LEBANESE AMERICAN UNIVERSITY

THE RELATIONSHIP BETWEEN SCHOOL-ENTRY AGE AND ACADEMIC ACHIEVEMENT IN LEBANON

By

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To Natalie

Who always reminds me to do the right thing
THE RELATIONSHIP BETWEEN SCHOOL-ENTRY AGE AND ACADEMIC ACHIEVEMENT IN LEBANON

By

(Paul) William I. Oueis

Abstract

This ex post facto correlational study investigated the relationship between children's age when they started kindergarten and their academic achievement in school. Two samples of students of a Lebanese private school were used in the study.

In Part 1 of the study, the sample included all kindergarten II children (150 girls and 179 boys) who were enrolled in the school over a 5 year period beginning in October 2005. Teachers' ratings were used as the academic achievement variable. A two-tailed Spearman correlation test revealed a significant positive correlation of moderate strength between school-entry age and academic achievement in kindergarten ($r_s = .241, p < .001$). Controlling for sex revealed a stronger positive correlation among boys ($r_s = .301, p < .001$) than among girls ($r_s = .175, p < .032$).

In Part 2 of the study, the sample included all students who were enrolled in Grade 9 over a 10 year period beginning October 2000 (321 girls and 355 boys). A two-tailed Pearson correlation test revealed a weak but statistically significant negative correlation between school-entry age and school grades in Grade 9 ($r = -.083, p = .030$). Students’ school-entry age was similarly correlated with their Brevet exam scores ($r = -.087, p = .023$). Further analysis revealed that the negative correlation was limited to a subsample of Grade 9 students who had delayed school entry beyond the age of eligibility ($r = -.125, p = .046$). No correlation was found between the age of school entry and achievement among Grade 9 students who had enrolled in kindergarten when they were age-eligible ($p > 0.05$).

The study agrees with the findings of the general research that children, especially boys, who start school when they are older achieve more in kindergarten than their younger peers but finds no evidence of a school-entry age advantage at the Grade 9 level. The findings, therefore, do not support delaying school entry beyond the age of eligibility. Recommendations for future research are discussed.

Key words: School-entry Age, Academic Achievement, Kindergarten, Grade 9, Lebanon.
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I – Introduction

Every year between mid-September and the first week of October, an estimated 65,000 Lebanese children begin formal education in Lebanon with their first day in kindergarten. Some cry and cling to the coattails of their mothers as they bring them into the school, while others confidently walk into the classroom and happily embrace their new environment. The children differ in physical growth, cognitive development, and social maturity. They also differ in age. The youngest would have just turned three years and three months, which is the cut-off age for kindergarten as regulated by the Ministry of Education and Higher Education (MEHE). In the older groups would be those who had narrowly missed the cut-off age the year before and were now a full year older. Older still would be those who had been age-eligible the year before but had stayed home for one more year probably because their parents had believed that they were not ready for school.

Are these children equally ready for school? Will the age difference affect their school performance? Will older children achieve more than younger ones?

This study investigates what relationship, if any, exists between the age at which students start formal education in Lebanon and their academic achievement in school. Chapter 1 begins with an overview of the relevant issues of school-entry age, the role of parental choice and school admission policies, followed by background information on the Lebanese educational system, kindergarten, and entry age in Lebanon.
1.1 – Overview

The optimal age at which children should start formal schooling has been debated among educators, developmental psychologists, and policy makers for many years. The various positions have resulted in disparities in the age of school entry regulations between states and across countries. In Northern Ireland and the Netherlands children must be four years old to start school, compared to five in the United Kingdom and Australia, six in France, Germany, Spain and Italy, and seven in Scandinavian countries (National Institute of Child Health and Human Development NICHD, 2007).

1.1.1 – School-entry age (SEA).

The age of starting school is an important issue because it is likely to affect children's adjustment and success in school (Bedard & Dhuey, 2006; Byrd, Weitzman, & Auinger, 1997; Lincove & Painter, 2006). The timing of school entry also influences other aspects of children’s lives. Sending children to school early cuts down on the amount of time they spend with their mother and diminishes the mother's contribution to their development (Datar, 2003). SEA may also affect how well they perform in school (Bedard & Dhuey, 2006; Bickel, Zigmond, and Strayhorn, 1991; Bigelow, 1934; Boardman, 2006; Breznitz & Teltsch, 1989; Crosser, 1991; Datar, 2003, 2006; Davis, Trimble, & Vincent, 1980; Dickinson & Larson, 1963; DiPasquale, Moule, & Flewelling, 1980; Uphoff & Gilmore, 1985; Verachtert, Fraine, Onghena, & Ghesquiere, 2010) and may influence how much schooling they receive, i.e., their academic attainment (Angrist & Krueger, 1992; Dobkin & Ferreira, 2010; Pagani, Fitzpatrick, Archambault, & Janosz 2010). In addition, SEA determines the age at which children finish school and eventually enter the labor force, therefore affecting their cumulative
life-time contribution to the economy before retirement (Deming & Dynarski, 2008; Hámori, 2007). SEA policies may also accelerate or delay the participation of the children's mothers and care-takers in the labor force.

1.1.2 – Relative age.

Researchers often refer to the age of the child in relation to other children in the same class as relative age (Aliprantis, 2010; Bedard & Dhuey, 2006; Deming & Dynarski, 2008; Dhuey & Lipscomb, 2008, 2010; Dobkin & Ferreira, 2010; Elder & Lubotsky, 2009; Evans-Becker, 2003; Graue & DiPerna, 2000; Kern & Friedman, 2009; Puhani & Weber, 2007; Stipek, 2002; Weil, 2007; Yesil-Dagli, 2006; Zill, Loomis, & West, 1997). Large differences between the ages of same-grade students arise in countries and school districts that have a single annual intake window. Only a few countries, among which New Zealand and the Netherlands, implement rolling admissions policies that allow children to enter school immediately after they reach the required age (Leuven, Lindahl, Oosterbeek, & Webbink, 2004; NICHD, 2007). Schools in the rest of the world have a single cut-off age that must be reached by the start of the school year to be eligible for enrollment. Children younger than the required age when school starts have to await the following school year to enroll. Consequently, the season and month of birth determine the relative age of individual students with the oldest students having mid-fall birthdays and youngest students having late-summer birthdays (Bedard & Dhuey, 2006). The month of birth accounts for up to one year difference in age between students in the same class. This age gap remains constant as the class cohorts move up the grade levels in subsequent years. The age difference may become less noteworthy, relatively speaking, in secondary school when one year represents a
smaller fraction of the age of the children. It is very pronounced in the early years of school, however, when the difference may represent 20% or more of the child's age.

1.1.3 – Parental choice.

Parents usually enroll their children in school when they become old enough to be accepted. They may, however, choose to delay sending their children to school for one or more years. Parental choice is subject to several variables including the cost of alternative childhood care, household income, employment opportunities, and market wages for working mothers: considerations that Datar (2003) refers to as "household's utility maximization" (p. 25). Parents’ child-rearing philosophies, their attitudes, their experiences, and their fears regarding the school environment also play an important role in the timing of school entry of their children (Noel & Newman, 2003).

Some parents may delay school entry of their children past the age of eligibility in order to give them a head-start advantage. This practice is often called holding out or red-shirting as in some sports when younger athletes are dressed in red shirts and kept on the side-lines during play until they have grown larger and stronger (Katz, 2000; Deming & Dynarski, 2008). Parents who hold-out their children reason that the age advantage may give them a competitive edge that will serve them well not only in the first year of school but in subsequent school years. Parents cite concerns regarding social and emotional development as well as academic expectations, particularly reading requirements, and as reasons for delaying sending their children to school past the age of eligibility (Hatcher, 2005; Datar, 2003). As expectations of what is required of children in school grow with intensified kindergarten curricula, more parents deem their children not ready for school (Bellisimo, Sacks, & Mergendoller, 1995). Parents worry that
sending their children to school too early places the children at risk of failure throughout all school years. A city council advice to the parents in a district of Melbourne, Australia expressed the following concern:

The decision you make now could impact on the following 14 years of your child's school life. Starting three year-old preschool as a younger child within the group means that your child will always be one of the youngest children in their school group, up to 15 months younger in some cases. There may be difficulties for them at each transition stage – three year old to four-year-old preschool, preschool to primary school, primary school to secondary school and even VCE to university. *(What is the difference between Preschool and Kindergarten?, 2007).*

Research in the United States shows that approximately 9% of children are held-out of school with boys twice as frequently held-out as girls, particularly in families of higher socioeconomic status (Aliprantis, 2010; Bellisimo et al., 1995; Datar, 2003; Zill et al., 1997).

Conversely, the majority of parents are eager to enroll their children in school and will do so as early as the law allows. The Early Childhood Longitudinal Study, Kindergarten Class of 1998-99 (ECLS-K), which involved a nationally representative sample of 22,666 children who had started kindergarten in the fall of 1998 in 1,277 schools in the US, showed that 91% had enrolled in the academic year they were age-eligible and the remaining 9% either enrolled before the cut-off date or delayed school entry past the year of eligibility (Aliprantis, 2010).

As a school principal I have experienced firsthand the frustration of parents when told that they will have to wait an additional year to enroll their child. Their
disappointment is exacerbated if the child is barely underage. Some admit to having altered the date of birth they reported to the authorities in order to coincide with favorable school-entry dates. This is less likely to occur in countries where birth records are not easily manipulated. Some parents attempt to time the birth of their children (i.e., by inducing labor or scheduling cesarean sections) to coincide with the specific calendar day that would allow their children to enroll in school at the youngest possible age (Dickert-Conlin & Elder, 2009).

1.1.4 – Admission policies.

Public schools in Lebanon and in many parts of the world accept all students who apply if they meet the age requirement by the cut-off date. Private schools, on the other hand, may accept age-eligible children only when they deem the children ready for school. They may screen-out applicants they predict were likely to have problems in regular classrooms. Screening helps to identify developmental delays, hyperactivity, attention problems, or unusual behavior. Screening may also pin-point individual differences at the initial, and possibly most important, stage of formal education (Ahr, 1965, Braymen & Piersel, 1987; Freberg, 1991). As a result of screening, private schools may turn down or assign to prekindergarten children they consider in need for additional maturity. Parents of an age-eligible child who were refused admission to kindergarten in one school may enroll their child in another less restrictive school, or heed the advice of educators and delay school entry by one year or more beyond the age of eligibility.

Calls of parents and educators for more accountability and incentives aimed at improving student scores on standardized achievement tests increased pressures on
schools particularly after the "No Child Left Behind Act of 2001" (U.S. Department of Education, 2003). School authorities accelerated the trend to increase the minimum age requirement of school entrance. The age increase was motivated by the belief that older children perform better in school (Stipek, 2002; Lincove & Painter, 2006). Educational policy makers viewed raising the age of entry as a cheap way to get results. Weil (2007) reiterated this view by stating:

Indeed, increasing the average age of the children in a kindergarten class is a cheap and easy way to get a small bump in test scores, because older children perform better, and states' desires for relative advantage is written into their policy briefs. (p. 2)

Lebanese schools, on the other hand, experience little external accountability pressures to improve the performance of their students partly because they are not subjected to high stakes standardized achievement testing, Consequently, the age of student-entry receives little attention in Lebanon. In fact, over the past 10 years the Lebanese MEHE decreased the age of school entry without given any explanation for the decision. The decrease might have been intended to free more women to work in response to market pressures rather than for academic considerations.

1.1.5 – The Lebanese school system.

According to the Lebanese Center for Educational Research and Development (CERD), 942,391 children were enrolled in approximately 2,800 public and private schools in 2010 (CERD, 2011). Private schools form the backbone of the Lebanese educational system, accounting for more than 64% of total enrollment (CERD, 2011).

The Lebanese MEHE recognizes one prekindergarten grade level commonly called Nursery. Nursery activities revolve around play and exploration designed to
improve muscles coordination and social skills with little academic instruction. MEHE records show that only 27% of school children start school at the Nursery level (CERD, 2011).

