2005

The relationship between year-round education and student achievement

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NOTE TO USERS

THE RELATIONSHIP BETWEEN YEAR-ROUND EDUCATION AND STUDENT ACHIEVEMENT

A Thesis

Presented to

The Faculty of the Department of Sociology

San Jose State University

In Partial Fulfillment

Of the Requirements for the Degree

Master of Arts

By

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May 2005

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ABSTRACT

THE RELATIONSHIP BETWEEN
YEAR-ROUND EDUCATION AND STUDENT ACHIEVEMENT

By Lori Turk-Bicakci

Year-round education, a system of dividing the long summer vacation into short breaks dispersed throughout the year, offers an alternative to the traditional nine-month calendar. This study assesses the effect of school calendar type (year-round or traditional), the effect of the type of tracking instituted within year-round schools (single-track or multi-track), and the impact of poverty level of students in both calendar types on standardized reading and math test scores of public school students throughout the state of California. Findings indicated that students attending year-round schools have slightly lower test scores than students attending traditional schools, and a comparison of test scores of single-track and multi-track year-round students offered mixed results. Furthermore, poverty level has a weaker effect on test scores in year-round schools than in traditional schools. Analyses, based on multiple regression, also include student, teacher, and school characteristics.

ACKNOWLEDGEMENTS

To Ara, who lovingly supported my efforts toward this master's degree.

To my father and Sylvia, who have supported me in every direction I have traveled throughout my life.

To Dr. Yoko Baba who encouraged me to continue my studies in a Ph.D. program.

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CHAPTER 1: INTRODUCTION

The American public education system was formed during the early 1800s and shaped by the circumstances of that era. A major factor in devising the school calendar was economic -- farming was a way of life for almost three-quarters of the population, and families relied on their children's help during the summer months. Today, although farming is a livelihood for only 2.5 percent of Americans (World Almanac, 1999), public school calendars continue to cater to the scheduling dictated by a farming lifestyle. Without the initial focus of fitting education to the predominant American lifestyle, the need to provide students with a three-month summer vacation has diminished. Instead, the summer vacation has become an ingrained cultural artifact, largely without a critical interrogation of its contemporary purpose and value. If a different school calendar structure is found to significantly raise student achievement levels, a focus of growing concern in public education, then that new system should be considered for adoption.

In 1990, a national goal was set by the President and governors of the United States, which specifies:

> By the year 2000, American students will leave grades four, eight and twelve having demonstrated competency in challenging subject matter including English, mathematics, science, history, and geography; and every school in America will ensure that all students learn to use their minds well, so they may be prepared for responsible citizenship, further learning, and productive employment in our modern economy. (Mullis, Owen, and Phillips, 1990, p. 8)

This statement established academic performance as a clear priority among the stated goals of today's education. One question that arises as educators strive to meet this goal is whether the need to provide students with a three-month vacation is academically

sound or whether it is simply an entrenched tribute to our agricultural past. The year-round program was conceived and instituted in some school districts to provide a potentially powerful alternative to the traditional calendar with the expectation that a number of benefits would result. This study addresses one of those potential benefits -- academic performance will improve. If year-round education (YRE) is more academically sound than traditional education, and academic achievement is the primary aim of education, then a shift to YRE is justified.

Year-round education has had a long history in the United States, although it has only received greater attention during the last few decades. In 1904, Blufton, Indiana, was the first community to adopt YRE in the United States (National Association of Year-Round Education, 1999). Decades later, in 1968, Hayward became the first district in California to adopt YRE, and it is now the longest running YRE program in the United States (National Association of Year-Round Education, 1999). With significant growth since that time, the United States now has more than 2,800 year-round schools with enrollment surpassing two million students (National Association of Year-Round Education, 1999). During the 1997/1998 academic year, California had 1,371 year-round schools (17.4 percent of the total number of schools), 70 percent of which were multi-track (California Year-Round Education Directory, 1998). More than half of the country's students who attend year-round schools live in California (National Association of Year-Round Education, 1999; California Year-Round Education Directory, 1998), making California a prime location for studying this alternative to the traditional organization of education.

The terms "traditional education," "year-round education," "single-track," and "multi-track" are well defined. "Traditional education" indicates that students are in session for nine months from September to June and are on break during the summer months. The term "year-round education" indicates that the three month summer vacation of traditional school is dispersed throughout the year. School is in session year-round, but the number of instructional days is typically equivalent to that in traditional school (see Appendix A).

The major types of YRE plans that schools can adopt are a 45-15 plan, 60-20 plan, 60-15 plan, or 90-30 plan. The first number in the plan titles refers to the number of days students attend school and the second refers to the number of vacation days per cycle. For example, in the 45-15 plan, students attend school for 45 days (nine weeks), then have a 15-day vacation (three weeks). All plans permit flexibility to allow days off for holidays.

The type of tracking incorporated in a YRE school calendar is another level of organization that should be seriously considered. "Single-track" refers to the entire student body following one calendar with all attending school at the same time. "Multi-track" refers to staggering student attendance so that at any one time, a portion of the student body is on vacation. For example, YRE could be organized as a multi-track system by dividing the student body into four groups. Group A attends July, August, and September then has vacation in October, group B attends August, September, and October and has vacation in November, and so forth. Thus, only three-fourths of the student population are in session. The school year begins in July for all students, but one-

fourth of the students spends the first month of the school year on vacation as in the case with group B above (see Appendix B).

This study seeks greater understanding of the efficacy of year-round education: Are year-round schools more academically effective than traditional schools and, among year-round schools, are single-track schools academically preferable to multi-track schools? To consider these questions, first an explication of the overall benefits and costs of each of these organizational plans and a literature review are necessary.

Past assessments of the academic efficacy of YRE over traditional education have been mixed, although a strong theoretical argument can be made in its favor. Briefly stated, by dividing the long summer break into short refresher breaks, students have an opportunity to reflect on the previous term and improve motivation for the coming term. The more continuous learning environment fostered by the year-round calendar diminishes learning loss, promoting academic achievement.

An important supplementary question is whether YRE affects the relationship between academic achievement and socioeconomic status. Sadly, an achievement gap persists between socioeconomic groups of students, despite the long-standing goal that one of the functions of the public school system is to create equal opportunity for social advancement of all groups of students. Some at-risk student populations may be less likely to fall behind their peers with the more systematic attendance of YRE, helping to bring the education system closer to its goal (Fischer, et al., 1993; Greenfield, 1994; Heyns, 1978; Kneese, 1996; Morton, 1994; Weaver, 1992).

In the present study, these questions are investigated by comparing mean standardized test scores of students at YRE schools with scores of students at traditional schools throughout the state of California from 1998 to 2000. Standardized regression analyses and a comparison of the regression coefficients across the three years using F-tests indicate whether one scheduling type is associated with higher test scores than the other, and if one type helps to increase test scores at a faster rate than the other.

CHAPTER 2: REVIEW OF LITERATURE

Every school is unique in its community, people, and philosophy, making the study of YRE complex. A review of the literature that compares the academic strength of each of the organizational types has yet to indicate clearly whether student knowledge is bolstered or hindered by YRE, although impressions of YRE of those who have experienced it are generally positive.

Kneese (1996) conducted a meta-analysis of 13 studies in which she integrated findings through statistical analysis. By observing the effect size of YRE versus traditional school, and single-track versus multi-track education of the combined studies, she concluded that YRE has an overall positive but very small effect on academic achievement, and that single-track is more effective than multi-track (Kneese, 1996).

Another study, completed for the Perris Union High School District by the California Educational Research Cooperative, found mixed results. It compared math and reading standardized achievement test scores for middle school students at the same school for the year before and the year of changing to YRE (Zykowski, Hemsley & Zhu, 1995). In seventh and eighth grade, reading scores improved from 1992-93 to 1993-94; however, math scores improved in seventh grade but became worse in eighth grade in the two years (Zykowski, et al., 1995).

On the other hand, officials from San Diego Unified School District found that there was a significantly higher percentage of year-round schools that maintained or increased scores compared to results of traditional schools using both CAP exams and the Comprehensive Test of Basic Skills (CTBS) exams from 1982 to 1990 (Mutchler, 1993,

as cited in Morton, 1994). Similarly, Ballinger (1995) found statistically significant differences in math and reading in favor of all YRE students when he compared 311 YRE upper grammar school students in southern California with matched traditional school students. In addition, teachers in Socorro Independent School District in Texas have seen significant gains in their students' academic performance. Regardless of a 12 percent unemployment rate and a 70 percent poverty rate in the community, and district enrollment that has doubled in eight years in the district, teachers, and administrators report an elevation in academic performance every year since implementing YRE in 1991 (Barber, 1996). Their students have consistently earned high scores on the Texas Assessment of Academic Skills standardized test, the drop-out rate is less than 1 percent, and 65 percent continue on to college (Barber, 1996). Barber largely attributes these successes in Texas to YRE.

Opinions about YRE are more clear. In Texas, an attitudinal survey returned by 19 principals of traditional elementary schools and 42 principals of YRE elementary schools was analyzed (Opheim, Mohajer, and Read, 1995). Out of several indices surrounding YRE experiences such as extra-curricular, budgetary, and staffing issues, they found that the student achievement index had the strongest relationship with YRE. With statistical significance at the .001 level, principals reported benefits in achievement in related areas such as retention, special education, bilingual/ESL education, learning, and enrichment programs and standardized test scores. Even though YRE "was originally designed to handle overcrowding" in Texas, these researchers find that

principals in Texas see improvement in student achievement as a very strong and important result of this system (Opheim, et al., 1995, p. 118).

In Sweetwater Union High School District in California, consensus among teachers who responded to an attitudinal survey is that student achievement has improved "dramatically" compared to the time period during which the school was on a traditional calendar (Stenvall, 1996, p. 32). In addition, in Trenton, New Jersey two schools adopted YRE in 1995 despite resistance from some teachers and parents. In its first year of operation, teachers all reported gains with their students compared to previous years in traditional education, and parents are now on a waiting list to become a part of the system (Venable, 1997). According to attitudinal surveys, YRE appears to be a success in relation to student achievement.

Similar to the analysis presented in the next section, a statewide study sponsored by the California Department of Education (CDE) examined standardized scores from the California Assessment Program (CAP) from 1982-83 to 1984-85 (Quinlan, 1987). Comparing scores between YRE and traditional schools was inconclusive; however, single-track schools were found to perform at or above the state expectancy and multi-track schools performed below predicted levels (Quinlan, 1987).

The present study differs from the Department of Education's study by analyzing a new standardized test implemented in all California schools in 1998, the Stanford Achievement Test Series, Ninth Edition, as administered by the Standardized Testing and Reporting Program (STAR). In addition, the CDE study takes into consideration family socioeconomic status (SES) measured on a three point scale, the percent of students

whose families receive assistance under the Aid to Families with Dependent Children (AFDC) program, and the percent of limited and non-English speaking students. The present study does not include an SES scale, but does include the other two variables (AFDC has since become CalWorks) as well as variables that measure additional student, teacher, and school characteristics.

Statistical testing differs as well. Whereas the CDE study was cross-sectional at three time periods, the present study compares the three time periods and assesses the relative rates of change in test scores of YRE and traditional students across time. The present study also compares the impact of the socioeconomic level of students on test scores between YRE and traditional schools, an issue not addressed in the CDE study.

Summarizing past research, studies utilizing analyses of standardized test scores vary in their conclusions, but attitudinal surveys and qualitative interviews indicate that YRE appears to be a positive affect on academic achievement. Numerous districts nationwide, such as Los Angeles, Houston, Provo, and Oxnard with more than ten years of experience with YRE, report that students do as well or better academically than students in traditional schools. However, a California statewide assessment conducted more than a decade ago and other district level studies using standardized test scores found inconclusive results. A current statewide assessment of student test scores may more conclusively provide evidence of the benefit of one organization over another.

CHAPTER 3: THEORETICAL PERSPECTIVE

Max Weber's theory about the progression of societies offer insight about the likely further development of YRE. Weber (1930), in The Protestant Ethic and the Spirit of Capitalism, identifies greater efficiency as a trend in society as people organize their activities using increasingly rational methods. As people consider the costs and benefits of taking a particular action to help guide their decision-making, emotional considerations decrease in importance in the decision-making process while calculated, sensible cognition takes their place. Weber states that "rationalizations of the most varied character have existed in various departments of life and in all areas of culture" (Weber, 1930: p. 26), so rationalization may be a guiding principle in organizing educational institutions. Weber, in examining the school establishment, might conclude that YRE embodies a more rational organization type than traditional education.

Currently in California, challenges to effectively educate students are ever-present. Foremost among the problems is a lack of resources. A continual increase in student population, 24.6 percent of which is not English proficient (Rumberger, 1998), combined with a policy of class-size reduction in which kindergarten through third grade classrooms are reduced to 20 students instituted in 1996, and anemic state and federal funding seriously burdens school resources, making year-round education an attractive and rational alternative to traditional education. It more efficiently uses school resources by operating at a school's physical capacity on a continual basis. Year-round education, with a change in organizational structure, can immediately increase capacity by up to 100 percent by rotating classes of students in and out of classrooms and they go on and off

vacation without the expensive process of building more schools. In addition, through economies of scale, personnel, and operational costs per pupil drop in YRE facilities. For example, in a traditional school that houses 635 students, the cost per pupil is $515.00, while the cost per pupil in a YRE school is $490.00. (Statistical Summary of Year-Round Programs, 1997-1998). YRE facilities are more fully utilized; never do they sit empty for three months every year.

