A COMPARISION OF QUANTITATIVE SKILLS IN TEXAS YEAR-ROUND SCHOOLS WITH TEXAS TRADITIONAL CALENDAR SCHOOLS

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Dissertation prepared for the Degree of

DOCTOR OF EDUCATION

UNIVERSITY OF NORTH TEXAS

May 2001

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Cole, Homer W., A Comparison of Quantitative Skills in Texas Year-round Schools with Texas Traditional Calendar Schools. Doctor of Education (Education Administration). May 2001, 236 pages, 50 tables, 18 illustrations, 158 titles.

This study analyzed the academic impact of year-round calendar schools as compared with the academic achievement of traditional calendar schools. The population studied was the 1998 public elementary schools in Texas. The academic impact was based upon the 1998 Texas Assessment of Academic Skills (TAAS) test administrated by the Texas Education Agency. The two groups of schools studied were Texas elementary schools that were on a year-round calendar schedule, and the Texas elementary schools on a traditional calendar schedule. Multiple regression statistics were used, in addition to means, and differences between the means of variables. Year-round schools (YRE), when compared to the means of traditional schools, have means lower in math scores (6.16 percent) than traditional schools. Year-round schools have fewer African Americans students (2.78%), White students (21.06%), and special education students (.25%). Year-round schools are higher in population size (72.72students), Economic Disadvantaged students (15.87%), Hispanic students (23.46%), and Mobility (3.23%).

ACKNOWLEDGMENTS

Completing my doctorate at the University of North Texas has been a long-time personal goal. Many people have been instrumental in making that goal a reality for me. However, there has been one person who has truly challenged, encouraged, and helped me to complete this challenging goal in life. I am fortunate to have as my support and encouragement one very special person. I would like to thank my wife, Sharon Cole for her support, encouragement, and patience throughout this difficult process.

I appreciate the guidance of my doctoral committee: Dr. William Camp, Dr. Terry Holcomb, and Dr. Johnetta Hudson. I extend my sincere gratitude to thank Dr. William Camp for serving as the major professor of my doctoral committee. I would also like to express my thanks to my minor professor, Dr. Terry Holcomb. I particularly extend my gratitude to Dr. Johnetta Hudson for her suggestions that broadened the scope of this dissertation.

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INTRODUCTION

Year-round education is a controversial school calendar configuration that might be more accurately described as "continuous learning" (Warrick-Harris, 1995). The National Education Commission on Time and Learning urged school systems to alter their calendars in 1994 based upon (1) differences in student learning, and (2) major changes occurring in American society (Kneese, 2000). The significant increase in Texas year-round education programs, during the decade of the 1990s, is consistent with a national trend. Nineteen of the fifty United States had a representation of year-round schools in 1990; and that number has increased to 43 states in 1999-2000. The number of year-round schools in the United States has increased from 618 in 1990 to 2,880 in 2000. The number of students enrolled in year-round education has increased from 520,323 in 1990 to 2,063,217 students enrolled in year-round education during the 1999-2000 school year (NAYRE, 2000). Historically, year-round schools have been on a roller coaster ride of popularity, but the current increase in year-round education suggests a permanent force in public education for the twenty-first century (Glines and Bingle, 1993). In spite of the dramatic increase in popularity of year-round education in the decade of the 1990s, no statewide Texas study investigating the impact of the year-round calendar configuration on student achievement has been conducted.

The obvious lack of statewide studies, aligning the impact of year-round education with student learning, leaves an uncertain foundation for the rapid growth and expansion of Texas year-round education during the past decade. The curious void of statewide studies that might support the rapid expansion of year-round education, based upon student achievement, is particularly puzzling in light of national concerns with declining student achievement since the 1981 publication of *A Nation at Risk*. In spite of centralized educational reforms following the publication of *A Nation at Risk*, an incongruent problem has continued to haunt our educational system in the last fifteen years. "While education costs in Texas, and in the nation, have increased dramatically from 1984-1999, indicators of student achievement such as student performance on college admissions tests have not risen at the same rate" (Clark, 1997). The primary appeal of year-round education has been financial for facility expansion. Theoretically, a district could serve twenty-five percent more students simply by adding summer months to the school calendar without extending the number of student attendance days. However, the enduring appeal of year-round education was not simply financial, but was the expectation of improved student achievement. "Proponents of year-round education (YRE) espouse the theory that a school year with more frequent and shorter vacations, rather than one long summer vacation, will increase student learning and the overall efficiency of the educational system" (Kneese, 2000). Increased student achievement was an expected benefit of a school year with shorter, more frequent vacations, allowing "continuous learning" throughout the year and higher retention of student learning.