Nursery is followed by two years of kindergarten: kindergarten I and kindergarten II (respectively: Grand Jardin and Douzième in French-instruction schools). Kindergarten children learn the letters of the alphabet as well as numbers, colors, and shapes. They also learn simple scientific concepts and practice speaking skills in English or French as well as classical Arabic and to develop commonly used vocabulary in both languages. At the completion of the two-year kindergarten program, children are expected to be able to decode and write consonant-vowel-consonant words as well as simple sight-words in Arabic and, depending on the foreign language of choice, in French or English. They are also expected to count and recognize the ordinal nature of numbers. Kindergarten also provides activities that encourage social and emotional maturity considered essential for the more structured environment of Grade 1 and beyond.

Basic education begins with Grade 1 and extends for 9 years. Grades 1 through 6 of basic education are referred to as elementary school. Grades 7 through 8 are referred to as middle or intermediate school. Basic education culminates in the government-administered Brevet exams. Students are not allowed to enroll in secondary school if they fail the Brevet exams. Secondary school is a three-year program with four tracks or content emphases: Humanities, Economics-Sociology, Mathematics, General Science, and Life Sciences. The program concludes with government administered Baccalaureate exams qualifying students for admission to universities in Lebanon and abroad.
Lebanese children with no prior schooling can enroll in all public and many private elementary schools provided they meet academic standards set by the school as well as a minimum age requirement set by the MEHE. Almost all children in Lebanon, however, complete two or even three years of schooling in preschools and kindergartens before they apply for admission to an elementary school. Although not required by law, the pre-elementary school years provide students with essential social, psychomotor, and academic skills that will prepare them for the more rigorous requirements of first grade. MEHE records for the academic year 2009-2010 show that 98.9% of the 66,894 Grade 1 students had completed both years of Kindergarten (CERD, 2011).

1.1.6 – Kindergarten.

Kindergarten in the US and around the world is considered as the first stage of formal, structured education. In many countries, including the US and Canada, kindergarten is a one-year program. In other countries, such as France and Lebanon, kindergarten is a two-year program. In China three years of kindergarten precede elementary school, whereas in Scandinavian countries none are required. The kindergarten curriculum differs across countries but is usually a mix of exploration and play with some abstract work-book tasks intended to help children acquire foundational skills, knowledge, and behavior in environments designed to provide positive early experiences with school. In the US and in Lebanon, accountability pressures to improve educational outcomes in school have resulted in more academic content pushed down into the early grades and kindergarten. As a result, kindergarten children are asked to cope with what was previously first-grade work-book tasks (Bracey, 2000; Hatch, & Freeman, 1988; Lin, Freeman, & Chu, 2009; Martin, 2009; Meisels, 1992; Noel, &
Newman, 2003; Shepard, & Smith, 1988). The escalation of the academic demands in kindergarten played a major role in raising the age of school entry in the US over the past several decades (Deming and Dynarski, 2008; Stipek, 2002; Zill et al., 1997).

Lebanese law states that children entering Kindergarten II must be five years of age by the end of the school year in which they are to be enrolled. (Legislative Decree Number 26 of 1955, art. 17 amended by Law Number 686 of 1998). The school year in Lebanon is nine months beginning on or around the first of October of each year. The cut-off age for starting school at the kindergarten II level is, therefore, set at 39 months (four years and three months). The mandated cut-off age requirement is augmented by one year with each subsequent grade level. The minimum age for admission to Grade 1, for example, is five years and three months.

By comparison, the modal entry age for kindergarten in the US is five years to be completed by the beginning of September of the school year (Stipek, 2002). In view of the fact that the curriculum of kindergarten II of the Lebanese program closely resembles the kindergarten curriculum in US schools, Lebanese children are expected to acquire knowledge and skills similar to their US counterparts when they are almost a full year younger. The introduction of rigorous academic requirement at a younger age in Lebanon is justified in part by the need for the early introduction of a foreign language of instruction (usually French or English) in addition to classical Arabic. Beginnings with Grade 1, most private school children learn a third language, usually French for English-instruction schools. My examination of the programs of several private Lebanese schools revealed that 40-50 % of K-6 classroom instruction time is dedicated to learning Arabic and foreign languages. Many educators and parents believe
that children should begin exposure to a second language as early as possible during childhood (Krashen, Long, & Scarcella, 1979) a conviction strengthened in Lebanon by the need for the development at an early age of the cognitive abilities, phonological awareness, and the diverse fine motor and coordination skills employed in acquiring the correct orthography and phonemic-orthographic correspondence to support learning dissimilar languages.

This study considers that Lebanese children begin formal education in kindergarten II and not kindergarten I because (1) almost all Lebanese students complete kindergarten II before they can be accepted in Grade 1 of elementary school, whereas prior schooling is not a requirement for entry to kindergarten II; and (2) the curriculum objectives of the Lebanese kindergarten II closely resemble those learned in kindergartens in the US and many other countries where kindergarten is considered as the school-entry class.

The remainder of this chapter details the purpose of the study, the research problem, the hypothesis, major questions, and key definitions of the study, the rationale, and significance of the research and its limitations.

1.2 – Purpose

Despite the plethora of educational research on age and achievement, there is little consensus on the optimal age of school-entrance and on the effects of age on achievement, (Verachtert et al., 2010; Aliprantis, 2010). The lack of agreement among the various studies points to the complexity of the relevant questions. Several variables mediate and confound the age and achievement relationship including cultural and socioeconomic factors (Suggate, 2009).
If academic performance benefits from older entry age, we can expect students who entered school at an older age to outperform their younger classroom peers, i.e., a positive relationship can be established between student's SEA and their academic performance. The age advantage may be apparent only in the early years of school or it may persist as children, at varying stages of maturity, try to catch up with the escalating demands of the curriculum.

This study examines the correlation between age and academic achievement among students of a Lebanese private school. In kindergarten, academic achievement was measured using teacher's evaluation of the academic performance of the children in the spring of the school year on a four point rating scale. In subsequent grade levels, academic achievement was assessed using school grades which are the common instrument used for the summative evaluation of academic performance in Lebanese schools. The study also evaluated the strength and persistence of the correlation.

1.3 – Statement of the Problem

The purpose of this study is to determine what relationship exists between the age of entry to kindergarten of the students who were enrolled over a ten school-year period beginning October 2000 and their academic achievement.

The study compared the mean academic achievement of the various entry-age groups as measured by: (1) teachers' ratings of their academic learning in kindergarten, (2) overall grade averages in Grade 9, and (3) scores in the government administered Brevet exams. More specifically, the study attempted to answer the following research questions:
• Is there a statistically significant correlation between the age of starting school and academic achievement in kindergarten II? Do children who had started school when they were relatively older receive higher academic ratings from their kindergarten teachers as compared to kindergarten children who had started school when they were younger?

• Is there a statistically significant correlation between the age of starting school and academic achievement in Grade 9? Do Grade 9 students who had started school when they were relatively older receive higher school grades compared to peers who had started school when they were younger?

• Is the same correlation evident in Grade 9 when the instrument for measuring academic achievement is changed from school grades to Brevet exam scores?

• Are any of the correlations influenced by gender?

1.4 – Hypothesis

In agreement with the general empirical research, the study hypothesizes that children who start school when they are older achieve more in school than their younger peers. It seeks to define the relationship between SEA and academic achievement in kindergarten and in Grade 9. The study will test the null hypothesis $H_0$ which states that there is no significant correlation between the age of students when they start school and their academic achievement. The study will reject the null hypothesis $H_0$ if it finds a significant relation between age of school entry and academic achievement with 95% certainty. If $H_0$ is rejected, the study will provide evidence for the alternative hypothesis $H_1$ which states that there is a significant correlation between the age of students when they start school and their academic achievement. The study will then determine the
direction and statistical significance of these relations and examine whether the relations exist or persist under the following conditions:

1. When students are in kindergarten.
2. When students are in Grade 9 based on their school grades as the measure of academic achievement.
3. When Grade 9 Brevet exams are used as the measure of academic achievement rather than school grades.
4. When children who are considered as having delayed starting school beyond the age of eligibility are removed from the sample.
5. When variation caused by gender is controlled for.

1.5 – Rationale

Although the educational literature is rich in research dealing with SEA, there appears to be no consensus on whether older children maintain an age-advantage over their younger peers particularly in the long run. Researchers have highlighted many problems that limit the usefulness of extant research for making inferences (Datar, 2003; Stipek, 2002; Yesil-Dagli, 2006). This study capitalizes on the following advantages as it attempts to shed light on the relevant issues and to respond to some of the concerns that have been raised in the research literature:

1.5.1 – Context.

The age and academic achievement debate is confused in part because of the difficulty in harmonizing findings across the various educational systems and countries. Differences in the age of school entry, for example, range from 4 years to 7 years in various parts of the world. The older group in one country may well be the age of the
younger group in another (Braymen & Piersel, 1987). Also, the curriculum i.e., content, pace, instructional strategies, and learning expectations differ across geographical regions (Lin, Lawrence,& Gorrell, 2003). Family support, parental involvement, and socioeconomic conditions also vary and therefore may exert country-specific influences on achievement (Fryer & Levitt, 2004; Pearce, 2006; Sirin, 2005; St. Clair & Jackson, 2006). In addition, economic development conditions appear to play a role. Analysis of the 2003 Trends in International Mathematics and Science Studies (TIMMS) has demonstrated a strong association between each country's economic development and TIMSS results (Mikk, 2005).

It is therefore necessary to understand the relationship between age and achievement within well-defined contexts. Andersson (1994) maintained that "although the same debate is raging in different countries, it is not valid to use data or arguments from one country and adopt them to another" (p. 113). McDonald (2001) agreed and observed that "in some countries the youngest continue to be disadvantaged but in other countries they perform best" (p. 381). Bickel et al., (1991) pointed out that the advantage that older children maintain over younger ones may be curriculum-specific and should not be generalized to apply to other districts or localities with different curricula. Crosser (1991) observed that the different curricula and type of educational programs may unequally influence the academic achievement of the various age groups. More recent research pointed to a high correlation between delaying school entry and demographic variables (Aliprantis, 2010; Dobkin & Ferreira, 2010).

This study examines these issues within Lebanese parameters and contexts.

1.5.2 – Scope.
Research findings on academic performance are more meaningful when performance is measured over several years (Datar, 2003, 2006; NICHD, 2007). The study tests the relationship between SEA and academic achievement at two critical transition points in the curriculum: (1) Kindergarten, which is widely considered as the first year of formal education, and (2) Grade 9, which is the last year of basic education under the Lebanese educational system. Grade 9 also offers the opportunity to test the relationship between SEA and achievement in government-administered Brevet exams.

1.5.3 – Methodology.

Causative studies have to account for the selection bias in SEA resulting from parental choice. The same factors that may cause parents to delay or accelerate school entry of a child, such as perceived low ability or poor concentration, may influence the child’s performance in school (Datar, 2003; Bedard & Dhuey, 2006; Gredler, 1980). This study does not attempt to find possible causal effects of age on academic performance; rather, the study evaluates the general correlation between age and achievement. It also assesses the relationship when parental choice is minimized by focusing on children who entered school in the year in which they were of eligible age, i.e., children whose parents did not delay or accelerate their entry to school based on their perception of the child's abilities. The relationship between SEA and achievement among these children can be more meaningful because their SEA depends on chance variations in their birth dates unrelated to factors that may influence performance.
1.6 – Significance

Educators emphasize the importance of children's experiences during the earliest years of formal schooling when the success or failure of children often predicts later outcomes (Alexander & Entwisle 1998; NAEYC, 1995). The age of school entry and the influence of classroom relative age are significant contributors to the children's wellbeing and success in school as well as to their long-term educational attainment and prosperity (Dobkin & Ferreira, 2010; Deming & Dynarski, 2008; Datar, 2003). Age is also a significant factor in making school entry and admission decisions as well as in deciding grade retention or promotion of students and in dealing with underachieving and maladjusted students.

Age may also influence the pace of classroom instruction and teacher expectations of student performance. If older children perform better, the presence of older children in the class raises the bar of student achievement to the disadvantage to their younger classmates (Frey, 2005; Lin et al., 2009; Verachtert et al., 2010; Wu, West, & Hughes, 2010).

As a school principal I have long known that many kindergarten and early elementary school teachers are quick to attribute a poor performance of a relatively younger child to inadequate maturation and to recommend that she repeat her class. By shedding light on the role of age in the performance of Lebanese school children, this study fills a gap in our understanding of this role and may encourage much needed additional research in this area.