Weber's theory of rationality would predict a trend toward YRE because it is a more rational approach to school organization than traditional education. Furthermore, within YRE, multi-track is a more rational approach than single-track schools. The benefits of YRE enumerated above apply more strongly to the multi-track method of organizing than to the single-track method because of the continual rotating sets of students throughout the year. In fact, California statistics show that almost 70 percent of YRE schools are multi-track. (Statistical Summary of Year-Round Programs, 1997-1998). However, this factory-like, rational, mass-production style education may not be most beneficial to the educational advancement of students.

Research conducted on YRE tentatively supports the theoretical perspective of Weber and also suggests two arguments regarding academic achievement – it may lead to an increase in knowledge retention and help narrow the socioeconomic achievement gap. Student academic performance can benefit in a variety of ways by dispersing time off throughout the year. Past findings indicate that time spent on review is less necessary under YRE, thus more time can be spent learning new material. A study conducted for the Board of Regents of New York indicated that substantial learning loss occurs over the

summer break of traditional education, requiring teachers to spend four or six weeks in the fall reviewing past material (Anderson and Walberg, 1993). On the other hand, with short intercession periods (the time period that students are off-track under YRE), students retain more information from the previous term and require less time to readjust to the school routine after returning than with the usual long summer vacation (Warrick-Harris, 1995).

In addition, intersession can be used for remediation and enrichment programs as a replacement for summer school, and because these programs take place several times throughout the year, they may be more effective (Ballinger, 1995; Ballinger, Kirschenbaum, Poimbeauf, 1987; Morton, 1994; Warrick-Harris, 1995; Weaver, 1992). After nine months of poor grades, as may be the case under the traditional calendar, resignation to failure may stubbornly remain despite an attempt at catching-up in summer school. "Catch-up" can occur more frequently with YRE, helping to prevent a long slide into failure. The YRE schedule can also offer parents and teachers more flexibility to adjust to individual learning needs and interests of students by taking advantage of intersession enrichment activities (Ballinger, 1995; YRE Program Guide, 1999). Not only is knowledge better retained, but student interest in learning may be easier to maintain because students have an opportunity to relax and re-energize several times during the year; their motivation to learn maintains a higher level compared with traditional education (Ballinger, 1995).

In addition to apparent financial and academic attributes of YRE, several drawbacks of this system are evident and highlight important differences between single-

track and multi-track YRE. Year-round education may interfere with summer vacations plans, and activities such as summer camp would need to be reorganized to match the new school calendar. Parents who have children attending different schools on different systems face an additional challenge of organizing family activities around potentially conflicting school schedules. Also, teachers may have difficulty in planning their professional growth activities outside of school because these activities often are in the form of summer classes from a local university (YRE Program Guide, 1999).

Many of the challenges; however, are a result of a district choosing a multi-track year-round instead of single-track year-round system. The planning for and organization of multiple groups of students can be an exhausting process for administrators and teachers. The coordination of club activities, sports, a music program, intersession programs and other extra-curricular activities is difficult because some students will always be on vacation, perhaps promoting burn-out among administrators and teachers (Weaver, 1992; YRE Program Guide, 1999). In addition, some schools that adopt a multi-track system do not have enough classrooms to accommodate a larger number of teachers and students, requiring teachers to move out of their classrooms when they track off and to move into new classrooms, those that were vacated by the outgoing teachers, upon beginning a new session (YRE Program Guide, 1999). This process of changing classrooms several times a year can have a negative impact on student and teacher morale because moving is physically exhausting and does not promote ownership of and identification with a classroom. A single-track year-round program avoids many of these problems since all students and teachers follow the same schedule, creating significantly

less confusion and more cohesion. Thus, single-track YRE is predicted to be more beneficial to student academics than multi-track despite its inefficiencies (see Appendix C for a more comprehensive list of benefits and costs of YRE).

Arguably, the general population can expect greater academic gains while learning under a YRE system than under the traditional system. Might gains vary among different socioeconomic groups of students? Heyns' (1978) analysis of the unique effects of schooling on children's learning is useful to predict the impact of YRE on the achievement gap compared to traditional education. The achievement gap refers to the finding that children from lower socioeconomic households tend to score lower on standardized exams than children from higher socioeconomic households. Heyns analyzed the differences in cognitive growth patterns of public school students in Atlanta, Georgia public schools while they were in session compared to while they were on summer vacation. She found that during the summer break, the direct effect of parental socioeconomic status doubles, thus the gap in achievement widens. Therefore, being in school appears to lessen the relative gap between high and low socioeconomic groups of students.

If the cumulative impact of parental SES is increased while students are on summer vacation, then shortening the time period during which students are out of school might have a positive effect on mitigating the socioeconomic-achievement gap among students. Thus, if students are away from school periodically for a few weeks instead of a continuous three months, parental SES may have a weaker effect. Although students would have the same total amount of time off as in traditional school, disadvantaged

students may be comparatively better off academically by having smaller segments of time off instead of receiving one very long summer vacation.

Several other researchers' findings support the argument that YRE decreases the achievement gap (Fischer, et al., 1993; Greenfield, 1994; Kneese, 1996; Morton, 1994; Weaver, 1992). Similar to Heyns, Fischer, et al., (1993) argued that many academically weaker students gain from YRE because students from disadvantaged backgrounds have greater learning loss during the summer than middle class students. Parents who provide experiences during the summer break such as camp, travel, and lessons minimize learning loss in their children, leaving some students, whose parents cannot provide summertime stimulation at a disadvantage when they begin the new school year. Supporting this assertion, Lareau (1987), in her study about variation in parental involvement by socioeconomic status, observed that educational resources and non-school activities differed noticeably between low and high socioeconomic families, confirming the disparity in material educational support provided by parents. In a study conducted by Kneese (1996), learning loss occurred at a rate about 27 percent greater for disadvantaged students during the summer months than for more advantaged students. Kneese (1996) found that students with a low socioeconomic background had some gain in math scores and greater gains in reading and language scores in YRE, compared to similar students in traditional schools indicating that YRE "may in fact alleviate the disparity which now exists" between academic levels of higher and lower socioeconomic students (Kneese, 1996, p. 68).

Together, these researchers support the arguments that not only should all students benefit academically by attending YRE schools, but disadvantaged students should derive even more benefit compared to advantaged students. Year-round education may bring us closer to the goals of improved academic achievement and to more equality.

CHAPTER 4: HYPOTHESES

Three hypotheses have been developed to test the efficacy of year-round education:

Hypothesis one – Standardized test scores of students attending year-round schools improve at a faster rate than scores of students in traditional schools.

Hypothesis two- Among year-round schools, standardized test scores of students attending single-track schools will be higher than for students attending multi-track schools.

Hypothesis three- Student test scores benefit more from year-round education than from traditional education as poverty level increases.

For the first hypothesis, test scores of YRE students and traditional students are compared over time. The expectation is that scores of YRE students will increase faster than scores of traditional students. By examining rate of change over time rather than a cross-sectional comparison of scores, two objectives are being met. First, this analysis will give an indication of the performance of the two groups of students across three years. This more dynamic view of the data strengthens our understanding of the relative effectiveness of YRE by incorporating several years of information and comparing them over time. For example, if YRE students show greater improvement in test scores over time compared to traditional students, then YRE would be expected to be more effective than traditional education in the long run.

Second, by analyzing scores' rate of change instead of scores at a point in time, this study attempts to mitigate powerful control variables such as SES and language ability of students. Student demographic variables such as these have a strong impact on academic achievement, but their impact may be weaker on a measure of change in academic achievement. For example, SES typically has a strong impact on reading test scores, but the impact may not be as strong on the change of reading test scores from one year to the next.

The impact of demographic variables on academic achievement is a particularly important concern in research comparing traditional and YRE schools because of demographic peculiarities of YRE schools. As will be shown in the next section, YRE schools tend to be established in higher poverty areas with higher minority and limited English language proficient students. Their teachers are less likely to have teaching credentials and are less experienced. All of these characteristics in isolation are associated with lower test scores; combined, their impact may be overwhelming compared to the type of calendar a school has adopted. Though the statistical procedure that will be used to test this hypothesis, multiple regression, attempts to control for these extraneous considerations with the inclusion of variables to represent student, teacher, and school level variations, viewing how scores change over time may further minimize their effect.

Another factor that may negatively impact the relationship between YRE and student achievement is that YRE schools have experienced change in their organizational structure while traditional schools have not -- *change* itself may further impact test

scores. Year-round education is a more recent structure than traditional education. Traditional education is the norm – YRE is a deviation from the norm – and this change may have an adverse effect on academic achievement. Looking at and comparing the same statistical model over several years may alleviate some of these challenges in weighing the academic merit of YRE. Regression coefficients of the impact of calendar type on test scores will be compared across three years using an F-test to determine if scores have significantly changed over time.

Comparing single- and multi-track year-round schools in the second hypothesis does not meet the same challenges as comparing YRE and traditional schools. The population is restricted to students attending YRE schools, so demographic differences are less of an issue. Also, all schools in this population have experienced change in the structure of their school calendar, nullifying this effect as well. Therefore, scores will be compared at one point in time to test this hypothesis.

The third hypothesis addresses the issue of poverty and whether year-round school attendance might promote improved test scores for students living in poverty. If a given poverty level is associated more strongly with improved test scores under YRE than under traditional education, we may surmise that it is overall a more effective system for students living in poverty. Finding that high poverty students score higher in YRE than in traditional education supports the argument that YRE mitigates the academic gap due to poverty.

CHAPTER 5: METHODS

Data were assembled by combining seven sources from the California Department of Education: The list below identifies the names of data sources and the years of data collection.

1. California Year-Round Directory, 1997-1998, for the variables type of calendar (CAL), type of track (TRK), and year of implementation (ESTABLYR), 1998;

2. California Basic Education Data System (CBEDS) School Information Form, Section G through J, for the variables type of calendar (CALTRAD), single-track (CALSING), multi-track (CALMULT), and type of school (SCHLTYPE), 1998;

3. CBEDS student demographic report, Enrollment by Ethnic Group by School for the variable Ethnicity (MINORITY), 1998, 1999, 2000.

4. Teacher Credentials and Experience by School Report for the variables percent of teachers that are fully credentialed (FULLPCT) and the average number of years teachers have taught (YRSTEACH), 1998, 1999, 2000;

5. List of Public School Districts and Schools Report for the census population designation for the surrounding area in which a school is located (POPSTAT), 1998;

6. Free and Reduced Price Meals/CalWorks (California Work Opportunity and Responsibility to Kids) School Level report for the variable percentage of students participating in the CalWorks program (CALWORKS), 1998, 1999;

7. Standardized Testing and Reporting Program for the variables grade level of groups of students (GRADE), designation of limited English proficient (LEP) or all students, and reading and math mean test scores (READMEAN) and (MATHMEAN), 1998, 1999, 2000.

Each of these data sources also includes school, district, and county names, and codes (see Table 1 for list of variables.).

Data from the California Year-Round Directory (source one) was hand-entered and downloaded data sources (sources two through seven) were combined by matching

district, county, and school codes to form a comprehensive data set. School calendar and track variables were verified by comparing two different sources of the same information. The data sources (California Year-Round Directory and CBEDS School Information Form, Section G through J) containing the similar variables, "CAL," "TRK," "CALTRAD," "CALSING," and "CALMULT" were used to verify each other, resulting in the new variables, "CALENDAR" and "TRACK."

Each case in the data set represents a group of students at a school by grade who comprises either the total tested population or the tested population of limited-English proficient students. For example, fourth grade students from Abbott Elementary School in Los Angeles consist of one case while the fourth grade limited-English proficient students from the same school comprise another case. Schools were selected that were labeled elementary, middle, junior high, high school, or K-12 (schools such as continuation or county schools are not a part of this study), and cases in which fewer than ten students were tested in either math or English were eliminated. The resulting total number of cases, representing groups of students by grade and language ability for each school in California is 42,727 in 1998, 44,249 in 1999, and 44,676 in 2000.

The dataset was reduced further by selecting fourth, seventh, and tenth grade students as the sample population. Without reduction, using grade level as an independent variable in regression models resulted in a large amount of variation in scores being explained simply by students' grade level. In order to focus attention on the impact of the variables of interest in this study, one grade level for each academic level was chosen: fourth grade for elementary school, seventh grade for middle school, and

tenth grade for high school. The final sample sizes for each year are 10,625 in 1998, 10,730 in 1999, and 10,756 in 2000.

In order for a school to become a part of analysis, it must have been designated as YRE or traditional as of the 1995/1996 school year. Year-round education schools have experienced change in their organizational structure while traditional schools have not, and this structural change may have a negative impact on test scores. The traditional calendar is a highly institutionalized part of schools, and to make adjustments to it can adversely affect academic outcomes. Meyer and Rowan (1977) argue that highly institutionalized forms follow rules of organization and procedures to promote legitimacy and stability. Conversely, to change a major component of the institution, of which changing the school calendar is an example, would be seen as illegitimate and jeopardizes success. The transitional period between calendar types, which could be interpreted as an illegitimate change, may have a negative impact, and this impact is minimized by assigning calendar status a few years before the beginning of the study period.

