed by theory, significantly affect students' educational expectations or SE participation directly, although it did affect both indirectly, through their Previous Achievement and the Influence of their Significant Others'. Overall, the results show that female students do better in school than their male counterparts. Female students' GPA are more than three quarters of a grade point (.718, p=.003) higher than that of males. This finding has been quite consistent in related research in Greece (Psacharopoulos & Soumelis, 1979; Katsillis, 1987; Katsillis & Rubinson, 1990; Flouris et al., 1994; Moustairas & Katsillis, 2006; Katsillis, 2015). The majority (approximately 80%) of Gender's total effect on Educational Achievement is indirect, passing through Previous Achievement and Significant Others' Influence. Previous relevant findings posited that the majority of these indirect effects might be heavily mediated by student effort (Katsillis, 2015) or be an expression of Agidrag et al.'s (2012) futility culture, expressed as lower expectations in male students.

Neither, however, appears to be true. Only about 11% of the indirect effects of Gender pass through student effort, with approximately a quarter of that passing through their Educational Expectations. More than half (53.76%) of Student Gender's total indirect effects are through Previous Achievement and directly into differential achievement, while a substantial portion (34.98%) is translated into higher Significant Others' Expectations and then directly into higher achievement.

8.4.4 Ethnic Otherness and Educational Achievement

Non-Greek Ethnicity has a statistically significant, negative, total effect on Educational Achievement. This is not unexpected. Fifteen years ago, Ethnicity played such a significant role in students' educational achievement in Greece as to warrant separate modelling of the process for students of "Greek" and "Other" ethnicity, indicating the severe detriment to the latter group (Katsillis, 2015). The magnitude of this effect is substantially diminished –a discrepancy likely due in part to advances and reforms addressing the readiness and ability of the Greek educational system to deal with the relatively new ethnic heterogeneity characterizing its classrooms. However, a discrepancy nonetheless persists. Further examination indicated a significant interaction between students' Ethnicity and Gender (b=.356, p=.043), such that non-Greek Ethnicity female students suffered less of a penalty than their male counterparts did. Taken in concert the (diminished but persistent) negative effect of Ethnic Otherness and its interaction with Gender warranted a more in-depth examination of its role in the educational achievement process, which is presented in a later chapter.

8.4.5 Shadow Education as a Mechanism of Educational Reproduction

Several of the paths representing significant indirect effects of Family Socioeconomic Status on Educational Achievement include one or more of the aspects of SE (Group SE Participation, SE Quality, and Student Effort) included in the Final Model. Indeed, with the exception of School Academic Composition, some portion of the statistically significant effect of each of the preceding variables on Educational Achievement passes through one or more aspect. In total, however, the statistically and substantively (i.e., non-zero) paths including SE measures comprised only a small portion of the total indirect effect of Family Socioeconomic Status on Educational Achievement. In short, using 11th Grade GPA as the measure of Educational Achievement, it appears that SE does function as a mechanism of educational reproduction, albeit not the most important one.

8.5 A Note on the use of SEM in the establishment of Causal Relationships

There is an ongoing debate regarding the use of SEM in the process of estimating causal effects (Bollen & Pearl, 2013). While the debate has run since Wright's (1922) initial use of path analysis in the early 1920s (Bollen & Pearl, 2013), arguably the most well-known (and widely cited) criticisms on the use of SEM in causal inquiries rest on Freedman's (1987) review of path analysis, and its suggestions regarding the limitations of the method for the analysis of complex phenomena. The work is essentially comprised of a structured and explicit presentation of the mathematical foundations behind the assumptions implicit in complex structural modelling methods. Freedman's (1987) critique seems largely a response to the

surge in the application of SEM in the 1970s and early 80s, following Blau and Duncan's (1967; see also Duncan, 1966) proposal of the use of path models in educational and stratification research. It delineates in great detail the difficulties in perfectly satisfying all of the conditions and assumptions implicit in structural modelling applications. However, while Freedman's (1987) arguments are regularly employed in arguments against the use of SEM, his arguments were not against the *use* of the techniques but their *misuse*. Freedman (1987) cautions against ignoring these assumptions and, of course, inferring causal relationships from the associations estimated using SEM, a concern rightly shared by other researchers of note (e.g., Goldthorpe, 2001; Sobel, 2008; etc.). This, of course, is not and should not be the goal of SEM Analysis. Duncan (1966) specifically cautioned against the use of the method for the discovery of "causes" and placed great weight on the assumptions and limitations of the technique (1975, as cited in Freedman, 1987). However, researchers properly employing SEM in their analytical framework "do not derive causal relations from an SEM. Rather the SEM represents and relies upon the causal assumptions of the researcher. These assumptions derive from the research design, prior studies, scientific knowledge, logical arguments, temporal priorities, and other evidence that the researcher can marshal in support of them" (Bollen & Pearl, 2013, p. 309). In an attempt to put the argument regarding the inference of causal claims from SEM to rest, Bollen and Pearl (2013, p. 309) point out that:

> SEM is an inference engine that takes in two inputs, qualitative causal assumptions and empirical data, and derives two logical consequences of these inputs: qualitative causal conclusions and statistical measures of fit for the testable implications of the assumptions. Failure to fit the data casts doubt on the strong causal assumptions of zero coefficients or zero covariances and guides the researcher to diagnose, or repair the structural misspecifications. Fitting the data does not "prove" the causal assumptions, but it makes them tentatively more plausible. Any such positive results need

> to be replicated and to withstand the criticisms of researchers who suggest other models for the same data.

Another frequently cited critique of structural equation modelling proposed by Freedman (1987, p. 112) tied to the above misconception argues that "path analysis does note derive the causal theory from the data, or test any major part of it against the data". Were researchers to, in fact, to assume they could dredge data and extract causal inference from their models, this might be true, although, as Bollen and Pearl (2013, p. 321) argue: "no analysis in the world can derive the causal theory from nonexperimental data". On the other hand, one could argue that the second half of the statement is subtle if not outright problematic, since SEMs, by definition, "test *all* [of] the testable implications of the theory" underlying their construction.

SEMs are built on a series of causal assumptions and their corresponding empirical implications. When testing a model, these empirical implications must hold, if the model is true. Rejection of said model implies the rejection of at least one implication (and thus at least one causal assumption). Failure to reject the model, on the other hand, does not definitively prove the causal assumption; it simply suggests that the assumptions are consistent with the data under examination. While this implies that such causal assumptions are, in perpetuity, one study away from rejection, the longer such assumptions hold, the more contexts and times they are examined and hold under, the more plausible they become (Bollen & Pearl, 2013). Indeed, in many sociological, educational, and demographic contexts, where manipulation of causal factors and/or treatments is ethically or logistically untenable,

this may well be the best, if not only means of working towards the establishment of any kind of lasting causal framework.

Many of these points become much more interesting if one considers that, in later research, Freedman (2004; 2005; 2009) himself largely embraced "response schedules" –structural equation models whose causal variable(s) could be manipulated. However, this practice of assuming no causation could be inferred without manipulation (Holland, 1986) can and has been repeatedly questioned (Goldthorpe, 2001; Glymour, 1986) and critiqued (Angrist & Pischke, 2009; Bhrolchain & Dyson, 2007; Bollen, 1989; Morgan & Winship, 2007; Pearl, 2011). Pearl (2011) pointed out that this restriction has led to harmful consequence by forcing investigators to compromise their research questions only to avoid the manipulability restriction. The essential ingredient of causation, as argued in Pearl (2009: 361), is responsiveness, namely, the capacity of some variables to respond to variations in other variables, regardless of how those variations came about." Pearl (2009, p. 361) further argued that allowing scientists to "state and conceive the realization of antecedent conditions without specifying the physical means by which these conditions are established" could well have been the reason for the implementation of the counterfactual, in the first place. Pearl (2009) also argued that the essential ingredient of causation is "responsiveness", that is, the capacity of some variables to respond to changes in other variables, regardless of the means by which these changes came about. Bollen (1989, p. 41) had perhaps the most illustrative example of the inherent and arguably irrational limitations imposed by the assumption, somewhat graphically pointing out that, assuming extreme cases of no causation without

manipulation, we could counterintuitively conclude that “the moon does not cause the tides, tornadoes and hurricanes to not cause destruction of property, and so on”.

Bollen and Pearl (2013) address these and many other misconceptions regarding the use of SEM (including its use in mediation analysis, its equivalence to potential outcome frameworks, and its relationship to regression analysis, and its ability to handle nonlinear causal relationships) in depth, both mathematically and empirically. An in-depth analysis of them all is, arguably, beyond the scope of this inquiry and would, in any case, rehash their points. The salient point, in short, would seem to be the avoidance of rash, unfounded methodological implementation of SEM. Freedman (1987) respected and accepted the work of Duncan (1967; 1975), which took stock of the assumptions inherent in the methodology, employed it to assess logically, theoretically, and empirically founded models, and drew reasonable conclusions thereof. His critiques, which have been widely used to demonize SEM as a technique, are, ostensibly, critiques of its fundamental (or at least overenthusiastic) misuse.

This study employs structural models based on decades of existing theory and empirical research, which are expanded through logic and previously observed relationships. Evidence and rationale for the linkages proposed are presented early on and built upon throughout the course of the study. The paths presented in the estimated models are then compared to those suggested by theory. And, while this study does not propose to make hard causal claims on the back of any model estimation presented, the persistent re-affirmation of many of the directional relationships under examination examined herein does increase the body of evidence in favor of the validity of their existence.

8.6 Further Discussion and Limitations

Several of the findings presented and discussed in previous sections were based on simple relationships. These findings offer basic and necessary insight into the relationships between various aspects of SE and both student characteristics and various measures of educational achievement. They arguably embody much of the common understanding of the relationship between student characteristics and SE, and SE and students' achievement. The simplicity of these examinations and their disregard of other, mitigating factors and processes makes them potentially misleading. Thus, in each case, these basic relationships were expanded into logistic, linear and structural models. The incorporation of SE and its characteristics into these models presents a more insightful picture into its function and allows for a more realistic evaluation of previous findings.

8.6.1 Effective Shadow Education Selection

Taken alone, the relationship between Group, Private, or concurrent Group and Private SE participation and Educational Achievement seems to indicate that students and their families are, in fact, investing in SE efficiently. The incorporation of SE participation into a model of educational achievement, however, alters the picture somewhat. Group SE appears to be, primarily, the purview of students from lower socioeconomic strata, higher achievers, and students from schools with overall lower academic performance. Private SE, on the other hand, appears independent of the common predictors of Overall and Group SE participation,

functioning as a vessel of educational mobility. However, if this were the case, then, given the substantive relationship between family background and educational achievement, surely effective SE participation would entail far higher participation in Private SE. Thus, it seems that, provisionally, at least, we must conclude that Greek students' choices regarding SE are not particularly effective.

It is important, however, to remember that, while school performance is likely perceived as a *de facto* benefit of SE participation, it is not perceived as its primary motivation. The motivation remains stronger performance on Panhellenic examinations, which this study could not examine.

8.6.2 Persistent Direct Effects

Educational Achievement is by no means a new field of study. It remains, as most social processes, an imperfect field. This is most clearly indicated by the persistence of a series of direct effects in the models examined above. It is important to recognize that perfect mediation is an unrealistic expectation. However, the fact that the majority of the effects of Previous Achievement and Significant Others' Influence, among the strongest predictors of Educational Achievement, persist as direct effects, is an indication that further expansion of existing theory is required. This study represents one step in that direction, presenting a new avenue for the mediation of a portion of their effects. Much, however, remains to be explained before the issue can be comfortably said to be truly understood.

8.7. An Examination of Heterogeneity of Effects in Shadow Education Participation using Inverse Propensity Score Weighting

As indicated in the main body of this study, the estimation of the linear and structural models was carried out under the assumption of homogeneity of effects. It is, however, possible that these effects are not consistent across treatment (i.e., those who participated in SE) and control (i.e., those who did not) groups. Propensity scores for SE participation were obtained in the course of the examination of the modal strategy informing SE participation. This section will employ propensity score weighting to estimate the causal effect of SE Participation on Educational Achievement and examine the assumption of homogeneity of effects held in previous model estimations. It begins by briefly addressing the subject of the estimation of the effects of a binary treatment on an outcome of interest and the methods used to do so. It presents the rationale behind the use of inverse propensity score weighting in this study, the estimation of the relevant weights, and briefly discusses the use of Weighted Least Squares regression, before presenting the results of the relevant analyses. The section closes with a brief discussion of the findings.

8.7.1 Introduction

The estimation of the causal effect of a binary treatment on a given outcome of interest is the fundamental goal of observational research across a number of disciplines (Hirano & Imbens, 2001; Hirano et al., 2003; McCaffrey et al., 2015). If assignment to such treatments is random, inferences of this sort can be relatively straightforward (Hirano & Imbens, 2001). Random

assignment, however, is not always possible, whether due to logistical or ethical considerations –for example in settings where conventional wisdom favors treatment over non-treatment or vice versa (Shadish et al., 2002). SE participation is a prime example of just such a case, with students overwhelmingly reporting participation in SE in order to better prepare for Panhellenic Examinations, which, in conjunction with the proportion of students strongly participating in SE, would seem to indicate a rather strong conventional belief that favors participating in SE.

The identification of true causal effects from non-randomized observational studies can often prove challenging, in part because treatment assignment mechanisms may be unknown (Hirano & Imbens, 2001). These unknown and potentially varied treatment selection mechanisms may correspond to variation in pre-treatment conditions, which in turn influence treatment related outcomes (Hirano & Imbens, 2001). Researchers often address this potentiality through the implementation of adjustment techniques including, though not limited to analysis of covariance models, gain score models, instrumental variables and propensity score models (for an in-depth discussion of these approaches see Shadish et al., 2002). Propensity score modelling functions under the assumption that the treatment assignment mechanism is a known function (Imbens & Rubin, 2015) and it is with this method that we will concern ourselves here.

Rosenbaum and Rubin (1983, p. 41) define the propensity score as the “conditional probability of assignment to a particular treatment given a vector of observed covariates”. In effect, it is a summary of the pre-intervention (or pre-treatment) conditions (Dehejia & Wahba, 1999). Rubin (2001) argues that the use of propensity score methods is advantageous because they allow the separation of the design of observational studies from the analysis of

the effect of exposure to treatment on the outcome of interest. Rosenbaum and Rubin (1983, 1985) showed that, assuming selection on observables, adjusting for differences in the propensity score between individuals who receive treatment and those who do not (i.e., the controls) removes all biases incurred by potential subpopulation differences. Under the same assumption and given that the range of propensity scores overlaps across treatment and control groups, Dehejia and Wahba (1999) found that propensity score methods can provide "a means to estimate the treatment impact" (p. 1062).

8.7.2 Propensity Score Methods

Intuitively, propensity score methods treat this conditional probability as a balancing score (Hirano & Imbens, 2001) with which, in one way or another, researchers can weight data, in order to balance treatment and control groups. There are, broadly speaking, four methods of weighting using propensity scores: Stratification on the Propensity Score, Propensity Score Matching, Propensity Score Regression Adjustment, and Inverse Propensity Score Weighting (Rosenbaum & Rubin, 1983; Rosenbaum, 1987). These are briefly discussed below.

8.7.2.1 Stratification on the Propensity Score

Random selection within strata ranks all observations based on their propensity scores, divides into quintiles, and selects equal sample sizes from treatment and control groups within each stratum (Rosenbaum & Rubin, 1983). Inferences are only made in the space where the distributions of the two groups overlap. Given the

uneven sizes of the subsamples of who did and did not participate in SE (i.e., the treatment and control groups, respectively) this would lead to the exclusion of a large portion of the study's data, making it a less than ideal approach.

8.7.2.2 Propensity Score Matching

Propensity score matching pairs one treatment observation with one control via an algorithm based on propensity score (Rosenbaum, 2002) or the logit of the propensity score (Rosenbaum & Rubin, 1985). The matching depends on the algorithm employed and can therefore result in sub-optimal pairing. To put this into context, Rosenbaum (2002) employs optimal matching, which Stuart (2010) points out will create well-matched pairs. However, Gu and Rosenbaum (2003) compared "greedy" and "optimal" algorithms and found that optimal algorithms can sometimes be only marginally better than their greedy counterparts. This is a potentially significant detriment, since greedy algorithms, while efficient in the creation of well-matched groups (Stuart, 2010), optimize one match at a time, instead of the whole system. Apart from the concerns regarding match quality, propensity score matching would also unavoidably result in disregarding large portions of the study's sample.

8.7.2.3 Regression Adjustment

Direct regression adjustment includes the propensity score as an additional covariate in the outcome model (assuming a linear relationship between propensity and

outcome). This method is preferable to stratification because it estimates treatment with lower variance than random selection within strata but similarly removes nearly all the bias (Rosenbaum & Rubin, 1983, 1984; D'Agostino Jr., 1998). However, the linear inclusion of the propensity score may dilute the effect of the treatment on the outcome of interest. This can be illustrated fairly succinctly. Let Y be the outcome of interest, X be the vector of covariates (or independent variables), T the treatment, and $P(z_T)$ the propensity to receive the treatment T. Thus, if the initial model of Y were:

$$Y = a + b_X X + b_T T + \varepsilon$$

then, following adjustment, it would become:

$$Y = a' + b'_X X + b'_T T + b_{P(z)} P(z) + \varepsilon'$$

Since $P(z)$ will likely be high for $T = 1$, then it is reasonable to assume that $b'_T < b_T$ meaning the effect of treatment will likely be underestimated by this adjustment.

8.7.2.4 Inverse Propensity Score Weighting

Inverse propensity score weighting (IPSW), also referred to as inverse probability of treatment weighting (IPTW), applies weights to each group inverse to the probability of the treatment they actually received (Imbens, 2000; see also Rosenbaum, 1987). This creates "a synthetic sample in which the distribution of the propensity measured baseline covariates is independent of treatment assignment" (Austin, 2011, p. 408). IPSW is discussed by Hirano and Imbens (2001) and closely resembles the

methodology proposed by Robins and Rotnitzky (1995). Intuitively, IPSW gives greater weight to treatment cases that resemble control cases (based on the set of covariates predicting the propensity to receive treatment) and vice versa. In its initial form (Imbens, 2000), IPSW entailed multiplying each treatment observation by $\frac{1}{P(z_T)}$ and each control observation by $\frac{1}{1-P(z_T)}$ for the estimation of the Average Treatment Effect (ATE). Inverse propensity score weighting uses all of the available data, can deal with more complex non-linear link functions and introduces, by and large, less bias than stratification (Lunceford & Davidian, 2004).

The potential shortfall of this method is apparent through simple mathematics, such that extreme values of $P(z_T)$ (i.e., $P(z_T) \to 0$ for treated cases and $P(z_T) \to 1$ for control cases) could result in very large weights (Austin & Stuart, 2015) tending asymptotically to infinite values. To address this issue, Robins et al. (2000) proposed the use of stabilizing weights, obtained by multiplying the reciprocal probability of receiving a given treatment (or not receiving it, in the case of the control cases) by the marginal probability of receiving the same treatment (Austin, 2016). The general formulae for the estimation of conventional and stabilized inverse propensity score weights are presented in Table 60.