Far-reaching policy decisions can also be informed by the study. A prime example is the Lebanese MEHE's recent revision of its social-promotion policies which
applied to all public schools. The MEHE now allows schools to retain children they
deem not ready for the next grade under strict MEHE guidelines. It is likely that the
practice of grade retention in kindergarten and early elementary school hitherto
constrained by the MEHE will increase in the future. It is also likely that most of the
children that will be affected by the new policy will be younger than their peers. If by
giving these children "the gift of time" (Graue & DiPerna, 2000), their chances for
future success are improved, then the MEHE 's policy change might be warranted.

1.7 – Limitations

The implications of this study, both theoretical and practical, must be understood
in light of its limitations. The study is limited to the students of one Lebanese urban
school serving a middle-income community who were enrolled in the school between
October 2000 and June 2010. The findings of the study cannot be generalized to other
populations or different educational settings. Also, any inferences derived from the
study should be examined bearing in mind the following:

The study was carried out in one private school serving a middle class
community in an urban densely populated district of Beirut. This study benefited from
the relative homogeneity of the school community and the student population. It is
important to note, however, that the physical characteristics of Lebanese communities,
such as family size, number of adults in the households, parental education, and
occupation and poverty status, vary between the different geographic regions of
Lebanon (El-Hassan, 1998) and even across districts in the same city. Some of these
regional variables are known to influence academic achievement. It is therefore
reasonable to suspect that regional differences may unequally influence the relationship
between age and achievement. A case in point is families' socioeconomic status (SES). The SES of children's families have been shown to impact their age of school entry (Bedard & Dhuey, 2006; Entwisle, Alexander & Olson, 2005). SES also impacts academic achievement (Pearce, 2006; Sirin, 2005). The SES impact was found to be contingent on the location of the school; weak in urban schools and strong in rural areas (Sirin, 2005). The SES factor is probably amplified in Lebanon and other countries where the language of instruction in schools is not the same as the language spoken at home. High SES families are more likely to be familiar with their children's language of instruction in school than low SES families (Yesil-Dagli, 2006) and, therefore, more able to assist their children with much of their homework. These considerations underscore the need to investigate the age and achievement relationship taking into account how several moderating factors influence the relationship between SES and academic achievement.

Another significant contributor to the academic achievement of children is parental involvement (Bedard & Dhuey, 2006; Datar, 2003; Dhuey & Lipscomb, 2008; Dickert-Conlin & Elder, 2009; Dockett & Perry, 2009; National Education Goals Panel, 1999; St. Clair & Jackson, 2006). In their analysis of reviews of 447 research studies, White, Bush, and Casto (1985) observed that parental involvement was the variable most frequently associated with the effectiveness of early intervention and remedial support. Englund, Luckner, Whaley, and Egeland (2004) reported findings that the quality of the interaction between mother and child had a significant effect on IQ and consequently on academic achievement in first and third grades. The effect of parental involvement on their child's school performance outcomes may vary with the age of the
child. It is likely, for example, that younger children are more in need of the support and
collection of parents in their first year of school than are older ones. The unequal
contribution of parental involvement to the academic performance of the various age
groups should therefore be considered.

1.8 – Definition of Terms

For the purposes of this study, the following definitions will apply:

Kindergarten: The year of schooling prior to first grade. In Lebanon it is the last
year of a three year preschool program designated kindergarten II. French schools and
Lebanese French-instruction schools refer to this grade as grand jardin.

School-entry Age (SEA): The chronological age when a child starts kindergarten.
For children in Lebanon, SEA is their age on the first of October of the year in which
they enrolled in kindergarten II expressed in years rounded to one decimal point. For
example, an age of 65 months (5 years and 4 months) is equal to 5.3 years.

Age-normal students: Students who did not delay school entry, i.e., enrolled in
school when they were age-eligible (Grissom, 2004).

Over-age students: Students who were likely to have delayed starting school past
the year they would have been age-eligible, i.e., Students who were older than the 12
month enrollment window for the school year.

Delayed school entry: Entry to school in the year or years after the year in which
the child had reached the age of eligibility.

Academic achievement (AA): In kindergarten academic achievement is the
student's level of acquisition of knowledge and skills in the academic domains as rated
by the teacher on a four-point scale. In subsequent grade levels academic achievement is
the student's annual grade average assigned at the end of the school year describing the student's academic performance for the year and calculated as the weighted averages of the end-of-year grade of all subjects taught during the academic year. AA is similar to the yearly grade point average (GPA) used in many schools.

Brevet Total Score (BTS): The total score of the student in the Brevet exams calculated by adding the student's score on all nine subjects tested in the exams. The score determines the pass or fail outcome of the exams as well as the mention status of the student.

Grade retention: Repeating a grade commonly referred to as flunking.

Educational attainment: The highest level of schooling completed. This includes school grades successfully completed in elementary, middle, and secondary school as well as post secondary education, diplomas, and degrees acquired.

Instrumental Variable: A calculated variable that is used as a proxy for the actual observed variable in order to estimate the impact of a treatment.

Exogenous variable/ exogenous variation: Variable/ variation external to the relationship that affects it without being itself being affected by it. The opposite of exogenous is endogenous.
II – Literature Review

There is little agreement among child development researchers, professional educators, and education policy makers regarding the appropriate SEA, the developmental characteristics that indicate that children were ready for school, and the effects of children's age when they begin school on their later school adjustment and academic performance.

This chapter reviews the research literature and presents a theoretical framework of the various views and issues relevant to school readiness, the age of school entry, and the relationship between children's age and their success in school. The chapter also reviews the findings of the relevant empirical research focusing on the more recent studies.

2.1 – Readiness for School

The concept of school readiness is at the heart of the school-entrance age question. It was debated among educational and developmental psychologist for more than seventy years (Bigelow, 1934; Graue & DiPerna, 2000; Green & Simmons, 1962; May & Welch, 1984a). Still, the concept of readiness remains elusive:

Conceptually, readiness remains poorly defined and variously interpreted. It is mired in confusion, with practitioners and policy makers advancing widely differing positions regarding it and related issues, including dates of school entry, retention, tracking, transitional classes, and even the matter of structured versus unstructured kindergartens (Kagan, 1990, p. 272)

The readiness question gained momentum with the publication of the report of the National Education Goals Panel (1999) which stated in goal #1 that "by the year 2000,
all children in America will start school ready to learn" (p. 1). The debate centered on what constitutes readiness, how to measure it, and who should be responsible for achieving it: the children, the schools, or the society that should provide the needed support (Lew & Baker, 1995). The debate is often grounded in the various theories of learning and resembles the proverbial nature-nurture question with the Piagetian view focusing on the natural development of the learner, i.e., nature, and the Brunerian and ecological perspective attributing greater role to experiential and environmental influences, i.e., nurture (Frielick, 2004; Kagan, 1990).

2.2 – The Maturational Perspective

2.2.1 – Theoretical framework.

The maturational approach is primarily related to the work of Arnold Gessell who argued that children should begin school when they are ready based on their developmental age rather than on their chronological age (Evans-Becker, 2003). Proponents of this view take the position that children should be sufficiently mature to successfully learn before they start school; i.e., development must precede learning (Graue & DiPerna, 2000). Readiness in their view is "a level of maturity or skills that anticipates [children's] success in the school" (Graue, 1992, p.1), and a "threshold that should be reached before starting school" (Yesil-Dagli, 2006, p. 250). Another assumption of the maturational view is that development comes naturally with age as if responding to an internal biological clock with little that can be done to accelerate the process (Lincove & Painter, 2006).

In a minimalist approach to the maturational view, Bigelow (1934) considered children's chronological age and their IQ as sufficient indicators of their level of
maturity as exemplified in the guidelines he laid out for the appropriate age of entry to Grade 1. Among his 8 categories of age and IQ, items 1 and 7 stated:

1. If a child is chronologically between six years old and six years and four months old and has an intelligence quotient of 110 or over, he is practically certain to succeed in school.

7. A child who is chronologically below six years and four months of age and whose mental age is below six years has practically no chance of success. (p. 192)

Later Maturationalists considered general IQ, i.e., ability, to be only one of several competencies that facilitate school adjustment and learning including motor development and physical wellbeing, emotional and social development, development of language, development of cognition and knowledge, and approaches toward learning (Kagan, Moore, & Bredekamp, 1995). Blair (2002) offered a neurobiological conceptualization of the maturational view stating that executive functions, which control behavior needed for school adjustment such as sitting still and paying attention, is dependent on the development of the prefrontal cortex at ages that roughly coincide with school entry.

2.2.2 – Implications for educational practices.

The implications of the maturational view for educational practices in general and school entry policies in particular are significant. They include the following:

2.2.2.1 – Delaying school entry.

Maturationalists believe that maturity comes naturally with age. Donofrio (1977) advised that children should remain in their home environment until they achieve the required level of maturity. The immature child "may be best served by “marking time”
to align his psychological “wave frequency” with that of his behavioral and maturational peers." (p. 351). Uphoff and Gilmore (1986) agreed:

> Many well-meaning but ill-informed parents and educators are pushing young children into our school systems too soon. Being bright and being ready to begin formal schooling are two very separate issues. When children enter school before they are developmentally ready to cope with it, their chances for failure increase dramatically. (p.1)

The maturational view gained support based on research showing that older children perform better (Breznitz & Teltsch, 1989; Crosser, 1991; Davis et al., 1980; Dickinson & Larson, 1963; DiPasquale et al., 1980; King, 1955).

Over the past 50 years, many states in the US increased the age required for kindergarten school entry and more parents delayed sending their children to school (NICHD, 2007). As a result, kindergarten children have become increasingly older (Bracey, 1989; Deming and Dynarski, 2008; Stipek, 2002; Zill et al., 1997). Bracey called the trend "The graying of kindergartens" (p. 732), and Deming and Dynarski described it as "The lengthening of childhood" (p. 71).

### 2.2.2.2 – Screening.

Several screening tests, such as the Gesell School Readiness Test, the Gesell Preschool Test, the Brigance K & 1, and the Daberon Screening for School Readiness, have been developed to measure children's motor abilities, language development, number skills, social awareness, and visual and auditory discrimination. The tests are also called readiness tests because they are often used to identify which children were ready to begin formal education in kindergarten (May, 1986).
Screening tests determine the developmental age of each child in each of the developmental competencies needed for learning. Chronological age alone does not suffice because children of the same chronological age vary in maturational development (Bracey, 1989). Also, girls mature before boys as supported in findings that boys were retained more often than girls (Frey, 2005; Zill et al., 1997) and findings that boys are also more often held-out of school (Bellisimo et al., 1995; Shepard & Smith, 1987; Datar, 2003; Zill et al., 1997). Proponents of screening tests maintain that by screening out those who have not reached the appropriate maturity, the tests protect children from the emotional scars of failure.

2.3 – Critique of the Maturational View

Critics of the maturational view point out that the maturational approach ignores the normal developmental variability among children. DeMeis and Stearns (1992) warn that teachers and educational professionals "should not confuse temporary lower skill levels that are within the range of normal development with continued long-term failure" (p. 26). They add that

Past research indicates that in many cases, student academic and social skills will eventually even out and enable children with lower skill levels to compete satisfactorily with their classmates . . . especially if teachers and the curriculum accommodate these differences. (p. 26)

Critics also derided what Gredler (1980) called "the destructive aspects of Gesellian psychology" (p. 9). They disapproved of many educational practices that emanate from the maturational approach. Most of the disapproval was directed at the practices of screening and delaying school entry.
2.4 – Critique of Screening

Kagan (1990) stated that "school readiness, as we have understood and used the concept, is a somewhat narrow and artificial construct of questionable merit" (p. 272). Educators disagree on what the specific characteristics that indicate that a child is ready for school are and how these characteristics can be measured (Datar, 2006). Critics also question the validity, reliability, and usefulness of readiness testing for the purpose of screening children. Their disapproval of screening is summarized as follows:

2.4.1 – Lacking validity.

Detractors argued that the most popular screening and readiness tests were not able to predict future school success and therefore should not make decisions about the readiness of individual children (Grissom, 2004; May, 1986; Shepard, 1997).

2.4.2 – Counterproductive.

Bracey (1989) pointed out that it is likely that the criteria used in readiness tests screen out children who stand to profit most from early schooling. Siegel and Hanson (1991) argued that the readiness tests deem rejected children to fail even before they start school. Dockett and Perry (2009) concurred. They stated that the focus of readiness on the characteristics of individual children "provides, at best, a narrow and limited conceptualization of readiness and one that can act against children’s best interests" (P. 1).