For all three hypotheses, the dependent variable is student achievement and is measured by the STAR test score program in reading and math. The STAR program utilizes the Stanford Achievement Test Series, Ninth Edition, (Stanford 9), and was administered to all students in grades two through eleven between March 15 and May 25 in 1998 and 1999 and between March 15 and May 15 in 2000. These multiple-choice tests are designed to measure basic skills in each subject area. Test scores are continuous variables and are reported by grade level, by subject area, by English proficiency for each school in California. Mean scaled scores were utilized.

The independent variable in the first hypothesis is type of school calendar. The two types are traditional education defined as nine months of instruction and three months of summer vacation and year-round education defined as a 45-15 plan, 60-20 plan, 60-15 plan, 90-30 plan, Concept 6 plan, or modified year-round plan. The variable, "CALENDAR," is coded as (1) YRE (2) Traditional (3) mixed YRE and traditional in school (this category is eliminated, n=27), (4) Became YRE in 1995/96 or later (this category is eliminated, n=26) . This nominal variable was dummy-coded as (0) Traditional (1) YRE.

The independent variable in hypothesis two is type of track system – single-track in which all students attend school at the same time or multi-track in which student attendance is staggered. The variable, "TRACK," is coded as (1) single-track (2) multi-track (3) mixed single- and multi-track (for testing of the second hypothesis, this category is eliminated, n=3221). This nominal variable was dummy-coded as (0) multi-track (1) single-track.

The independent variable in the third hypothesis is socioeconomic status of students measured by the percent of students in the CalWorks program in the school's attendance area. This variable is measured at the ratio level. Since the economic status of students' families is difficult to obtain, "CALWORKS" was chosen as an indicator of economic status of students within a school. Percentage of students in the CalWorks program has been shown to be a valuable measure by Felter (1999) in his study, "High School Staff Characteristics and Mathematics Test Results." This variable is also used as an additional independent variable for hypotheses one and two.

Several descriptive variables are included as control variables and are a part of the models since education researchers have suggested that demographic variables are important considerations when measuring student achievement (Felter, 1999; Kneese, 1996). These variables can be categorized into student, teacher, or school characteristics.

Variables measuring student characteristics are "LEP," "MINORITY," and "CALWORKS" (discussed above). English proficiency (LEP) is measured by the school's designation of students as English proficient or limited English proficient. Non-English speakers are not a part of the study. The variable "LEP" is nominal and is coded as (1) all students (2) Limited-English proficient and is dummy coded as (0) Limited-English Proficient (1) All Students. The variable "MINORITY" is a continuous variable. "MINORITY," a ratio level variable, indicates the percentage of non-white students attending a school.

Teacher characteristics are represented by "FULLPCT" and "YRSTEACH." "FULLPCT" is the percentage of teachers that have a clear, preliminary or life credential at a school, and "YRSTEACH" is the average total number of years of teaching experience of teachers at a school, including years that teachers might have taught at other schools. Both are ratio level variables.

A variable representing school characteristics is "POPSTAT." "POPSTAT" is an ordinal variable that indicates the census classification of the locality in which a school resides. Classifications are (1) large city, more than 250,000 people; (2) midsize city, less than 250,000 people; (3) urban fringe of large city; (4) urban fringe of midsize city; (5) large town, more than 25,000 people; (6) small town, 2,500 to 24,999 people; (7)

rural. Although this variable is ordinal, it will be used as an interval variable in the statistical analysis (Bohrnstedt and Knoke, 1994). Table 1 provides a synopsis of these variable code names.

Multiple regression was used to test the hypotheses. The Statistical Package for the Social Sciences (SPSS) was used to accomplish this statistical procedure. Multiple regression indicates the relationship between test scores and the type of school calendar or type of track and the other independent variables, and how well these variables explain the variation in test scores. The standardized regression coefficient (β) represents the standard deviation change that can be expected in test scores with a one standard deviation change in an independent variable. This value permits comparisons of the relative influences of each independent variable on test scores. Similarly, the unstandardized regression coefficient (b) represents the unit change that can be expected in test scores with a one-unit change in an independent variable. This value maintains the original scale of measurement. The standard error shows the amount of unexplained variation in the variables, while R-square indicates the amount of variation that is explained. R-square adjusted shows the amount of variation explained while taking into account the number of independent variables relative to the sample size (Stevens, 2001) and was used in this study to increase comparability since sample sizes vary across models (models involve different years and different populations of students, both of which affect sample size). Models for testing hypotheses are

TABLE 1: Variable Code Names

Dependent Variables

READ_MEAN	Reading mean score
MATH_MEAN	Math mean score

Independent Variables

CALENDAR	Verified calendar type, year-round or traditional, 0 = traditional; 1 = year-round
TRACK	Verified track type, single- or multi-track, 0 = multi-track; 1 = single-track

Additional Independent Variables

Student Characteristics:

LEP	Limited English proficiency status, 0 = limited English proficient; 1 = all students
CALWORKS	Percent of students in CalWorks program in attendance area
MINORITY	Percent of students in a school that are non-white

Teacher Characteristics:

FULLPCT	Percent of teachers holding a preliminary, clear or life credential in a school
YRSTEACH	The average number of years of teaching of all teachers in a school

School Characteristics:

POPSTAT	Census designation of the type of area where the school is located. 1 = large city; 7 = rural

presented in Tables 10 through 23 and include standardized and unstandardized regression coefficients, standard errors, and R-square adjusted.

First-order interaction variables were tested but were found to not improve the fit of the models so they do not appear in analysis. Collinearity was assessed among independent variables and was determined to not be in conflict with the assumptions for multiple regression that variables not be highly correlated (see appendix D for correlation tables).

For testing the first hypothesis, all variables except TRACK were included in the multiple regression analysis. Then, the regression coefficients for CALENDAR were compared across years using an F-test to determine if a significant change in test scores between year-round and traditional students occurred over time. F-tests were calculated by hand using a formula developed by Clogg, Petkova and Haritou (1995) and Pasternoster, Brame, Mazerolle and Piquero (1998) indicated as, $b_1\text{-}b_2/\sqrt{SE\ b_1^2 + SE\ b_2^2}$, where "$b_1$" represents the unstandardized regression coefficient for year-round education, "b_2" represents the unstandardized regression coefficient for traditional education and "SE" represents the standard error of the regression coefficients. This formula was used to compare coefficients for CALENDAR from 1998 to 1999, from 1999 to 2000, and from 1998 to 2000, and an F-distribution table was consulted to determine significance. If a significant difference were found between the coefficients of two years, then we conclude that the type of calendar impacted test scores differently across the years. If the coefficients were positive, then the interpretation would be that year-round education is having a more positive impact on test scores than traditional education across time.

For testing the second hypothesis, groups of students attending year-round schools were selected as the population before applying multiple regression to test the effect of track-type on test scores.

The third hypothesis changes the focus to the variable, CALWORKS, and its effect on test scores under YRE and traditional education. Groups of students attending these two types were split into separate populations, then after applying multiple regression to the data, coefficients for CALWORKS of each group were compared for differences using the same formula used for the first hypothesis. If a significant and positive difference in the coefficients is found using the F-test, then the interpretation would be that year-round student test scores are less affected by poverty level than traditional student test scores.

For all hypothesis testing, fourth, seventh, and tenth grade groups of students were selected as the sample populations. Roughly, these grades represent grammar, middle and high school levels of inquiry.

CHAPTER 6: RESULTS

According to the California Department of Education, 17.4 percent of all California schools are YRE (California Year-Round Directory, 1998). Of the schools that are YRE, 31 percent are single-track and 69 percent are multi-track (California Year-Round Directory, 1998). According to the dataset statistics, for those districts that have YRE, an average of half of their schools are on YRE and half are on traditional education, (56.8 percent YRE). Districts range from having 3 percent to 100 percent of their schools on YRE. Schools adopted the YRE program between the years 1968 and 1997, with 99.6 percent of the schools adopting it before the 1995/96 school year. Frequency statistics for the independent variables are reported in Tables 2 through 9.

Table 2: Number of Tested Groups of Students Attending Traditional and Year-Round Schools by Grade and Year

	4th Grade		7th Grade		10th Grade	
Calendar	N	Percent	N	Percent	N	Percent
1998						
Traditional	5,043	73.8	2,145	88.3	1,287	94.6
Year-Round	1,792	26.2	285	11.7	73	5.4
1999						
Traditional	5,112	73.8	2,157	88.3	1,287	94.8
Year-Round	1,816	26.2	287	11.7	71	5.2
2000						
Traditional	5,111	73.7	2,142	88.1	1,321	95.0
Year-Round	1,822	26.3	290	11.9	70	5.0

Table 2 shows that across the years, population size varies slightly. At the fourth grade level, the number of groups of tested students increases from 6,835 in 1998 to 6,928 in 1999 to 6,933 in 2000. For seventh grade, groups of tested students increases

from 2,430 in 1998 to 2,444 in 1999 but reverses to 2,432 in 2000. For 2000, the count is 1,360 in 1998, 1,358 in 1999, and 1,391 in 2000. The proportion of YRE students to traditional students consistently drops through the grades. In fourth grade, about quarter of the groups of students attend YRE, whereas in seventh grade slightly over 10 percent are YRE and only about 5 percent are YRE in tenth grade.

Table 3: Number of Tested Groups of Students Attending Single-Track and Multi-Track Year-Round Schools by Grade and Year

	4th Grade		7th Grade		10th Grade	
Track	N	Percent	N	Percent	N	Percent
1998						
Single-Track	304	26.5	59	29.2	21	35.6
Multi-Track	845	73.5	143	70.8	38	64.4
1999						
Single-Track	305	26.5	61	30.0	21	35.6
Multi-Track	846	73.5	142	70.0	38	64.4
2000						
Single-Track	302	26.3	55	27.4	22	36.7
Multi-Track	847	73.7	146	72.6	38	63.3

Viewing only groups of YRE students in Table 3, the type of track that students attend is quite consistent across the years. About 1,147 groups in 1998, 202 groups in 1999, and 59 groups in 2000 are a part of the analysis. Through the grades, students are less likely to attend single-track schools. Just over a quarter of the groups of students in fourth grade, almost 30 percent in seventh grade and about 35 percent in tenth grade are attending single-track schools.

Below, Tables 4 through 6 compare traditional and year-round population data regarding the student characteristic, English Proficiency, by year and by grade level.

Table 4: Groups of Tested Students by LEP Status and Calendar Type, 4th Grade

	Traditional		YRE		Total 4th Grade	
LEP Status	N	Percent	N	Percent	N	Percent
1998						
All Students	3502	69.4	1041	58.1	4543	66.5
LEP	1541	30.6	751	41.9	2292	33.5
1999						
All Students	3501	68.5	1041	57.3	4542	65.6
LEP	1611	31.5	775	42.7	2386	34.4
2000						
All Students	3441	67.3	1028	56.4	4469	64.5
LEP	1670	32.7	794	43.6	2464	35.5

Table 4 shows that in fourth grade, about one-third of tested groups of students are considered limited in their English proficiency. For traditional schools, this proportion is slightly less at around 30 percent and for YRE schools it is higher at over 40 percent. From 1998 to 2000, groups of LEP students receive slightly higher representation, increasing by about two percentage points of the total population.

In seventh grade, Table 5 shows that the number of groups of students that are labeled as LEP is much smaller than in fourth grade, but the proportion of LEP students to the total population is similar, though in traditional schools it increases slightly. For the entire seventh grade, between 35 percent to 38 percent of groups are designated as LEP. At traditional schools, around 36 percent of groups of students are LEP and at YRE schools, around 42 percent are labeled as such.

Table 5: Groups of Tested Students by LEP Status and Calendar Type, 7th Grade

	Traditional		YRE		Total 7th Grade	
LEP Status	N	Percent	N	Percent	N	Percent
1998						
All Students	1405	65.5	169	59.3	1574	64.8
LEP	740	34.5	116	40.7	856	35.2
1999						
All Students	1381	64.0	168	58.5	1549	63.4
LEP	776	36.0	119	41.5	895	36.6
2000						
All Students	1345	62.8	163	56.2	1508	62.0
LEP	797	37.2	127	43.8	924	38.0

In tenth grade, Table 6 shows that again the number of LEP groups of students drops and the proportion of LEP to the total number of groups increases. Roughly, four out of ten groups of students are considered LEP for both the entire tenth grade population and for the traditional population, a number that increases to four and one-half out of ten under YRE.

Table 6: Groups of Tested Students by LEP Status and Calendar Type, 10th Grade

	Traditional		YRE		Total 10th Grade	
LEP Status	N	Percent	N	Percent	N	Percent
1998						
All Students	774	60.1	40	54.8	814	59.9
LEP	513	39.9	33	45.2	546	40.1
1999						
All Students	772	60.0	39	54.9	811	59.7
LEP	515	40.0	32	45.1	547	40.3
2000						
All Students	765	57.9	38	54.3	803	57.7
LEP	556	42.1	32	45.7	588	42.3

Tables 7 to 9 present traditional, year-round and total population averages for student, teacher, and school characteristics by year for fourth, seventh, and tenth grade.