This study employs Inverse Propensity Score Weighting, due to the existence of a model for the estimation of SE Participation propensity scores (see Baker et al., 2001), its prevalence in the relevant literature, and the relative ease of dealing with its potential shortcomings.

Table 60. Inverse Propensity Score Weights

	(A) Conventional	(B) Stabilized
ATE:	$W_{ATE} = T * \frac{1}{P(z_t)} + (1-T) * \frac{1}{1-P(z_T)}$	$W_{ATE} = T * \frac{P(T=1)}{P(z_t)} + (1-T) * \frac{P(T=0)}{1-P(z_T)}$
ATT:	$W_{ATT} = T + (1-T) * \frac{P(z_T)}{1-P(z_T)}$	$W_{ATT} = T * P(T=1) + (1-T) * \frac{P(T=0) * P(z_T)}{1-P(z_T)}$
ATU:	$W_{ATU} = T * \frac{1-P(z_T)}{P(z_t)} + (1-T)$	$W_{ATU} = T * \frac{P(T=1) * (1-P(z_T))}{P(z_t)} + (1-T) * P(T=0$

Source: Hernán & Robins, 2020.

The ATE, however, is not the only effect we can estimate, nor is it, necessarily, the only one we are interested in examining. While the ATE represents the average effect of treatment (or slope) over the entire sample, there is additional substantive value to the estimation of the average effect of treatment among the treated (ATT) and the average effect of treatment among the untreated (ATU). In more lay terms, Austin (2016) describes the ATE as the average effect of shifting the entire population from untreated to treated, and the ATT as the average effect of treatment on those who ultimately received treatment. Commensurately, the ATU represents what the average effect of treatment would be on those who did not receive treatment (i.e., the controls), were they to receive treatment (Wang et al., 2017). While the ATE is useful for the overall impact of a treatment, the estimation of all of the effects is useful for "the evaluation of treatments or interventions on those who received them, the presence of treatment heterogeneity, or the projection of potential outcomes in a target (sub-) population" (Wang et al., 2017, p. 1).

The estimation of these weights is, of course, dependent upon knowledge of the relevant propensity scores and, in the case of the stabilized weights, the marginal probability to receive treatment. In observational studies, however, propensity scores are unknown, *a priori*, and must be estimated. The propensity scores employed in this analysis are taken from the examination of the modal strategies associated with SE participation estimated in a previous chapter. The estimation of these scores was based on models proposed by Baker et al. (2001) with expansions given new and more comprehensive data. Although initially taken from previous research, the models employed nonetheless contain variables related to the outcome of interest (i.e., Educational Achievement) and confounders (related to both SE Participation and Educational Achievement), as suggested by Austin et al. (2007) and exclude instruments as proposed by Myers et al. (2011).

Since the propensity scores estimated using the model presented in Table 37 ranged from .01740 to .98972. To avoid inflated weights, and the instability and inflated standard errors they bring with them, the stabilized IPSW (see column B, Table 60) were used lieu of their conventional counterparts. The marginal probability of treatment (i.e., SE Participation) were estimated at $P(T = 1) = .857745$[47].

[47] As a result, of course, $P(T = 0) = 1 - P(T = 1) = 1 - .857745 = .142255$.

8.7.3 Assumptions of Propensity Score Methods

Cole and Frangakis (2009) list three assumptions sufficient for causal inference using of propensity score methods:

1. *Consistency*: An individual's potential outcome under their given background characteristics is the same as their observed outcome.
2. *Positivity*: A non-zero probability of receiving treatment (which, since probabilities are, by definition greater than zero, is equivalent to a "positive" probability).
3. *Exchangeability*: There are no unmeasured confounders (also referred to as ignorable treatment assignment).

Cole and Hernan (2006, p.656) include a fourth condition, that of "no misspecification of the model used to estimate the weights". However, as Austin (2016) points out, since the propensity score is a balancing score, and as conditioning on any such score will induce a balance, the specification of the model used to estimate the propensity score may well be impossible. Cole and Hernan (2006) also point out that the assumption of no unmeasured confounding cannot be formally tested[48]. The assumption of positivity is met, given the range of values taken by the propensity score. This leaves only the assumption of consistency.

Consistency is guaranteed by design in experimental studies and, likely as a result, is often overlooked in the literature (Cole & Frangakis, 2009). It will, moreover "rarely (if ever) be

[48] Austin (2016) proposes that empirical knowledge of the field may be the best practice to avoid violation of the assumption.

exactly true" (Cole & Frangakis, 2009, p. 4) in observational studies but caution against researchers ignoring gross violations of the assumption. Cole and Frangakis' (2009) informally explain consistency as defining the exposure to a treatment of interest such that it includes the causally relevant features. It is, of course, impossible to know with absolute certainty if this is the case. However, the model under examination is, fundamentally, guided by existing SE (and broader educational achievement) theory and should, as such be close enough to ensure that we have avoided any gross violation of the assumption.

8.7.4 The Estimation of Average Treatment Effects

The stabilized weights presented in Table 60 were applied to our sample in order to estimate the true average treatment effects across the entire sample, treated and control cases, using Weighted Least Squares (WLS) regressions. To compensate for bias due to clustering within schools, this was done employing SPSS' CSGLM function.

One of the most significant disadvantages of WLS regression is the assumption that the weights employed are known exactly. This is rarely if ever the case in empirical studies, necessitating the use of estimated weights instead. It is difficult to assess the impact of using estimated weights but small variations in the weights due to estimation should not affect a regression analysis or its interpretation (Carroll & Rupert, 1988). Nevertheless, the potential issue persists and necessitates care that WLS weights are estimated precisely, relative to one another (Carroll & Ruppert, 1988; Ryan, 1997).

WLS regression is also sensitive to the effects of outliers, which, if not investigated and dealt with appropriately, may negatively impact parameter estimation. In the estimation of the study's model, potential outliers were identified from a scatterplot of residuals and standardized predicted values. After discarding these outliers, the model was re-estimated and the estimated values were compared to the original model. This process was repeated iteratively with progressively more conservative samples. In the most conservative iteration, the estimated results correlated almost perfectly (ρ=.998, p=.000) with those of the model estimated using the complete sample[49].

The model used to estimate the ATE, ATT, and ATU of SE participation on Educational Achievement included all of the predictors of Educational Achievement presented in this study's structural models up to and inclusive of SE Participation. This is the model used to estimate the Total Effects of SE Participation on Educational Achievement, which has not been explicitly presented to this point, although the results of its estimation (and of others like it for all the intervening variables in the initial structural model) are present in Table 36. The results of the estimation of the ATE, ATT, and ATU are presented in Table 61.

The effect of SE Participation remains significant overall, as well as among both Treated and Untreated. There is, in other words, a statistically significant, positive total effect of SE

[49] The most conservative sample excluded 242 cases. The results of the estimation had the weakest correlation of all the iterations.

Participation on Educational Achievement, which was underestimated by 35% in the estimation of the structural models.

Table 61. IPSW WLS Regression Estimates of ATE, ATT, and ATC of SE Participation on Educational Achievement

	ATE **B(S.E.)**	*ATT* **B(S.E.)**	*ATU* **B(S.E.)**
Constant	.344(2.809)	-2.024(2.263)	4.382(4.746)
Family SES	.007(.032)	.000(.032)	.017(.054)
Gender	.170(.063)*	.171(.059)**	.211(.090)*
Ethnic Otherness	.058(.048)	.078(.045)	.009(.077)
Urbanicity	-.021(.110)	-.027(.100)	.074(.143)
Cultural Capital	.161(.076)*	.073(.036)*	.386(.085)***
Previous Ach.	.755(.076)***	.882(.048)***	.502(.087)***
School Comp.	.126(.122)	.133(.113)	.140(.218)
S.O.I.	.410(.048)***	.407(.047)***	.460(.052)***
Educational Exp.	.103(.048)*	.070(.036)	.147(.068)*
SE Participation	.238(.097)*	.215(.099)*	.280(.104)*
	R^2	**R^2**	**R^2**
	.650	.649	.629

*. Significant at the .05 level **. Significant at the .01 level ***. Significant at the .001 level

In a randomized control trial (RCT) the ATE, ATT, and ATU are, by design equal. While the ATE remains a weighted average of the ATT and ATU, this is not always the case in observational studies. Heckmann and Vytlacil (2001), for example, note that there is a substantial body of evidence that econometric models fit on individual level data often present heterogeneity in treatment, even after conditioning on observables. There is no evidence of such an imbalance in this study. Indeed, statistically speaking, both groups benefit/would benefit, respectively, from SE equivalently. This is an important finding, since it is important to remember that heterogeneity of treatment effects is not simply another name for variability in outcomes –a *de facto* aspect of any probabilistic enquiry. Heterogeneity of treatment regards, particularly, the non-random variability in the direction or magnitude of treatment effect, attributable to

individual, environmental, or treatment factors (Segal et al., 2012) and it is, as such, evidence of these characteristics that we have failed to find in our enquiry.

Nevertheless, this finding poses a series of interesting questions regarding both its interpretations and causes. For example, what effect would this knowledge have on those students who did not participate in SE? Although not all students who did not participate in SE gave a reason, those who did largely cited either lack of requisite economic wherewithal or no intention to sit Panhellenic exams and/or continue into higher education.

Given the levels of expenditure discussed previously (see Chapter 5.1.6 Shadow Education Cost), which often surpassed families' stated means, it is not inconceivable that families who perceived a greater or more definite benefit found ways to procure further funds[50]. Would students who had not participated in SE citing monetary difficulties attempt to procure extra funds, given the promise of increased returns? Would such students/families see the increased benefit as sufficient cause to reassess the potential returns from higher education?

What effect could this knowledge have on educational policy makers? As is the case in the U.S. (Brand & Xie, 2012), the widespread and deeply rooted Greek belief in the socioeconomic returns to educational achievement and attainment has been a driving motivation in both policy and personal level choices within Greek society for decades. Most, if not all of the research on the subject within a local context has been carried out under the normative

[50] As discussed previously, one potential source could, for example, be found in extended family such as grandparents, given the propensity for Greek households to contain three generations and the generally accepted perceived significance of higher education (higher or otherwise).

assumption of homogeneity in returns to investments in education. And indeed, this research seems to bear out that assumption.

There is, in short, a group of students who would benefit from SE participation but who do not, justifying their nonparticipation on economic grounds. The Greek government openly criticizes SE practitioners and laments their interference in the educational process, while at the same time officially and explicitly recognizing the function of SE institutions legislatively –thus tacitly accepting the role of SE in the educational process. Therefore, it could be argued that the Greek government, in some ways, serves educational reproduction by perpetuating the imposition of a structural impediment on certain students' education achievement. Of course, the argument is not entirely one sided; this could, for example, spark discourse regarding targeted, in school policies, classical educational tracks, or even expanded social tutoring (Greek: *Κοινωνικά Φροντιστήρια* [Kinonika Frontistiria] –a free-of-charge initiative at times inconsistently applied by some local municipalities during the recent ongoing recession).

The list of potential debates these results could spark is extensive, and strays far into the realm of theoretical speculation. Suffice it to say the results are both statistically and substantively significant and, arguably, the premise for future debate and enquiry.

8.8. Shadow Education and Educational Achievement by Ethnicity

The role of Ethnicity in the Educational Achievement process is a topic of ongoing debate. Not to detract from issues related to student ethnicity characterizing other locales but this is,

arguably, more evident in Greece than most Western countries as an expression of the relative novelty of large-scale ethnic and cultural heterogeneity in the country. Indeed, until the early 1990s, Greece considered itself (and arguably was) fundamentally ethnically homogeneous. As such, the country and its educational system were ill prepared for the influx of immigrants, and the heterogeneity they introduced to its classrooms from the early 1990s onwards. Indications of this are apparent in changes in tertiary Elementary Education department and continuing teacher education modules' curricula, which changed to include courses on multilingual-multicultural education and classes targeted at minority populations.

The extent to which such changes were successful in addressing the new heterogeneity in classrooms, however, is debatable. Analyses of data from the mid-2000s indicated that the process of educational achievement for students with non-Greek ethnicity had very little in common with that of Greek ethnicity students (see Figure 4). In fact, the process bore striking differences, diverging from that of Greek ethnicity students in fundamental ways (including, though not limited, to a complete lack of any effect of socioeconomic status on educational achievement) (Figure 4). The indications that the educational achievement process may function differently for Greek and non-Greek ethnicity students are not as strong in this study as they were previously. However, the significant total effect of Ethnicity on Educational Achievement (see Table 58) and its significant interaction with one of the two other exogenous variables in model, in conjunction with the previous findings, is a strong indication that there may still be significant deviation between the two groups.

Having already estimated the Average Treatment Effects for the overall sample and the Treated and Untreated cases therein, a basic assessment of one fundamental difference

becomes apparent when estimating the ATE, ATT, and ATU by student Ethnicity (see Table 62). Indeed, not only are the ATE, ATT, and ATU universally stronger within the subsample of students with Greek Ethnicity than those estimated in the overall sample (see Table 61), the effects of SE participation disappear when examining students of "Other" ethnicity.

Table 62. ATE, ATT, and ATU of SE Participation by Ethnicity

	ATE **B(S.E.)**	ATT **B(S.E.)**	ATU **B(S.E.)**
"Greek" Ethnicity	.279(.105)*	.252(.109)*	.355(.134)**
"Other" Ethnicity	.123(.151)	.105(.153)	.069(.170)

In light of this difference, it is tempting to simply re-estimate the corresponding structural model presented in the chapter 8.1 separately by ethnicity and comparing the results. However, while this might constitute a viable option for the sub-sample of 1116 ethnically Greek students, the estimation of such a complex structural model for the 392 ethnically "Other" students would be somewhat tenuous.

Alternatively, we employ a series of Reduced Form Equations to estimate the direct effects of each independent (i.e., exogenous and intervening) variable in the model (see Table 47) on Educational Achievement (Alwin & Hauser, 1975). The equations are estimated separately for students of Greek and "Other" ethnicity. The reduced form equations are a series of equations, structured such that they all have a common dependent variable (Educational Achievement), initially include only the exogenous variables in the model and progressively each of the following variables, in the order they appear in the structural model (see Table 63).

Table 63. Reduced Form Equations for the Educational Achievement Process

a. $GPA11 = F(FSES, SEX, RES)$
b. $GPA11 = F(FSES, RES, SEX, CULCAP)$
c. $GPA11 = F(FSES, RES, SEX, CULCAP, PACH)$
d. $GPA11 = F(FSES, RES, SEX, CULCAP, PACH, SCHCOMP)$
e. $GPA11 = F(FSES, RES, SEX, CULCAP, PACH, SCHCOMP, SOI)$
f. $GPA11 = F(FSES, RES, SEX, CULCAP, PACH, SCHCOMP, SOI, EDEX)$
g. $GPA11 = F(FSES, RES, SEX, CULCAP, PACH, SCHCOMP, SOI, EDEX, SE)$
h. $GPA11 = F(FSES, RES, SEX, CULCAP, PACH, SCHCOMP, SOI, EDEX, SE, EFFORT)$

This allows the estimation of each variable's total effects on Educational Achievement. Since it is unclear how the Educational Achievement Process may vary by ethnicity, Area of Residence and Cultural Capital are reintroduced in the reduced form equations, despite playing no significant role in the estimation of the structural models for the overall sample. Area of Residence was also one of the few variables dictated by theory that significantly affected ethnically "Other", previously (Katsillis, 2015). The estimation of the entire set of Reduced Form Equations, weighted by the IPSW and corrected for clustering bias, are presented in Table 64 for students of Greek Ethnicity and Table 65 for students of "Other" Ethnicity.

Table 64. Reduced Form Equations (Greek Ethnicity)

	Ed. Achievement **B(S.E.)**	*Ed. Achievement* **B(S.E.)**	*Ed. Achievement* **B(S.E.)**	*Ed. Achievement* **B(S.E.)**
Constant	17.215(.121)***	17.211(.120)***	-.506(1.502)	-3.732(3.178)
Family SES	.539(.061)***	.537(.062)***	.150(.047)**	.141(.049)*
Gender	.593(.093)***	.596(.093)***	.192(.084)*	.197(.085)*
Urbanicity	-.089(.173)	-.086(.173)	-.072(.114)	-.093(.110)
Cultural Capital		.022(.052)	.190(.108)	.195(.108)
Previous Ach.			.961(.078)***	.955(.077)***
School Comp.				.180(.133)
S.O.I.				
Educational Exp.				
SE Participation				
Student Effort				
	R^2	**R^2**	**R^2**	**R^2**
	.219	.221	.643	.645

Table cont'd on following page.

Table 64 cont'd

	Ed. Achievement B(S.E.)	*Ed. Achievement* B(S.E.)	*Ed. Achievement* B(S.E.)	*Ed. Achievement* B(S.E.)
Constant	-.360(3.018)	-.848(2.870)	-.901(2.813)	-.307(2.864)
Family SES	.029(.043)	.024(.042)	.032(.041)	.043(.044)
Gender	.140(.076)	.140(.076)	.135(.073)	.133(.073)
Urbanicity	-.076(.106)	-.069(.105)	-.068(.104)	-.058(.103)
Cultural Capital	.165(.096)	.167(.093)	.172(.091)	.165(.085)
Previous Ach.	.781(.082)***	.778(.081)***	.787(.081)***	.762(.081)***
School Comp.	.174(.127)	.178(.128)	.163(.126)	.150(.128)
S.O.I.	.498(.049)***	.406(.047)***	.389(.050)***	.345(.053)***
Educational Exp.		.114(.061)	.097(.061)	.076(.056)
SE Participation			.279(.105)*	.178(.112)
Student Effort				.013(.005)**
	R^2	R^2	R^2	R^2
	.708	.711	.712	.726

*. Significant at the .05 level **. Significant at the .01 level ***. Significant at the .001 level

The results of the robust estimation of the Reduced Form Equations on the weighted sample paint a picture refreshingly different to that previously estimated from data collected in the mid-2000s (see Figure 4). As one might expect, the total effects for students of Greek Ethnicity are largely in line with those estimated in the Initial structural model in both magnitude and significance (see Table 58) and, by extension, theoretical expectations. This is also largely the case for students of "Other" Ethnicity. There are, however, some interesting deviations, both from the initial structural model and the theory it represents but also between the two groups.

Table 65. Reduced Form Equations ("Other" Ethnicity)

	Ed. Achievement B(S.E.)	*Ed. Achievement* B(S.E.)	*Ed. Achievement* B(S.E.)	*Ed. Achievement* B(S.E.)
Constant	16.621(.193)***	16.633(.191)***	.260(1.389)	-3.612(4.501)
Family SES	.569(.101)***	.562(.102)***	.072(.07)	.063(.069)
Gender	1.130(.199)***	1.116(.196)***	.442(.131)**	.447(.127)***
Urbanicity	-.126(.211)	-.122(.211)	.175(.149)	.173(.152)
Cultural Capital		.131(.116)	.111(.083)	.114(.085)
Previous Ach.			.907(.074)***	.895(.071)***
School Comp.				.221(.223)
S.O.I.				
Educational Exp.				
SE Participation				
Student Effort				
	R^2	R^2	R^2	R^2
	.176	.178	.629	.630

Table cont'd on following page.