2.4.3 – Prejudicial.

The National Association for the Education of Young Children NAEYC (2001) opposed the use of readiness and screening tests to "determine the educational fate of many young children before they enter kindergarten" (p. 12). Opponents of the tests
complained that they place the burden of proof of readiness on children and will often result in decisions that are harmful to them (NAEYC, 2005; Panter & Bracken, 2009). Ellwein, Walsh, Eads, and Miller (1991) criticized screening as prejudicial to boys, children of low socioeconomic status, and minorities. They argued that schools may refuse kindergarten entry to a disproportionate number of these groups of children allocating them to what they called "ghetto" junior kindergartens (p. 170).

**2.4.4 – Unwarranted.**

May & Welch (1984b) found screening tests expensive, required specialized training, and were time-consuming to administer. They found little justification to use them for the placement of children absent convincing evidence that they could predict school performance better than chronological age.

**2.4.5 – Allows schools to shirk their responsibility.**

Under the maturational construct, the responsibility for school readiness resides with the individual child and not with the school. Schools need not accommodate individual needs because children not possessing the needed qualifications are screened out; in Kagan's words "access is individualized while services are homogenized" (Kagan, 1990, p.276 ). Critics deride the implicit shirking of the schools responsibility to accommodate the various learning styles and abilities of different children that comes with the maturational approach to learning. Stipek (2002) called for a "greater focus on making schools ready for children by tailoring teaching and learning opportunities to children’s diverse skills, rather than concentrating on making children ready for schools" (p. 8).
2.5 – Critique of Delaying School entry

Lin et al. (2009) reported research indicating that up to 16% of children start kindergarten later than the law allows. The practice was criticized on several grounds including the following:

2.5.1 – Prejudicial to low-income families.

Critics of delaying starting school on maturational grounds maintain that the practice penalizes low income families unable to pay for an additional year of high quality preschool transitional programs. These programs, as evidence suggests, has a positive effect on achievement (Datar, 2003). Opponents argue that children of low income families, already at greater risk of school failure, were also less likely to benefit from their less enriching home environment. Delaying school entry further would widen the SES related school performance gaps (Deming & Dynarski, 2008; Morrison, Griffith, & Alberts, 1997; Shepard & Smith, 1988; Siegel & Hanson, 1991; Stipek, 2002). As demonstrated by Massetti and Baracken (2010), a greater emphasis on promoting emergent literacy development among children of low-income families can overcome their social development disadvantage.

2.5.2 – Harmful to younger classmates.

Delaying school entry increases the 12 month age range expected with any mandated cut-off age of school entry by an additional 4 to 12 months (Crosser, 1991; Meisels, 1992; May, Kundert, & Brent, 1995). An age-difference of 2 years in a kindergarten class adds to the normal range of variability of children's development in the class and is detrimental to younger children who must now satisfy teacher
expectations raised to match the abilities of the older students (Bracey, 1989; Graue & DiPerna, 2000; May et al., 1995; Meisels, 1992; Walsh, 1989).

2.5.3 – Of limited short-term benefits.

Opponents of delaying school entry on developmental grounds note that early child development is very fluid and difficult to assess. Children who may appear lagging behind in kindergarten may experience developmental spurts that propel them ahead of their peers. It is therefore unnecessary to delay school on the basis of observed developmental deficits (Zill et al., 1997). Critics also point to studies that show that the association between achievement and the age of starting school was too small and that the advantages enjoyed by older children dissipate in succeeding years (Davis et al., 1980; Elder & Lubotsky, 2009). Grissom (2004) remarked:

Delaying school entry or retaining students in other ways to ensure some arbitrary level of achievement is a futile exercise. It cannot be over emphasized that attaining a certain test score is not the same thing as achieving mastery, even if mastery could be defined. At best, schools can identify where students are and move them further along the continuum. (p. 37)

2.6 – The Experiential Perspective

The experiential perspective (Deming & Dynarski, 2008; Morrison et al., 1997) posits that children learn through new experiences and by interacting with their environment and with others. Proponents of this view value experience over maturation (Stipek, 2002). In its position statement on developmentally appropriate practices The National Association for the Education of Young Children (2009) stated that "Development and learning advances when children have opportunities to practice
newly acquired skills as well as when they experience a challenge just beyond the level of their present mastery" (P. 15). Jimerson and Ferguson (2007) called this process transactional, describing it as "the complex interplay of individual and experiential influences across time" (p. 320). Proponents of the experiential view emphasize the influence of interacting with the environment on development (Morrison et al., 1997). The experiential approach is suggestive of Bruner's scaffolding and Vygotsky's zone of proximal development (Gage, & Berliner, 1998) in which children reach new levels of development in collaboration with more competent peers under the guidance of adults. Children "need to be in environments in which adults and peers will nurture their learning and, consequently, their development" (Kagan, 1990, p. 274).

Advocates of the experiential perspective favor using chronological age as the criterion for school entry and oppose delaying sending children to school, arguing that the instructional experience in school is more valuable in promoting academic achievement than additional maturation under the less enriching environment of home. Stipek, (2002). Deming and Dynarski, (2008) argued that "If the experientialist model is correct, then delaying school only delays learning and produces no social or private benefits" (p. 86).

Elder and Lubotsky (2008) presented evidence that the achievement advantage that some older children enjoy over their younger peers was not a result of additional maturation but of accumulation of skills prior to school entry. They cited declining association between SEA and achievement scores past the first months of kindergarten. They also based their findings on data showing that the initial age advantage was most pronounced among children of high-income families and reasoned that upper-income
families were likely to have provided their children with more enriching experiences prior to kindergarten.

2.7 – The Chronological Age Standard

Disagreement on the usefulness, validity, and fairness of readiness testing helped promote chronological age as the main criterion for school entry. Most countries and states today adopt chronological age as the standard for eligibility for enrollment in school (Suggate, 2009). Compulsory education laws requiring children to be in school by a certain age are also based on the chronological-age standard.

Most parents send their children to school as soon as schools would accept them (Zill et al., 1997), begging the questions of when children should be allowed to go to school and what the optimum age of school entry is. The answer to these questions has serious implications for the school authorities that have to accommodate the students and provide them with developmentally-appropriate resources. Parents are also affected because their time and freedom to work are constrained by the presence of home-bound children. Most importantly, the children themselves are impacted because their success or failure in school brings about life-long consequences bearing on their social and emotional wellbeing, academic attainment, and future prosperity.

It is nearly impossible to determine the optimal age when an individual student should start school because the timing of school entry involves many influences (Hatcher, 2005; Kern & Friedman, 2009). It is also important to keep in mind that no matter at what age children go to school, there will always be older and younger children in the same class as well as developmental differences between children of the same age. Zill et al. (1997) made this view clear:
The findings of developmental psychology do not demonstrate that one age of school entry is inherently preferable to another. No matter where the age of entry is set, educational systems have to deal with the fact that children vary in their rates and patterns of development. Because rates of development are so rapid in the preschool and early elementary years, disparities between different children of the same chronological age can be striking. (p. 1)

2.8 – Research Problems

In her seminal work, Stipek (2002) suggested that the studies that compared delayed-entry children with those who entered on time were inconclusive because accommodations were not made for parental choice and other factors that could influence the sample selection process and bias the findings. Datar (2006) explained that:

Unobservable factors such as child’s maturity or parental motivation not only influence parents’ decision regarding entrance age but may also be related to child outcomes. It is conceivable that parents who feel that their children are less mature or have developmental delays are more likely to delay their child’s entry into school. (p. 49)

Hámori (2007) described how the discretion of teachers, readiness assessment specialists, and most importantly, parents, regarding enrollment decisions, biased the study samples. She explained that the delayed entry groups were likely to come from a pool of relatively lower-ability children or from wealthier families who could afford childcare costs, whereas the early entrants were likely to come from a pool of higher ability children or from ambitious parents eager to give their children an early start. The result is a selection process that did not produce a non-random sample. Given the non-
random selection process, delayed entry students were likely to generate "a downward biased estimate of the age effect on academic performance" (Hámori, 2007, p. 4). Likewise, early entrants were likely to produce an upward biased estimate.

In more recent studies, several researchers used instrumental variable estimation as a proxy for the actual; i.e., observed chronological age. (Bedard & Dhuey, 2006; Datar, 2003, 2006; Dobkin & Ferreira 2010; Dong, 2010; Eide & Showalter, 2001; Hámori, 2007; Puhani & Weber, 2007). This methodology circumvents the problem created by the non-random selection of the sample when there is evidence of significant delayed or accelerated school entry. Hámori (2007) and Puhani and Weber (2007) explained that for the instrumental variable to be valid it had to be, (1) correlated with the observed starting age, (2) uncorrelated with the factors that influence the decision to delay or accelerate school entry. Dhuey and Lipscomb (2010) and Hámori (2007) among others, used the calculated starting age of the children assuming they had enrolled on time as the instrumental variable for their actual starting age.

2.9 – Empirical Research Findings

The findings of the general research favors a positive relationship between SEA and academic achievement, i.e., older school-entrants perform better in school (Bedard & Dhuey, 2006; Bickel et al., 1991; Bigelow, 1934; Boardman, 2006; Breznitz & Teltsch, 1989; Crosser, 1991; Datar, 2003, 2006; Davis et al., 1980; Dickinson & Larson, 1963; DiPasquale et al., 1980; Dobkin & Ferreira 2010; Easton-Brooks, 2010; El-Hassan, 1998; Lin et al., 2009; Verachtert et al., 2010). Some researchers have also found that older children experience less emotional problems in school and are less readily referred for learning disabilities and less readily made to repeat a grade (Dhuey
& Lipscomb, 2010; Langer, Kalk, & Searls, 1984; Weinstein, 1969). Older children were also found more likely to be leaders in high school than their younger peers (Dhuey & Lipscomb, 2008) and consequently more likely to become managers and earn higher wages when they enter the labor market (Kuhn & Weinberger, 2005).

Other researchers, however, found no relationship between SEA and academic achievement (Aliprantis, 2010; Bellisimo et al., 1995; Cameron & Wilson, 1990; Demarest, Reisner, Anderson, Humphrey, Farquhar, & Stein, 1993; DeMeis & Stearns, 1992; Dennebaum & Kulberg, 1994; Dietz & Wilson, 1985; Garratt, 2002; Narahara, 1998).

Research findings on the long-term effects of SEA on academic achievement are also contradictory. Many studies have found that age advantages wane and disappear in later school years (Bickel et al., 1991; Davis et al., 1980; Deming & Dynarski 2008; Grissom, 2004; Stipek & Byler, 2001; Verachtert et al., 2010), whereas other studies found that the age advantages persist (Massey, Elliott, & Ross, 1996) and even increase with time (Breznitz & Teltsch, 1989).

The association between SEA and long-term educational attainment has also been disputed. Puhani and Weber (2007) found that German children who had delayed school entry have higher educational attainment than their younger peers. In contrast, Black, Devereux, and Salvanes (2008) found little effect of SEA on educational attainment in Norway. Dobkin and Ferreira (2010) found that relatively older school entrants in California have lower academic attainment. The California findings were contradicted by Kern and Friedman (2009) who reported that starting school early was associated with increased mortality risk partially mediated by a reduced educational
attainment and increased midlife adjustment problems of the early school entrants. The lack of harmony between these studies underscores the role played by the multitude of regional factors influencing the outcomes.

Grissom (2004) and Martin (2009) compared the academic outcomes of relatively older children who started school when they were age-eligible (Grissom called them *age-normal* and Martin used the term *age-appropriate* for this group) with outcomes of children who were relatively older due to delayed school entry past the age of eligibility (i.e., those more than 12 months older than their peers). Grissom used data from the standardized achievement tests administered every year from 1998 to 2002 to grades 2 through 11 California public school students. He found that older age-normal students scored slightly better than their younger peers. The advantage diminished as grade level increased, however, and vanished by 10th grade. On the other hand, Grissom found a *negative* relationship between age and achievement for over-age, i.e., delayed entry, students.