Table 7: Student, Teacher and School Characteristics by Calendar Type, 4th Grade

	Traditional			YRE			Total 4th Grade		
	M	SD	n	M	SD	n	M	SD	n
1998									
Student Characteristics									
CalWorks	18.8	15.3	5041	28.7	16.9	1790	21.4	16.4	7158
Minority	60.8	28.6	5042	76.7	24.3	1792	65.0	16.4	7158
Teacher Characteristics									
Fullpct	87.7	14.1	5042	82.3	13.2	1792	86.3	14.1	7162
Yrstch	13.1	3.2	5042	11.8	3.0	1792	12.8	3.3	7162
School Characteristics									
Popstat	2.7	1.4	5035	2.2	1.1	1792	2.6	1.3	7155
1999									
Student Characteristics									
CalWorks	16.7	14.7	5109	25.2	15.6	1815	19.1	15.6	7397
Minority	62.2	28.3	5112	77.9	23.6	1816	66.2	27.9	7406
Teacher Characteristics									
Fullpct	88.1	13.3	5112	82.6	14.1	1816	86.2	13.7	7261
Yrstch	12.5	3.4	5112	11.0	2.9	1816	12.0	3.3	7257
School Characteristics									
Popstat	2.7	1.4	5104	2.2	1.1	1816	2.6	1.3	7253
2000									
Student Characteristics									
CalWorks	16.9	14.8	5108	25.1	15.6	1822	19.1	15.6	7402
Minority	63.3	28.2	5111	78.4	23.3	1822	67.2	27.6	7472
Teacher Characteristics									
Fullpct	87.5	13.6	5111	82.2	14.3	1822	86.1	14.0	7472
Yrstch	12.5	3.3	5111	11.1	2.9	1822	12.0	3.3	7472
School Characteristics									
Popstat	2.7	1.4	5106	2.2	1.1	1822	2.6	1.3	7256

Note: Traditional and YRE does not add to total because of cases that were unverified for calendar type.

Summarizing across the years in Table 7, fourth grade student, teacher, and school characteristics are markedly different between traditional and YRE schools. For

student characteristics, an average of 17 percent to 19 percent of traditional school students are participants in the CalWorks program while an average of 25 percent to 29 percent of students in YRE schools participate. The percentage of minority students at each school type is equally discrepant. At traditional schools, 61 percent to 63 percent of students are considered minorities and 77 percent to 78 percent of YRE students are considered minorities.

Teacher characteristics are measured by the percentage of teachers that possess a teaching credential and the average number of years that teachers have taught at a school. Around 88 percent of teachers have credentials and have taught for about 13 years at traditional schools, whereas in YRE schools, about 82 percent of teachers have credentials and have taught for about 11 years.

A school-level characteristic, measured by the type of area in which a school is located as designated by the U.S. Census Bureau, is the final variable taken into consideration when testing the hypotheses. Traditional schools are more likely to be located in communities that are smaller in population than are YRE schools. Traditional schools are typically located in mid-size cities while YRE schools are usually located in more populated areas, such as the urban fringe of a large city.

Table 8 demonstrates that compared to fourth grade, seventh grade students are less likely to be participants in the CalWorks program and less likely to be minorities, and the teachers are more likely to have credentials and to have taught longer. Nevertheless, differences persist between traditional and YRE students and teachers. Around 15 percent of traditional students participate in CalWorks compared to about 19

Table 8: Student, Teacher and School Characteristics by Calendar Type, 7th Grade

	Traditional			YRE			Total 7th Grade		
	M	SD	n	M	SD	n	M	SD	n
1998									
Student Characteristics									
CalWorks	16.3	13.5	2144	21.3	14.4	285	16.9	13.7	2518
Minority	56.6	28.5	2145	70.9	27.1	285	58.4	28.6	2520
Teacher Characteristics									
Fullpct	88.9	12.8	2143	84.2	12.4	285	88.3	12.9	2518
Yrstch	14.1	3.2	2143	12.1	3.1	285	13.8	3.2	2518
School Characteristics									
Popstat	3.0	1.6	2138	2.4	1.2	285	3.0	1.6	2513
1999									
Student Characteristics									
CalWorks	14.6	12.7	2156	18.5	13.6	286	15.1	12.7	2611
Minority	57.7	28.4	2157	71.5	27.0	287	59.5	28.5	2618
Teacher Characteristics									
Fullpct	88.7	11.6	2155	83.8	14.1	287	88.0	12.2	2541
Yrstch	13.3	3.4	2155	11.6	3.3	287	13.1	3.4	2540
School Characteristics									
Popstat	3.0	1.6	2152	2.4	1.1	287	2.9	1.6	2538
2000									
Student Characteristics									
CalWorks	14.7	12.8	2141	18.2	13.6	290	15.2	12.8	2593
Minority	59.1	28.2	2142	72.5	26.1	290	60.9	28.2	2621
Teacher Characteristics									
Fullpct	86.2	13.0	2142	81.8	14.8	290	85.4	13.5	2621
Yrstch	13.1	3.3	2142	11.7	2.9	290	12.9	3.3	2621
School Characteristics									
Popstat	3.0	1.6	2138	2.4	1.1	290	2.9	1.5	2521

Note: Traditional and YRE does not add to total because of cases that were unverified for calendar type.

percent of YRE students, and about 58 percent of traditional students and 72 percent of YRE students are minorities. About 88 percent of teachers in traditional schools and 83 percent of teachers in YRE schools have credentials, and teachers in traditional schools have taught about 13 years while teachers in YRE schools have taught an average of 12

years. The size of the community in which seventh grade students attend school is very similar to where fourth grade students typically attend, although it may be slightly less urban for both traditional and YRE schools.

Table 9: Student, Teacher and School Characteristics by Calendar Type, 10th Grade

	Traditional			YRE			Total 10th Grade		
	M	SD	n	M	SD	n	M	SD	n
1998									
Student Characteristics									
CalWorks	13.3	12.7	1285	19.8	10.8	73	13.7	12.8	1394
Minority	55.8	26.5	1286	77.1	28.7	73	56.8	27.0	1395
Teacher Characteristics									
Fullpct	89.3	11.3	1286	86.2	7.9	73	89.2	11.1	1395
Yrstch	15.6	2.8	1286	14.3	3.0	73	15.6	2.8	1395
School Characteristics									
Popstat	2.9	1.5	1284	2.3	1.3	73	2.9	1.5	1393
1999									
Student Characteristics									
CalWorks	11.9	11.7	1285	18.2	10.2	71	12.3	11.7	1439
Minority	56.6	26.5	1287	77.2	28.9	71	57.6	26.9	1444
Teacher Characteristics									
Fullpct	89.7	8.2	1287	85.1	95.2	71	89.6	8.3	1397
Yrstch	14.7	2.9	1287	13.7	3.1	71	14.7	2.9	1397
School Characteristics									
Popstat	2.9	1.5	1285	2.2	1.3	71	2.8	1.5	1395
2000									
Student Characteristics									
CalWorks	11.8	11.6	1319	18.0	10.0	70	12.2	11.7	1465
Minority	56.9	26.5	1321	77.1	29.4	70	57.9	26.9	1487
Teacher Characteristics									
Fullpct	87.6	9.4	1321	81.7	10.5	70	87.3	9.7	1487
Yrstch	14.3	2.7	1321	13.6	2.7	70	14.2	2.8	1487
School Characteristics									
Popstat	2.9	1.5	1321	2.2	1.3	70	2.9	1.5	1432

Note: Traditional and YRE does not add to total because of cases that were unverified for calendar type.

Overall, Table 9 shows that tenth grade data continues the trend indicated in fourth to seventh grade. Students are less likely to be CalWorks participants or minorities, however the YRE CalWorks participation level at tenth grade is nearly equal to that in fourth grade. Differences between traditional and YRE schools persist -- an average of 12 percent of traditional students participate in CalWorks and about 56 percent are minority, compared to about 19 percent of YRE students who are involved in CalWorks and around 77 percent who are minority. In addition, teachers are more likely to have credentials and to have taught longer in tenth grade compared to the other grades. Comparing traditional and YRE teachers, about 89 percent have credentials and have taught an average of 15 years in traditional schools, and about 84 percent have credentials and have taught an average of 14 years in YRE schools. Again, the type of areas in which these schools are located is very similar to fourth and seventh grade schools.

Tables 10 through 23 display the outcomes of multiple regression analysis for testing each of the hypotheses. Tables 10, 11, and 12 show regression analyses comparing YRE and traditional education across time for fourth, seventh, and tenth grade. The coefficients for the impact of calendar type on test scores from these analyses then become a part of F-tests that are presented in Table 13. These F-tests are a direct test of the first hypothesis by assessing whether YRE students are expected to outperform traditional students over time. In Tables 10, 11, and 12, the set of independent variables are more effective at explaining variation in reading scores than in math scores (reading R^2_{ADJ} ranges from .73 to .79; math R^2_{ADJ} = .47 and .58).

Table 10: Summary of Multiple Regression Analysis for Variables Predicting Fourth Grade Reading and Math Scores: Calendar Type

	Reading			Math		
	1998	1999	2000	1998	1999	2000
Intercept	638.58	640.07	646.42	625.26	628.42	636.69
	--	--	--	--	--	--
	(410.79)***	(371.30)***	(380.72)***	(383.05)***	(343.46)***	(354.33)***
CALENDAR						
	-3.80	-4.83	-4.95	-4.87	-5.47	-5.33
	-.06	-.08	-.09	-.10	-.11	-.11
	(-9.61)***	(-12.47)***	(-12.97)***	(-11.68)***	(-13.32)***	(-13.20)***
LEP						
	20.55	19.98	20.26	12.42	11.80	12.66
	.36	.36	.38	.27	.26	.28
	(54.93)***	(55.04)***	(57.03)***	(31.86)***	(30.90)***	(33.81)***
CALWORKS						
	-.42	-.40	-.40	-.42	-.40	-.40
	-.26	-.24	-.24	-.31	.29	-.29
	(-35.30)***	(-33.01)***	(33.43)***	(-33.60)***	(-31.41)***	(-31.70)***
MINORITY						
	-.46	-.45	-.44	-.30	-.29	-.30
	-.49	-.48	-.47	-.39	-.38	-.38
	(-60.62)***	(-55.27)***	(-53.92)***	(-37.20)***	(-34.09)***	(-34.86)***
FULLPCT						
	.04	.06	.03	.06	.08	.07
	.02	.03	.02	.04	.05	.04
	(2.77)***	(4.0)***	(1.96)*	(4.01)***	(4.83)***	(4.18)***
YRSTEACH						
	.75	.67	.60	.57	.50	.39
	.09	.09	.08	.08	.08	.06
	(13.8)***	(12.35)***	(10.95)***	(9.90)***	(8.83)***	(6.65)***
POPSTAT						
	-2.60	-2.58	-2.50	-2.84	-2.59	-2.23
	-.13	-.13	-.13	-.17	-.16	-.14
	(-19.36)***	(19.61)***	(-19.17)***	(-20.19)***	(-18.57)***	(-16.17)***
R^2_{ADJ}	.75	.74	.73	.58	.57	.57
SS_{ERR}	1207589.6	1221695.5	1210413.2	1371570.5	1398109.9	1370741.4
(N)	6680	6841	6878	6771	6911	6918

*** $p < .001$; ** $p < .01$; * $p < .05$

Assessing reading and math scores in fourth grade as displayed in Table 10, the expected effect of YRE is similar though slightly stronger on math scores. Students who attend year-round schools have slightly lower test scores than students who attend traditional schools. In 2000, for example, YRE students score about five points lower on the reading test and slightly over five points lower on the math test than traditional students. However, out of the variables examined, calendar type has among the weakest effect on test scores (2000 reading β = -.09 and math β = -.11). In 2000, only the variables measuring teacher characteristics are slightly weaker (YRSTEACH reading β = .08 and math β = .06; FULLPCT reading β = .02; math β = .04). The strongest impacts on test scores according to this model are the percentage of minority students at a school (reading β = -.47 and math β = -.38) followed by students' English language proficiency (reading β = .38 and math β = .28). For each percentage increase of the minority population at a school, students are expected to score almost one-half point less on the reading test and almost one-third point less on the math test. Limited English proficient students are expected to score about 20 point lower on the reading test and 12 points lower on the math test than the general population.

The same model presented for seventh grade groups of students, as seen in Table 11, demonstrates that the variable measuring calendar type is extremely weak (2000 reading β = -.05 and math β = -.1). Of the variables measured, it is among the weakest predictors of test scores. In 2000, YRE students are expected to score less than four points lower than traditional students on the reading test and about six and one-half points lower on the math test.