Table 65 cont'd

	Ed. Achievement B(S.E.)	*Ed. Achievement* B(S.E.)	*Ed. Achievement* B(S.E.)	*Ed. Achievement* B(S.E.)
Constant	3.123(3.772)	2.987(3.755)	2.785(3.728)	2.525(3.661)
Family SES	-.066(.065)	-.064(.065)	-.064(.063)	- .063(.061)
Gender	.306(.122)*	.297(.115)*	.299(.114)*	.294(.104)**
Urbanicity	.098(.141)	.065(.136)	.062(.137)	.061(.136)
Cultural Capital	.124(.079)	.107(.076)	.111(.077)	.103(.078)
Previous Ach.	.711(.080)***	.694(.080)***	.697(.081)***	.672(.083)***
School Comp.	.049(.176)	.045(.177)	.049(.174)	.087(.179)
S.O.I.	.542(.077)***	.461(.096)***	.456(.095)***	.409(.094)***
Educational Exp.		.127(.091)	.120(.095)	.072(.086)
SE Participation			.123(.151)	-.099(.153)
Student Effort				.019(.005)***
	R^2	**R^2**	**R^2**	**R^2**
	.686	.687	.689	.693

*. Significant at the .05 level **. Significant at the .01 level ***. Significant at the .001 level

The collected total effects of both groups, excluding full model estimates, (see Table 66), make both the deviations and commonalities clearer. Although we are most interested in the differential total effects of SE participation, the most noteworthy deviation from established theory is arguably evident in the lack of any significant effect of students' Educational Expectations on either group's Educational Achievement, when examined separately.

It is, however, also one of a number of notable commonalities; Cultural Capital, Area of Residence, School Academic Composition and students' Educational Expectations have no total effect on Educational Achievement. The magnitude of the (statistically significant) total effects of Family Socioeconomic Status, Previous Achievement, and SOI for ethnically "Other" students differ only slightly from those of their Ethnically Greek counterparts. The total effect of Gender is significant for both groups but is nearly twice as large for students of "Other" Ethnicity. Ethnically "Other" female students receive grades, on average, approximately 1.1 of a grade point (on the aforementioned 0-20 point scale) higher than their male counterparts (compared to a respective difference of approximately .6 points for their ethnically "Greek"

counterparts). More tellingly, while SE participation appears to have no effect on educational achievement for Ethnically "Other" students, the total effect of their Effort is nearly one-and-a-half times that of their ethnically Greek counterparts

Table 66. Total Effects for Students of Greek and "Other" Ethnicities

	GREEK	OTHER
	B(S.E.)	**B(S.E.)**
Family SES	.539(.061)***	.569(.101)***
Gender	.593(.093)***	1.130(.199)***
Urbanicity	-.089(.173)	-.126(.211)
Cultural Capital	.022(.052)	.131(.116)
Previous Ach.	.961(.078)***	.907(.074)***
School Comp.	.180(.133)	.221(.223)
S.O.I.	.498(.049)***	.542(.077)***
Educational Exp.	.114(.061)	.127(.091)
SE Participation	.279(.105)*	.123(.151)
Student Effort	.013(.005)**	.019(.005)***

For all the commonalities currently observed, educational achievement still presents significant differences between the two groups. Average achievement for ethnically "Other" students is almost half a grade point lower than the average achievement of their ethnically Greek counterparts (Mean dif.=.406, t=4.256, p=.000). Notably, it is also lower than that of male Greek students (m_{GPA}=17.2122), who in turn perform worse than their female peers. However, each hour of effort ethnically "Other" students invest shows almost 50% higher returns than it does for their ethnically Greek counterparts.

It is perhaps not entirely unexpected that SE participation does not have the same effect for ethnically "Other" and ethnically Greek students, given the lower average investment on their part observed in almost all aspects of the process. Since, however, ethnically "Other" students did invest in SE participation, its lack of association with their Educational Achievement raises new questions: Are they not investing enough or on the correct aspects

of SE? Do ethnically "Other" receive different treatment within schools, altering the effectiveness of their investments in SE? Are there other factors (potentially within the home) which otherwise interact with their investment in SE which change its function for these students? These questions are, for better or worse, beyond the scope of this particular inquiry but given the deviations shown in the overall educational achievement process between the two groups, arguably indicate the need for further, focused study into the differences between the two groups.

Regardless, the comparison of the Total Effects between ethnically Greek and ethnically "Other" students presented above paints a picture at once both concerning and reassuring. When compared to previous examinations of the educational achievement process for ethnically "Other" students, the reality presented by these results presents an educational reality much closer to that experienced by the majority of students than was once the case. This arguably indicates significant progress on the part of the part of the Greek educational system and its educators.

While substantial steps in the right direction appear to have been made, there is still much work to be done before the two groups' educational realities can be said to be truly equivalent. One could argue that the educational system is very close to providing equal opportunities to both groups, since the mechanisms representing the conventional educational system and established educational processes appear to function in a roughly equivalent manner for both groups.

The approximation of equivalency and equivalency itself are, of course, very different things. The reality of the situation involves an effective doubling of the gender gap and a complete absence of any effect of SE participation on students' achievement for students of other ethnicity. These significant and substantial deviations of just over a quarter of the sample from the majority students' population indicate areas in which the function of the Greek educational system persists, in some way, to fail in realizing its presumed egalitarianism.

The underlying motivations of these differences may well be beyond the scope of this particular study. It may be the case that, much like formal Greek education, SE practitioners and institutions have been less diligent to adapt their curricula to conform to the multicultural classroom. It may also be a combination of the significantly lower Family Socioeconomic Status and Parental Educational Expectations of ethnically "Other" students. In such family environments, male students may be urged into the workforce earlier or more readily than their female counterparts, for whom extended education may appear to be a more viable avenue for future earnings. These explanations are, of course, little more than logical conjecture, based on observed differences. The existence of these persistent substantive differences, however, is not. Indeed, their persistence is arguably impetus for more extensive focused future research on the topic, in hopes of eventually closing the already diminished gap between ethnically Greek and "Other" students.

9. Summary, Conclusions, and Recommendations

9.1 Summary

The main goal of this study was to examine the role Shadow Education plays in the process of educational achievement in Greece within an educational and social reproduction framework. A working model was established to assess the role of SE in the educational achievement process based on established theories and previous research findings (see Figure 5). The working model includes SE towards the end of a unidirectional causal chain leading from differential student background characteristics to differential educational achievement. This was then expanded to include the two distinct formats of SE prevalent in Greece (Private and Group –see Figure 24), and later students' Average SE Quality (see Figure 26).

Data from 1508 students in the final year of Greek Upper Secondary education were used to estimate this model. The sample was selected from all Greek Upper Secondary school students using a single stage stratified cluster sampling technique. The relevant information was obtained through one questionnaire administered to students of the sampled high schools. Missing data was imputed using Full Information Maximum Likelihood. The model was estimated as a whole by Ordinary Least Squares Regression Analyses, following bootstrapping to enable the estimation of robust standard errors. A summary of the findings of the Initial, Expanded and Final Models are presented in Figure 23, Figure 25, and Figure 27 respectively.

The analysis suggested that SE Participation and Group SE Participation in particular mediate a proportion of the significant effect of differential background characteristics on students' Educational Achievement. The same is true for SE Quality and Student Effort. Indeed, Student Effort, which was a compound measure, including and often primarily composed of students' SE-related effort, was the third strongest predictor[51] of students' Educational Achievement in the Final Model.

It is arguably worth noting that the term "Final" applied to the third structural model examined in this study does not imply that it is the ultimate representation of the either the educational process in Greece or the role of SE therein. Rather the term is employed to convey the fact that this is the most viable representation of reality corresponding to a specific theoretical design and its subsequent estimation using a particular set of data. Whether or not this is, indeed, the best representation of the role of SE in the educational achievement process cannot be determined by this, or any, study alone. The underlying model of educational achievement is the result of a rich theoretical tradition, which has been tested and expanded within the Greek context. SE was included according to logic and interpretation of existing research. The ultimate validity of the models employed herein can only be determined through replication and comparison to alternative implementations. This study proposed several such alternatives, including though not exclusively through multiple operationalizations of SE; we expect still more alternatives to be proposed in the future.

[51] The strongest was students' Previous Achievement, followed by the Significant Others' Influence.

It is, moreover, worth remembering that this study was a predominantly quantitative undertaking with a limited in-depth focus on students' beliefs regarding SE. There are several facets of this research that could benefit from qualitative inquiries into views and beliefs of students, their families, their schools or their teachers and the deeper, more personal insights they can often elicit. Such information may contextualize and inform quantitative findings, potentially leading to more relevant questions or question-wording. This, in turn, may provide additional understanding of the relationships and mechanisms surrounding SE and possibly even to the discovery of completely new pathways through which it can affect students' educational achievement and other, later outcomes.

9.2 Conclusions

The central objective of this study was to examine the role of SE in the educational achievement process in Greece. To this end, several integrant questions were asked. Does SE depend on students' background characteristics? Does it affect students' educational achievement? Is SE a major mechanism of educational, and thus social, reproduction? Do students participate in SE for the purposes of remediation or enhancement? Which students stand to gain the most from SE participation?

Does SE depend on students' background characteristics? Certainly. All of the measures of SE participation examined in this study were significantly associated with students' Family Socioeconomic Status, Area of Residence, Gender, and Ethnicity. Students who participate in SE come from higher SES families, regardless of the type of SE they participate in. Students

living in urban locales spent significantly more time in more Group and Private SE courses of higher quality, while also spending more money on SE than their rural counterparts. These findings were not, perhaps, particularly surprising. SE comes at a cost of both time and money, making it more accessible to students from higher SES families. SE is also more readily available in metropolitan areas and their direct surroundings. Differences by gender and ethnicity were, perhaps, somewhat more interesting. On one hand, female students participated in significantly more, higher quality, and invested more hours of Effort studying for SE than their male counterparts. Ethnically "Other" students, on the other hand, invested significantly less in SE across the board, participating in fewer and lower quality SE courses than their ethnically "Greek" counterparts, beginning SE later in life, spending less money and investing less effort in SE.

Does SE affect students' educational achievement? Yes. SE participation corresponds to a significant increase in students' grades. This effect is entirely mediated by the quality of SE students participate in and the amount of effort they invest in their studies –meaning that the effect of SE participation appears to depend on not only tutorial delivery but also students' own motivation(s). More interesting perhaps is the fact that, when broken down into its component types, *Private* SE participation does not affect students' achievement. This is surprising, given the higher costs and prevalent perception of greater effectiveness associated with Private SE. A partial explanation may be found in the complete mediation of the effects of Group SE through Student Effort. Group SE courses position students in groupings resulting in competitive peer pressure. This pressure could, in turn, result in greater investiture of effort and thus higher student achievement.

Is SE a major mechanism of educational reproduction? SE functions as a mechanism of educational reproduction although arguably not a major one. There were three prerequisites for SE to function as a major mechanism of educational reproduction (see Section 2.1 Primary Questions Examined in this Study). The first was that SE had to be significantly affected by students' background characteristics and also significantly affect their educational achievement. As discussed above, both of these conditions were met. The second prerequisite was that the model in which the role of SE was examined be reasonably comprehensive –a condition ensured by the models' definition based on an extensive research tradition (see Section 4.5 Discussion and Theoretical Justification of the Study's Models). The third and final prerequisite was that SE mediate a major portion of the effect of social background on educational achievement. In total, however, the statistically and substantively (i.e., non-zero) paths including SE measures comprised only a small portion of the total indirect effect of Family Socioeconomic Status on Educational Achievement. In short, while it appears that SE does function as a mechanism of educational reproduction, it is not the most important one.

Do students participate for the purposes of remediation or enhancement? The primary motivation underlying SE participation appears to depend on what point in their academic careers SE participation starts. Students who first participate in SE in lower secondary education pursue a mixed modal strategy (i.e., participate concurrently for both enhancement and remediation purposes). Those who begin in upper secondary education do so for enhancement purposes. Both are significant findings, since previous research has been interpreted to imply that SE usage in Greece is motivated by considerations of remediation

or show significant enough levels of remedial usage to warrant special mention. Students, however, overwhelmingly reported their motivation for participation in SE as being oriented toward better preparation for the Panhellenic Examinations. Courses specifically related to these exams do not appear in the curriculum until upper secondary education and become more specialized as students approach its end. We would, therefore, expect that, as students approach this point in their academic careers, their motivations would become more focused and, based on their own claims, enhancement oriented.

Which students stand to gain the most from SE participation? We can speak with some confidence regarding the causal relationship between SE participation and educational achievement and it is worth pointing out that the magnitude of this relationship is consistent across the student population. From an analytical standpoint, this is rather surprising, since regression analysis provides us with average effect estimates, even if it has been the almost universally accepted assumption in relevant analyses. We can, however, extract substantively significant information from the affirmation of this assumption of homogeneity of effect. A rational-behavioral model, for example, tells us that we should expect that those individuals who are most likely to participate in SE should also be those who would benefit the most from it. We did not find this to be the case. Indeed, all students, from those most to those least likely to participate in SE would seem to reap the same benefits (actual or hypothetical) from said participation.

This finding could have important social and educational policy ramifications. The differential rewarding of students' achievement functions as a mechanism of educational reproduction which in large part may cleverly mask the reproduction of differential background

characteristics behind a widely accepted perception of meritocracy. However, given the hypothetical benefit to those students who did not participate, it may also stand out as a clear structural impediment to their educational (and thus later status) achievement. This raises concerns regarding the presumed egalitarian nature of the educational system, affecting its ability to smoothly function as a means for social mobility. These concerns become even more salient when one takes into account that SE institutions are recognized and sanctioned by the Greek government.

Propensity to participate in SE is not the only factor which affects returns to SE participation, though. There are also noteworthy differences by ethnicity in both the achievement process and the function of SE. The most noteworthy differentiation seems to be that ethnically "Other" students do not appear to benefit from participation in SE. It should be noted at this point that efforts have been made to equalize the educational realities of ethnically Greek and "Other" students compared to the state of affairs in the early 2000s (see Figure 4). Indeed, at first glance, the official aspects of the educational system appear largely indistinguishable. However, they only appear to be so. The Gender achievement gap is almost doubled for students of "Other" ethnicity. Ethnically "Other" students' return to effort is also nearly 1.5 times that of their ethnically Greek counterparts. There are, in short, several substantial differences between the majority and minority student populations, which appear to motivate differences in regards to both the official and "shadow" educational realities.

9.3 Recommendations

No study is perfect and even the best study benefits from replication and theoretical expansion. This research is no different; future research on the topic of SE in Greece may clarify and will either validate or challenge some of its findings. At the same time, future studies could also benefit from the research findings and the conclusions of this study.

The findings and the experience gained from this research suggest the need for a more in-depth study which also includes the proprietors of Group SE institutions. This would allow cross-validation of students' claims regarding SE costs, number of courses, and intensity. Moreover, it would provide insight into the proprietors' specific motivations and teaching strategies as well as their perception of their students' motivations.

Another arguably beneficial in-depth follow-up study could focus on students who participated in Private SE. It is, as we discussed previously, historically harder to retrieve specific information regarding Private SE. Its lack of effect on students' educational achievement remains perplexing, however, and arguably warrants further examination. It may be that the use of students' Panhellenic Examination grades presents a different picture. While students' achievement at the end of secondary education is the strongest predictor of said grades, it is not clear if the function of SE is consistent in relation to upper secondary education GPAs and Panhellenic Exam grades. Indeed, while we expect that at least part of the effect of SE on Panhellenic Exam grades is mediated by students' upper secondary education GPAs, we cannot be sure without formally examining the relationships.

Many of the relationships and processes presented in this study have been previously examined in the Greek context. Indeed, this study in large part based its theoretical models on pre-existing research. In doing so, it replicated aspects of previous studies, further validating or challenging their findings. Future replications and expansions are key to establishing the validity of the effects, and relationships, suggested in this study. Ideally, we would like to see a future expansion of this study to follow a cohort of students throughout, at the very least, secondary education. The longitudinal data collected by such a study could provide a more detailed picture of the educational process, minimize the chance of recollection bias on the part of respondents, and lend further credence to causal claims regarding the relationship between SE and educational achievement.

There is an ongoing debate regarding a consistent measure of SE for international comparisons. This search for such a measure is particularly significant given the different characteristics and metrics of SE from country to country. Indeed, it is unclear at this point if such a comparison can be made in a meaningful manner. Studies like this one, which present as many measures of SE participation as possible in any given country, as well as their relationships with both students' background characteristics and educational outcomes may be a necessary step forward. They provide invaluable information stores which, taken in concert with equivalent stores from other countries may provide useful insight into a universal measure.

In some respects, this study was only one early step in a long process of the broader, cross-national examination of the role of SE in the educational achievement process. As SE becomes more prevalent in Western countries, it is incumbent upon us to examine not only the

continued validity of this study's findings regarding the process through which SE transforms students' background characteristics into differential educational achievement but also whether this process remains consistent across multiple settings.

It is, finally, worth acknowledging that Greece is, in some respects, a singular case, in terms of SE. Greece is characterized by exceedingly high levels of participation, spanning several decades, widely recognized and clearly defined distinctions between organized Group and Private tuition, and a nearly universal self-proclaimed motivation behind participation in SE – among other things.

The persistent global expansion of the SE phenomenon makes these findings particularly salient. As a growing number of students participate in SE in an increasing number of countries, the realities of an educational system with such widespread SE use become increasingly relevant. Some of this study's findings may not be directly applicable to other national contexts (Western or otherwise). However, given the similarities between Greece and those East-Asian locales which show high levels of SE participation but also Egypt, Mauritius, and India, to name but a few, it seems more than reasonable to assume that, as SE becomes more prevalent, certain core characteristics become apparent across cases. In this light, findings extrapolated from the case of Greece, with its current and historical high levels of SE participation in a Western setting may provide valuable signposting for what the future may hold for other Western locales.

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Appendix A: The Study's Questionnaire [English Translation]



DEPARTMENT OF
SOCIOLOGY



Department of Sociology

University of Oxford

QUESTIONNAIRE FOR STUDENTS IN THE 3RD YEAR OF THE GENERAL LYCEUM

In partial completion of the requirements of a doctoral dissertation on the subject of:

FACTORS AND PROCESSES OF EDUCATIONAL AND SOCIAL STRATIFICATION IN GREECE: THE ROLE OF SHADOW EDUCATION

by Michail Katsillis

(Doctoral Candidate)

No page number in original.