Martin’s data included motivation, engagement, and academic performance measures of 3,684 high school students from seven Australian schools where approximately 25% of the students were older than the standard 12-month range for on-time school entry and 10% in the lower 3 month range. Martin called the former group *older-for-cohort* and the latter group *younger-for-cohort*. After taking the effects of retention and demographic variables into account, Martin found that older-for-cohort and delayed entry students were slightly disadvantaged on all outcomes. He also found that the younger-for-cohort group fared best.
The remainder of this chapter will briefly review four studies all completed within the past five years. The studies were selected because they involved large samples, examined long-term outcomes, and were of international relevance.

Bedard and Dhuey (2006) used data from the 1995 and the 1999 Trends in International Mathematics and Science Study (TIMSS). The 1995 TIMMIS included nationally representative math and science achievement results of fourth graders from 26 countries. The 1999 TIMMS contained the outcomes of the same children, now in the 8th grade. The study excluded countries that did not have clear and uniform nationwide SEA rules, such as the United States, Australia, and Germany. The study included 228,629 observations (test scores from the 4th and 8th grades) from 10 countries. The researchers employed an instrumental variable as proxy for relative age in order to estimate the causal impact of relative age on test scores. They compared the scores of younger and older assigned relative age groups of children when they were in grade 4 (in 1995) and again when they were in grade 8 (in 1999). The study found that at both the fourth and the eighth grade levels, the scores of the youngest students were considerably lower than the scores of the oldest students. An eleven-month age of entry advantage translated into 4-12 % increase in test scores at the fourth grade level. Almost half of the performance advantage disappeared, however, by the eighth grade.

Hámori (2007) used data from the 2003 TIMSS which included 48 countries. The study used Mathematics and Science scores of 3,222 Hungarian students who were tested after the completion of their fourth grade. Reading literacy data was drawn from the 2001 Progress in International Reading Literacy Study (PIRLS) which came from 35 countries. The PIRLS sample consisted of 4,508 fourth grade Hungarian students.
Hámori capitalized on the exogenous variations in SEA in Hungry to estimate its effect on academic achievement. She employed an instrumental variable for relative age and found that children who start school older do better in mathematics, science, and reading. She also found that among Hungarian fourth graders, girls performed better than boys in reading whereas boys performed better than girls in math.

Suggate (2009) used data from the 2006 Program for International Student Assessment (PISA). The PISA study included 44,000 students from 55 countries. Suggate employed sampling techniques aimed at ensuring a representative mix according to socio-economic status, and whether schooling was in an urban or a rural region. Suggate selected countries where there are little within-country differences in SEA. The SEA of countries included in the study ranged from 4 to 7 years. Suggate used differences in SEA across countries and compared the relative reading achievement of the 15 - 16 year-old students of the various SEA groups (i.e., students with different SEA who could be in different grade levels). He examined reading scores across countries and looked for evidence concerning the effect of early instruction on later achievement in the area of reading. Suggate found that despite the advantage that older children have in the development of language and learning skills, the mean reading achievement of early school starters approximated that of those who started school later. After controlling for economic and social differences, the study found no significant association between SEA and achievement in reading.

Aliprantis (2010) used data from the Early Childhood Longitudinal Study K-5th Grade (ECLS-K-5). The ECLS-K-5 was undertaken by the National Center for Education Statistics of the U.S. Department of Education. The ECLS-K-5 collected data
from parents, teachers, students, and schools on children's academic performance and
t heir physical, cognitive, emotional, and social development. The ECLS-K-5 also
included background information on children's home and school environments, teacher's
qualifications, and classroom curriculum. In order to focus on the effect of relative age
on achievement, rather than chronological age, Aliprantis limited the sample to children
who were deemed to be least affected by selection bias caused by the discretion of
parents and others. i.e., children who entered school on time. To do so, she restricted the
sample to first-time kindergarten students who lived in the 27 states whose school entry
cut-off date was between August 31st and the end of the calendar year. The study found
that there was no evidence that increasing SEA increased achievement.

2.10 – Summary

A review of the literature reveals theoretical perspectives that underline practices
and attitudes related to the age of school entry. Historically, maturational views
promoted delaying school entry until children were developmentally ready and
encouraged the use of screening tests to insure readiness for school. A dynamic social-
ecological and experiential model criticized delaying school entry and argued that
school experiences were more beneficial than aging under less enriching environments.
The greater part of empirical research reviewed in this study pointed to a slight
advantage in academic performance enjoyed by children who had started school at an
older age. Many studies, however, found that the academic achievement advantage was
small, most pronounced in the first years, and declined sharply in subsequent years. Of
particular interest to this study, two of the reviewed studies, Grissom (2004) and Martin
(2009), suggested that age differences between peers falling within the normal 12 month
range caused by variations in students’ birth month, may have different effects on
achievement than age differences due to delayed school entry.

Research findings were problematical due to the non-random selection of
entrance age necessitating complex statistical treatments of data. What is abundantly
clear is that the effects of SEA on academic achievement are not well understood and
that other aspects of children’s experiences play a more significant role in their academic
outcomes than age of entry to school. NICHD (2007) summarized this view:

The fact that age-of-entry effects were small in magnitude and dwarfed
by other aspects of children's family and child care experiences suggests that age
at starting school should not be regarded as a major determinant of children's
school achievement, but that it may merit consideration in context with other
probably more important factors (p. 338)
III – Research Design and Methodology

Students in the same class differ in age depending on when they started school and whether they have interrupted their study or repeated a grade. They also vary in academic achievement and abilities. Some students struggle to succeed while others excel with less effort. This study investigates whether there is a relationship between the age at which Lebanese students begin kindergarten and their academic performance in school. The study is in two parts that are designed to investigate the relationship at different times and grade levels in order to gauge the initial as well as the long-term relationship. Part 1 investigates the relationship in kindergarten and Part 2 studies the relationship in Grade 9. Part 2 uses two different instruments to measure academic performance: the first is based on school grades, and the second on government-administered Brevet exams. The study is important because the chronological age of the student as well as the age of school entry are often considered when writing school policy and making decisions regarding the admission, retention, and promotion of individual students. Furthermore, if the study finds a significant association between age and achievement, the finding may be used to aid instruction, particularly in classrooms with large age-differences between students. Teachers may have to alter their teaching strategies in order to cater to the needs of the different age-groups.

3.1 – Research Sample

The research sample for the study was drawn from the student population of a preschool to grade 12 private school located in the Mar Elias-Mseitbeh region of Beirut. Founded in 1954, the school serves the local Lebanese community along with a small number of Arab and foreign expatriate families. In the school year 2010-2011, the
school had 1303 students (689 boys and 614 girls), 133 teachers, and 60 administrative and support employees.

3.2 – Demographics

The school maintains a database of student's demographic information that includes sex, date and place of birth, religion, nationality, residential address, the highest educational attainment of the father and the mother, the occupation of the father and the mother, number of children in the household, and the birth-order of each student, as well as information on family environments (single parent, absent fathers, custody arrangements, etc.) Family income information is not recorded except for families applying for financial aid. The school periodically collects other information that it finds useful such as students’ computer, cellular phone, and internet use, and the academic attainment and careers of alumni.

The information supplied by the school reveals that 39.1% of the mothers and 43.3% of the fathers of the students are university graduates. In 30.2% of households both parents are employed, in 63.8% of households only the father works, and in 6% of households only the mother works. 20% of the parents are small-business owners, 13% are in the syndicated professions (doctors, dentists, engineers, lawyers, and pharmacists), 13% are employed by business and financial corporations. Other major employers of the parents are the Lebanese government, the Lebanese Army and other security forces, and educational institutions.

Considering the location of the school, the place of residence of the students, the occupation of the parents, and also the fact that school tuition costs are in the mid to upper range when compared to other private schools in Beirut, one can surmise that
school community is comprised of middle income families with a small percentage of higher or lower income households. 12% of the families receive financial aid.

The student body is ethnically homogenous. Except for a dozen children of expatriate families, all children are Lebanese with a few Palestinian, and Syrian Arabs. Students of the Moslem faith comprise 90% of the student body and are of the same sectarian diversity found among the Lebanese Moslem population. Only 10% of the students are Christian, mirroring the religious composition of the school's community. The language spoken at home and in the playgrounds is almost exclusively Arabic.

3.3 – Sampling

The study uses two convenient samples of students. The participants of Part 1 of the study are kindergarten II children who were enrolled over a five school-year period beginning October 2005 and ending in June 2010. The sample of Part 2 of the study comprises students who completed Grade 9 and sat for the Lebanese official government-administered Brevet exams over a 10 year period beginning October 2000 and ending in June 2010. Students whose age of entry to kindergarten is not established with reasonable certainty are excluded from the study. Doubtful dates of birth include those of children recorded as born on the first day of any given year. Such exclusion is justified because student records show a dramatic increase in the number of births recorded on the first of January of every year, probably due to a known practice of assigning the first day of the year to births of uncertain birthdays in a given year. The two samples of this study exclude 49 students whose birthdates were judged problematic (Table 1).
Table 1

Student Sample Composition of Part 1 and Part 2 of the Study

<table>
<thead>
<tr>
<th>Grade Level</th>
<th>Population</th>
<th>Excluded</th>
<th>Sample Size</th>
<th>Age Range in years</th>
<th>Enrollment Years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part 1</td>
<td>Kindergarten II</td>
<td>343 students</td>
<td>14 students</td>
<td>329 students</td>
<td>4.3 - 5.6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>159 girls</td>
<td>6 girls</td>
<td>150 girls</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>184 boys</td>
<td>3 boys</td>
<td>179 boys</td>
<td></td>
</tr>
<tr>
<td>Part 2</td>
<td>Grade 9</td>
<td>711 students</td>
<td>35 students</td>
<td>676 students</td>
<td>14.1 to 17</td>
</tr>
<tr>
<td></td>
<td></td>
<td>338 girls</td>
<td>17 girls</td>
<td>321 girls</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>373 boys</td>
<td>18 boys</td>
<td>355 boys</td>
<td></td>
</tr>
</tbody>
</table>

3.4 – Research Design

This research is a two-part ex post facto quantitative study of a correlational design. The study evaluates whether there is a relationship between SEA and academic achievement at two educational grade levels separated by a span of ten years in order to provide insight into the presence and persistence of the possible correlation between SEA and achievement.

Part 1 of the study examines the correlation in kindergarten II considered to be first year of formal education. Part 1 establishes the initial correlation between the two variables; SEA and academic achievement. Given that age differences among younger children constitute a larger proportion of their age. This initial correlation is likely to have the largest correlation coefficient. The relationship between SEA and academic achievement is also tested for kindergarten boys and again for kindergarten girls in order to observe if there are sex-related differences in the correlation between SEA and achievement.

Part 2 of the study evaluates the relationship between SEA and the academic achievement among Grade 9 students based on their school overall grade average in
Grade 9. The relationship is also evaluated with the data disaggregated by sex to see if
differences exist in the relationship when boys and girls are considered separately. Part 2
of the study also employs the Brevet exams as a second instrument for measuring
academic achievement in order to validate its findings. The same Grade 9 student
sample is tested to look for the correlation between SEA and the Brevet Total Score
(BTS) as the academic achievement variable. Again, the correlation is examined in
relation to sex.

3.4.1 – Instruments.

1. Data files of the students kept in the school registrar's office containing student's
date of birth information.
2. Kindergarten teacher rating scale: At the completion of every school-term,
kindergarten teachers rate the performance of their students in a progress report
that is sent to the parents. Letter grades are used to indicate the degree of
acquisition of each of the targeted skills in the areas of the English, Arabic,
Math, and Science as well as other psychomotor, cognitive and social skills. The
teachers also rate the overall academic performance of the children using a
numerical scale of 1 to 4 with 1 being poor, 2 acceptable, 3 good, and 4 very
good. Unlike the progress reports, the 1-4 rating scales are for internal use only
and do not indicate the specific academic domain of strength or weakness of
each student.
3. Grade 9 students' overall annual grade average as entered in the school's
information database. The grade average indicates the yearly academic
achievement of each student on a 100 point scale. It is equal to the sum of the
product of each subject grade multiplied by its weight (also called coefficient) and divided by the sum of all weights. The grade average is therefore the result of the performance of the students in all 10 component subjects: Arabic, English, French, Math, Chemistry, Physics, Life Science, Geography, History, and Civics. A general grade average of 60 qualifies the student for unconditional promotion to the next grade level. Students with an overall grade average of 80 and above are listed on the Honor Roll.