Table 11: Summary of Multiple Regression Analysis for Variables Predicting Seventh Grade Reading and Math Scores: Calendar Type

	Reading			Math		
	1998	1999	2000	1998	1999	2000
Intercept	663.38	663.46	662.02	662.02	660.97	662.24
	--	--	--	--	--	--
	(285.07)***	(251.96)***	(258.83)***	(257.02)***	(219.72)***	(223.37)***
CALENDAR						
	-2.41	-4.21	-3.74	-4.56	-5.72	-6.47
	-.03	-.06	-.05	-.07	-.09	-.10
	(-3.06)**	(-5.56)***	(-4.96)***	(-5.25)***	(-6.61)***	(-7.40)***
LEP						
	30.95	30.80	30.20	17.85	18.07	18.79
	.60	.61	.61	.42	.43	.43
	(57.72)***	(60.09)***	(59.09)***	(30.18)***	(30.19)***	(31.76)***
CALWORKS						
	-.37	-.37	-.39	-.40	-.40	-.42
	-.21	-.19	-.21	-.27	-.26	-.26
	(-17.96)***	(-17.25)***	(-18.54)***	(-17.57)***	(-16.67)***	(-17.22)***
MINORITY						
	-.35	-.33	-.30	-.24	-.23	-.22
	-.41	-.39	-.35	-.35	-.32	-.30
	(-32.59)***	(-28.69)***	(-25.24)***	(-20.44)***	(-17.33)***	(-16.01)***
FULLPCT						
	.02	.05	.06	.06	.11	.11
	.01	.03	.04	.04	.06	.07
	(.74)	(1.99)*	(2.60)**	(2.64)**	(3.71)***	(3.69)***
YRSTEACH						
	.47	.28	.36	.73	.51	.61
	.06	.04	.05	.12	.09	.10
	(5.84)***	(3.69)***	(4.29)***	(8.14)***	(5.86)***	(6.29)***
POPSTAT						
	-1.26	-1.34	-.98	-1.35	-1.40	-1.11
	-.08	-.09	-.06	-.10	-.11	-.08
	(-7.36)***	(-8.06)***	(-5.80)***	(-7.12)***	(-7.41)***	(-5.68)***
R^2_{ADJ}	.76	.77	.76	.57	.57	.58
SS_{ERR}	344976.7	332911.5	335486.8	421063.8	435643.8	452133.0
(N)	2397	2431	2421	2400	2435	2425

*** $p < .001$; ** $p < .01$; * $p < .05$

Table 12: Summary of Multiple Regression Analysis for Variables Predicting Tenth Grade Reading and Math Scores: Calendar Type

	Reading			Math		
	1998	1999	2000	1998	1999	2000
Intercept	671.80	672.35	675.52	688.96	687.29	689.05
	--	--	--	--	--	--
	(220.78)***	(160.73)***	(184.63)***	(187.73)***	(142.77)***	(164.31)***
CALENDAR						
	-.09	.09	-1.67	-3.21	-2.95	-4.91
	.00	.00	-.02	-.04	-.04	-.07
	(-.07)	(.07)	(-1.27)	(-2.09)*	(-1.96)*	(-3.27)**
LEP						
	34.16	33.41	34.36	14.90	15.28	16.32
	.73	.74	.76	.43	.45	.48
	(56.69)***	(55.64)***	(58.96)***	(20.88)***	(22.18)***	(24.38)***
CALWORKS						
	-.27	-.31	-.29	-.35	-.41	-.38
	-.15	-.16	-.15	-.26	-.29	-.26
	(-10.12)***	(-10.84)***	(-10.12)***	(-11.19)***	(-12.63)***	(-11.65)***
MINORITY						
	-.27	-.25	-.24	-.18	-.15	-.15
	-.32	-.30	-.29	-.29	-.24	-.24
	(-19.67)***	(-17.10)***	(-17.00)***	(-11.16)***	(-9.01)***	(-8.94)***
FULLPCT						
	-.02	.02	-.02	-.02	.03	.03
	-.01	.01	-.00	-.01	.01	.02
	(-.85)	(.47)	(.06)	(-.63)	(.50)	(.60)
YRSTEACH						
	.59	.44	.32	.93	.87	.78
	.07	.06	.04	.15	.15	.13
	(5.58)***	(3.85)***	(2.75)**	(7.39)***	(6.69)***	(5.77)***
POPSTAT						
	-1.05	-1.43	-1.27	-1.75	-1.86	-1.95
	-.07	-.1	-.08	-1.15	-.16	-.17
	(-4.90)***	(-6.71)***	(-6.12)***	(-6.91)***	(7.60)***	(-8.18)***
R^2_{ADJ}	.79	.78	.78	.47	.48	.48
SS_{ERR}	146055.3	149109.3	485443.0	207091.2	196804.2	198800.1
(N)	1338	1350	1387	1343	1351	1382

*** $p < .001$; ** $p < .01$; * $p < .05$

Table 12 demonstrates that students attending tenth grade YRE and traditional schools have similar outcomes for reading and math scores in contrast to the fourth and seventh grades where traditional students were found to outscore YRE students. In tenth grade, no significant differences is found in reading scores based on the type of calendar a school has adopted. On the math test, calendar type has a significant, although weak impact (2000 β = -.07). Year-round students score just under five points less on the math test than traditional students.

Hypothesis one – Standardized test scores of students attending year-round schools improve at a faster rate than scores of students in traditional schools.

To test the first hypothesis that test scores of students attending YRE improve at a faster rate than scores of students attending traditional schools, regression coefficients for calendar type were compared from 1998 to 1999, from 1999 to 2000, and from 1998 to 2000 using F-tests (see Table 13). Tenth grade reading scores were not tested since they lacked significance in regression analysis. Since tenth grade reading scores for YRE and traditional students were similar in each time period, there is no reason to test for different rates of change in scores of the two groups. F-test findings indicate that no significant differences were found at any level for either reading or math scores, indicating that calendar type does not affect test scores differently across the years. Year-round education students score consistently lower than traditional students from 1998 to 2000 on both the reading and math tests, with the exception of tenth grade reading scores in which no difference between the groups was found. The data do not support the hypothesis that scores of students attending YRE improve at a faster rate than scores of students attending traditional schools.

Table 13: Tests for Differences in Coefficients for Calendar Type

F-test: $b_1-b_2/ \sqrt{SE\ b_1^2 + SE\ b_2^2}$

Fourth Grade Reading Scores
1998 to 1999: $-3.80-(-4.83)/ \sqrt{.40^2 + .39^2} = 1.84$
1999 to 2000: $-4.83-(-4.95)/ \sqrt{.39^2 + .38^2} = .22$
1998 to 2000: $-3.80-(-4.95)/ \sqrt{.40^2 + .38^2} = 2.09$

Seventh Grade Reading Scores
1998 to 1999: $-2.41-(-4.21)/ \sqrt{.79^2 + .76^2} = 1.64$
1999 to 2000: $-4.21-(-3.74)/ \sqrt{.76^2 + .75^2} = -.44$
1998 to 2000: $-2.41-(-3.74)/ \sqrt{.79^2 + .75^2} = 1.23$

Fourth Grade Math Scores
1998 to 1999: $-4.87-(-5.47)/ \sqrt{.42^2 + .41^2} = 1.02$
1999 to 2000: $-5.47-(-5.33)/ \sqrt{.41^2 + .40^2} = .25$
1998 to 2000: $-4.87-(-5.33)/ \sqrt{.42^2 + .40^2} = .79$

Seventh Grade Math Scores
1998 to 1999: $-4.56-(-5.72)/ \sqrt{.87^2 + .87^2} = .54$
1999 to 2000: $-5.72-(-6.47)/ \sqrt{.87^2 + .88^2} = .60$
1998 to 2000: $-4.56-(-6.47)/ \sqrt{.87^2 + .88^2} = 1.55$

Tenth Grade Math Scores
1998 to 1999: $-3.21-(-2.95)/ \sqrt{1.53^2 + 1.50^2} = 1.55$
1999 to 2000: $-2.95-(-4.91)/ \sqrt{1.50^2 + 1.50^2} = .92$
1998 to 2000: $-3.21-(-4.91)/ \sqrt{1.53^2 + 1.50^2} = .79$

Note: F-distribution table indicates that the critical value for $\alpha = .05$ is 3.00 and for $\alpha = .01$ is 4.61.
* $p < .05$
** $p < .01$

Hypothesis two – In YRE, standardized test scores of students attending single-track schools will be higher than for students attending multi-track schools.

Tables 14, 15, and 16 display the data for the model to assess the effect of track type on test scores for year-round schools. These tables, showing regression models that predict test score outcomes for single-track and multi-track YRE students, indicate that

the models are generally more effective at predicting reading scores than math scores at each grade level (reading R^2_{ADJ} ranges from .74 to .84; math R^2_{ADJ} = .57 and .78). These data test the second hypothesis that single-track YRE students will outperform multi-track YRE students.

Table 14, focusing on fourth grade year-round students, students who attended single-track YRE schools were found to earn four and one-half more reading points two and one-half more math points than multi-track YRE students in 2000. However, the variable, TRACK, is among the weakest variables compared to the other variables in the model to predict test scores (2000 reading β = .1 and math β = .07).

Examination of other variables shows that the strongest variables in the model for predicting reading and math scores are MINORITY (reading β = -.58 and math β = .-.49), LEP (reading β = .36 and math β = .27) and CALWORKS (reading β = -.16 and math β = -.18). A higher minority population at a school is associated with a decrease in test scores, limited-English proficient students score lower than the general student population, and increased CalWorks participation at a school will decrease test score outcomes. Data for 1998 differ slightly from this scenario -- CALWORKS (math β = -.28) is a slightly more powerful predictor of math scores than LEP (math β = .24).

Data weakly support the second hypothesis that fourth grade students attending single-track YRE schools are expected to outscore multi-track students on both reading and math tests.

Table 14: Summary of Multiple Regression Analysis for Variables Predicting Fourth Grade Year-round Students' Reading and Math Scores: Track Type

	Reading			Math		
	1998	1999	2000	1998	1999	2000
Intercept	642.48	639.85	641.79	629.33	621.36	627.09
	--	--	--	--	--	--
	(196.45)***	(181.00)***	(178.06)***	(182.24)***	(169.85)***	(166.57)***
TRACK						
	4.33	3.51	4.48	2.61	2.27	2.61
	.09	.07	.10	.07	.06	.07
	(6.07)***	(4.69)***	(5.79)***	(3.47)**	(2.93)**	(3.23)**
LEP						
	13.98	14.01	14.84	7.87	8.31	9.49
	.33	.33	.36	.24	.25	.27
	(22.05)***	(22.09)***	(22.90)***	(11.81)***	(12.71)***	(14.06)***
CALWORKS						
	-.30	-.29	-.24	-.31	-.24	-.22
	-.22	-.19	-.16	-.28	-.20	-.18
	(-12.98)***	(-11.67)***	(-9.56)***	(-12.52)***	(-9.48)***	(-8.54)***
MINORITY						
	-.51	-.50	-.48	-.34	-.33	-.34
	-.62	-.60	-.58	-.53	-.50	-.49
	(-31.50)***	(-28.73)***	(-27.04)***	(-19.62)***	(-18.59)***	(-18.56)***
FULLPCT						
	.00	.04	.02	-.04	.08	.08
	.00	.03	.01	-.03	.07	.07
	(.02)	(1.32)	(.63)	(-1.15)	(2.48)*	(2.51)*
YRSTEACH						
	.68	.55	.59	.60	.45	.43
	.10	.08	.09	.11	.08	.07
	(6.08)***	(4.94)***	(5.00)***	(5.09)***	(3.85)***	(3.46)***
POPSTAT						
	-2.98	-1.82	-1.53	-2.87	-1.42	-.84
	-.16	-.10	-.08	-.19	-.09	-.05
	(-9.33)***	(-5.77)***	(-4.72)***	(-8.49)***	(-4.39)***	(-2.48)*
R^2_{ADJ}	.77	.76	.74	.57	.59	.59
SS_{ERR}	115163.3	118613.2	124865.8	130706.3	127939.1	137276.2
(N)	1131	1146	1144	1142	1151	1149

*** $p < .001$; ** $p < .01$; * $p < .05$

Table 15: Summary of Multiple Regression Analysis for Variables Predicting Seventh Grade Year-round Students' Reading and Math Scores: Track Type

	Reading			Math		
	1998	1999	2000	1998	1999	2000
Intercept	661.21	663.02	668.11	655.36	662.14	656.41
	--	--	--	--	--	--
	(89.21)***	(86.94)***	(85.95)***	(94.54)***	(95.20)***	(90.71)***
TRACK						
	3.87	3.35	3.80	2.49	2.79	1.24
	.08	.07	.08	.08	.08	.04
	(2.51)*	(2.10)*	(2.07)*	(1.72)*	(1.91)*	(.73)
LEP						
	21.30	22.79	20.71	12.01	12.22	12.81
	.49	.52	.50	.40	.38	.40
	(15.41)***	(16.15)***	(13.64)***	(9.30)***	(9.49)***	(9.06)***
CALWORKS						
	-.18	-.21	-.21	-.16	-.22	-.19
	-.11	-.11	-.12	-.14	-.16	-.14
	(-2.55)*	(-2.60)*	(-2.50)*	(-2.43)*	(-3.02)**	(-2.37)*
MINORITY						
	-.42	-.41	-.41	-.26	-.30	-.28
	-.52	-.51	-.50	-.47	-.50	-.44
	(-11.72)***	(-11.37)***	(-10.36)***	(-7.80)***	(-9.08)***	(-7.56)***
FULLPCT						
	.13	.08	.01	.12	.10	.18
	.08	.05	.04	.11	.10	.18
	(1.91)	(1.19)	(.82)	(1.89)	(1.69)	(2.91)**
YRSTEACH						
	.16	.30	.30	.33	.38	.30
	.02	.04	.04	.07	.08	.05
	(.66)	(1.19)	(.99)	(1.43)	(1.64)	(1.07)
POPSTAT						
	-1.05	-.88	-.30	-1.54	-1.39	-1.00
	-.06	-.05	-.02	-.12	-.10	-.07
	(-1.52)	(-1.17)	(-.38)	(-2.38)*	(-2.03)*	(-1.34)
R^2_{ADJ}	.81	.80	.74	.65	.70	.63
SS_{ERR}	16449.5	17964.9	20968.3	14612.4	14943.4	18186.7
(N)	201	203	201	202	203	201

*** $p < .001$; ** $p < .01$; * $p < .05$

Table 15 presents data for seventh grade single-track and multi-track YRE students. The variable, TRACK, is again a weak variable in predicting reading scores (2000 reading $\beta = .08$). Single-track students score fewer than four points more than multi-track students. For seventh grade students who took the reading test, the data supports the hypothesis that single-track students will outscore multi-track students.