LETTER TO 3rd YEAR LYCEUM STUDENTS

Dear Student,

My name is Michael Katsillis and I would like to ask you to complete the following questionnaire as honestly as you can. This questionnaire is part of a study entitled: "**Factors and processes of Educational and Social Stratification in Greece: The Role of Shadow Education**". This research is being carried out as part of studies to obtain a Doctorate of Philosophy, from the Department of Sociology of the University of Oxford[52], with the approval of the Institute for Educational Research and the Directorate of Secondary Education of the Ministry of Education, Research and Religions.
This study attempts to examine the role played by shadow education in the educational achievement process in Greece. It examines its role concurrently with many other factors and processes through which previous studies have shown socioeconomic differences are translated into differential achievement.
To successfully complete this study, I need your sincere answers to this questionnaire and your Panhellenic Examinations grades. I would like to point out that I will do my utmost to keep this information confidential, throughout the course of the study. Completed questionnaires will be returned to me via registered post and stored under lock and key. **No one but me** will have access to raw data. Furthermore, your *personal* information will NEVER be presented ANYWHERE. It will only be used in order to obtain information on your Panhellenic Examinations. The remaining, anonymized hardcopy data will be kept for a minimum of three years. Digital data will be kept on secure university servers and in a password protected folder on an encrypted drive, in an anonymized data file, to which only I and my supervisor will have access. Data collected via this questionnaire will only be used for statistical analysis in conjunction with your grades in the Panhellenic Examinations and the other questionnaires. Upon its successful submission, the thesis will be deposited both in print and online in the University archives, to facilitate its use in future research. The thesis will be published open access (available to the public)
To participate in this study, you must be at least 16 years old. Obviously, your participation in this study is completely optional. If, having read this letter, you wish to not proceed with the study, you may do so at any time, by simply letting the teacher responsible for your class know. However, **completion of this questionnaire and collection of the Panhellenic Examinations data is essential for the administration and success of this study**, and it is for this reason I ask you to take the small amount of time (approximately 40 minutes) required to complete the attached questionnaire. Please treat the questionnaire carefully and, if possible, **do not leave any questions unanswered**. Also, your answers should be as honest and accurate as possible. Completing this questionnaire, sealing it in the blank envelop provided with it, and returning it to the teacher responsible for your class confirms your consent to participate in this study and the use of your grades in the Panhellenic Examinations. Your help is truly invaluable and, for this reason, I am truly grateful.

Before you begin completing the questionnaire, please carefully read the following instructions.

QUESTIONNAIRE COMPLETION INSTRUCTIONS

On the following pages, you will find some simple questions regarding everyday social and school life, as well as some basic demographic information about you and your families. Some of these questions ask about events which have occurred, while others ask you to provide your personal opinion. Please read the questions carefully and answer with as much care and accuracy as possible. If there is something you don't understand or are unsure how to answer, please do not hesitate to ask for help from the teacher in charge. Most questions have a set of likely answers below or to the side to be marked in an accompanying box. For these questions, you need only **tick the box of the answer you wish to select**. In other questions where you will be asked to write a number or date, you can respond using either numbers or words. If you have any other questions relating to questionnaire completion, you may ask the teacher responsible for your class.
For any other related concerns, please do not hesitate to contact me in the first instance either via email, at michail.katsillis@sociology.ox.ac.uk or by telephone at: 2610.997769 or 6974.905859. I will attempt to acknowledge your concern within 10 working days and give you an indication of how I intend to deal with it. If you remain unhappy or wish to make a formal complaint, please contact the relevant chair of the Research Ethics Committee at the University of Oxford who will seek to resolve the matter in a reasonably expeditious manner: Chair, Social Sciences & Humanities Inter-Divisional Research Ethics Committee; Email: ethics@socsci.ox.ac.uk; Address: Research Services, University of Oxford, Wellington Square, Oxford OX1 2JD

Thank you for your cooperation and your valuable contribution to the completion of this study.

Kind Regards,
MICHAIL KATSILLIS (Doctoral Candidate)

[52] This study has received ethical clearance through the University of Oxford's ethical approval process. (Ref. SOC_R2_001_C1A_17_02)

1. Are you a boy or a girl;
Tick only one box.

	Boy		Girl

2. When were you born?
Write your date of birth, in DD/MM/YYY format (e.g., 17/11/2000).

Date of Birth	DD	MM	YYYY

3. A. Were you born in Greece?
Tick only one box.

	No		Yes

B. If you WERE NOT born in Greece, what country were you born in?
Write the country of your birth:

I was born in _____

4. What is your nationality;

	Greek		Other (write which): _____

5. A. Were your parents born in Greece?
Tick only one box for each parent.

Mother				Father			
	No		Yes		No		Yes

B. If one of your parents was NOT born in Greece, in what country were they born?
Write the name of the country:
My mother was born in _____

My father was born in _____

6. How often do you speak the Greek language in your home?
Tick only one box.

Never	Sometimes	Almost Always	Always

7. Where is your permanent residence located?
Tick only one box.

	In a geographically isolated area
	In a village or agrarian area
	In a suburb
	In the city

8. What is the highest level of education completed by your mother and father?
Tick only one box in each column.

		Mother	Father
a.	Completed a few grades of Primary Education		
b.	Graduated from Primary Education		
c.	Completed a few grades of the three-year Gymnasium		
d.	Graduated from the three-year Gymnasium		
e.	Completed some grades from the six-year Gymnasium or the Lyceum		
f.	Graduated from the from the six-year Gymnasium or the Lyceum		
g.	Graduated from a Vocational or Technical School following Gymnasium or Lyceum		
h.	Graduated from a Higher Educational Department (A.T.E.I.)		
i.	Studied some years at University		
j.	Graduated from University		
k.	Completed Graduate Studies		

9. What is your parents' occupational status?
Tick only one box in each column.

		Mother	Father
a.	Regularly Employed		
b.	Employed Intermittently		
c.	Unemployed		
d.	Not working but not unemployed		
e.	Pensioner		
f.	Deceased		
g.	Don't Know		
h.	Prefer not to say		

10.A. What is or was (if he is presently not employed or is deceased) your father's occupation?
Describe her profession in as much detail as possible: e.g., employee in a private company or employee at United Utilities:

_____

[ ] Don't Know [ ] Prefer not to say

B. Did he have a different job before the economic crisis?

Yes	No	Don't Know	Prefer not to say

C. If so, what was your father's occupation before the economic/debt crisis?
Describe her profession in as much detail as possible: e.g., employee in a private company or employee at United Utilities:

_____

[ ] Don't Know [ ] Prefer not to say

11. A. What is or was (if she is presently not employed or is deceased) your mother's occupation?
Describe her profession in as much detail as possible: e.g., employee in a private company or employee at United Utilities:

_____

[ ] Don't Know [ ] Prefer not to say

B. Did she have a different job before the economic crisis?

Yes	No	Don't Know	Prefer not to say

C. If so, what was your mother's occupation before the economic/debt crisis?
Describe her profession in as much detail as possible: e.g., employee in a private company or employee at United Utilities:

_____

[ ] Don't Know [ ] Prefer not to say

12.A. In their main occupation your parents are:
Tick only one box in each column.

		Mother	Father
a.	Employer (self-employed with own employees)		
b.	Self-employed without own employees		
c.	Waged employee in public sector or in a service that depends on the public sector (e.g., United Utilities, BT etc.)		
d.	Waged Employee in the private sector		
e.	Don't know		
f.	Prefer not to say		

B. If one of your parents works for someone else (e.g., in a public or private sector enterprise), are they tasked with overseeing other individuals;
Tick only one box for each parent.

Mother			
	No		Yes

Father			
	No		Yes

C. If one of your parents is an employer, how many staff do they permanently employ?
Write a number in each box:

Mother	

Father	

13. What is your parents' monthly income?
Write each of your parents' income separately:

Mother		Father	

If you don't remember exactly how much, please answer how much their monthly income is approximately, by selecting one of the following categories, *ticking only one box for each parent:*

		Up to 500	501-1000	1001-1500	1501-2000	2001 or more	D/K	PNTS
a.	Mother							
b.	Father							

14. A. Do you plan on continuing your education after high school?
Tick only one box.

	No		Yes

B. If you answered yes to the previous question, where do you plan on continuing your education?
Tick only one box.

	In Greece		Abroad

15. What educational level do you BELIEVE you will have reached when you are 30 years old?
Tick only one box.

a.	I will have graduated high school	
b.	I will have completed a private school	
c.	I will have a degree from an A.T.E.I.	
d.	I will have a university degree	
e.	I will have completed graduate studies	

16. What job do you believe you will have when you are thirty years old?
Write the occupation:

_____

17. What is the highest level of education your parents believe you *are capable* of reaching?
Tick only one box.

a.	Graduate from high school	
b.	Complete a private school	
c.	Get a degree from an A.T.E.I.	
d.	Get a university degree	
e.	Complete graduate studies	

18. What educational level does your best friend believe they will have reached when they are 30 years old?
Tick only one box.

a.	They will have graduated from high school	
b.	They will have completed a private school	
c.	They will have a degree from an A.T.E.I.	
d.	They will have a university degree	
e.	They will have completed graduate studies	

19. What is the highest level of education your teachers believe you *are capable* of reaching?
Tick only one box.

a.	Graduate from high school	
b.	Complete a private school	
c.	Get a degree from an A.T.E.I.	
d.	Get a university degree	
e.	Complete graduate studies	

20. What job do your parents believe your *will have* when you are 30 years old?
Write the occupation:

_____

21. What job does your best friend believe they will have when they are thirty years old?
Write the occupation:

_____

22. Is your best friend in your class?
Is your best friend a student in your school's 3rd year Lyceum cohort? Tick only one box.

	No		Yes

23. Consider your most highly educated relative and adult acquaintance. What are their levels of education?
Tick only one box in each column.

		Relative	Acquaintance
a.	Completed a few grades of Primary Education		
b.	Graduated from Primary Education		
c.	Completed a few grades of the three-year Gymnasium		
d.	Graduated from the three-year Gymnasium		
e.	Completed a few years of the six-year Gymnasium or the Lyceum		
f.	Graduated from the six-year Gymnasium or the Lyceum		
g.	Graduated from a Vocational or Technical School following Gymnasium or Lyceum		
h.	Graduated from a Higher Education Department (A.T.E.I.)		
i.	Studied some years at University		
j.	Graduated from University		
k.	Completed graduate studies		

24. What is there occupation; **Relative** _____ **Acquaintance** _____
Write the occupation for each:

25. Which of the following statements is true;
Tick only one box.

a.	My parents want me to study in higher education	
b.	My parents do not want me to study in higher education	
c.	My parents do not care if I study in higher education	
d.	My parents will not allow me to study in higher education	

26. Which Group Orientation (Educational Track) did you select in the Third Year of Lyceum?
Tick only one box.

a.	HUMANITIES STUDIES Group Orientation	
b.	POSITIVE STUDIES Group Orientation	
c.	ECONOMICS AND COMPUTER STUDIES Group Orientation	

27. A. Have you ever attended tutorial classes (apart from foreign language/ music)?
Tick only one box.

a.	At frontistirio	
b.	One-to-one lessons	
c.	Both of the above	
d.	None of the above	

B. If you attended neither frontistirio, nor one-to-one tutorials, write why:

_____

28. When did you first start attending tutorial classes?

_____

29. What is the primary reason you attended/attend tutorial lessons (in the third year of lyceum)?
Tick only one box.

a.	To cover knowledge gaps	
b.	To better prepare for Panhellenic examinations	
c.	To better prepare for school examinations	
d.	To better consolidate subjects I have been taught at school	
e.	To pass the course	
f.	My parents made me	
g.	Other:	

30.	Complete the table below by filling in the courses in which you have attended tutorial lessons (in a **group frontistirio**), the TOTAL number of months you attended, how many hours you attended each week and how many classmates you had, in each.			
	Tutorial Lesson (Group Frontistirio)	**TOTAL Months of Attendance**	**HOURS of Attendance per Week**	**Number of Classmates in the Course**
a.				
b.				
c.				
d.				
e.				
f.				
g.				
h.				

31.	What was the **reputation** of the frontistirio you attended, for each of these courses? *Tick only one box in each row.*				
	Average	**Above Average**	**Good**	**Very Good**	**Perfect**
a.					
b.					
c.					
d.					
e.					
f.					
g.					
h.					

32.	How much did you pay PER MONTH for each of these courses; *Write the amount paid for each course in the relevant box:*
	Cost per MONTH
a.	
b.	
c.	
d.	
e.	
f.	
g.	
h.	

33.	Complete the table below by filling in the courses in which you have attended (**one-to-one**) tutorial lessons, the TOTAL number of months you attended, how many HOURS you attended each week, and how many classmates you had in each.			
	Tutorial Lesson (One-to-One Lessons)	**TOTAL Months of Attendance**	**HOURS of Attendance per Week**	**Number of Classmates in the Course**
a.				
b.				
c.				
d.				
e.				
f.				
g.				
h.				

34.	What was the **reputation** of your tutor, for each of these courses? *Tick only one box in each row.*				
	Average	**Above Average**	**Good**	**Very Good**	**Perfect**
a.					
b.					
c.					
d.					
e.					
f.					
g.					
h.					

35.	How much did you pay PER HOUR for each of these courses? *Write the amount paid for each course in the relevant box:*
	Cost per HOUR
a.	
b.	
c.	
d.	
e.	
f.	
g.	
h.	

36. How often do you discuss each of the following with one of your parents?
Tick only one box in each column.

		Rarely	Almost once a month	Almost once a week	Almost Every Day
a.	School-related issues				
b.	School activities				
c.	Preparation for Panhellenic exams				
d.	Shadow Education related issues				
e.	Your choice of subject of study				
f.	Your chosen future occupation				
g.	Topics you learned about from newspapers, magazines, on the radio, television or internet				

37. Outside of school how often do you do each of the following?
Tick only one box in each column.

		Rarely	Almost once a month	Almost once a week	Almost Every Day
a.	Read a non-school related book or magazine				
b.	Visit a museum or an art exhibition				
c.	Attend a concert				
d.	Go to the theater				
e.	See a movie				
f.	Attend lectures				

38. On average, how many HOURS a week do you spend on each of the following:
Write the number of hours for each activity:

α. Reading or other study assigned to you by school teachers _____ hours per week
β. Reading or other study for group tutorial courses _____ ώρες την εβδομάδα
γ. Reading or other study for one-to-one tutorial courses _____ ώρες την εβδομάδα

39. What were your grades in the Second Year of Lyceum, in the following courses?

General Education Lessons	Grade
Ancient Greek Language and Literature	
Modern Greek Language	
Modern Greek Literature	
Algebra	
Geometry	
Physics	
Chemistry	
Biology	
Introduction to Computer Sciences	
History	
Philosophy	
Political Education	
Religion	
Research Project	
Foreign Language	
Physical Education	

Group Orientation: Humanities Studies	Grade
Ancient Greek Language and Literature	
Basic Principals of the Social Sciences	

Group Orientation Positive Studies	Grade
Mathematics	
Physics	

40. What was your grade on your primary school diploma?
Write your grade in the box.

Grade	

41. What was your average grade on your third year Gymnasium report card?
Write your grade in the box.

Grade	

42. What is your name?
I would like to remind you that your name will ONLY be used to obtain your grades in the Panhellenic Examinations, for data analysis in conjunction with the rest of your answers. Your name and personal information will NEVER be disseminated ANYYWHERE. If you agree, please write your full name below:

_____

43. Who are your best friends in your class?
These names will ONLY be used to collect information regarding social friend networks and their statistical analysis. Your choices here will NEVER be disseminated ANYWHERE. If you agree, please write the names of your best friends in your class below:

i. _____
ii. _____
iii. _____

44. Who lives with you in your home:
Tick only one box.

a.	No natural or adoptive parent	
b.	One natural and one adoptive parent	
c.	Only one of the natural parents (wither mother or father)	
d.	Both natural parents (mother and father)	

45. In total, how many people live in your house?
Don't forget to include yourself in the count.

One	Two	Three	Four	Five	Six	Seven	Eight or more

46. How many siblings do you have?
Tick only one box.

None	One	Two	Three	Four	Five	Six	Seven	Eight	Nine or more

47. How many of your siblings are:
Write the number in each box (if there are none, write zero).

a.	One or two years younger than you	
b.	One or two years older than you	
c.	More than two years *younger* than you	
d.	More than two years *older* than you	

48. **A.** Do you have older siblings who have not completed high school?
Tick only one box.

	No		Yes

B. If your answer was YES, *write how many* siblings have not completed high school: [_____]

49. How many times have you changed school because of family moves since the first grade of primary school?
Tick only one box.

None	One	Two	Three	Four	Five or more

Thank you very much for the effort invested in answering these questions.
I wish you all the best.

Appendix B: The Study's Questionnaire [Original Greek]



DEPARTMENT OF
SOCIOLOGY



Τμήμα Κοινωνιολογίας

Πανεπιστήμιο της Οξφόρδης

ΕΡΩΤΗΜΑΤΟΛΟΓΙΟ ΠΡΟΣ ΤΟΥΣ ΜΑΘΗΤΕΣ ΤΗΣ Γ' ΤΑΞΗΣ ΕΝΙΑΙΟΥ ΛΥΚΕΙΟΥ

Για την εκπόνηση διδακτορικής διατριβής με θέμα:

«**ΠΑΡΑΓΟΝΤΕΣ ΚΑΙ ΔΙΑΔΙΚΑΣΙΕΣ ΤΗΣ ΕΚΠΑΙΔΕΥΤΙΚΗΣ ΚΑΙ ΚΟΙΝΩΝΙΚΗΣ ΣΤΡΩΜΑΤΟΠΟΙΗΣΗΣ ΣΤΗΝ ΕΛΛΑΔΑ**: **Ο ΡΟΛΟΣ ΤΗΣ ΣΚΙΩΔΟΥΣ ΕΚΠΑΙΔΕΥΣΗΣ**»

του Μιχάλη Κατσίλλη
(Υποψήφιου Διδάκτορα)

No page number in original.

ΕΠΙΣΤΟΛΗ ΠΡΟΣ ΤΗ ΜΑΘΗΤΡΙΑ / ΤΟ ΜΑΘΗΤΗ ΤΗΣ Γ' ΛΥΚΕΙΟΥ

Αγαπητή Μαθήτρια / Αγαπητέ Μαθητή,

Το όνομά μου είναι Μιχάλης Κατσίλλης και θα ήθελα να σε παρακαλέσω να συμπληρώσεις το ερωτηματολόγιο που ακολουθεί όσο πιο ειλικρινά μπορείς. Το ερωτηματολόγιο αυτό είναι μέρος μιας έρευνας με θέμα: «**Παράγοντες και Διαδικασίες της Εκπαιδευτικής και Κοινωνικής Στρωματοποίησης στην Ελλάδα: Ο Ρόλος της Σκιώδους Εκπαίδευσης**». Η έρευνα εκπονείται στο πλαίσιο σπουδών για τη λήψη διδακτορικού διπλώματος στο Τμήμα Κοινωνιολογίας του Πανεπιστημίου της Οξφόρδης[53], με την έγκριση του Ινστιτούτου Παιδαγωγικής Έρευνας και της Διεύθυνσης Δευτεροβάθμιας Εκπαίδευσης του Υπουργείου Παιδείας, Έρευνας και Θρησκευμάτων.