4. Brevet exam scores (BTS) as published annually by SchoolNet, the official website of the Lebanese MEHE: (http://www.schoolnet.edu.lb/examens.htm). The BTS is the sum of the scores of the student in 9 subjects. The subjects and their relative weight (also called coefficient) are identical to those used in calculating the school's general grade average (Table 2).

Table 2

*Brevet Exam Subjects, their Full Grade and Coefficients*

<table>
<thead>
<tr>
<th></th>
<th>Arabic</th>
<th>English</th>
<th>Math</th>
<th>Chemistry</th>
<th>Physics</th>
<th>Biology</th>
<th>Geography</th>
<th>History</th>
<th>Civics</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full Grade</td>
<td>60</td>
<td>40</td>
<td>60</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>280</td>
</tr>
<tr>
<td>Coefficients</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>14</td>
</tr>
</tbody>
</table>

*Note.* Students of the school are not tested for French in Brevet exams because it is their second foreign language. Students of French instruction schools are tested for French and not for English.
3.4.2 – Validity and Reliability.

1. Kindergarten teachers' rating scale.

Teachers’ ratings of the academic achievement of kindergarten II children are employed in the school to guide the assignments of students to classes for the following school year in order to insure equitable distribution of abilities among the various Grade 1 class sections. Rating scales summarize teacher's daily observations and the many assessments of the academic activities of the kindergarten class. The small number of children, 20 to 24 in a typical kindergarten class, and the intimate daily interactions between children and their teacher, provide excellent opportunities for teachers to assess the academic achievement of younger students.

Many researchers have used teacher’s ratings to measure the academic performance of young children (e.g., Englund et al., 2004; NICHD, 2007; Shepard & Smith, 1987; Stipek & Byler, 2001). Other researchers have also found that teachers' ratings agree with standardized achievement test scores (Braymen & Piersel, 1987; Keith et al., 1998) and with readiness assessment tests (Panter & Bracken, 2009).

2. General grade average

The validity of the general grade average used as the instrument for measuring academic achievement in Part 2 of the study stems from the following considerations:

- The general grade average is the standard instrument for the assessment of the overall academic achievement of students in Lebanese schools. Universities and schools base their admission decisions in large measure on this instrument. Grades and not standardized test scores determine grade retention or advancement to the next grade level.
• The general grade average is based on the grades of a whole year in all subjects and not on the grade of a single subject matter or a single test.

• Teacher assigned grades, on which the general grade average is based, are especially useful when used to compare among classroom peers, as is the case in this study. Teacher assigned grades are of doubtful validity if used to compare the academic achievement between students in different schools because each school may employ different assessment strategies and assign different weights to the various subjects making comparisons across schools difficult.

• Some researchers have considered students' grades a more valid instrument for assessing student learning than standardized achievement tests (Keith et al., 1998).

3. Brevet Total Score

The validity of the Brevet exams has often been questioned by Lebanese teachers and educators because the exams are not standardized. Time limits and scoring procedures are generally well observed but test administration procedures and proctoring are not uniformly applied. Wholesale cheating is also known to occur in some locations. As used in this study, however, Brevet exam scores are a valid instrument for measuring academic achievement for the following reasons:

• Brevet scores are the only criterion by which promotion to the next grade level is decided. Brevet test scores define academic achievement at this grade level.

• Scoring in the exams is criterion referenced and is strictly and uniformly observed. Two teachers score the tests and follow a double-blind process by which scorers do not know the identity of the student nor that of the previous
scorer and are unaware of previous scores. A third person resolves any scoring discrepancies that may arise.

- The degree of cheating varies from region to region and is commonly believed to be less tolerated in Beirut. Students of each school are usually placed in up to three exam centers in the same geographic region. Students in the same school are likely to experience similar opportunities to cheat. It is reasonable to assume that, within the age range of Brevet students, older children are provided the same opportunities to cheat as their younger peers. Cheating is therefore likely to equally influence all age groups participating in the Brevet exams and will not alter the correlation between age and academic achievement.

- There is a strong alignment between Brevet exam scores and school grades. The alignment indicates that cheating on the Brevet exams has a limited impact on the score results.

3.4.3 – Variables.

1. School-entry age (SEA): Is the chronological age when a child starts kindergarten. In this study, SEA is the calculated age of the student on the first of October of the year in which the student enrolled in kindergarten II expressed in years rounded to one decimal point. For example, an age of 65 months (5 years and 4 months) is equal to 5.3 years.

2. Academic achievement (AA): Is a variable describing the degree of acquired proficiency in the academic content and skills of the curriculum. The study uses three different instruments for measuring AA, (1) kindergarten teachers' rating
scale, (2) Grade 9 school grades, and (3) Brevet exam scores, as appropriate and relevant to the grade level of the students.

3.4.4 – Data Analysis.

The study uses IBM® SPSS® Statistics Version 18 to input data, conduct descriptive analyses, examine data distributions, and plot the means of age groups and achievement data. SPSS is also used to run correlation tests on the data sets, and document and interpret the results.

Part 1 of the study uses a Spearman Rank-Order correlation test. The Spearman is used in Part 1 because the academic achievement variable is not an equal-interval variable. One cannot assume, for example, that the difference between poor academic performance indicated with the numerical designation "1" and acceptable academic performance indicated by the numerical designation "2" is equal to the difference between the designation "3" for good and "4" for excellent performance. The rating numbers 1 to 4 are therefore considered as ordinal categories indicating rank from low to high.

Part 2 of the study uses a Pearson correlation test. The Pearson is deemed appropriate because (1) All variables are continuous interval variables, (2) all variables are sampled from a population that is normally distributed as confirmed using a frequency-distribution test, and (3) the sampling size is sufficiently large (676 students). A two-tailed alpha test is employed in all correlations because the direction of the correlation cannot be assumed, i.e., achievement may increase or decrease with SEA.
3.5 – Summary

The research design is developed to answer the question of whether there is a statistically significant relationship between age of entry to school and achievement in kindergarten and in Grade 9. Two samples of students of the same school are employed in the study. In Part 1 of the study, the school-entry age of kindergarten II children is correlated with their academic achievement as rated by their teachers on a scale of 1 to 4 employing a Spearman correlation test. In part 2, the SEA of students of Grade 9 is correlated with their academic achievement based on their general grade average for the school year. The findings of part 2 are validated by testing the correlation in the same sample of students using their total score in the Brevet exams to measure academic achievement.
IV – Findings and Results

4.1 – Analysis of Samples

Comparing the kindergarten sample used in part 1 of the study with the Grade 9 sample used in Part 2 reveals the following (Figure 1):

- The SEA of children in the kindergarten sample is between 4.3 and 5.6 years, a range of 15.6 months ($M = 4.92$, $SD = 0.323$), whereas the SEA range in the Grade 9 sample is between 4.4 to 6.0 ($M = 5.25$, $SD = 0.307$), a range of 20 months.
- On average the Grade 9 students in the study sample started kindergarten 0.33 years (four months) older than the children of the kindergarten sample.
- There are negligible differences in the age of starting school for boys as compared to girls in either of the two samples (Table 3).

*Figure 1.* Box plot SEA range for both Grade 9 and Kindergarten II samples.
Table 3

*A Comparison between the SEA of the Kindergarten and the Grade 9 Samples*

<table>
<thead>
<tr>
<th></th>
<th>Kindergarten</th>
<th></th>
<th>Grade 9</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Boys</td>
<td>Girls</td>
<td>Boys</td>
</tr>
<tr>
<td></td>
<td>179</td>
<td>150</td>
<td>355</td>
</tr>
<tr>
<td>Mean</td>
<td>4.93</td>
<td>4.90</td>
<td>5.25</td>
</tr>
<tr>
<td>Median</td>
<td>4.90</td>
<td>4.90</td>
<td>5.20</td>
</tr>
<tr>
<td>Range</td>
<td>1.30</td>
<td>1.30</td>
<td>1.60</td>
</tr>
<tr>
<td>SD</td>
<td>.312</td>
<td>.337</td>
<td>.304</td>
</tr>
</tbody>
</table>

Note. The table shows a negligible difference in the age of starting school for boys as compared to girls in either of the two samples.

4.2 – Results of Part 1: Kindergarten II

The SEA of the children in the kindergarten sample (n = 329) exhibits normal distribution (Figure 2).

*Figure 2* SEA distribution of 329 Kindergarten II children enrolled between the years 2005 and 2010 included in the Sample 1.
The mean SEA of the kindergarten sample is 4.92 years ($SD = 0.323$). The mean of teachers' ratings of the academic achievement of kindergartners (Figure 3) is 2.69 ($SD = 0.932$).

![Frequency Distribution](image)

**Figure 3.** Academic achievement of kindergarten children as rated by their teachers on a four point scale: 1 = poor, 2 = acceptable, 3 = good, 4 = excellent.

Correlational analysis indicates that there is a significant positive relationship between the age of school entry and academic achievement in kindergarten II (Table 4).

**Table 4**

*Spearman's Correlation Between SEA and Academic Achievement in Kindergarten*

<table>
<thead>
<tr>
<th></th>
<th>Spearman's rho</th>
<th>Academic Achievement</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SEA</strong></td>
<td></td>
<td><strong>.241</strong></td>
</tr>
<tr>
<td>Correlation Coefficients</td>
<td></td>
<td><strong>.000</strong></td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td></td>
<td>329</td>
</tr>
<tr>
<td>95% Confidence Interval :</td>
<td>Lower</td>
<td>-.139</td>
</tr>
<tr>
<td></td>
<td>Upper</td>
<td>-.337</td>
</tr>
</tbody>
</table>

** Correlation is significant at the 0.01 level (2-tailed).
On average, kindergarten teachers gave higher academic achievement ratings to children who were older when they started kindergarten than to their younger SEA peers (Figure 4).

![Figure 4](image)

*Figure 4. The mean teacher ratings of the academic achievement of the different kindergarten SEA groups.*

Grouping SEA and AA by sex (Table 5) shows no difference between the mean SEA for girls as compared with boys whereas the mean of teachers' rating of academic achievement is 5.75% higher for girls ($M = 2.81, SD = .908$) than for boys ($M = 2.58, SD = .941$).

**Table 5**

*Group Statistics of Kindergarten Academic Achievement of Girls Vs. Boys*

<table>
<thead>
<tr>
<th>Sex</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>AA</td>
<td>Girls</td>
<td>150</td>
<td>2.81</td>
<td>.908</td>
</tr>
<tr>
<td></td>
<td>Boys</td>
<td>179</td>
<td>2.58</td>
<td>.941</td>
</tr>
<tr>
<td>SEA</td>
<td>Girls</td>
<td>150</td>
<td>4.9047</td>
<td>.33745</td>
</tr>
<tr>
<td></td>
<td>Boys</td>
<td>179</td>
<td>4.9296</td>
<td>.31169</td>
</tr>
</tbody>
</table>
Note. Grouping shows no difference between the mean SEA for girls as compared with boys whereas the mean of teachers' rating of academic achievement was 5.75% higher for girls than for boys.

An independent sample T test shows a significant effect for sex \( t(327) = 2.33, p < .05 \) favoring the performance of girls as compared to boys (Table 6).

Table 6

*Independent Sample T Test of Kindergarten Teachers Ratings of Girls Versus Boys*

<table>
<thead>
<tr>
<th>Levene's (^a)</th>
<th>t-test for Equality of Means</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F</td>
</tr>
<tr>
<td>Equal variances assumed</td>
<td>2.29</td>
</tr>
<tr>
<td>Equal variances not assumed</td>
<td>2.33</td>
</tr>
</tbody>
</table>

\(^a\) Levene's Test for Equality of Variances

\(^b\) 95% Confidence Interval of the Difference

Note. The test shows a significant effect for sex \( t(327) = 2.33, p = .021 \) in the kindergarten sample favoring the teachers' academic ratings of girls over boys.