On the math test, however, no significant difference is found between the scores of single-track and multi-track students in the year 2000. The second hypothesis, that single-track students will outscore traditional students, is not supported by the seventh grade math test data.

Table 16 highlights data for tenth grade YRE students who took the reading and math tests. Whether a student attends single-track or multi-track schools does not affect either reading or math scores. The data for tenth grade math and reading scores does not support the second hypothesis.

The trend across the grades is that the type of YRE track a student attends appears to decrease in importance in its affect on test scores. For reading scores, TRACK becomes weaker from fourth to seventh grade and becomes non-significant in tenth grade. For math scores, TRACK is not significant in either seventh or tenth grade. These findings indicate that attending a single-track YRE school is more academically beneficial in the early grades compared to attending a multi-track YRE school, and this benefit disappears in later grades.

Table 16: Summary of Multiple Regression Analysis for Variables Predicting Tenth Grade Year-round Students' Reading and Math Scores: Track Type

	Reading			Math		
	1998	1999	2000	1998	1999	2000
Intercept	690.56	686.60	666.65	680.14	693.54	665.31
	--	--	--	--	--	--
	(30.12)***	(37.38)***	(42.73)***	(46.78)***	(51.30)***	(50.45)***
TRACK						
	2.66	.16	-2.56	-1.61	-2.64	-2.89
	.08	.00	-.07	-.08	-.12	-.13
	(.58)	(.04)	(-.61)	(-.56)	(-.87)	(-.82)
LEP						
	23.05	23.30	25.41	9.36	10.26	12.10
	.68	.67	.70	.49	.48	.56
	(10.80)***	(12.52)***	(12.56)***	(6.91)***	(7.49)***	(7.08)***
CALWORKS						
	-.15	-.16	-.18	-.13	-.20	-.15
	-.09	-.09	-.10	-.14	-.18	-.14
	(-.83)	(-.89)	(-.92)	(-1.13)	(-1.54)	(-.92)
MINORITY						
	-.24	-.31	-.28	-.19	-.23	-.13
	-.39	-.47	-.42	-.53	-.58	-.33
	(-3.85)***	(-5.67)***	(-4.79)***	(4.73)***	(-5.79)***	(-2.67)*
FULLPCT						
	-.24	-.05	.15	.12	.05	.22
	-.11	-.03	.09	.10	.04	.21
	(-.93)	(-.20)	(.74)	(.74)	(.27)	(1.25)
YRSTEACH						
	.38	.09	.36	.34	.19	.67
	.06	.02	.05	.09	.05	.16
	(.80)	(.18)	(.62)	(1.01)	(.54)	(1.36)
POPSTAT						
	.57	.22	-.52	-.66	.13	-.53
	.04	.02	-.04	-.09	.02	-.06
	(.53)	(.22)	(-.47)	(-.96)	(.17)	(-.57)
R^2_{ADJ}	.78	.84	.82	.72	.78	.65
SS_{ERR}	3235.1	2464.2	3077.8	1301.3	1335.0	2198.5
(N)	59	59	60	59	59	60

*** $p < .001$; ** $p < .01$; * $p < .05$

For the remaining seven tables, Tables 17 through Table 23, the focus is on testing hypothesis three, that student test scores benefit more from year-round education than from traditional education as socioeconomic level decreases. A comparison is made of the effect of students' CalWorks participation rate (the proxy variable for poverty rate) on test scores between YRE and traditional schools. Tables 17 and 18 display data for reading and math tests for YRE and traditional students at the fourth grade level, Tables 19 and 20 show data for reading and math tests at the seventh grade level, and Tables 21 and 22 display the same data at the tenth grade level. Identical models are presented side by side for both the YRE and traditional populations in these tables. For both the YRE and traditional populations, the model is generally stronger in fourth, seventh, and tenth grade for predicting reading scores compared to math scores (reading R^2_{ADJ} ranges from .69 to .84; math R^2_{ADJ} = .45 and .75). The last table, Table 23, displays the results of F-tests which incorporate results from the multiple regression models and indicates whether there is a difference in the effect of CalWorks participation rate on test scores between YRE and traditional schools.

Table 17 displays the model for predicting reading scores at the fourth grade level using CALWORKS, LEP, MINORITY, FULLPCT, YRSTEACH, and POPSTAT. For both YRE and traditional students, the variable, CALWORKS, is found to have a moderate effect on reading scores (2000 YRE β = -.15; traditional β = -.27), trailing behind the percentage of minority students present at a school (YRE β =-.57; traditional β =-.45) and the English language proficiency status of students (YRE β =.38; traditional β =.41).

Table 17: A Comparison of Multiple Regression Analysis for Variables Predicting Fourth Grade Reading Scores to Assess the Effect of Poverty Level on Test Scores in Traditional and Year-Round Schools.

	Traditional			Year-Round		
	1998	1999	2000	1998	1999	2000
Intercept	636.08	637.33	644.38	638.48	636.51	643.35
	--	--	--	--	--	--
	(347.20)***	(307.55)***	(317.87)***	(231.13)***	(216.90)***	(216.63)***
CALWORKS						
	-.50	-.48	-.48	-.26	-.21	-.20
	-.28	-.27	-.27	-.21	-.17	-.15
	(-32.78)***	(31.69)***	(-32.50)***	(-15.17)***	(-11.65)***	(-10.66)***
LEP						
	22.97	22.19	22.41	15.30	15.01	15.31
	.38	.39	.41	.37	.37	.38
	(48.67)***	(49.08)***	(51.07)***	(28.71)***	(27.91)***	(28.37)***
MINORITY						
	-.44	-.43	-.41	-.50	-.48	-.49
	-.46	-.46	-.45	-.59	-.57	-.57
	(-49.03)***	(-44.97)***	(-43.76)***	(-35.26)***	(-31.57)***	(-31.42)***
FULLPCT						
	.04	.08	.04	.01	.02	.00
	.02	.04	.02	.00	.02	.00
	(2.82)*	(4.27)***	(2.09)*	(.27)	(.87)	(.003)
YRSTEACH						
	.78	.67	.61	.58	.60	.52
	.09	.09	.08	.09	.09	.08
	(11.95)***	(10.66)***	(9.58)***	(6.35)***	(6.13)***	(5.09)***
POPSTAT						
	-2.67	-2.86	-2.76	-1.72	-.94	-90
	-.14	-.15	-.15	-.09	-.05	-.05
	(-17.49)***	(-19.19)***	(18.57)***	(6.31)***	(-3.45)**	(-3.24)**
R^2_{ADJ}	.73	.72	.72	.73	.70	.69
SS_{ERR}	971037.0	967316.0	948856.4	201269.7	216253.6	221873.2
(N)	4914	5034	5065	1766	1807	1813

*** $p < .001$; ** $p < .01$; * $p < .05$

In addition, the effect of CalWorks participation on test scores becomes consistently weaker from 1998 to 2000 among YRE students compared to traditional students. For YRE students, for each percentage increase in participation of CalWorks, reading scores are expected to drop only two-tenths of a point whereas for traditional students, their reading scores are expected to drop nearly one-half of a point. Students who attend YRE will see less effect of their poverty level on their reading scores than will traditional students.

The analysis for the data comparing track type using math scores at the fourth grade level presented in Table 18 is similar to that of the previous table. The strength of the TRACK variable is weaker on scores for YRE students than on scores for traditional students (2000 YRE β = -.17; traditional β = -.33). Also, the loss of math points associated with CalWorks participation is essentially the same as the loss of reading points presented in Table 17 (2000 YRE B = -.19; traditional B = -.48). YRE students lose fewer math points through their CalWorks participation than traditional students.

Data for reading and math scores at the seventh grade level, as shown in Tables 19 and 20, also parallel each other. Both tables are discussed after Table 20.

Table 18: A Comparison of Multiple Regression Analysis for Variables Predicting Fourth Grade Math Scores to Assess the Effect of Poverty Level on Test Scores in Traditional and Year-Round Schools.

	Traditional			Year-Round		
	1998	1999	2000	1998	1999	2000
Intercept	623.95	627.95	636.40	621.50	617.62	629.22
	--	--	--	--	--	--
	(321.87)***	(283.84)***	(295.64)***	(217.27)***	(200.07)***	(198.20)***
CALWORKS						
	-.50	-.49	-.48	-.25	-.19	-.19
	-.34	-.33	-.33	-.26	-.18	-.17
	(-31.23)***	(-30.52)***	(30.90)***	(-14.10)***	(-9.87)***	(-9.53)***
LEP						
	13.94	13.12	13.93	9.05	8.81	9.77
	.28	.28	.30	.28	.27	.28
	(28.22)***	(27.50)***	(30.04)***	(16.48)***	(15.61)***	(16.99)***
MINORITY						
	-.28	-.28	-.27	-.32	-.31	-.35
	-.36	-.36	-.35	-.48	-.44	-.48
	(-29.64)***	(-27.50)***	(-.27.70)***	(.21.83)***	(-18.96)***	(-20.85)***
FULLPCT						
	.07	.01	.07	.00	.01	.05
	.04	.05	.04	.00	.06	.03
	(4.16)***	(4.41)***	(3.46)**	(.18)***	(2.47)*	(2.08)*
YRSTEACH						
	.55	.50	.39	.55	.47	.33
	.08	.08	.06	.10	.09	.06
	(7.94)***	(7.47)***	(5.82)***	(5.80)***	(4.59)***	(2.08)*
POPSTAT						
	-2.91	-2.91	-2.54	-1.92	-.61	-.37
	-.18	-.18	-.16	-.13	-.04	-.02
	(-18.06)***	(-18.37)***	(-16.36)***	(-6.78)***	(-2.13)*	(-1.25)
R^2_{ADJ}	.56	.54	.55	.53	.49	.52
SS_{ERR}	1123043.6	1122642.5	1082597.2	219833.4	241311.5	255988.4
(N)	4988	5096	5096	1783	1815	1822

*** $p < .001$; ** $p < .01$; * $p < .05$

Table 19: A Comparison of Multiple Regression Analysis for Variables Predicting Seventh Grade Reading Scores to Assess the Effect of Poverty Level on Test Scores in Traditional and Year-Round Schools.

	Traditional			Year-Round		
	1998	1999	2000	1998	1999	2000
Intercept	662.23	661.73	660.77	665.67	666.80	662.42
	--	--	--	--	--	--
	(267.81)***	(229.86)***	(238.82)***	(100.83)***	(103.70)***	(102.80)***
CALWORKS						
	-.40	-.39	-.43	-.19	-.20	-.12
	-.22	-.20	-.23	-.13	-.12	-.08
	(-.17.95)***	(-17.02)***	(-19.03)***	(-3.69)***	(-3.72)***	(-2.18)*
LEP						
	31.93	31.68	31.27	24.63	24.97	23.27
	.61	.63	.63	.56	.57	.57
	(54.79)***	(57.03)***	(57.07)***	(19.90)***	(20.44)***	(17.89)***
MINORITY						
	-.34	-.32	-.29	-.42	-.42	-.38
	-.39	-.37	-.33	-.52	-.52	-.49
	(-29.68)***	(-25.67)***	(22.62)***	(-13.77)***	(-13.31)***	(-11.48)***
FULLPCT						
	.01	.06	.06	.08	.04	.08
	.01	.03	.03	.04	.03	.06
	(.50)	(2.04)*	(2.35)*	(1.20)	(.74)	(1.38)
YRSTEACH						
	.52	.30	.39	.11	.16	.12
	.07	.04	.05	.02	.02	.02
	(6.00)***	(3.65)***	(4.46)***	(.54)	(.77)	(.49)
POPSTAT						
	-1.22	-1.35	-1.02	-1.71	-.97	.10
	-.08	-.09	-.07	-.09	-.05	.01
	(-6.78)***	(-7.80)***	(-5.88)***	(-2.95)**	(-1.62)	(.16)
R^2_{ADJ}	.76	.76	.76	.79	.79	.72
SS_{ERR}	311918.0	301023.2	294637.9	27775.6	27687.9	33429.2
(N)	2113	2145	2131	284	286	290

*** $p < .001$; ** $p < .01$; * $p < .05$

Table 20: A Comparison of Multiple Regression Analysis for Variables Predicting Seventh Grade Math Scores to Assess the Effect of Poverty Level on Test Scores in Traditional and Year-Round Schools.