Αυτή η μελέτη επιχειρεί να εξετάσει ποιος είναι ο ρόλος της σκιώδους εκπαίδευσης στην διαδικασία εκπαιδευτικής επιτυχίας, στην Ελλάδα. Εξετάζει το ρόλο της παράλληλα με μια σειρά παραγόντων μέσω των οποίων προηγούμενες μελέτες έχουν δείξει ότι μετατρέπονται οι κοινωνικοοικονομικές διαφορές σε διαφοροποιημένη εκπαιδευτική επιτυχία.

Για την επιτυχή ολοκλήρωση της μελέτης αυτής χρειάζομαι τις ειλικρινείς απαντήσεις σας στο ερωτηματολόγιο αυτό και τους βαθμούς σας στις Πανελλήνιες Εξετάσεις. Θα καταβληθεί *κάθε* προσπάθεια να διατηρηθεί η εχεμύθεια των πληροφοριών αυτών καθ' όλη τη διάρκεια της έρευνας. Τα συμπληρωμένα ερωτηματολόγια θα επιστραφούν σε 'μένα μέσω συστημένου ταχυδρομείου και θα φυλάσσονται σε κλειδωμένο αρχείο. **Κανείς άλλος, εκτός από εμένα** δεν θα έχει πρόσβαση στα ακατέργαστα δεδομένα. Επίσης, *προσωπικά* δεδομένα δεν θα παρουσιαστούν ΠΟΤΕ, ΠΟΥΘΕΝΑ. Θα χρησιμοποιηθούν μόνο για να πάρω πληροφορίες για τις Πανελλήνιες Εξετάσεις και τα Κοινωνικά Δίκτυα Φιλίας. Τα υπόλοιπα, ανώνυμα πλέον έντυπα δεδομένα θα διατηρηθούν για τουλάχιστον τρία χρόνια. Σε ψηφιακή μορφή θα φυλάσσονται ανώνυμα σε αρχείο δεδομένων που θα φυλάσσεται σε ασφαλείς διακομιστές του Πανεπιστημίου της Οξφόρδης σε κρυπτογραφημένο σκληρό δίσκο και σε φάκελο με κωδικό ασφαλείας, στο οποίο θα έχουν πρόσβαση μόνο εγώ και ο επιβλέπων καθηγητής μου. Οι πληροφορίες που θα πάρω από το ερωτηματολόγιο αυτό θα χρησιμοποιηθούν μόνο για στατιστική ανάλυση σε συνδυασμό με τους βαθμούς σας στις Πανελλήνιες Εξετάσεις, μαζί με τα υπόλοιπα ερωτηματολόγια. Με την επιτυχή ολοκλήρωση της διδακτορικής μου διατριβής, *αυτή* θα κατατεθεί σε έντυπη και ψηφιακή μορφή στο αρχείο του Πανεπιστημίου, για να διευκολύνει την χρήση της σε μελλοντικές έρευνες.

Για να συμμετάσχεις σε αυτή την έρευνα πρέπει να είσαι τουλάχιστον 16 χρονών. Προφανώς, η συμμετοχή σου στη μελέτη αυτή είναι καθαρά προαιρετική. Αν, αφού διαβάσεις το γράμμα αυτό, προτιμάς να μην συμμετάσχεις, μπορείς να αποσυρθείς από τη διαδικασία ανά πάσα στιγμή, απλά ενημερώνοντας τον υπεύθυνο καθηγητή. Παρ' όλ' αυτά, **η συμπλήρωση του ερωτηματολογίου και η λήψη των βαθμών σας στις Πανελλήνιες Εξετάσεις είναι απαραίτητες για την διεξαγωγή και επιτυχία της μελέτης**, για αυτό και θα σε παρακαλούσα να διαθέσεις τη λίγη ώρα (περίπου 40 λεπτά) που απαιτείται για να συμπληρώσεις το συνημμένο ερωτηματολόγιο. Σε παρακαλώ να αντιμετωπίσεις το ερωτηματολόγιο με προσοχή και, αν μπορείς, **να μην αφήσεις ερωτήσεις αναπάντητες**. Επίσης, οι απαντήσεις σας πρέπει να είναι όσο το δυνατόν πιο ειλικρινείς και ακριβείς. Η συμπλήρωση του ερωτηματολογίου, η σφράγισή του στο συνοδευτικό φάκελο και η επιστροφή του στον υπεύθυνο καθηγητή επιβεβαιώνει τη συγκατάθεση συμμετοχής σας στη μελέτη αυτή και την χρήση των βαθμών σας στις πανελλήνιες εξετάσεις. Η βοήθειά σου είναι πραγματικά πολύτιμη και γι' αυτό θέλω να σου εκφράσω τις ειλικρινείς ευχαριστίες μου.

Πριν αρχίσεις να συμπληρώνεις το ερωτηματολόγιο, σε παρακαλώ να διαβάσεις προσεκτικά τις οδηγίες που ακολουθούν.

ΟΔΗΓΙΕΣ ΓΙΑ ΤΗ ΣΥΜΠΛΗΡΩΣΗ ΤΟΥ ΕΡΩΤΗΜΑΤΟΛΟΓΙΟΥ

Στις παρακάτω σελίδες υπάρχουν κάποιες απλές ερωτήσεις που αφορούν την καθημερινή κοινωνική και σχολική ζωή και κάποιες βασικές δημογραφικές πληροφορίες που αφορούν εσάς και την οικογένειά σας. Μερικές ερωτήσεις ρωτάνε για γεγονότα τα οποία έχουν συμβεί, ενώ άλλες ζητάνε να καταθέσεις την προσωπική σου άποψη. Σε παρακαλώ να διαβάσεις προσεκτικά τις ερωτήσεις και να απαντήσεις με όσο μεγαλύτερη προσοχή και ακρίβεια μπορείς. Αν υπάρχει κάτι το οποίο δεν καταλαβαίνεις ή αν δεν είσαι σίγουρος/η πώς να απαντήσεις, τότε μη διστάσεις να ζητήσεις βοήθεια από τον υπεύθυνο καθηγητή. Οι περισσότερες ερωτήσεις έχουν από κάτω ή δίπλα τους μερικές πιθανές απαντήσεις με ένα τετραγωνάκι μπροστά ή δίπλα. Για τις ερωτήσεις αυτές χρειάζεται **να σημειώσεις το τετραγωνάκι της απάντησης που θα διαλέξεις.** Σε άλλες ερωτήσεις στις οποίες θα σου ζητηθεί να γράψεις έναν αριθμό ή μια ημερομηνία, μπορείς να απαντήσεις χρησιμοποιώντας αριθμούς ή λέξεις. Εάν έχεις κάποια άλλη απορία σχετικά με τη συμπλήρωση του ερωτηματολογίου μπορείς να ρωτήσεις τον υπεύθυνο καθηγητή.

Για ο,τιδήποτε άλλο, παρακαλώ μη διστάσεις να επικοινωνήσεις μαζί μου στην ηλεκτρονική διεύθυνση michail.katsillis@sociology.ox.ac.uk ή στα τηλέφωνα: 6974.905859 και 2610.994031. Θα προσπαθήσω να σου απαντήσω εντός 10 εργάσιμων ημερών. Αν η απάντησή μου δε σε ικανοποιήσει ή θέλεις να υποβάλεις επίσημα κάποιο άλλο παράπονο, μπορείς να επικοινωνήσεις με τον αρμόδιο πρόεδρο της Επιτροπής Ερευνητικής Δεοντολογίας του Πανεπιστημίου της Οξφόρδης, ο οποίος θα προσπαθήσει να επιλύσει το ζήτημα όσο πιο γρήγορα μπορεί, στη διεύθυνση: Chair, Social Sciences & Humanities Inter-Divisional Research Ethics Committee; Email: ethics@socsci.ox.ac.uk; Ταχ. Διεύθυνση: Research Services, University of Oxford, Wellington Square, Oxford OX1 2JD.

Σε ευχαριστώ για τη συνεργασία και για την πολύτιμη συμβολή σου στη διεξαγωγή της έρευνας.

Φιλικά,

ΜΙΧΑΛΗΣ ΚΑΤΣΙΛΛΗΣ (Υποψήφιος Διδάκτορας)

[53] Η έρευνα αυτή έχει αδειοδοτηθεί μέσω της διαδικασίας δεοντολογικής έγκρισης του Πανεπιστημίου της Οξφόρδης. (Αρ. Αδειοδότησης: Ref. SOC_R2_001_C1A_17_02)

1. Είσαι κορίτσι ή αγόρι;
Σημείωσε <u>ένα μόνο</u> τετράγωνο.

	Αγόρι		Κορίτσι

2. Πότε γεννήθηκες;
Γράψε την ημ/νία γέννησης σου, με μορφή ΗΗ/ΜΜ/ΕΕΕΕ (π.χ. 17/11/2000):

Ημ/νία γέννησης	ΗΗ	ΜΜ	ΕΕΕΕ

3. Α. Γεννήθηκες στην Ελλάδα;
Σημείωσε <u>ένα μόνο</u> τετράγωνο.

	Όχι		Ναι

Β. Αν ΔΕΝ γεννήθηκες στην Ελλάδα, σε ποια χώρα γεννήθηκες;
Γράψε την χώρα στην οποία γεννήθηκες:

Γεννήθηκα _____

4. Ποια είναι η εθνικότητά σου;

	Ελληνική		Άλλη (Γράψε ποια): _____

5. Α. Οι γονείς σου γεννήθηκαν στην Ελλάδα;
Σημείωσε <u>ένα μόνο</u> τετράγωνο για κάθε γονέα.

Μητέρα				**Πατέρας**			
	Όχι		Ναι		Όχι		Ναι

Β. Αν κάποιος από τους γονείς σου ΔΕΝ γεννήθηκε στην Ελλάδα, σε ποια χώρα γεννήθηκε;
Γράψε το όνομα της χώρας:

Η μητέρα μου γεννήθηκε _____
Ο πατέρας μου γεννήθηκε _____

6. Πόσο συχνά μιλάς την Ελληνική γλώσσα στο σπίτι σου;
Σημείωσε <u>ένα μόνο</u> τετράγωνο.

Ποτέ	**Μερικές Φορές**	**Σχεδόν Πάντοτε**	**Πάντοτε**

7. Ο μόνιμος τόπος κατοικίας σου βρίσκεται:
Σημείωσε <u>ένα μόνο</u> τετράγωνο.

	Σε γεωγραφικά απομονωμένη περιοχή
	Σε χωριό ή αγροτική περιοχή
	Σε προάστιο
	Σε πόλη

8. Ποιο είναι το υψηλότερο επίπεδο μόρφωσης στο οποίο έφτασαν ο πατέρας σου και η μητέρα σου;
Σημείωσε <u>ένα μόνο</u> τετράγωνο <u>σε κάθε στήλη</u>.

		Μητέρα	**Πατέρας**
α.	Τελείωσε μερικές τάξεις του δημοτικού		
β.	Αποφοίτησε από το δημοτικό σχολείο		
γ.	Ολοκλήρωσε κάποιες τάξεις από το τριτάξιο γυμνάσιο		
δ.	Αποφοίτησε από το τριτάξιο γυμνάσιο		
ε.	Ολοκλήρωσε κάποιες τάξεις από το εξατάξιο γυμνάσιο ή λύκειο		
στ.	Αποφοίτησε από το εξατάξιο γυμνάσιο ή το λύκειο		
ζ.	Αποφοίτησε από κάποια επαγγελματική ή τεχνική σχολή μετά το γυμνάσιο ή το λύκειο		
η.	Αποφοίτησε από κάποια Ανώτερη σχολή (Α.Τ.Ε.Ι.)		
θ.	Φοίτησε μερικά έτη στο Πανεπιστήμιο		
ι.	Αποφοίτησε από το Πανεπιστήμιο		
ια.	Εκανε μεταπτυχιακές σπουδές		

9. Ποια είναι η επαγγελματική κατάσταση των γονέων σου;
Σημείωσε <u>ένα μόνο</u> τετράγωνο <u>σε κάθε στήλη.</u>

		Μητέρα	**Πατέρας**
α.	Εργάζεται κανονικά		
β.	Εργάζεται πότε-πότε		
γ.	Είναι άνεργη/-ος		
δ.	Δεν εργάζεται, αλλά δεν είναι άνεργη/-ος		
ε.	Είναι συνταξιούχος		
στ.	Δεν ζει		
ζ.	Δεν ξέρω		
η.	Δεν απαντώ		

10.Α. Ποιο είναι τώρα ή ήταν στο παρελθόν (αν τώρα δεν εργάζεται ή δεν ζει) το επάγγελμα του πατέρα σου;
Να περιγράψεις με λεπτομέρεια ποια είναι ακριβώς η δουλειά του (π.χ. είναι οδηγός σε αστικά λεωφορεία ή είναι ταμίας στην τράπεζα):

_____

[ ] Δεν ξέρω [ ] Δεν απαντώ

Β. Είχε διαφορετική δουλειά πριν την οικονομική κρίση;

Ναι	**Όχι**	**Δεν Ξέρω**	**Δεν Απαντώ**

Γ. Αν ναι, ποιο ήταν το επάγγελμα του πατέρα σου πριν την οικονομική κρίση;
Να περιγράψεις με λεπτομέρεια ποια είναι ακριβώς η δουλειά του (π.χ. είναι οδηγός σε αστικά λεωφορεία ή είναι ταμίας στην τράπεζα):

_____

[ ] Δεν ξέρω [ ] Δεν απαντώ

11. Α. Ποιο είναι τώρα ή ήταν στο παρελθόν (αν τώρα δεν εργάζεται ή δεν ζει) το επάγγελμα της μητέρας σου;
Να περιγράψεις με λεπτομέρεια ποια είναι ακριβώς η δουλειά της (π.χ. είναι υπάλληλος σε ιδιωτική εταιρία ή είναι υπάλληλος στη ΔΕΗ):

_____

[ ] Δεν ξέρω [ ] Δεν απαντώ

Β. Είχε διαφορετική δουλειά πριν την οικονομική κρίση;

Ναι	**Όχι**	**Δεν Ξέρω**	**Δεν Απαντώ**

Γ. Αν ναι, ποιο ήταν το επάγγελμα της μητέρας σου πριν την οικονομική κρίση;
Να περιγράψεις με λεπτομέρεια ποια είναι ακριβώς η δουλειά της (π.χ. είναι υπάλληλος σε ιδιωτική εταιρία ή είναι υπάλληλος στη ΔΕΗ):

_____

[ ] Δεν ξέρω [ ] Δεν απαντώ

12.Α. Στην κύρια δουλειά τους οι γονείς σου είναι:
Σημείωσε <u>ένα μόνο</u> τετράγωνο <u>σε κάθε στήλη.</u>

		Μητέρα	**Πατέρας**
α.	Εργοδότης (δική του δουλειά με υπαλλήλους)		
β.	Εργαζόμενος για δικό του λογαριασμό χωρίς υπαλλήλους		
γ.	Με μισθό στο δημόσιο ή σε υπηρεσία που εξαρτάται από το δημόσιο (π.χ. ΔΕΗ)		
δ.	Με μισθό σε ιδιωτική επιχείρηση		
ε.	Δεν ξέρω		
στ.	Δεν απαντώ		

Β. Αν κάποιος από τους γονείς σου εργάζεται για λογαριασμό κάποιου άλλου (π.χ. δημόσιο ή ιδιωτική επιχείρηση), έχει ως καθήκον στη δουλειά του <u>να επιβλέπει</u> άλλα άτομα;
Σημείωσε <u>ένα μόνο</u> τετράγωνο για κάθε γονέα.

Μητέρα			
	Όχι		Ναι

Πατέρας			
	Όχι		Ναι

Γ. Αν κάποιος από τους γονείς σου είναι εργοδότης <u>πόσους</u> υπαλλήλους απασχολεί μόνιμα;
Γράψε έναν αριθμό μέσα στο ορθογώνιο:

Μητέρα	

Πατέρας	

13. Ποιο είναι το εισόδημα των γονιών σου κάθε μήνα;
Γράψε το εισόδημα για καθένα από τους γονείς σου ξεχωριστά:

Μητέρα		**Πατέρας**	

Αν δεν θυμάσαι ακριβώς, παρακαλώ απάντησε πόσο περίπου είναι ο μισθός τους, διαλέγοντας μια από τις παρακάτω κατηγορίες, *σημειώνοντας ένα μόνο τετράγωνο για κάθε γονέα:*

		Έως 500	**501-1000**	**1001-1500**	**1501-2000**	**2001 και πάνω**	**Δ/Ξ**	**Δ/Α**
α.	Μητέρα							
β.	Πατέρας							

14. Α. Σκοπεύεις να συνεχίσεις τις σπουδές σου μετά το Λύκειο;
Σημείωσε ένα μόνο τετράγωνο.

	Όχι		Ναι

Β. Αν απάντησες ναι στην προηγούμενη ερώτηση, που σκοπεύεις να συνεχίσεις τις σπουδές σου;
Σημείωσε ένα μόνο τετράγωνο.

	Στην Ελλάδα		Στο Εξωτερικό

15. Σε ποιο εκπαιδευτικό επίπεδο ΠΙΣΤΕΥΕΙΣ ότι μπορεί να έχεις φτάσει όταν θα είσαι 30 ετών;
Σημείωσε ένα μόνο τετράγωνο.

α.	Θα έχω αποφοιτήσει από το λύκειο	
β.	Θα έχω τελειώσει κάποια ιδιωτική σχολή	
γ.	Θα έχω πτυχίο από κάποια σχολή στα Α.Τ.Ε.Ι.	
δ.	Θα έχω πανεπιστημιακό πτυχίο	
ε.	Θα έχω κάνει μεταπτυχιακές σπουδές	

16. Ποιο επάγγελμα πιστεύεις ότι θα κάνεις όταν θα είσαι τριάντα χρόνων;
Γράψε το επάγγελμα:

_____

17. Σε ποιο επίπεδο εκπαίδευσης πιστεύουν οι γονείς σου *ότι μπορείς* να φτάσεις;
Σημείωσε ένα μόνο τετράγωνο.

α.	Να αποφοιτήσω από το λύκειο	
β.	Να τελειώσω κάποια ιδιωτική σχολή	
γ.	Να πάρω πτυχίο από κάποια σχολή στα Α.Τ.Ε.Ι.	
δ.	Να πάρω πανεπιστημιακό πτυχίο	
ε.	Να κάνω μεταπτυχιακές σπουδές	

18. Σε ποιο εκπαιδευτικό επίπεδο πιστεύει ο/η καλύτερος/-η φίλος/-η σου ότι θα έχει φτάσει όταν θα είναι 30 ετών;
Σημείωσε ένα μόνο τετράγωνο.