The correlation between SEA and academic achievement is significant among both boys and girls (Table 7). On the average, older boys and older girls performed better than their same-sex peers. The significance and strength of the correlation are more pronounced between younger and older boys than between younger and older girls.
Table 7

*Correlation between SEA and Academic Achievement in Kindergarten of Boys and Girls*

<table>
<thead>
<tr>
<th>Spearman's rho</th>
<th>Academic Achievement</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Boys</td>
</tr>
<tr>
<td>SEA Correlation Coefficients</td>
<td>.301**</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.000</td>
</tr>
<tr>
<td>N</td>
<td>179</td>
</tr>
<tr>
<td>95% Confidence Interval : Lower</td>
<td>.160</td>
</tr>
<tr>
<td>Upper</td>
<td>.432</td>
</tr>
</tbody>
</table>

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

4.3 – Results of Part 2: Grade 9 Students

Part 2 of the study uses Pearson product moment correlation tests. The Pearson is deemed appropriate after statistical analysis confirmed that all correlated variables were normally distributed (Table 8 and Figures 5, 6, and 7).

Table 8

*Descriptive Statistics of all Part 2 Variables*

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Skewness</th>
<th>Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Statistic</td>
<td>Statistic</td>
<td>Statistic</td>
<td>Statistic</td>
<td>Statistic</td>
<td>Statistic</td>
<td>Std. Error</td>
</tr>
<tr>
<td>SEA</td>
<td>676</td>
<td>4.4</td>
<td>6.0</td>
<td>5.25</td>
<td>.3074</td>
<td>-.002-</td>
<td>-.393-</td>
</tr>
<tr>
<td>BTS</td>
<td>676</td>
<td>38.9</td>
<td>92.1</td>
<td>66.78</td>
<td>9.552</td>
<td>-.107-</td>
<td>-.230-</td>
</tr>
<tr>
<td>AA</td>
<td>676</td>
<td>36.7</td>
<td>94.5</td>
<td>67.61</td>
<td>10.115</td>
<td>.163</td>
<td>.094</td>
</tr>
</tbody>
</table>

*Note. SPSS descriptive statistics show skewness and kurtosis well within the range of +/- 1 to +/-2 considered acceptable normal distribution for psychometric purposes.*
Figure 5. Normal distribution of SEA of Grade 9 students.

Figure 6. Normal distribution of the academic achievement of Grade 9 students based on school grades.
4.3.1 – Correlations based on school grades.

Correlational analysis of the sample of Grade 9 students (Table 9) indicates that there is a significant negative relationship between the age of school entry and academic achievement ($r = -.083, p = .030$). Disaggregating the data by sex shows that the relationship is also negative and significant among boys ($r = -.122, p = .022$). The Pearson does not find a significant correlation between SEA and achievement among girls $p > .05$.

Table 9

<table>
<thead>
<tr>
<th></th>
<th>Pearson Correlation</th>
<th>All</th>
<th>Boys</th>
<th>Girls</th>
</tr>
</thead>
<tbody>
<tr>
<td>SEA</td>
<td>Sig. (2-tailed)</td>
<td>.083*</td>
<td>-.122*</td>
<td>-.048*</td>
</tr>
<tr>
<td>N</td>
<td>676</td>
<td>355</td>
<td>321</td>
<td></td>
</tr>
</tbody>
</table>

95% Confidence Interval: Lower -.151 -.222- -.157-
Upper -.013 -.025- .068

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

A scatter plot charts the distribution and the mean of SEA groups (Figure 8).
Figure 8. The interpolation line of the scatter plot of SEA versus academic achievement shows a slight decline in mean academic achievement with older SEA groups.

4.3.2 – Correlations based on Brevet exams.

When the SEA of the same students is correlated with their performance in the Brevet exams, the results show a significant negative correlation between SEA and Brevet Total Score ($r = -0.087$, $p = 0.023$). Disaggregating the data by sex shows that the negative correlation is significant both among boys and among girls (Table 10).

Table 10

Pearson Correlation between SEA and BTS

<table>
<thead>
<tr>
<th></th>
<th>Brevet Total Score</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>All</td>
<td>Boys</td>
<td>Girls</td>
</tr>
<tr>
<td>SEA</td>
<td>Pearson Correlation</td>
<td>-.087*</td>
<td>-.146-**</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.023</td>
<td>.006</td>
<td>.004</td>
</tr>
<tr>
<td>N</td>
<td>676</td>
<td>355</td>
<td>321</td>
</tr>
<tr>
<td>95% Confidence Interval</td>
<td>Lower</td>
<td>-.158-</td>
<td>-.236-</td>
</tr>
<tr>
<td></td>
<td>Upper</td>
<td>-.019-</td>
<td>-.004-</td>
</tr>
</tbody>
</table>

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).
The results of the correlation between SEA and Brevet total scores (BTS) are nearly identical to the correlation results obtained when SEA is correlated with academic achievement (AA) in school (Figure 9).

Figure 9. Plotted against SEA, academic achievement as measured by school general grade average (AA) and again by Brevet scores BTS shows a slight in-tandem decline in achievement with SEA.

4.3.3 – Gender differences in Grade 9.

Girls outperformed boys in Grade 9 based on their school grades as well as their total scores on the Brevet exams (Table 11).

Table 11

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>AA</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Girls</td>
<td>321</td>
<td>69.38</td>
<td>10.55</td>
<td>.58</td>
</tr>
<tr>
<td>Boys</td>
<td>355</td>
<td>66.01</td>
<td>9.43</td>
<td>.50</td>
</tr>
<tr>
<td>BTS</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Girls</td>
<td>321</td>
<td>68.01</td>
<td>9.91</td>
<td>.55</td>
</tr>
<tr>
<td>Boys</td>
<td>355</td>
<td>65.67</td>
<td>9.08</td>
<td>.48</td>
</tr>
</tbody>
</table>
An independent sample t-test (Table 12) indicates that there is a statistically significant difference in the academic achievement of Grade 9 girls as compared to boys. $t(674) = 4.384, p < .001$) with girls ($M = 69.39, SD = 10.56$) achieving higher grades than boys ($M = 66.01, SD = 9.43$). There is also a statistically significant difference between the mean Brevet total scores (BTS) for girls and boys $t(674) = 3.190, < .001$) with girls ($M = 68.02, SD = 9.92$) scoring higher than boys ($M = 65.6, SD = 9.08$). Girls achieved an average of 3.4% higher grades in school and scored 2.3% higher in Brevet exams than did boys.

Table 12

*Independent Sample T-Test of Grade 9, Boys vs. Girls*

<table>
<thead>
<tr>
<th></th>
<th>Levene’s $^a$</th>
<th>t-test for Equality of Means</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F</td>
<td>Sig.</td>
</tr>
<tr>
<td>AA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Equal variances assumed</td>
<td>6.631</td>
<td>.010</td>
</tr>
<tr>
<td>Equal variances not assumed</td>
<td>4.35</td>
<td>644.8</td>
</tr>
<tr>
<td>BTS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Equal variances assumed</td>
<td>2.418</td>
<td>.120</td>
</tr>
<tr>
<td>Equal variances not assumed</td>
<td>3.19</td>
<td>650.9</td>
</tr>
</tbody>
</table>

$^a$ Levene’s Test for Equality of Variances

$^b$ 95% Confidence Interval of the Difference

4.3.4 – Over-age versus age-normal in Grade 9.

The Grade 9 sample includes 257 students whose SEA indicates that they did not start school in the school year when they were age-eligible and were therefore designated, for the purpose of this study, as over-age. The remaining 419 students started school when age-eligible and were designated age-normal. Testing the correlation among the age-normal students in the sample shows no significant
correlation between SEA and achievement based on school grades (Table 13). On the other hand when the correlation is tested among the over-age students in the sample, the results show a significant negative correlation between SEA and achievement based on school grades with a larger correlation coefficient ($r = -.125, p = .046$) than when the sample includes all students.

Similar results are obtained when Brevet exam scores instead of school grades are correlated with SEA. The Brevet exam scores of age-normal students do not correlate significantly with SEA ($p > .05$) whereas there is a significant negative correlation between BTS and SEA among over-age students ($r = -.121, p = .050$).

Table 13

*Pearson Correlation Between SEA And Academic Achievement In School, All Students, Age-Normal, and Over-Age Students*

<table>
<thead>
<tr>
<th></th>
<th>age-normal AA Pearson Correlation</th>
<th>over-age AA Pearson Correlation</th>
<th>age-normal BTS Pearson Correlation</th>
<th>over-age BTS Pearson Correlation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sig. (2-tailed)</td>
<td>.581</td>
<td>.046</td>
<td>.403</td>
<td>.050</td>
</tr>
<tr>
<td>N</td>
<td>419</td>
<td>257</td>
<td>419</td>
<td>257</td>
</tr>
<tr>
<td>95% Confidence Interval</td>
<td>Lower -.124- .238-</td>
<td>Lower -.132- .255-</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Upper .072 .000</td>
<td>Upper .052 .005</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

Note. The current study considers all children who started kindergarten II when they were between the age of 4.3 and 5.3, i.e., within a 12 month window, as having enrolled in the year they were eligible and therefore belong to the age-normal category and those who were more than 5.3 years old as having delayed school and belong to the over-age category. The 12 month window is the normal age range in a class caused by the once-a-year school intake system that if missed, one has to wait a full year to enroll. Due to the variations in school-entry regulations during the 10 year span of the Grade 9 sample, it is likely that some of the students who were older than the 12 month window would allow were not held back but rather enrolled when entry-age regulations were more restrictive. If this is the case, the 12 month window would have separated most but not all delayed entry over-age children from on-time entry age-normal children.
4.3.5 – Grade Retention.

Sixty two Grade 9 students had repeated a grade some time prior to grade 9. Grade retention explains the wide 2.9 year range in chronological age found among Grade 9 students while the range of SEA among the same students is only 1.6 years. Because grade retention is a consequence of markedly poor academic achievement, the study tests the correlation between SEA and grade retention. Upon removing the 62 students who have repeated one or more grades since they started school, the study found no meaningful difference in the correlation among the non-retained students and the entire sample that included the 62 previously retained. Similar results are obtained when school grades are used as the academic achievement variable and when Brevet scores are used as the academic achievement variable (Table 14).

Table 14

*Pearson Correlation Between SEA And Academic Achievement In School and in the Brevet Exams After Removing Previously Retained Students*

<table>
<thead>
<tr>
<th></th>
<th>AA</th>
<th>BTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>SEA</td>
<td>Pearson Correlation</td>
<td>- .084-&quot;*&quot;</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td>.037</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>614</td>
</tr>
<tr>
<td></td>
<td>95% Confidence Interval</td>
<td>Lower</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Upper</td>
</tr>
</tbody>
</table>

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

Note: Not all retained students remain in school and therefore the Grade 9 sample does not include all students who had repeated a grade. Some students who fail a grade decide to leave the school for public schools or other private schools rather than repeat a grade. Other schools may, and do, accept to promote failing students if they meet their less rigorous promotion requirements.
V– Analysis, Synthesis and Discussion

This study is motivated by the need to determine if academic achievement is related to the age of school entry. The question is of importance to educational policy and practice because if such a relationship exists it must be recognized in making admission and promotion decisions and in judging student performance. Children that may be disadvantaged by starting school at an untimely age may benefit from early intervention designed to forestall anticipated problems in their future school performance.

5.1 – School-entry age

The findings that the mean SEA of the Grade 9 sample is four months greater than the mean SEA of the kindergarten sample and the greater SEA range found of the Grade 9 sample are due in part to changes in SEA regulations. The Grade 9 sample included students who were enrolled in kindergarten between October 1991 and October 2001; a 10 year period in the first half of which school-entry regulations required children to be four years old by December 31st of the year of enrollment. Later regulations reduced the age requirement by as much as six months allowing younger children who would reach the age of four during the following June to enroll. The kindergarten sample covers the latter five year period when the age of entry was already reduced.. If the same downward shift in the age of starting school reflects a nationwide occurrence, which is probable considering that SEA regulations apply to all of Lebanon, we can safely say that Lebanese children are starting school four months younger on average than they did before, a fact that may have important implications for the
Lebanese labor market as well as for their educational and psychosocial outcomes in the years to come.

The study also found that there were no differences in the SEA in the two samples between girls and boys. This finding is in contrast with a preponderance of US studies showing that boys are likely to start school later than girls and are more often held back than girls (Bellisimo et al., 1995; Brent, et al., 1996; Graue & DiPerna, 2000; Ellwein et al., 1991; Yesil-Dagli, 2006; Zill et al., 1998). If the purposeful delay in sending children to school in order to give them a maturational advantage (also called redshirting) is more prevalent among boys than among girls, as the general research would indicate, then the fact that no gender differences were found in the samples might suggest that redshirting children is not as widely practiced in Lebanon as in the US.