	Traditional			Year-Round		
	1998	1999	2000	1998	1999	2000
Intercept	658.42	658.28	661.60	660.64	666.05	657.05
	--	--	--	--	--	--
	(237.28)***	(196.59)***	(201.63)***	(113.98)***	(114.96)***	(108.29)***
CALWORKS						
	-.44	-.44	-.47	-.16	-.16	-.11
	-.29	-.27	-.28	-.15	-.14	-.09
	(-17.59)***	(-16.52)***	(-17.54)***	(-3.43)**	(-3.39)**	(-2.09)*
LEP						
	18.50	18.67	19.34	13.76	14.19	15.05
	.43	.44	.44	.45	.44	.47
	(28.29)***	(28.94)***	(29.81)***	(12.69)***	(12.91)***	(12.29)***
MINORITY						
	-.24	-.21	-.21	-.28	-.31	-.27
	-.33	-.29	-.28	-.51	-.23	-.44
	(-18.29)***	(-14.82)***	(-14.09)***	(-10.71)***	(-8.42)***	(-8.52)***
FULLPCT						
	.07	.13	.10	.08	.08	.15
	.04	.07	.03	.06	.07	.14
	(2.61)**	(3.81)***	(3.12)**	(1.34)	(1.49)	(2.84)**
YRSTEACH						
	.79	.55	.67	.29	.22	.10
	.12	.09	.10	.06	.05	.02
	(8.10)***	(5.75)***	(6.46)***	(1.55)	(1.14)	(.42)
POPSTAT						
	-1.29	-1.38	-1.09	-1.72	-1.37	-.73
	-.10	-.11	-.08	-.13	-.10	-.05
	(-6.38)***	(-6.84)***	(-5.29)***	(-3.38)**	(-2.55)*	(-1.20)
R^2_{ADJ}	.55	.54	.56	.66	.68	.59
SS_{ERR}	393478.3	408440.3	415754.8	21572.50	22412.4	29641.5
(N)	2115	2149	2135	285	286	290

*** $p < .001$; ** $p < .01$; * $p < .05$

Tables 19 and 20 demonstrate that for both reading and math scores, CALWORKS has a weaker impact on test scores for YRE students than for traditional students (2000 reading YRE β = -.08 and traditional β = -.23; math YRE β = -.09 and traditional β = -.28) and a smaller loss of points due to CalWorks participation is found for YRE students compared to traditional students (2000 reading YRE B = -.12 and traditional B = -.43; math YRE B = -.11 and traditional B = -.47). Students attending YRE lose a little over one-tenth of a point on both reading and math scores for each percentage increase of CalWorks participation while students attending traditional schools lose almost one-half point in reading and math scores for each percentage increase of CalWorks participation.

Data for tenth grade reading and math scores are discussed after Table 22. Table 21 displays the model for tenth grade reading scores and Table 22 displays the model for math scores at the same grade level.

Tables 21 and 22 exhibit data about the effect of CalWorks participation on reading and math for traditional and YRE students in tenth grade. Interestingly, in tenth grade CALWORKS is no longer a significant variable in the reading and math models for YRE students, although it remains significant for traditional students. The level of participation at a school in CalWorks does not affect test scores for tenth grade YRE students. Tenth grade traditional students, however, continue to be affected. In 2000, traditional students lose three-tenths of a reading point and four-tenths of a math point for every percentage increase in CalWorks participation at a school.

Table 21: A Comparison of Multiple Regression Analysis for Variables Predicting Tenth Grade Reading Scores to Assess the Effect of Poverty Level on Test Scores in Traditional and Year-Round Schools.

	Traditional			Year-Round		
	1998	1999	2000	1998	1999	2000
Intercept	671.39	671.56	675.84	681.95	680.43	662.14
	--	--	--	--	--	--
	(216.31)***	(154.69)***	(178.02)***	(39.06)***	(46.62)***	(49.67)***
CALWORKS						
	-.27	-.31	.29	-.15	-.14	-.01
	-.15	-.16	-.15	-.09	-.08	-.04
	(-10.09)***	(-10.72)***	(9.98)***	(-1.08)	(-1.09)	(-.49)
LEP						
	34.77	33.94	34.75	23.75	23.85	26.95
	.74	.74	.76	.68	.66	.71
	(55.87)***	(54.57)***	(57.53)***	(12.05)***	(13.08)***	(14.25)***
MINORITY						
	-.27	-.25	-.24	-.23	-.27	-.25
	-.31	-.29	-.28	-.38	-.42	-.39
	(-19.31)***	(-16.43)***	(-16.39)***	(-4.76)***	(-6.06)***	(-5.43)***
FULLPCT						
	-.02	.02	-.01	-.14	.01	-20
	-.01	.01	.00	-.06	.00	.11
	(-.75)	(.55)	(-.20)	(-.72)	(.03)	(1.21)
YRSTEACH						
	.61	.46	.33	.21	-.18	-.16
	.07	.06	.04	.04	-.03	-.02
	(5.57)***	(3.88)***	(2.71)**	(.57)	(-.49)	(-.33)
POPSTAT						
	-1.13	-1.51	-1.32	1.37	1.11	.06
	-.07	-.10	-.09	.10	.08	.00
	(-5.18)***	(-6.86)***	(-6.16)***	(1.56)	(1.34)	(.07)
R^2_{ADJ}	.79	.78	.78	.78	.84	.83
SS_{ERR}	138889.7	143665.8	147241.0	4399.4	3383.4	3756.0
(N)	1265	1280	1317	73	70	70

*** $p < .001$; ** $p < .01$; * $p < .05$

Table 22: A Comparison of Multiple Regression Analysis for Variables Predicting Tenth Grade Math Scores to Assess the Effect of Poverty Level on Test Scores in Traditional and Year-Round Schools.

	Traditional			Year-Round		
	1998	1999	2000	1998	1999	2000
Intercept	688.55	686.38	689.67	673.99	678.12	658.78
	--	--	--	--	--	--
	(180.74)***	(135.98)***	(157.31)***	(56.50)***	(60.09)***	(58.05)***
CALWORKS						
	-.36	-.42	-.38	-.01	.05	.03
	-.27	-.30	-.27	-.01	.04	.03
	(-11.08)***	(-12.54)***	(-11.49)***	(-.10)	(.44)	(.27)
LEP						
	15.18	15.5	16.46	10.21	11.26	13.44
	.43	.45	.49	.51	.50	.58
	(20.25)***	(21.49)***	(28.54)***	(7.58)***	(8.05)***	(8.35)***
MINORITY						
	-.18	-.15	-.15	-.18	-.21	-.13
	-.28	-.23	-.23	-.52	-.53	-.32
	(-10.71)***	(-8.42)***	(-8.68)***	(-5.35)***	(-6.00)***	(-3.29)**
FULLPCT						
	-.02	.03	.02	.13	.16	.32
	-.01	.01	.01	.10	.14	.29
	(.61)	(.56)	(.46)	(1.00)	(1.25)	(2.36)*
YRSTEACH						
	.96	.91	.78	.32	-.08	.02
	.16	.15	.13	.09	-.02	.00
	(7.28)***	(6.63)***	(5.62)***	(1.28)	(-.28)	(.05)
POPSTAT						
	-1.78	-1.91	-2.01	-.32	.79	.08
	-.15	-.17	-.18	-.04	.09	.01
	(-6.74)***	(-7.51)***	(-8.11)***	(-.54)	(1.23)	(.10)
R^2_{ADJ}	.45	.46	.47	.69	.75	.68
SS_{ERR}	203779.3	193288.6	195279.0	2054.3	2082.1	2719.8
(N)	1270	1280	1312	73	71	70

*** $p < .001$; ** $p < .01$; * $p < .05$

Hypothesis Three - Student test scores benefit more from year-round education than from traditional education as socioeconomic level decreases.

Table 23 presents F-tests that calculate whether there is a significant difference between the loss of points that traditional and YRE students experience due to the average CalWorks participation of their schools. These F-tests test the third hypothesis that student test scores benefit more from year-round education than from traditional education as socioeconomic level decreases. Multiple regression models presented in Tables 17 through 22 indicate that scores of students attending YRE schools appear less impacted by school-wide CalWorks participation rates than traditional student scores in fourth, seventh, and tenth grade. In fourth and seventh grade, the impact of CALWORKS on test scores is significant for both YRE and traditional students, but the level of impact varies. From regression analysis, we can conclude that both sets of students will have a negative impact on their test scores with an increase in CalWorks participation. Traditional students *appear* to lose more when they attend higher poverty schools than YRE students, but is this comparative loss statistically significantly different? An F-test is calculated in response to this question. With a significant outcome, we can conclude that YRE student scores are less impacted by the poverty rate of their school than are traditional student scores.

At the tenth grade level, traditional student scores experienced a significant impact of CalWorks participation while YRE student scores were not significantly impacted. Since traditional students are impacted by the general student poverty level at school and year-round students are not, the level of impact of poverty on test scores clearly varies between the two types of calendars and testing with an F-test becomes

unnecessary. Data for tenth grade students support the third hypothesis that student test scores benefit more from year-round education than from traditional education as socioeconomic level decreases.

Table 23: Tests for Differences in Coefficients for CalWorks participation between YRE and Traditional Students

F-test: $b_1-b_2/ \sqrt{SE\ b_1^2 + SE\ b_2^2}$

Fourth Grade Reading Scores
1998: $-.495-(-.260)/ \sqrt{.015^2 + .017^2} = -10.217^{**}$
1999: $-.477-(-.214)/ \sqrt{.015^2 + .018^2} = -11.435^{**}$
2000: $-.478-(-.197)/ \sqrt{.015^2 + .018^2} = -12.217^{**}$

Fourth Grade Math Scores
1998: $-.500-(-.249)/ \sqrt{.016^2 + .018^2} = -10.458^{**}$
1999: $-.486-(-.191)/ \sqrt{.016^2 + .019^2} = -11.800^{**}$
2000: $-.480-(-.188)/ \sqrt{.016^2 + .020^2} = -11.232^{**}$

Seventh Grade Reading Scores
1998: $-.403-(-.191)/ \sqrt{.022^2 + .052^2} = 3.786^{*}$
1999: $-.390-(-.196)/ \sqrt{.023^2 + .053^2} = -3.345^{*}$
2000: $-.429-(-.122)/ \sqrt{.023^2 + .056^2} = -5.033^{**}$

Seventh Grade Math Scores
1998: $-.442-(-.156)/ \sqrt{.025^2 + .046^2} = -5.500^{**}$
1999: $-441-(-.160)/ \sqrt{.027^2 + .047^2} = -5.204^{**}$
2000: $-.469-(-.110)/ \sqrt{.027^2 + .053^2} = -6.085^{**}$

Note: F-distribution table indicates that the critical value for $\alpha = .05$ is 3.00 and for $\alpha = .01$ is 4.61.
* $p < .05$
** $p < .01$

Table 23 indicates that there is a significant difference between the coefficients for CalWorks participation predicting test scores of YRE and traditional students. Reading and math scores of traditional students are found to be more impacted by increasing poverty rates at school compared to scores of YRE students in fourth and

seventh grade. Data supports the third hypothesis that student test scores benefit more from year-round education than from traditional education as socioeconomic level decreases.

CHAPTER 7: DISCUSSION

After assessing three years of data for three grade levels, fourth, seventh, and tenth grade, and two different standardized exams for reading and math, linkages become more apparent among theoretical arguments, previous studies, and the current study regarding the effect of the calendar choice of schools on academic achievement. A major argument in favor of YRE is that students experience more continuous learning. Never having more than a three to six week break from school allows them to retain more knowledge and to refresh their motivation to learn compared to traditional education. Largely because of these shortened breaks, students in poverty likely benefit more from YRE than traditional education because they avoid the long summer break when they are expected to experience the greatest learning losses compared to other students. Students in poverty suffer in comparison to their wealthier peers without the summertime enrichment activities that are often provided by the latter's parents. Year-round education provides more consistent academic stimulation through its scheduling to normalize the learning experience among all children.

Single-track YRE, a simpler organizational plan than multi-track YRE, may contribute more to academic excellence than multi-track YRE by its stable nature of allowing all students to attend school at the same time. Staggered student attendance under multi-track can complicate academic and extra-curricular programs and exhaust those who must organize them, possibly to the detriment of academic achievement.

Previous studies based on teacher, administrator, and student opinions clearly favor YRE over traditional education, but the consensus of statistical studies is

disputable. Assessing data for selected grade levels for the entire state of California across several years, the goal of this study, can add to our knowledge of the comparison of YRE and traditional education.

For each of the hypotheses considered in this study, separate tests were conducted for the selected grade levels, fourth, seventh, and tenth, and for the two different exams, reading and math. The first hypothesis, that standardized test scores of students attending year-round schools will improve at a faster rate than scores of students in traditional schools, was not supported at any grade level for either exam. The type of school that students attend has a weak impact on scores, and the difference between the scores of YRE and traditional students is quite small – fewer than ten points on exams where the constant is around 650 points. The difference is almost negligible, yet it is significant. YRE students score lower on the reading and math tests than traditional students at fourth, seventh, and tenth grade, though only by a few points.

Considering the less well-established organization of YRE compared to traditional education and the possible effect of changing structures on academic achievement, viewing scores across time is a plausible extension of the above analysis. However, tests of the first hypothesis indicate that YRE students score consistently lower than traditional students at all three grade levels from 1998 to 2000.

The second hypothesis considered whether standardized test scores of students attending single-track schools will be higher than for students attending multi-track schools. On the reading test, single-track students perform better than multi-track students in fourth and seventh grade. In tenth grade, whether a student attended a single-

track or multi-track school has no effect. On the math test, only in fourth grade do single-track students outscore multi-track students. In seventh and tenth grade, again, no difference is found in the test scores of students attending the two different type of tracks. In instances where track-type does affect test scores, the effect is weak and the point difference is small. Fewer than five points determine the difference between single-track and multi-track student test scores.