α.	Να έχει αποφοιτήσει από το λύκειο	
β.	Να έχει τελειώσει κάποια ιδιωτική σχολή	
γ.	Να έχει πτυχίο από κάποια σχολή στα Α.Τ.Ε.Ι.	
δ.	Να έχει πανεπιστημιακό πτυχίο	
ε.	Να έχει κάνει μεταπτυχιακές σπουδές	

19. Σε ποιο επίπεδο εκπαίδευσης πιστεύουν οι καθηγητές σου *ότι μπορείς* να φτάσεις;
Σημείωσε ένα μόνο τετράγωνο.

α.	Να αποφοιτήσω από το λύκειο	
β.	Να τελειώσω κάποια ιδιωτική σχολή	
γ.	Να πάρω πτυχίο από κάποια σχολή στα Α.Τ.Ε.Ι.	
δ.	Να πάρω πανεπιστημιακό πτυχίο	
ε.	Να κάνω μεταπτυχιακές σπουδές	

20. Ποιο επάγγελμα πιστεύουν οι γονείς σου *ότι θα κάνεις* όταν θα είσαι 30 χρόνων;
Γράψε το επάγγελμα:

_____

21. Ποιο επάγγελμα πιστεύει ο/η καλύτερος(η) φίλος(η) σου ότι θα κάνει όταν θα είναι τριάντα χρόνων;
Γράψε το επάγγελμα:

_____

22. Ο/Η καλύτερος(η) φίλος(η) σου είναι συμμαθητής(τρια) σου;
Ο/Η καλύτερος(η) φίλος(η) σου είναι μαθητής(τρια) στην Γ' Λυκείου του σχολείου σου; Σημείωσε ένα μόνο τετράγωνο.

	Όχι		Ναι

23. Σκέψου ποια(ος) είναι ο/η συγγενής σου με το υψηλότερο μορφωτικό επίπεδο και ποιος ο οικογενειακός φίλος με το υψηλότερο μορφωτικό επίπεδο. Ποιο είναι το επίπεδο μόρφωσής τους;
Σημείωσε ένα μόνο τετράγωνο σε κάθε στήλη.

		Συγγενής	Γνωστός
α.	Τελείωσε μερικές τάξεις του δημοτικού		
β.	Αποφοίτησε από το δημοτικό σχολείο		
γ.	Ολοκλήρωσε κάποιες τάξεις από το τριτάξιο γυμνάσιο		
δ.	Αποφοίτησε από το τριτάξιο γυμνάσιο		
ε.	Ολοκλήρωσε κάποιες τάξεις από το εξατάξιο γυμνάσιο ή λύκειο		
στ.	Αποφοίτησε από το εξατάξιο γυμνάσιο ή το λύκειο		
ζ.	Αποφοίτησε από κάποια επαγγελματική ή τεχνική σχολή μετά το γυμνάσιο ή το λύκειο		
η.	Αποφοίτησε από κάποια Ανώτερη σχολή (Τ.Ε.Ι		
θ.	Φοίτησε μερικά έτη στο Πανεπιστήμιο		
ι.	Αποφοίτησε από το Πανεπιστήμιο		
ια.	Εκανε μεταπτυχιακές σπουδές		

24. Ποιο είναι το επάγγελμα τους; **Συγγενής** **Γνωστός**
Γράψε το επάγγελμα για τον καθένα τους: _____ _____

25. Ποια από τις παρακάτω δηλώσεις είναι αληθινή;
Σημείωσε ένα μόνο τετράγωνο.

α.	Οι γονείς μου θέλουν να σπουδάσω	
β.	Οι γονείς μου δεν θέλουν να σπουδάσω	
γ.	Οι γονείς μου δεν ενδιαφέρονται αν θα σπουδάσω	
δ.	Οι γονείς μου δεν θα με αφήσουν να σπουδάσω	

26. Ποια Ομάδα Προσανατολισμού επιλέξατε να ακολουθήσετε στην Γ' Λυκείου;
Σημείωσε ένα μόνο τετράγωνο.

α.	Ομάδα Προσανατολισμού ΑΝΘΡΩΠΙΣΤΙΚΩΝ ΣΠΟΥΔΩΝ	
β.	Ομάδα Προσανατολισμού ΘΕΤΙΚΩΝ ΣΠΟΥΔΩΝ	
γ.	Ομάδα Προσανατολισμού ΣΠΟΥΔΩΝ ΟΙΚΟΝΟΜΙΑΣ ΚΑΙ ΠΛΗΡΟΦΟΡΙΚΗΣ	

27. Α. Έχεις παρακολουθήσει ποτέ φροντιστηριακά μαθήματα (εκτός ξένων γλωσσών/ μουσικής);
Σημείωσε ένα μόνο τετράγωνο.

α.	Σε φροντιστήριο	
β.	Ιδιαίτερα μαθήματα	
γ.	Και τα δύο	
δ.	Τίποτα από τα δύο	

Β. Αν δεν παρακολούθησες ούτε φροντιστήριο, ούτε ιδιαίτερα μαθήματα, γράψε γιατί

_____

30. Πότε ξεκίνησες να παρακολουθείς φροντιστηριακά μαθήματα για πρώτη φορά;

_____

31. Ποιος είναι ο κυριότερος λόγος που παρακολούθησες/παρακολουθείς φροντιστηριακά μαθήματα (στην ΄Γ λυκείου);
Σημείωσε ένα μόνο τετράγωνο.

α.	Να καλύψω κενά γνώσεων	
β.	Να προετοιμαστώ καλύτερα για τις πανελλήνιες εξετάσεις	
γ.	Να προετοιμαστώ καλύτερα για τις εξετάσεις του σχολείου	
δ.	Να εμπεδώσω καλύτερα θέματα που έχω διδαχθεί στο σχολείο	
ε.	Να περάσω το μάθημα	
στ.	Με ανάγκασαν οι γονείς μου	
ζ.	Άλλο:	

30.	Συμπληρώστε στον παρακάτω πίνακα για ποια μαθήματα έχετε παρακολουθήσει φροντιστηριακά μαθήματα (σε **ομαδικό φροντιστήριο**), πόσους μήνες έχετε παρακολουθήσει ΣΥΝΟΛΙΚΑ το καθένα, πόσες ώρες την εβδομάδα παρακολουθούσατε και πόσους συμμαθητές είχατε στο καθένα.			
	Φροντιστηριακό Μάθημα (Ομαδικό Φροντιστήριο)	**ΣΥΝΟΛΙΚΟΥΣ Μήνες Παρακολούθησης**	**Ώρες Παρακολούθησης την Εβδομάδα**	**Αριθμός Συμμαθητών στο Τμήμα**
α.				
β.				
γ.				
δ.				
ε.				
στ.				
ζ.				
η.				

31.	Για καθένα από τα μαθήματα αυτά, τι φήμη έχει το φροντιστήριο όπου το παρακολουθήσατε; *Σημείωσε <u>ένα μόνο</u> τετράγωνο σε <u>κάθε σειρά</u>.*				
	Μέτρια	**Κάπως Καλή**	**Καλή**	**Πολύ Καλή**	**Άριστη**
α.					
β.					
γ.					
δ.					
ε.					
στ.					
ζ.					
η.					

32.	Για καθένα από τα μαθήματα αυτά, πόσα πληρώνεις τον ΜΗΝΑ; *Γράψε το ποσό που πληρώνεις <u>για κάθε μάθημα</u> στο αντίστοιχο τετράγωνο*:
	Κόστος ανά ΜΗΝΑ

33.	Συμπληρώστε στον παρακάτω πίνακα για ποια μαθήματα έχετε παρακολουθήσει φροντιστηριακά μαθήματα (σε **ιδιαίτερο**), πόσους μήνες έχετε παρακολουθήσει ΣΥΝΟΛΙΚΑ το καθένα, πόσες ώρες την εβδομάδα παρακολουθούσατε και (εάν είχατε) πόσους συμμαθητές είχατε στο καθένα.			
	Φροντιστηριακό Μάθημα (Ομαδικό Φροντιστήριο)	**ΣΥΝΟΛΙΚΟΥΣ Μήνες Παρακολούθησης**	**Ώρες Παρακολούθησης την Εβδομάδα**	**Αριθμός Συμμαθητών στο Τμήμα**
α.				
β.				
γ.				
δ.				
ε.				
στ.				
ζ.				
η.				

34.	Για καθένα από τα μαθήματα αυτά, τι **φήμη** έχει ο καθηγητής που σας έκανε τα ιδιαίτερα; *Σημείωσε <u>ένα μόνο</u> τετράγωνο σε <u>κάθε σειρά</u>.*				
	Μέτρια	**Κάπως Καλή**	**Καλή**	**Πολύ Καλή**	**Άριστη**
α.					
β.					
γ.					
δ.					
ε.					
στ.					
ζ.					
η.					

35.	Για καθένα από τα μαθήματα αυτά, πόσα πληρώνεις την ΩΡΑ; *Γράψε το ποσό που πληρώνεις <u>για κάθε μάθημα</u> στο αντίστοιχο τετράγωνο*:
	Κόστος ανά ΩΡΑ

36. Πόσο συχνά συζητάς με κάποιον από τους γονείς σου για κάποιο από τα παρακάτω;
Σημείωσε <u>ένα μόνο</u> τετράγωνο <u>σε κάθε σειρά</u>.

		Σπάνια	Σχεδόν μια φορά το μήνα	Σχεδόν μια φορά την εβδομάδα	Σχεδόν κάθε μέρα
α.	Θέματα που έχουν σχέση με το σχολείο				
β.	Δραστηριότητες του σχολείου				
γ.	Την προετοιμασία για τις πανελλαδικές εξετάσεις				
δ.	Θέματα που έχουν σχέση με τα φροντιστήρια				
ε.	Την επιλογή του αντικειμένου το οποίο θέλεις να σπουδάσεις				
στ.	Το επάγγελμα το οποίο θα ήθελες να ακολουθήσεις				
ζ.	Θέματα που έχεις διαβάσει σε εφημερίδες ή περιοδικά ή έχεις ακούσει από το ραδιόφωνο ή την τηλεόραση				

37. <u>Έξω από το σχολείο</u> πόσο συχνά κάνεις κάποιο από τα παρακάτω;
Σημείωσε <u>ένα μόνο</u> τετράγωνο <u>σε κάθε σειρά</u>.

		Σπάνια	Σχεδόν μια φορά το μήνα	Σχεδόν μια φορά την εβδομάδα	Σχεδόν κάθε μέρα
α.	Διαβάζεις κάποιο μη σχολικό βιβλίο ή περιοδικό				
β.	Επισκέπτεσαι ένα μουσείο ή μια έκθεση τέχνης				
γ.	Παρακολουθείς μια συναυλία				
δ.	Πηγαίνεις στο θέατρο				
ε.	Πηγαίνεις στον κινηματογράφο				
στ.	Παρακολουθείς διαλέξεις				

38. Κατά μέσο όρο, πόσες ΩΡΕΣ αφιερώνεις <u>κάθε εβδομάδα</u> σε καθένα από τα παρακάτω:
Γράψε των αριθμό ωρών που για <u>κάθε ένα</u> από τα παρακάτω:

α. Διάβασμα ή άλλη μελέτη που σου έχουν αναθέσει οι καθηγητές στο σχολείο _____ ώρες την εβδομάδα
β. Διάβασμα ή άλλη μελέτη για τα ομαδικά φροντιστηριακά μαθήματα _____ ώρες την εβδομάδα
γ. Διάβασμα ή άλλη μελέτη για τα ιδιαίτερα φροντιστηριακά μαθήματα _____ ώρες την εβδομάδα

39. Ποιοι ήταν οι βαθμοί σου στη Β' Λυκείου, στα παρακάτω μαθήματα;

Μαθήματα Γενικής Παιδείας	**Βαθμό**
Αρχαία Ελληνική Γλώσσα και Γραμματεία	
Νέα Ελληνική Γλώσσα	
Νέα Ελληνική Λογοτεχνία	
Άλγεβρα	
Γεωμετρία	
Φυσική	
Χημεία	
Βιολογία	
Εισαγωγή στις Αρχές της Επιστήμης των Η/Υ	
Ιστορία	
Φιλοσοφία	
Πολιτική Παιδεία	
Θρησκευτικά	
Ερευνητική Εργασία (Project)	
Ξένη Γλώσσα	
Φυσική Αγωγή	

Ομάδα Προσανατολισμού Ανθρωπιστικών Σπουδών	**Βαθμό**
Αρχαία Ελληνική Γλώσσα και Γραμματεία	
Βασικές Αρχές Κοινωνικών Επιστημών	

Ομάδα Προσανατολισμού Θετικών Σπουδών	**Βαθμό**
Μαθηματικά	
Φυσική	

40. Ποιος ήταν ο βαθμός σου στο απολυτήριο του Δημοτικού;
Γράψε τον βαθμό σου στο ορθογώνιο:

Βαθμός	

41. Ποιος ήταν ο μέσος όρος της βαθμολογίας σου στο ενδεικτικό της Γ' Γυμνασίου;
Γράψε τον βαθμό μέσα στο ορθογώνιο:

Βαθμός	

42. Ποιο είναι το όνομά σου;
Σου υπενθυμίζω ότι το όνομά σου θα χρησιμοποιηθεί ΜΟΝΟ για να μπορέσω να πάρω τους βαθμούς σας στις Πανελλήνιες Εξετάσεις, για ανάλυση μαζί με τις υπόλοιπες απαντήσεις σας. Το όνομά σου και τα προσωπικά στοιχεία σου δεν θα εμφανιστούν ΠΟΤΕ και ΠΟΥΘΕΝΑ. Εάν συμφωνείς, παρακαλώ γράψε το όνομά σου ολογράφως παρακάτω:

_____

43. Ποιοι είναι οι καλύτεροί(ες) σου φίλοι(ες) στην τάξη σου;
Τα ονόματα αυτά θα χρησιμοποιηθούν ΜΟΝΟ για τη συλλογή πληροφοριών για τα κοινωνικά δίκτυα φιλίας και στατιστική τους ανάλυση. Οι επιλογές σας αυτές δεν θα κοινοποιηθούν ΠΟΤΕ και ΠΟΥΘΕΝΑ. Εάν συμφωνείς, παρακαλώ γράψε τα ονόματα των καλύτερων φίλων σου στην τάξη σου παρακάτω.

i. _____
ii. _____
iii. _____

44. Στο σπίτι που ζεις, μένουν μαζί σου:
Σημείωσε ένα μόνο τετράγωνο.

α.	Κανένας φυσικός ή θετός γονέας	
β.	Ένας φυσικός και ένας θετός γονέας	
γ.	Μόνο ένας από τους φυσικούς γονείς (είτε ο πατέρας, είτε η μητέρα)	
δ.	Και οι δύο φυσικοί γονείς (πατέρας και μητέρα)	

45. Συνολικά, πόσοι άνθρωποι μένουν στο σπίτι σου;
Μην ξεχάσεις να συμπεριλάβεις τον εαυτό σου στη μέτρηση.

Ένας	Δύο	Τρεις	Τέσσερις	Πέντε	Έξι	Επτά	Οκτώ ή περισσότεροι

46. Πόσα αδέλφια έχεις;
Σημείωσε ένα μόνο τετράγωνο.

Κανένα	Ένα	Δύο	Τρία	Τέσσερα	Πέντε	Έξι	Επτά	Οκτώ	Εννέα ή περισσότεροι

47. Γράψε πόσα από τα αδέλφια σου είναι:
Γράψε μέσα στο τετράγωνο έναν αριθμό (εάν δεν υπάρχει, γράψε μηδέν):

α.	ένα ή δύο χρόνια *μικρότερα* από εσένα	
β.	ένα η δύο χρόνια *μεγαλύτερα* από εσένα	
γ.	περισσότερο από δύο χρόνια *μικρότερα* από εσένα	
δ.	περισσότερο από δύο χρόνια *μεγαλύτερα* από εσένα	

48. Α. Έχεις αδέλφια μεγαλύτερα από εσένα, τα οποία δεν έχουν τελειώσει το λύκειο;
Σημείωσε ένα μόνο τετράγωνο.

	Όχι		Ναι

Β. Εάν η απάντησή σου ήταν ΝΑΙ, γράψε πόσα είναι αυτά τα αδέλφια: [_____]

49. Πόσες φορές έχεις αλλάξει σχολείο, λόγω οικογενειακής μετακίνησης, από την πρώτη τάξη του δημοτικού;
Σημείωσε ένα μόνο τετράγωνο.

Καμία	Μία	Δύο	Τρεις	Τέσσερις	Πέντε ή περισσότερες

Σε ευχαριστώ πολύ για την προσπάθεια που κατέβαλες για να απαντήσεις στις ερωτήσεις.
Σου εύχομαι ό,τι καλύτερο.

Appendix C: Accompanying Documentation for Questionnaire: Letter to Schools' Principals

University of Oxford – Department of Sociology

LETTER TO THE LYCEUM PRINCIPAL

Dear Principal,

My name is Michael Katsillis and I am a Doctoral Candidate in the Department of Sociology of the University of Oxford. I would like your help and cooperation for the purposes of a study I am undertaking entitled "**Factors and processes of Educational and Social Stratification in Greece: The Role of Shadow Education**". *This research is being undertaken in partial fulfillment of the requirements for the degree of Doctor of Philosophy*, from the Department of Sociology of the University of Oxford.

A few words about the nature of the study:

This study attempts to examine what the role of Shadow Education is in the process of educational achievement, in Greece. It examines this role in conjunction with a series of other factors through which previous studies have shown socioeconomic differences are transformed into differential educational achievement.

For the purposes of the study I am undertaking, I require certain details concerning 3rd year Lyceum students. Collection of this data will be take place via questionnaire, which your school's students are called upon to complete. The questionnaire contains approximately 50 questions, whose completion has been calculated, through a piloting process, to require approximately 40 minutes of students' time. The questionnaire is prefaced by a cover letter/information sheet informing study participants about the nature of the study, providing them with information about the type of data the study proposes to collect, its future uses, confidential nature, ultimate anonymization and proper storage. Special attention is paid to the fact that I request students' names. Every precaution will be taken to ensure the confidential nature of this data, throughout the course of this research. This information will be used to obtain panhellenic examination data and subsequently destroyed.

The study is nationwide. I should point out that this study **has been approved** by the Directorate of Studies for Secondary Education of the Ministry of Education, as well as the Central University Research Ethics Committee (CUREC) of the University of Oxford. Please find the relevant permissions attached.

I am therefore asking you to participate in this study, which will involve all of your school's 3rd year Lyceum students. For this reason, after receiving the questionnaires, you should select a teacher to be responsible for each 3rd year Lyceum class. The research must

be undertaken within the first few days following questionnaire receipt, in order to assure the necessary time coordination between all the schools selected to take part in this study.