Analysis of the two samples also revealed that there were proportionally far fewer over-age SEA children in the kindergarten sample than in the Grade 9 sample. Some of the children in the Grade 9 sample would have transferred from other schools or other regions of Lebanon or abroad and, therefore, might have been subject to different entry age and school admissions policies. The study did not control for the possible contribution of the transferees to the correlation between SEA and achievement.

5.2 – Correlational Results in Kindergarten

The results of the kindergarten study as presented in Chapter 4 revealed that there is a statistically significant difference between the academic achievement of children who started school relatively young and those who began school at an older age favoring the older children. SEA children were rated by their teachers to have learned
more than their younger peers. The study gives support to the finding that older children perform better than younger children in academic achievement (Datar, 2006; Elder & Lubotsky, 2009; Lin et al., 2009; Yesil-Daghli, 2006). The correlation is significant at the 99% confidence level with moderate strength ($r_s = .24$). The coefficient of determination ($r_s^2 = .058$) indicates that 5.8% of the variance in academic achievement can be explained by the age of school entry.

The study therefore rejects the null hypothesis $H_0$ which states that there is no significant correlation between the age of students when they start school and their academic achievement in kindergarten and provides evidence for the alternative hypothesis $H_1$ which states that there is a significant correlation between the age of students when they start school and their academic achievement in kindergarten.

Comparing the performance of boys versus girls in kindergarten shows that there is a significant effect for sex, $t(327) = 2.33$, $p < .05$, with girls receiving higher scores than boys. This finding is congruent with research indicating that girls surpass boys in academic skills in early childhood (Garratt, 2002; Narahara, 1998). Splitting the kindergarten sample into subgroups by gender also shows a stronger correlation between SEA and achievement among boys as compared to the girls. Disaggregating the data reduced the significance of the correlational estimates for girls but not for boys. At the 99% confidence level, 9% of the variance in achievement among boys could be explained by SEA. Among girls, the correlation is weaker ($r_s = .175$, $p = .032$) at a confidence interval of 95% and an $r_s^2$ of .03, i.e., only 3% of the variance in academic achievement among girls maybe explained by their SEA.
The gender difference in the strength of the relation between SEA and achievement in kindergarten is in agreement with the findings of Dhuey and Lipscomb (2010) who, in studying the effect of relative age on special education classification, found much stronger relative age effects for boys than for girls in kindergarten through 1st grade. Dhuey and Lipscomb concluded that "while relative age eventually predicts disability outcomes for all students, in the early grades it matters almost exclusively for boys." (P.865). Considering that there is little difference in our sample between the mean school starting age between girls ($M = 4.90$, $SD = .34$) and boys ($M = 4.93$, $SD = .31$), one may conclude that the maturity difference that a few months make were more pronounced in boys than in girls. This conclusion resonates with Aliprantis (2010) who found that relative age effects are larger for boys than for girls in 1st grade. It is also in agreement with Crosser (1991) who found larger effects of SEA for boys as compared with girls in fifth and sixth grade. One explanation may lie in findings that the attention skills and classroom engagement of boys are less developed in boys as compared to girls in early childhood (Pagani et al., 2010). Older boys may therefore benefit more from a relative age advantage as compared with the advantage gained by older girls over younger girls, i.e., a diminishing return effect might be at work.

In contrast to these findings Aliprantis (2010) found much larger age effects for girls than for boys. The findings of Aliprantis, however, were for 5th grade reading, raising the possibility that relative age effects can change with subject matter content and with grade level.
5.3 – Correlational Results in Grade 9

The results of the Grade 9 study as presented in Chapter 4 reveal that the academic achievement advantage seen in kindergarten favoring older SEA children is not found in the Grade 9 sample. What is found is a negative correlation between the age of starting school and achievement. Although the strength of the correlation is very small, if not negligible, the significance is there ($r = -.083, p = .030$), i.e., there is a statistically significant difference between the academic achievement of children who started school relatively young and those who started school at an older age favoring the younger children. Almost identical results are obtained when SEA was correlated with academic achievement in the Brevet exams as indicated by the Brevet scores ($r = -.087, p = .023$).

The absence of a positive correlation in the Grade 9 sample agrees with studies showing that the age advantage of early school entry diminishes with time (e.g., Bickel et al., 1991; Davis et al., 1980; DeMeis & Stearns, 1992; Deming & Dynarski, 2008; Grissom, 2004; Stipek & Byler, 2001; Oshima & Domaleski, 2006; Verachtert et al., 2010).

The findings favor the experiential perspective which values experience over maturation (see chapter 2) and validate the suggestions of Dhuey and Lipscomb (2008) and the conclusions of Elder and Lubotsky (2008) who suggested that the achievement advantages enjoyed by older SEA children are largely a result of skill accumulation prior to kindergarten and not of additional maturation. Had the achievement advantages been maturational, e.g., a heightened ability to learn, they would likely have persisted
well beyond kindergarten whereas skill accumulated prior to kindergarten would be of only short-term benefit.

The finding that there was a negative correlation between SEA and academic achievement in Grade 9 echoes Grissom (2004) and Martin (2009) who, as reviewed in Chapter 2, distinguished between children whose SEA would indicate that they had started school when they were age-eligible and those whose SEA would indicate that their entry to school was delayed past the school year in which they were age-eligible. The latter category comprised, according to both Grissom and Martin, those who started school after a 12 month window beginning with the school-entry cut-off age. Both studies found that among the over-age students there was on average a negative correlation between SEA and achievement whereas there was no statistically significant difference between the performance of older and younger age-normal students. Testing the correlation between SEA and academic achievement among the 419 age-normal students did not result in a significant correlation ($p > .05$) whereas testing the correlation among the remaining 256 over-age students showed a significant negative correlation between SEA and academic achievement in school ($r = -.125, p = .046$). Both findings agree with Grissom (2004) and with Martin (2009).

5.4 – Selection Bias in the Grade 9 Sample

Students whose age of school entry was dictated by school-entry regulations may be considered as randomly selected because they enrolled in school when SEA regulations allowed them to; a condition indiscriminately and randomly imposed. Those who did not enroll in the year they were eligible may have been delayed by their parents or through school screening, i.e., they were held-back because they were deemed not
ready for kindergarten. The over-age children in the Grade 9 sample are therefore likely to have come from a pool of lower ability children as compared with the age-normal children in the same sample (Datar, 2003; Hámori, 2007). The same factors that had influenced the age of school entry, i.e., relatively diminished ability, cause a downward bias in the academic achievement mean of the over-age children and results in the observed negative correlation between SEA and achievement among this group of children. The proportion of over-age children in the kindergarten sample was too small to influence the correlation results.

5.5 – Grade Retention

The fact that removing children who were previously retained did not change the correlation between SEA and achievement is not surprising given that the retained children had benefited from one or more instruction years in school in order to bring their achievement to the required standards. This result may not be used to support the practice of grade retention, but may add to our understanding of the usefulness of grade retention as a remedial measure.
VI – Conclusions and Recommendations

The effect of the age of starting school on the child's academic outcomes in kindergarten and in subsequent school years has long been debated and researched. Still, there is no agreement on the issue of the optimal age neither of school entry nor on the long-term outcomes of SEA. The lack of consensus stems from the differing underlying developmental and educational viewpoints of educational researchers and policy makers as well as from the often inconclusive empirical research findings which are hampered by the numerous contextual factors that moderate and confound educational outcomes in general and the relationship between age and achievement in particular. Even if one could control for the many variables that can influence the relationship between SEA and achievement, the differences in educational systems around the globe may well remain a major hindrance to the generalization of the findings of research undertaken in one country.

Nevertheless, much of extant research supports the view that children who start school when they are older achieve higher academic ratings or get better grades in school than their younger peers (Bedard & Dhuey, 2006; Bickel et al., 1991; Bigelow, 1934; Boardman, 2006; Breznitz & Teltsch, 1989; Crosser, 1991; Datar, 2003, 2006; Davis et al., 1980; Dickinson & Larson, 1963; DiPasquale et al., 1980; Dobkin & Ferreira 2010; Easton-Brooks, 2010; El-Hassan, 1998; Lin et al., 2009; Verachtert et al., 2010). The current study is an exploratory effort to determine whether this is the case in one relatively large private school in Lebanon. It is not intended for generalization or extrapolation to a global scale and is not constrained by the challenges that accompany causative research.
6.1 – General Conclusions

The study concurs with the findings of the general research that children who start school when they are older learn more in kindergarten than their younger peers. Notwithstanding the many limitations of the study, the evidence for a relationship between SEA and achievement among the kindergartners of the school is clear and the strength of the relationship is substantial. The study gives credence to the beliefs of kindergarten teachers who consider age as an important factor in kindergarten performance (NICHD, 2007; Wallingford & Prout, 2000). Considered separately, the results of the kindergarten study argue against lowering the age of school entry and dispute the recent change in MEHE regulations to that effect.

Conversely, Part 2 of the study failed to find evidence for a positive correlation between SEA and achievement among age-normal children in Grade 9, thereby casting doubt on the persistence of the relationship between SEA and achievement. Although educational researchers are far from unanimous on the long-term outcomes of the different SEA groups, the absence of a persistent correlation agrees with much of the existing literature (Bickel et al., 1991; Davis et al., 1980; Deming & Dynarski 2008; Grissom, 2004; Stipek & Byler, 2001; Verachtert et al., 2010).

The negative correlation found in the entire Grade 9 sample might be explained as resulting from a nonrandom selection of older children of lower ability. Testing the correlation among both the age-normal groups of SEA and the over-age groups supports this explanation by finding that the negative correlation is only evident among the over-age SEA groups.
The finding that girls surpass boys in academic achievement in kindergarten and in Grade 9, if confirmed by additional contextual research, may encourage the admission of girls who narrowly miss the cut-off age while holding firm to the regulated cut-off age when boys are considered. Children who narrowly miss the regulated age of entry to school represent a special challenge to schools that have to explain admission decisions to parents who, quite understandably, refuse to accept delaying school entry by a full year because their child missed the deadline by a few days.

The study does not support holding-back children when they are age-eligible. The findings indicate that delaying school entry may have short-term benefits but may not be beneficial in higher grades.

6.2 – Evaluation of the Research

This study highlights the complexity of the SEA issue and points to the myriad of variables that would have to be controlled for in order to gain a deeper understanding of the association between and SEA and achievement. The design of the study resulted in several drawbacks, including:

- The study did not account for differences among kindergarten II children in the number and quality of schooling years prior to kindergarten. All of the kindergarten II children had enrolled in kindergarten I but not all had enrolled in pre-kindergarten schools. If prior schooling is associated with SEA, then it may influence the relationship between SEA and achievement in kindergarten and beyond possibly giving those who had enrolled in pre-kindergartens a performance advantage.
• The data of the Grade 9 sample did not distinguish between children who started school in the same school and those who started school elsewhere and later transferred to the school before reaching Grade 9. If the transferees are of relatively older SEA and if transferees do not achieve as well as their home-grown peers, their contribution to the correlation between SEA and achievement would be biased.

Despite these limitations, the study succeeds in providing insight into the issues of the age of starting school and its relationship with academic achievement and in providing plausible evidence for its main hypothesis that SEA is correlated with achievement, at least in kindergarten.

6.3 – Limitations and Recommendations for Future Research

The fact that the research samples were limited to students of one private school in one urban middle class community limits the extrapolation of the findings to other populations and other school systems in Lebanon and elsewhere. The consistency of the findings, however, indicates that SEA and achievement are not unrelated, particularly in the early school years. This inference should encourage replicating the study on a larger scale with a more representative sample of students. What appears in this study to be a trend of diminishing SEA–achievement correlation ending in its observed disappearance by Grade 9 suggests that future studies should not only examine the relationship in Kindergarten and in Grade 9, but also trace the changes in the relationship between the two grade levels particularly during the early elementary years.

As noted earlier, the study does not control for many variables that may unequally influence SEA as well as academic achievement including but not limited to
the student's home environment; such as family size, parental education, occupation and poverty status, and schooling prior to kindergarten. A causative study that investigates not only the correlation between SEA and achievement but also the effect of SEA on achievement will have to control for even more variables such as general IQ and school characteristics, and is likely to be of more value to educational practice and policy across broader scales.
VII – References


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