The last hypothesis, that student test scores benefit more from year-round education than from traditional education as socioeconomic level decreases, is supported for fourth, seventh, and tenth grade for both the reading and math exams. Using student participation in CalWorks as a proxy variable for poverty level, CalWorks participation has more impact on reading and math scores in traditional education than in YRE. Also, students in traditional education can expect a greater loss of math and reading points due to their CalWorks participation than students in YRE. In tenth grade, in fact, reading and math scores of students attending YRE are not affected by their CalWorks participation.

Poverty level, a persistent and insidious predictor of academic achievement, appears to wither in importance under YRE. With great differences in socioeconomic status that students bring to the academic environment, the potentially equalizing effect of YRE can eradicate a factor that should be foreign to the learning process of children. Income level of parents should not affect the learning ability of their children, yet it consistently and significantly has under traditional education. Though a part of the difference is likely due to the greater resources that wealthier parents can contribute to their children's schools, thus enriching their learning environment, this test of the third

hypothesis indicates that some of the difference is due to the structuring of the school. By providing a more continuous learning environment, schools can provide children what some parents may not be able through no fault of their own, supervised time to learn and enrichment activities. Parents' monetary circumstance no longer needs to be a detriment to their children's education to the extent that it has in the past.

CHAPTER 8: CONCLUSION

Several issues are of concern in this study. The unit of analysis in the dataset is groups of students. Data on individual students would permit more confidence in results, but data at this level is unavailable in large samples.

Other concerns relate to the variables chosen for analysis. Using standardized test scores as a proxy for academic achievement has long been in question, but their accessibility and standardizing feature render them a best-choice alternative at this stage of education research. The time of year in which tests are given is another factor to be aware of, which may influence results. Tests are given to all students across California within a general time frame in the Spring of each year. For students in traditional schools, the timing is not an issue, but when comparing YRE to traditional students and when comparing multi-track and single-track students, a problem may arise. Some students may have received more or fewer instructional days depending on the type of YRE they are attending. Future research may be aided by closer attention to this detail.

The set of independent variables that was chosen to clarify the effect of YRE explains a high degree of variance in dependent variables. Although several important effects on academic achievement were included in the study, such as English language proficiency, poverty level, minority population, teacher experience, and school locality, the multitude of effects on achievement is tremendous. Additional variables may add explanatory power for this type of study, such as the reason why a district chose YRE for its schools -- financial or academic.

Another potentially important variable is the level of commitment to developing YRE schools in a district. Districts that have adopted YRE range from having three percent to all of their schools on the YRE system, with an average of 57 percent, according to the data used for this study. Schools belonging to districts that have all or nearly all of their schools on YRE may be more effective at using the system to its full advantage. All planning activities and resources can be directed toward developing an effective YRE environment for the children, and child-oriented organizations in the community can adjust their schedules to fit YRE, whereas attention is split in districts maintaining both systems.

In addition, more effective measures may be found to represent poverty rate. Although the percentage of students on CalWorks in a school's attendance area does not directly measure the level of poverty of students in a school, the difficulty of collecting data about students' families' socioeconomic situation makes the use of this variable indispensable. If a better measure could be utilized, the strength of the study would increase. Moreover, the demographic properties of YRE and traditional schools are very different (review Tables 2 through 9) and may vary widely on untested variables as well, further confounding the exploration of the academic comparison of these two school types.

The message that this study promotes about the calendar choice of schools is that test scores do not appear greatly affected by that choice. Arguments in favor of it, such as reduction of learning loss during breaks from school may balance arguments against it, such as difficulty of academic and extra-curricular planning. A promising study to

further sort out this comparison would be to compare single-track YRE schools with traditional schools. Many of the drawbacks associated with YRE are actually drawbacks specifically associated with the multi-track system. Since most schools are multi-track, largely due to its financial and population accommodating benefits, including both multi-track and single-track together in the comparison of YRE to traditional school, with weight toward the multi-track system, may be unfair. This study investigated YRE versus traditional school and single-track versus multi-track as independent issues, but further knowledge may be gained by combining these investigations.

Importantly, YRE does appear to mitigate the influence of the socioeconomic status of students on test scores. This conclusion is consistent with the theoretical construct that a more continuous learning environment will provide lower socioeconomic students with somewhat equivalent learning experiences that higher socioeconomic students may receive from home. Although overcoming the impact of familial economics to promote a more equal education for all students is challenging, adoption of YRE may be a promising alternative to traditional education to promote greater equity in education.

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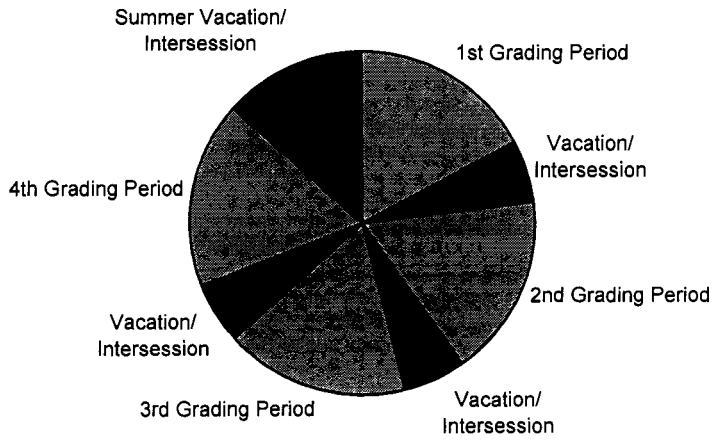
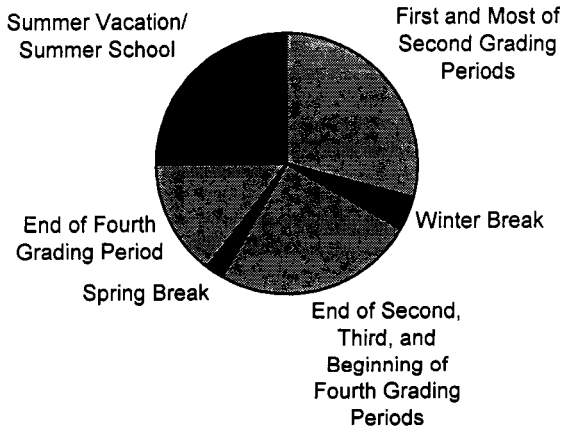
APPENDIX A:
Learning and Vacation Cycles for Year-Round and Traditional Calendars*

45-15 Single-Track Calendar

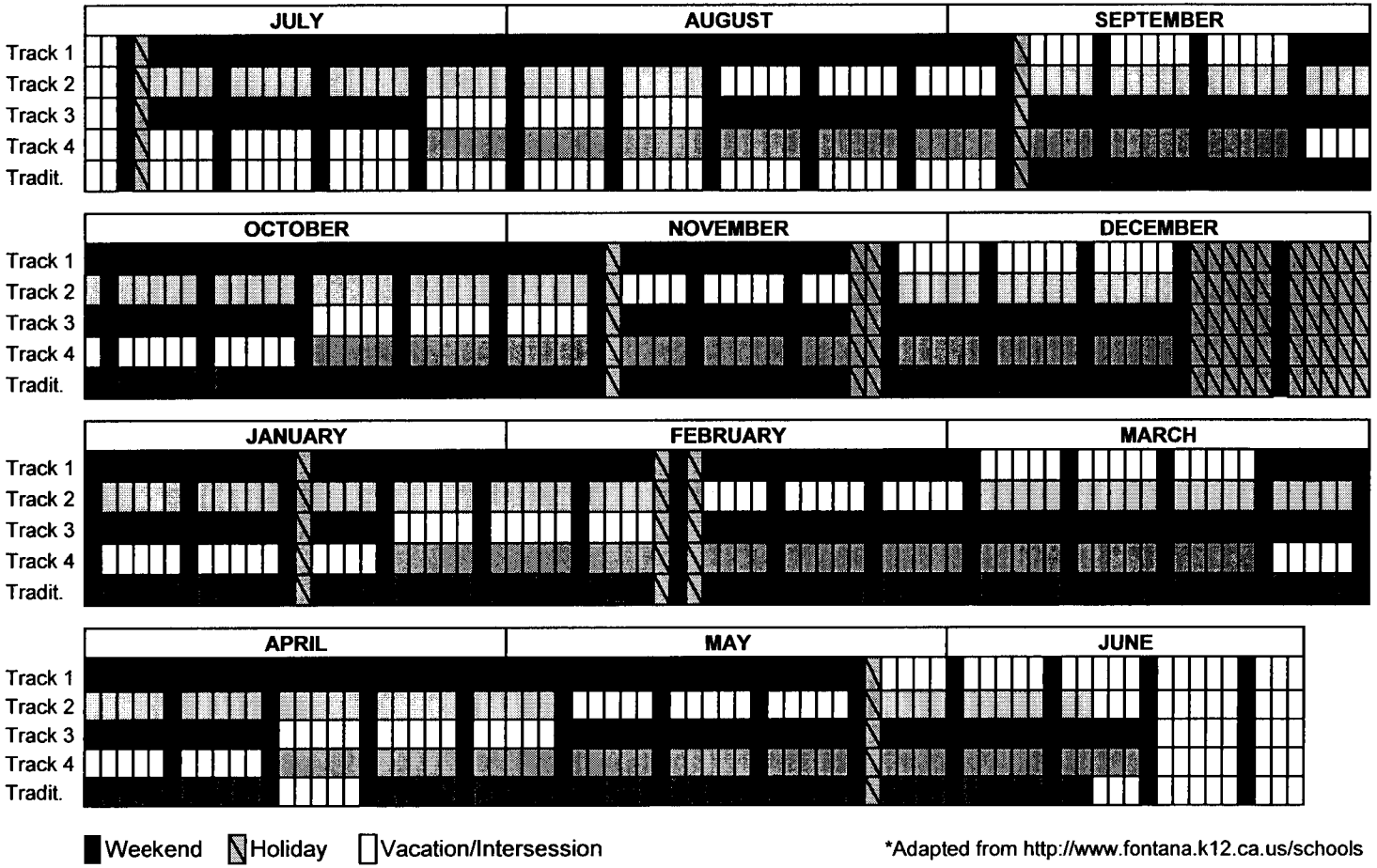


Traditional School Calendar



*Adapted from Ballinger (1995)

APPENDIX B:
Comparison of 45-15 Multi-Track Calendar and Traditional Calendar*



*Adapted from http://www.fontana.k12.ca.us/schools

APPENDIX C:
Benefits and Costs of Year-Round Education*

Benefits

~ May increase retention
~ May increase student and teacher motivation
~ Vandalism at school site reduced
~ Intersession offers time to supplement instruction
~ Some families prefer staggered vacation schedules
~ Provides calendar options that more closely fit today's lifestyle and work patterns
~ More frequent remediation

For multi-track only:

~ School sites can accommodate a larger number of students
~ Teachers can earn more money by substituting during intersession
~ Lower cost per student than acquisition of a new site and building
~ Kindergarten students can enter when ready instead of waiting till September
~ Districts incur fewer capital costs
~ Saving in insurance costs
~ Offers parents alternatives in scheduling

Costs

~ Families are required to adjust to a new system
~ May be more difficult to accommodate legislated school reforms such as extended school year and mandatory summer school

For multi-track only:

~ Maintenance must be done at night and on weekends
~ Teachers pack and move everything after every session
~ Scheduling athletics and other activities is difficult
~ Communication among the school community suffers
~ Teachers may need to develop individualized programs and blocked curriculum
~ Transportation cost may increase
~ Storage for materials for off-track teachers may be insufficient
~ Increased placement of children in combination classes
~ Increased administrative costs for designing schedules
~ Children jumping tracks cause possible loss of community, identity
~ Increased administrative costs for principal's vacation
~ Teacher training more difficult to coordinate

* Adapted from Year-Round Education Program Guide (1999) and Ballinger (1995)

APPENDIX D:
Correlation Tables

Year-Round Versus Traditional

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
VERICAL	1.000								
GRADE	-.153***	1.000							
LEP	-.084***	-.019***	1.000						
CALWORKS	.264***	-.140***	-.136***	1.000					
MINORITY	.241***	-.091***	-.290***	.500***	1.000				
FULLPCT	-.165***	.071***	.123***	-.289***	-.414***	1.000			
YRSTEAC	-.214***	.227***	.040***	-.176***	-.178***	.315***	1.000		
AVGCLS	.079***	.031***	-.125***	.027***	.222***	-.174***	.001	1.000	
POPSTAT	-.173***	.085***	.125***	-.234***	-.360***	.203***	.056***	-.289***	1.000

Note: Total population was used for correlations
*p < .05; **p < .01; ***p < .001.

Single-Track Versus Multi-Track

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
VERITRK	1.000								
GRADE	.031*	1.000							
LEP	.111***	.010	1.000						
CALWORKS	-.147***	-.096***	-.120***	1.000					
MINORITY	-.272***	-.041***	-.213***	.453***	1.000				
FULLPCT	.163***	.067***	.108***	-.284***	-.536***	1.000			
YRSTEAC	.138***	.093***	.022*	-.093***	-.150***	.372***	1.000		
AVGCLS	-.165***	-.010	-.037***	.041***	.045***	-.093***	-.015	1.000	
POPSTAT	.180***	.037***	.089***	-.341***	-.422***	.290***	.074***	-.036**	1.000

Note: YRE population was used for correlations
*p < .05; **p < .01; ***p < .001.