We have sent you a number of questionnaires (each of which contains instructions for students regarding their completion) and blank, sealable envelops corresponding to the number to students in each class of your school's 3rd year Lyceum grade. Each student must place their completed questionnaire in an envelope and seal it before returning it to the teacher responsible for their class. This correspondence also contains ***a letter to the teacher responsible for each 3rd year Lyceum class***, regarding conducting survey administration. After distributing the questionnaires to each teacher, along with their corresponding letter, you simply need to set the survey date and time. I should be noted that the research *should be carried out* (*insofar as this is possible*) *simultaneously in all of your school's 3rd year Lyceum classes*.

When questionnaire completion is finished, I would like to ask that you collect them and return them to me, via registered mail, ***as soon as possible***. You may use the postage box they were sent to you in (or any other box of your choosing), by simply affixing the Sender/Recipient address page and calling in the courier**. Return postage has been paid by me.**

For any other information or clarification, please do not hesitate to get in touch either via email, at michail.katsillis@sociology.ox.ac.uk or by telephone at 6974.905859. I will attempt to respond within 10 working days and will try to provide you with the requisite explanations or possible solutions. If you remain unsatisfied or wish to make an official complaint, you may contact the head of the Committee for Research Ethics of the University of Oxford, who will attempt to solve you issue in a reasonable manner, via: Chair, Social Sciences & Humanities Inter-Divisional Research Ethics Committee; Email: ethics@socsci.ox.ac.uk; Address: Research Services, University of Oxford, Wellington Square, Oxford OX1 2JD.

I would like to thank you for your contribution to the conduct of this research.

Kind Regards,

MICHAIL KATSILLIS

Mathematician

Doctoral Candidate in Sociology – University of Oxford

Appendix D: Accompanying Documentation for Questionnaire: Letter to Teachers

University of Oxford – Department of Sociology

LETTER TO THE TEACHER RESPONSIBLE FOR EACH 3rd YEAR LYCEUM CLASS

Dear Teacher,

My name is Michael Katsillis and I am a Doctoral Candidate in the University of Oxford's Department of Sociology. I would like your help and cooperation for the purposes of a study I am undertaking entitled "**Factors and processes of Educational and Social Stratification in Greece: The Role of Shadow Education**". *This research is being undertaken in partial fulfillment of the requirements for the degree of Doctor of Philosophy*, from the Department of Sociology of the University of Oxford.

A few words about the nature of the study:

This study attempts to examine what the role of Shadow Education is in the process of educational achievement, in Greece. It examines this role in conjunction with a series of other factors through which previous studies have shown socioeconomic differences are transformed into differential educational achievement.

Collection of this data will be take place via questionnaire, which your school's students are called upon to complete. The questionnaire contains approximately 50 questions, whose completion has been calculated, through a piloting process, to require approximately 40 minutes of students' time. The questionnaire is prefaced by a cover letter/information sheet informing study participants about the nature of the study, providing them with information about the type of data the study proposes to collect, its future uses, confidential nature, ultimate anonymization and proper storage. Special attention is paid to the fact that I request students' names, to which ONLY I will have access. This information will be used to obtain panhellenic examination data, for analysis in conjunction with their other responses, and subsequently destroyed.

This study **has been approved** by the Directorate of Studies for Secondary Education of the Ministry of Education, as well as the Central University Research Ethics Committee (CUREC) of the University of Oxford. The relevant approvals are in your principal's possession.

When students take their places in the classroom, you will disseminate the one questionnaire and one envelop to each and instruct them to *each silently read* the cover letter and questionnaire completion instructions. If possible, please ensure that students are sitting as far from each other as possible, to best safeguard the confidentiality of their personal information. When this process is completed, students should be offered the opportunity to

ask you questions regarding the nature of the study. Afterwards, they may begin questionnaire completion. All of the questions are elective and if students do not feel comfortable completing the questionnaire, they may be excused at any time from the study, provided they have informed you of their wish to do so. Once their questions have been addressed, they may begin completing the questionnaires. The questionnaire is, basically, simple and there should be no issues with its completion. However, if students do encounter some difficulty in the course of its completion, they may direct relevant questions to you. Students may withdraw from the study at any time, by simply letting you know. When students finish completing the questionnaires, they should seal them in the accompanying blank envelops. You should then collect them and turn them over to the school's principal, who will arrange for their return. To ensure students' confidentiality to the greatest extent possible, I ask that you please refrain from examining their questionnaires beyond providing help where explicitly requested by them.

This research is nationwide and **its success depends to a great degree on you and your positive response and cooperation**. For this reason, I would like to personally thank you for your cooperation and effort. Your contribution and feedback is truly important to me. To this end, once students have completed and returned their questionnaires, I would be grateful if you would take just a few minutes to provide some feedback, via the attached form, if you deem it to be necessary.

For any other information or clarification, please do not hesitate to get in touch either via email, at michail.katsillis@sociology.ox.ac.uk or by telephone at 6974.905859. I will attempt to respond within 10 working days and will try to provide you with the requisite explanations or possible solutions. If you remain unsatisfied or wish to make an official complaint, you may contact the head of the Committee for Research Ethics of the University of Oxford, who will attempt to solve you issue in a reasonable manner, via: Chair, Social Sciences & Humanities Inter-Divisional Research Ethics Committee; Email: ethics@socsci.ox.ac.uk; Address: Research Services, University of Oxford, Wellington Square, Oxford OX1 2JD.

Respectfully Yours,

MICHAIL KATSILLIS

Mathematician

Doctoral Candidate in Sociology – University of Oxford

Teacher Feedback Form

1. Did you encounter any problems during the survey process?

   [ ] Yes [ ] No

   If you answered yes, please elaborate: _____

   _____

   _____

   _____

2. Did you encounter any special student needs during the survey process?

   [ ] Yes [ ] No

   If you answered yes, please elaborate: _____

   _____

   _____

   _____

3. Other comments or feedback:

   _____

   _____

   _____

   _____

   _____

   _____

   _____

   _____

   _____

   _____

If you have chosen to provide feedback, please return this form along with the sealed questionnaire envelopes. I would like to thank you once again for your feedback and overall contribution to the successful completion of this research!

Michail Katsillis

Mathematician

Doctoral Candidate in Sociology – University of Oxford

Appendix E: Central University Research Ethics Committee (CUREC) Checklist for the Social Sciences

CENTRAL UNIVERSITY RESEARCH ETHICS COMMITTEE (CUREC) Form CUREC 1A Checklist for the Social Sciences and Humanities

The University of Oxford places a high value on the knowledge, expertise, and integrity of its members and their ability to conduct research to high standards of scholarship and ethics. The research ethics clearance procedures have been established to ensure that the University is meeting its obligations as a responsible institution.

They start from the presumption that all members of the University will take their responsibilities and obligations seriously and will ensure that their research on human subjects is conducted according to the established principles and good practice in their fields and in accordance, where appropriate, with legal requirements. Since the requirements of research ethics review will vary from field to field and from project to project, the University accepts that different guidelines and procedures will be appropriate.

- Please check the **CUREC flowchart and NHS flowchart** first to see if you need ethics approval.
- Please complete this form using a word processor and email it, together with your supporting documents, to your **Departmental Research Ethics Committee (DREC)** (**if applicable**). If you don't have a DREC please email this form to **ethics@socsci.ox.ac.uk** using your official **ox.ac.uk email** address. **Only emailed applications will be accepted.**

WHAT THIS CHECKLIST IS DESIGNED FOR

This **CUREC 1A checklist** is designed largely for research that falls within the Divisions of Social Sciences and Humanities where ethical issues are relatively few and straightforward. Interviews, field work and oral history are also included in the CUREC process.

The **full CUREC 2 application** is only required where certain project characteristics (e.g., type of participants, or procedures) result in a more complex set of ethical issues. It is expected that only in a limited number of cases will it be necessary for researchers to complete a CUREC 2 application. The checklist below will direct you to a CUREC 2 application if needed.

WHAT THIS CHECKLIST WILL NOT ASSESS

This checklist does not cover research governance, satisfactory methodology, or compliance with the requirements of publishers when administering their tests or questionnaires. As principal researcher, it is your responsibility to ensure that requirements in these areas are met.

CUREC does not review studies classed as **audit** (see Glossary and Decision Flowchart for CUREC on our website).

If your study involves **NHS patients, NHS staff / data / facilities, or human tissue**, please check the Decision Flowchart for NHS approval and contact the Clinical Trials and Research Governance (CTRG) team in the first instance.

Further information on the University's research ethics procedures is available from the CUREC website: www.admin.ox.ac.uk/curec.

SECTION A: Filter for CUREC2 application

This section determines whether your study raises more complex issues which require the completion of a full application for ethical review, known as the CUREC 2 application.

(Please mark 'X' in the Yes/No column as appropriate to indicate your response.)

1.	Are research participants classed as **people whose ability to give free and informed consent is in question**? (This may include those under 18 (though see "competent youths" in **FAQ C12**), prisoners, or adults "at risk".) Your attention is drawn to the University's **Safeguarding Code of Practice** and its implications for researchers involving children or adults at risk, including the need for the work to be risk assessed and for researchers to undertake related training. (**Note**: If any of your participants are aged 16 or under, please answer 'Yes' here **and** also answer question 5 below.)	Yes	No **X**
2.	By taking part in the research, will participants be at serious risk of criminal prosecution (e.g., by providing information on drug abuse or child abuse)?	Yes	No **X**
3.	Does the research involve the **deception** of participants?	Yes	No **X**
4.	Does your research raise issues relevant to the **Counter-Terrorism and Security Act (the Prevent duty)**, which seeks to prevent people from being drawn into terrorism? Please see advice on this on our **Best Practice Guidance web page**.	Yes	No **X**

If you have answered 'No' to all of the questions above please go to **Section B**. If you have answered 'Yes' to any question above continue to question 5 below.

5.	Is your project covered by a CUREC **approved procedure** (formerly known as "CUREC Protocols")?	Yes **X**	No

If yes, please give research procedure number(s): **25**

If you answered '**Yes'** to **ANY** of questions **1-4**, **and** answered '**No'** to question **5**, **please stop completing this checklist and do not submit it for ethical review**. Instead, please complete the CUREC 2 application form from the CUREC website. Then submit the CUREC 2 form for ethical review.
If you answered 'Yes' to ANY of questions 1-3, **and** answered 'Yes' to question 5, please go on to **Section B**.

SECTION B: Contact details and project description (NB: must be typed not handwritten)

Contact details:	
1. **Principal researcher/**supervisor (title and name) (if student research):	Professor Richard Breen
2. Name of student (if student research):	Mr. Michail Katsillis
3. Degree programme, e.g., DPhil, BA, MPhil, BSc, MSc (if student research):	DPhil Sociology
4. Department or Institute name:	Department of Sociology, University of Oxford
5. Address for correspondence (if different from above):	Lady Margaret Halls, Norham Gardens, Oxford, Oxfordshire, OX2 6QA
6. University e-mail (**not** private email) and telephone:	michail.katsillis@sociology.ox.ac.uk 07424885950
7. Name and status of others taking part in the project, e.g., third year undergraduate; postdoctoral research assistant:	N/A

SECTION B continued	
Project description:	
8. Title of research project:	Factors and Processes of Social Stratification in Greece: The Role of Shadow Education
9. List of location(s) where project will be conducted:	Greece, Oxford: In Greece, research will include mailed self-completion questionnaires sent to Greek public Lyceums' final (3rd) year classrooms. In Oxford, research will include data entry, coding, cleaning and analysis.

10. If your research involves overseas travel or fieldwork, by the time the research starts, will you have completed and returned a travel risk assessment form? (This has to be approved by your department before you travel. If you are travelling overseas, you are strongly advised to take out University travel insurance.)	Yes X ~~No~~ ~~N/A~~
11. Anticipated duration of research project overall:	months or 4 years (maximum 5)
12. Anticipated start and end dates of the research project involving human participants:	From: (01/04/17) (Estimated – as soon as possible, following approval) To: (10/04/21) Please note that you will need ethics approval **before** you start your research. CUREC1As may take up to 30 days to process.
13. External organisation funding the research (if applicable): N/A	
14. Title and very brief and simple lay description of **research** (about 150 words), plus description (about 200 words) of the nature of participants.	
a) Title, brief lay description of research (150 words). When describing the research, please include your methodology, how you are applying professional guidelines, and the use to which results/data will be put. **Please also declare any conflicts of interest here.**	
Title and Brief Description of Research (150 Words): "Factors and Processes of Social Stratification in Greece: The Role of Shadow Education" This application regards the piloting and later administration of a mailed, self-completion questionnaire, which proposes to collect data on students in the final stages of secondary education in Greece. This data, including measures of variables classically included in examinations of educational achievement and attainment, will also include a novel combination of questions regarding students' participation in shadow education (remunerated extracurricular classes aimed at helping students navigate the educational process). The study's goal is to assess the role of qualitative and quantitative differences in shadow education participation on educational achievement.	

Questionnaires will be mailed to a randomly selected sample of Greek secondary schools, accompanied by an explanatory cover letter/information sheet, blank, sealable envelops, and correspondence to the school's principal and the teachers responsible for students' classes.

SECTION B continued

b) Description of participants and **obtaining informed consent** (200 words). When describing participants, please include

- criteria for inclusion/exclusion
- method of recruitment
- processes for consent to participate

Please ensure you attach as separate documents (if applicable, in English translation):

- your recruitment and advertisement material e.g., a poster or brief invitation letter/ email
- information for participants to read (or hear) before they agree to take part e.g., written information sheets or (only if applicable) oral information scripts.
- a document to record informed consent. Templates for written consent forms and/or oral consent scripts (in case of an oral consent process) are available from the CUREC website
- a guide to interview questions (this may be a list of questions to be asked, or a preliminary scope of questions), or a sample of other instruments (such as a sample questionnaire)
- (if relevant) debriefing document after participants have taken part

The study's target demographic is students in the last year of Greek upper secondary education, the 3rd year of Lyceum, who are expected to be almost exclusively age 17 to 18 or older, in the case of students who have been held back. (Grade skipping is exceedingly infrequent in Greek schools, minimizing the probability of students younger than this.)

Questionnaires (please find attached*) will be mailed to a randomly selected sample of Greek secondary schools, where they will be self-completed by these students. They will be prefaced by an information sheet/cover letter (find attached), which will also function as the study's information sheet, containing a brief description of the study and questionnaire, ultimate data uses, assurances of confidentiality and the anonymity/aggregate nature of any results produced from data analysis, data storage policies, and a notification that these responses will be used in concert with students' national university entrance (Panhellenic) examination grades. This letter will also inform students of their ability to opt-out of the study at any time and instructions on how to do so.

Students will be asked to provide their names, in order to correspond their questionnaires to their Panhellenic examination grades. This is addressed in the letter to principals and teachers, as well as both the information sheet and on the relevant question. In all instances, it is explicitly stated that this information will be handled solely by the researcher and then only in order to correspond students' responses to Panhellenic examinations results. (Handling of students' names is further discussed in Qs.15 and 18.)

The questionnaires will also be accompanied by a letter to the teacher responsible for their class (find attached), thanking them for their part in disseminating the questionnaires to their students and providing them with a brief explanation regarding student questionnaire completion and collection. This letter will also cover respondent questions and opt-out policies. Each school will also receive a letter addressed to its principal (also find attached),

thanking them for their cooperation and providing a set of suggestions/guidelines for the most efficient, ethical and appropriate questionnaire administration practices.

Questionnaires will be sent in boxes with pre-printed return address forms and return postage (via registered mail), to expedite questionnaires' return. To help ensure respondents' confidentiality and anonymity, each questionnaire will be accompanied by a blank, sealable envelope. Students are instructed to place their completed questionnaires in these envelopes and seal them, before returning them to the teachers responsible for their classes.

*All attached forms are English translations, which have been submitted to a process of iterative back translation in order to achieve the best possible conceptual and linguistic correspondence. Actual forms will be provided to students and institutions in Greek.

15. What are the ethical issues connected with your research and what steps have you taken to address them?

Please do not answer 'none'. The committee needs to see evidence that you have identified potential ethical issues with respect to your research and have taken steps to address them. These issues could relate to:

- your own physical and psychological safety as a researcher (please see the University's and Social Science Division's Safety in Fieldwork guidance
- participant burdens and/or risks, and
- data protection/ confidentiality.

For more guidance on ethical issues, please see www.admin.ox.ac.uk/curec/resources/.

As with all studies which collect socio-demographic data, the potential exists for individuals to be identified through any individual level reproduction thereof. Participants are assured that this will never take place and that only the researcher will have access to their personal information in its raw form, in the questionnaire's cover letter/information sheet. Furthermore, this study specifically requests participants' names, in order to correspond their responses to their national university entrance exams marks, which are the true measure of secondary education academic achievement in Greece (and the determinant of entry to the country's Higher Educational Institutions). Students sit these exams at the end of the academic year and their grades are returned, at best, mid-summer. Apart from the previous assurances of confidentiality and ultimate anonymity, students are separately and specifically provided assurance that their names will be used *only* to correspond their responses to their examination grades, which will then be used in conjunction with their other responses. (Handling of students' names is further discussed in Q.18).

Access to students will be acquired on three separate levels. Initially, access to schools will be acquired through the Greek Ministry of Education. Following Ministry acquiescence and random selection, schools will be contacted, to request their participation (at the discretion of their principal). Finally, students will be provided with the

opportunity to opt-out at any time in the process, through the questionnaire's cover letter (and accompanying instructions provided in correspondence to the teachers responsible for their class).

Participants will be provided with the researcher's institutional email address, as well as local phone numbers, in order to communicate any issues that may arise, not addressed in the cover letter or correspondence to their teachers, or otherwise ad hoc in nature.

Section B continued

16. Will you obtain informed consent according to CUREC guidelines and good practice in your discipline before participation?	Yes **X**	No

If you have marked '**No**', please give a brief explanation and justification for this decision here:

17. Will your research involve discussing sensitive issues? This could be information relating to race or ethnic origin, political opinions, religious beliefs, physical/mental health, trade union membership, sexual life or criminal activities.	Yes **X**	No

If you have marked '**Yes**', please make sure that you have included some **supporting information** (as directed in question 14 of this section) showing the range of questions covering these issues.

*See Q. 14, 15 and 18 for the necessity and proposed handling of **students' names**.*

18. Will you ensure that **personal data** collected directly from participants or via a **third party** is held and processed in accordance with the provisions of the Data Protection Act?	Yes **X**	No

19. How will you ensure that any personal and/or sensitive data are captured, transferred and stored securely? In particular if data are to be captured electronically, please consult with the University's research data team (**researchdata@ox.ac.uk**) and your local IT department and, with respect to University IT security policies, please comment on how you will capture such data in the first instance, how you will transfer them over networks or via portable media and how, where and how long data will be stored. For more information please see the University's web pages on research data management: http://researchdata.ox.ac.uk/university-of-oxford-policy-on-the-management-of-research-data-and-records/
Confidentiality and anonymity for participants will be ensured, in accordance with the Data Protection Act. All questionnaires will be safely stored. Hard date will be stored locally within a lockable drawer, while electronic data will be stored on university servers and encrypted media, in a password protected folder. All hard copies will be destroyed after the research is completed. Any data collected will only be used for research purposes. Each student will be assigned a numerical code, corresponding their data to their names. Names will be stored in a work file independent of other data. Respondent names will ONLY be used to correspond students to their later national university entrance examination scores. Thereafter, names will be removed from previously collected data. Personal data other than this will only be used in conjunction with other questionnaires and will only be presented in aggregate form. Initial data collection will take place in Greece; the relevant correspondence to school principals will request that they are initially returned to the researcher at a (nationally) local address, in order to maximize returns and minimize the potential for data loss in international transfers. Questionnaires and data will be stored locally under the same conditions previously described.
SECTION C: Methods and procedures to be used

Method used: Please ensure you have addressed any potential ethical issues related to these methods in Section 14 and in your Participant Information Sheet	**Please mark 'X'**
1. Analysis of existing records	
2. Snowball sampling (recruiting through contacts of existing participants)	
3. Use of casual or local workers e.g., interpreters	

4. Participant observation	
5. Covert observation	
6. Observation of specific organisational practices	
7. Participant completes questionnaire in hard copy	**X**
8. Participant completes online questionnaire or other online task	
9. Using social media	
10. Participant performs paper and pencil task	
11. Participant performs verbal or aural task (e.g., for linguistic study)	
12. Focus group	
13. Interview	
14. Audio recording of participant (you will generally need specific consent from participants for this)	
15. Video recording of participant (you will generally need specific consent from participants for this)	
16. Photography of participant (you will generally need specific consent from participants for this)	
17. Others (please specify):	

SECTION D: Professional guidelines and training		
In this section, please mark 'X' against at least one of the following professional guidelines you aim to adhere to. You should use the principles listed in your chosen guideline(s) in conducting your own research. **Note**: this is not an exhaustive list.		**Please mark 'X'**
Research specialism/ methodology	**Association and guidance document**	
Anthropology	Association of Social Anthropologists of the UK and Commonwealth	
Criminology	British Society of Criminology: Code of Ethics for Researchers in the Field of Criminology	
Education	British Educational Research Association Ethical Guidelines for Educational Research	**X**
Geography	Association of American Geographers Statement on Professional Ethics Royal Geographical Society: Research Ethics and Code of Practice	
History	Oral History Society of the UK Ethical Guidelines	
Internet-based Research	British Psychological Society: Conducting Research on the Internet Association of Internet Researchers Ethics Guide Also see our Best Practice Guidance on internet-based research	
Law (Socio-Legal)	Socio-Legal Studies Association: Statement of Principles of Ethical Research	
Management	Academy of Management's Professional Code of Ethics	
Political Science	American Political Science Association (APSA) Guide to Professional Ethics in Political Science	
Politics	Political Studies Association. Guidelines for Good Professional Conduct	
Psychology	British Psychological Society Code of Ethics and Conduct British Psychological Society: Conducting Research on the Internet Also see "Internet-based Research" guidance above	
Social Research	Social Research Association: Ethical Guidelines	**X**

Sociology	The British Sociological Association: Statement of Ethical Practice	**X**
Visual Research	ESRC National Centre for Research Methods Review Paper: Visual Ethics: Ethical Issues in Visual Research	
Other professional guidelines. Please specify the other guidelines used here*:*		

Please indicate what training in research ethics the researchers involved with this study have received, e.g., the title of the course and date completed (online training available at www.admin.ox.ac.uk/curec/training).

If no formal training has been undertaken, please indicate any discussions of research methodology between researchers and supervisors here.

- Online course Research Integrity: Social and Behavioural Sciences (02 February, 2017)
- Introduction to Research Ethics at Oxford for the Social Sciences and Humanities (and relevant MPLS departments) (Social Sciences Division) (09 February, 2017) provided by the SSH REM (Mrs Claudia Kozeny-Pelling) and a subsequent discussion with Mrs. Kozeny-Pelling regarding the handling of sensitive respondent information.
- Participation (and successful completion, with distinction) of a Methodology and Research Design module with a significant ethical component, taught by Professor Wendy Olsen, at the University of Manchester's School of Social Sciences (2014-2015 academic term). This also entailed several extensive discussions on research ethics both general and specific to dealing with youth in social sciences research.
- Participation (and successful completion, with distinction) of a Survey Research module, taught by Dr Maria Pampaka, at the University of Manchester's School of Social Sciences (2014-2015 academic term). The course dealt with survey design, including ethical considerations in overall design, accompanying documentation and question structure.

SECTION E: Signatures

- 'Electronic signatures' sent as email confirmations from a University of Oxford email address can be accepted. Separate emails should come from each of the relevant signatories as outlined below, indicating acceptance of the relevant responsibilities.
- If you have obtained handwritten (wet-ink) signatures, please scan them and the rest of the checklist pages to create a single PDF document and email through.

Please ensure this checklist is signed by:

For staff research:	**For student research**:
1. **Principal researcher**	1. **Principal researcher (project supervisor)**
2. **Head of Department (or nominee)**	2. **Head of Department (or nominee)**
	3. **Student researcher**

1. **Principal researcher signature/supervisor signature (if student research)**

I understand my responsibilities as **principal researcher** as outlined in the CUREC glossary and guidance on the CUREC website.

I declare that the answers above accurately describe the research as presently designed, and that a new checklist will be submitted should the research design change in a way which would alter any of the above responses so as to require completion of CUREC 2 (involving full scrutiny by an IDREC). I will inform the relevant IDREC if I cease to be the principal researcher on this project and supply the name and contact details of my successor if appropriate.

Signature: ……..

Print name (block capitals): …….. **Date**: ……...

2. Departmental endorsement signature

I have read the research project application named above. On the basis of the information available to me, I:

(i) consider the principal researcher to be aware of her/his ethical responsibilities in regard to this research;
(ii) consider that any ethical issues raised have been satisfactorily resolved or are covered by relevant professional guidelines and/or CUREC approved procedures, and that it is appropriate for the research to proceed (noting the principal researcher's obligation to report should the design of the research change in a way which would alter any of the above responses so as to require completion of a CUREC 2 full application);
(iii) am satisfied that: the proposed project design and scientific methodology is sound; the project has been/will be subject to appropriate **peer review**; and is likely to contribute to existing knowledge and/or to the education and training of the researcher(s) and that it is in the **public interest**.

Signed by Head of Department or nominee *(example nominees for student research include the Director of Graduate Studies/ Director of Undergraduate Studies)*:

Signature: ……..

Print name (block capitals): ……..... **Date**: ……...

3. Student signature (if student research)

I understand the questions and answers that have been entered above describing the research, and I will ensure that my practice in this research complies with these answers, subject to any modifications made by the principal researcher properly authorised by the CUREC system.

Signed by student: …….

Date: ……...

Print name (block capitals): …….....

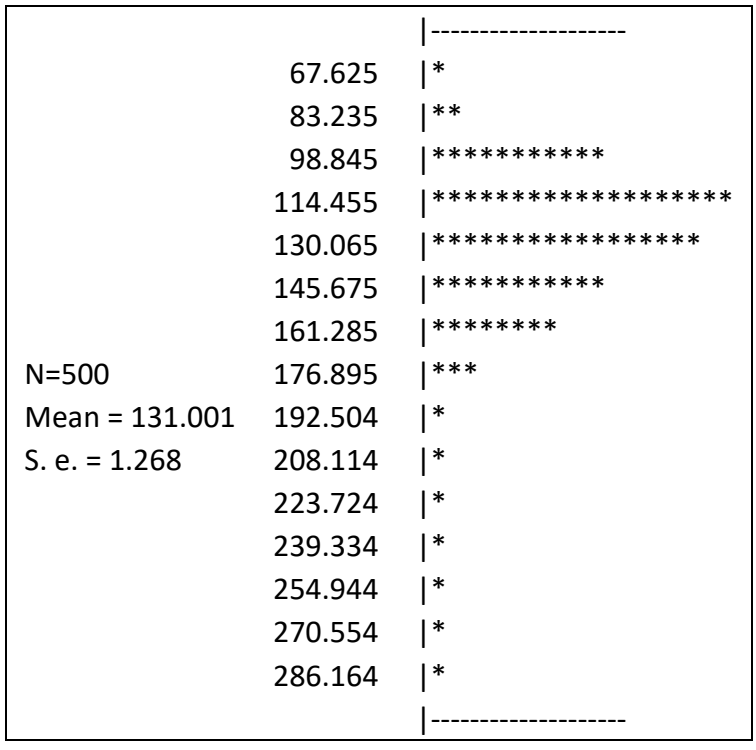
SECTION F: SUBMITTING THE COMPLETED CHECKLIST	**Please mark 'X'**
1. Check you have completed all sections (A-E)	**X**
2. Ensure your application is signed by you, your supervisor (if student) and department	
3. **Please attach all supporting documents (see section B, question 14b for details).** If the appropriate supporting documentation is not included with your application, you will then be asked to provide this separately. **This may well delay the ethical review process, and thus the start of your research.**	**X**
4. Ensure you have declared conflicts of interest (if any) in Section B, question 14a.	
5. If your department has a Departmental Research Ethics Committee (DREC), submit this checklist and supporting information to the appropriate departmental officer.	**N/A**
6. If your department does not have a DREC, submit the checklist and supporting information to the SSH IDREC (email ethics@socsci.ox.ac.uk).	**X**
7. Applications must be sent by email from your official ox.ac.uk email account. Please do not send applications by post.	**N/A**
	X

Appendix F: Bootstrapping Sample Distributions

Bootstrapping effectively treats the study's sample as a pseudo-population and selects a large number (here 500) of random samples from it with replacement. The chi-square values for each are calculated and presented in the plots below.

If a_b contains the sample moments from the b^{th} bootstrap sample, and $\hat{\gamma}_b$ is the value of γ that minimizes the $C(a(\gamma), a_b)$ function, $\hat{a}_b = a(\hat{\gamma}_b)$, then Figure E1 illustrates the distribution of $C_{ML}(\hat{a}_b, a_b)$ or how much the sample moments differ from the moments estimated from the b^{th} bootstrap sample. The difference between the minimum of the discrepancy function ($\min[C_{ML}(\hat{a}_b, a_b)] = .000$) and the mean discrepancy ($\overline{C_{ML}(\hat{a}_b, a_b)} = 1.371$) was 8.852 –a sufficiently low discrepancy according to Steiger, Shapiro, and Brown (1985) and McDonald (1989).

Figure E1. ML discrepancy (implied vs sample) (Default model)



Appendix G: Structural Model Residual Covariance Matrices

Table F1. Residual Covariance Matrix for the Initial Model

	ETHN	SEX	URBAN	FSES	CULCAP	PACH	SCHCOMP	SOI	EDEX	HSSEBIN	EFFORT	GPA11
ETHN	.000											
SEX	.000	.000										
URBAN	.000	.000	.000									
FSES	.000	.000	.000	.000								
CULCAP	.000	.000	.000	.000	.000							
PACH	.000	.000	.000	.000	.000	.000						
SCHCOMP	.000	.000	.000	.000	.000	.000	.000					
SOI	.000	.000	.000	.000	.000	.000	.000	.000				
EDEX	.000	.000	.000	.000	.000	.000	.000	.000	.000			
HSSEBIN	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000		
EFFORT	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	
GPA11	.000	.000	.000	.000	.000	.002	.002	.000	.000	.000	.002	.004

Table F2. Residual Covariance Matrix for the Expanded Model

	ETHN	SEX	FSES	PACH	SCHCOMP	SOI	EDEX	PTSE	GRPSE	EFFORT	GPA11
ETHN	.000										
SEX	.000	.000									
FSES	.000	.000	.000								
PACH	.000	.000	.000	.000							
SCHCOMP	.000	.000	.000	.000	.000						
SOI	.000	.000	.000	.000	.000	.000					
EDEX	.000	.000	.000	.000	.000	.000	.000				
PTSE	.000	.000	.000	.000	.000	.000	.000	.000			
GRPSE	.000	.000	.000	.000	.000	.000	.000	.000	.000		
EFFORT	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	
GPA11	.000	.000	.000	.002	.002	000	000	000	.000	.002	.004

Table F3. Residual Covariance Matrix for the Final Model

	ETHN	SEX	FSES	PACH	SCHCOMP	SOI	EDEX	PTSE	GRPSE	SE_QUALITY	EFFORT	GPA11
ETHN	.000											
SEX	.000	.000										
FSES	.000	.000	.000									
PACH	.000	.000	.000	.000								
SCHCOMP	.000	.000	.000	.000	.000							
SOI	.000	.000	.000	.000	.000	.000						
EDEX	.000	.000	.000	.000	.000	.000	.000					
GRPSE	.000	.000	.000	.000	.000	.000	.000	.000				
PTSE	.000	.000	.000	.000	.000	.000	.000	.000	.000			
SE_QUALITY	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000		
EFFORT	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	
GPA11	.000	.000	.000	.002	.002	.000	.000	.000	.000	.000	.002	.004

Appendix H: A Formal Presentation of the CFI, RMSEA, PNFI, and SRMR Fit Indices

This appendix will provide a brief introduction to fit indices in Structural Equation modelling and a formal presentation of the indices employed in this study.

There is a plethora of fit indices available to evaluate structural equation models (SEM), and the debate regarding which of them are best fit for purpose is ongoing. Hooper, Coughlan, and Mullen (2008) propose the Root Mean Square Error of Approximation (RMSEA; Steiger & Lind, 1980), Standardized Root Mean-Square Residual (SRMR), Comparative Fit Index (CFI; Bentler & Bonett, 1980), and Parsimonious Normed Fit Index (PNFI) as the best measures of goodness of fit for the evaluation of structural equation models. These four measures are also the measures employed in this study. The RMSEA and CFI, among the most popular indices employed in SEM (McDonald & Ho, 2002) are heavily dependent on "conventional cutoff values developed under normal-theory maximum likelihood (ML) with continuous data" (Xia & Yang, 2019 p.409).

RMSEA

The RMSEA is an absolute measure of fit, based on the non-centrality parameter. It indicates how well the model, with unknown but optimally chosen parameter estimates would fit the population's covariance matrix (Byrne, 1998). If N is the sample size and *dof* are the degrees

of freedom of the model under examination, the RMSEA is estimated (Kenny & McCoach, 2003; Kline, 2005) as:

$$RMSEA = \frac{\sqrt{\chi^2 - dof}}{\sqrt{(N-1)dof}}$$

If we wish to express the RMSEA in terms of the NCP, the RMSEA can be expressed as:

$$RMSEA = \sqrt{\frac{\lambda_{proposed\ model}}{(N-1)dof}}$$

If $\chi^2 < dof$ the RMSEA is set to 0. The measure is positively biased (i.e., shows inflated values), inversely proportional to sample size and (more so) the model's *dof* (Kenny, Kaniskan, & McCoach, 2015). Diamantopoulos and Siguaw (2000, p.85) consider it to be "one of the most informative fit indices". The RMSEA improves (i.e., its absolute value decreases) as more variables are added to the model (Kenny & McCoach, 2003).

CFI

The CFI is an incremental measure of fit, which is dependent on the average size of the correlations in the data, directly based on the non-centrality parameter (NCP). Data characterized by low average correlation between variables of interest will result in a lower CFI, while data with stronger correlations will result in a higher CFI. If $\Delta = \chi^2 - dof$, where *dof* are the degrees of freedom of the model under examination, then the CFI can be estimated (Kenny & McCoach, 2003; Kline, 2005) as:

$$CFI = 1 - \frac{\chi^2_{proposed\ model} - dof_{proposed\ model}}{\chi^2_{proposed\ model} - dof_{proposed\ model}} = 1 - \frac{\Delta(proposed\ model)}{\Delta(null\ model)}$$

$$= \frac{\Delta(null\ model) - \Delta(proposed\ model)}{\Delta(null\ model)}$$

Expressed in terms of the NCP, used to determine the theoretical values of the fit index (Kenny & McCoach, 2003; Kline, 2005), this becomes:

$$CFI = 1 - \frac{\lambda_{proposed\ model}}{\lambda_{null\ model}}$$

Where λ_M is the NCP for the *M* model.

The CFI is adjusted to a scale of [0,1], such that values greater than 1 are set to 1, and values less than 0 are set to 0. The CFI incurs a penalty for each additional parameter estimated (Kenny & McCoach, 2003; Morgan et al., 2015).

SRMR

The SRMR is an absolute measure of fit, defined as the standardized "square root of the difference between the residuals of the sample covariance matrix and the hypothesized covariance model" (Hooper, Coughlan, & Mullen, 2007). The SRMR is estimated (Hu & Bentler, 1989) as:

$$SRMR = \sqrt{\frac{2\sum_{i=1}^{p}\sum_{j=1}^{i}\left(\frac{s_{ij} - \widehat{\sigma_{ij}}}{s_{ii}s_{jj}}\right)^2}{p(p+1)}}$$

Where s_{ij} are the observed covariances; σ_{ij} are the reproduced covariances; s_{ii} and s_{jj} are the observed standard deviations; and p is the number of observed variables (Hu & Bentler, 1989).

In other words, the SRMR can be considered the (quadratic) mean difference between the observed correlation and predicted correlations of a given SEM. SRMR values range from 0 (indicating a perfect fit) to 1. Like the RMSEA it is positively biased in favor of small sample sizes and (more so) lower *dof*. The SRMR does not penalize for model complexity (Morgan et al., 2015).

PNFI

The estimation of saturated, complex models is heavily dependent upon sample data and results in less rigorous theoretical models. Counterintuitively, this produces better fit indices (Mulaik et al., 1989; Crowley and Fan, 1997). To address this issue, Mulaik et al. (1989) developed the PNFI –a version of Bentler and Bonett's (1980) Normed Fit Index (NFI) adjusted for models' degrees of freedom. The index strongly penalizes for model complexity. The NFI is estimated (Bentler & Bonett, 1980) as:

$$NFI(proposed\ model) = \frac{F_0 - F_{proposed\ model}}{F_0 - F_s}$$

where:

- F_0 is a lack of fit measure when comparing the sample covariance to the hypothetical covariance matrix derived from all parameters of the null model (i.e., the χ^2 statistic in ML estimation);

- $F_{proposed\ model}$ is the lack of fit measure comparing the sample covariance matrix to the hypothetical covariance matrix derived from the parameters of a less restrictive model j and,
- F_s is the lack of fit measure comparing the sample covariance to the hypothetical covariance matrix derived from the parameters of a saturated model.

However, since better estimates of the NFI (among other indices) can be obtained simply by freeing up parameters within the model, James et al (1982) proposed adjusting the NFI by the ratio of degrees of freedom of the proposed model ($dof_{proposed\ model}$) by the degrees of freedom of the null model ($dof_{null\ model}$). Mulaik et al (1989) referred to this new index as the PNFI, estimated as:

$$PNFI(proposed\ model) = \frac{dof_{proposed\ model}}{dof_{null\ model}} NFI(proposed\ model)$$

Mulaik et al. (1989 p.436) propose that the PNFI "compensates for the increase in fit of a less restricted model obtained at the expense of degrees of freedom lost in the estimation of free parameters".