Despite the current interest in year-round education, no previous Texas statewide study has been conducted that investigates the impact of year-round education on student achievement in math and/or reading. Prior to 1990, the quality of available research was questionable regarding the design of the studies, appropriate comparison groups, and extraneous variables. "While studies rarely show that year-round education lessens achievement, research findings are mixed and inconclusive" (Weaver, 1993). A limited number of Texas school studies, each including a small number of local campuses, have been conducted in the area of student achievement and year-round education, especially as it pertains to the Texas Assessment of Academic Skills (TAAS) exam. For example, Elsberry evaluated the impact on student achievement following the implementation of year-round education in Austin, Texas (Elsberry, 1992). Ritter investigated the impact of the year-round calendar on some sixth grade gifted and talented students in San Antonio, Texas (Ritter, 1992). Kneese conducted studies investigating the impact of year-round education on student achievement in Conroe and Houston, Texas (Kneese, 1994). Stripling studied the effectiveness of year-round education on student achievement in Waco, Texas (Stripling, 1995). Dunn investigated the effect of year-round education on elementary student achievement gains in Austin, Conroe, and Waxahachie, Texas Independent School Districts (Dunn, 1995). Woolley conducted a study of the effect of year-round education on student learning in Waco, Texas (Woolley, 1996). Brinson compared 1994-97 TAAS results of 28 Fort Worth year-round campuses with comparable traditional calendar campuses in a 1996-97 Year-round Schools Report

(Brinson, 1997). Curry presented a 1996-97 year-round evaluation report comparing year-round Austin schools to Title I and district schools as a whole.

The investigation of this current study has expanded beyond local school district studies to focus on a statewide Texas assessment of student achievement in year-round education. This study, under consideration, has compared elementary student mathematics scores of the Texas Assessment of Academic Skills test in school districts across Texas. The TAAS math subtest results in Texas year-round calendar schools have been compared to TAAS math subtest results of Texas traditional calendar schools as cited in the Texas Education Agency (TEA) annual Academic Excellence Indicator System (AEIS) reports.

Context of the Problem

The base of knowledge for student learning is broadening and expanding at a tremendous rate, and educational institutions are expected to prepare a competent workforce for the emerging global economy. Since the release of two major national education reports, A Nation at Risk (1983) and Action for Excellence (1983), the perceived decline in student achievement in public schools has been a primary focus of education reform. National reform efforts in public education have focused on more effective use of instructional time, higher education standards, and improved standardized test scores. Faced with indicators that the effectiveness of American schools is declining, the American public made an outcry for an accountability system.

The release of the 1983 National Commission on Excellence Report triggered a national education reform movement (NCEE, 1983). The Texas education reform movement was spearheaded by Governor Mark White, and the 1984 Governor’s Blue Ribbon Commission was chaired by Dallas businessman Ross Perot (Governor's Commission on Education Reform, 1984). The mandate for improved student achievement, as measured by a standardized examination, led to the planning and development of the Texas Assessment of Academic Skills (TAAS) examination. It was developed and implemented in the 1990-91 school year, and mandated by the state of Texas for students in public school grades three to twelve. The Texas State Board of Education policy established a minimum standard of items correct in each subject area tested. All public school students in Texas are now required to pass the reading, writing, and math portions of the TAAS test prior to high school graduation.

At the national level, President Clinton’s response to the focus on strengthening the public school system was GOALS 2000: Educate America Act Fact Sheet (1993). One measure of educational performance receiving much attention at the national level was the average score on the Scholastic Aptitude Test (SAT). SAT scores have declined about 5% over the past 20 years (Carson, 1993). In 1991, the SAT had declined 30 points on the verbal and 7 points on the math since 1963 (Sava, 1991). An extensive examination of eighth grade mathematics skills found considerable deficiencies in American student achievement in mathematics with only 14% of all eighth grade students demonstrating an understanding of fractions, decimals, percents, and simple algebra (Snyder, 1991). Heyns (1978) criticized this American preoccupation with using test scores like the SAT as a measure of student achievement, acknowledging that national norm standardized tests were not designed to measure student learning. In contrast, the

TAAS examination, used as the comparison test instrument in the statewide study presented in this paper, is a criterion-referenced instrument designed with the intent to measure student learning. For the purpose of this study, student learning is quantified as a student's ability to maintain and improve educational achievement as measured by the Texas Assessment of Academic Skills Test.

Innovative alternative models of the traditional public school, such as year-round schools, have mushroomed during the 1990's. The chart published for the 1999-2000 school year on year-round education statistics reveals the surge in popularity of Year-round Education since 1990 (NAYRE, 2000). The beneficial effects of year-round education most frequently cited are cost effectiveness; climate; morale; attitudes of students, teachers and parents; discipline, and attendance rather than improved student achievement (National Association of Secondary School Principals Review, 1992). Ballinger, a leader in year-round education, has promoted year-round education by suggesting that it may not be cost effective to close school buildings, in which America has invested nearly a trillion dollars, for at least a quarter of the calendar year (Ballinger, 1989). More importantly, Ballinger suggested that academic achievement, as well as cost effectiveness, can be enhanced by a change in the school calendar configuration with more frequent and shorter vacations. However, studies assessing the effect of year-round education upon student achievement have generally produced limited or mixed findings (Holliman, 1992; Hazelton, Blakely, and Denton 1992; Six, 1993). This Texas statewide study has been an effort to determine if academic achievement in mathematics skills can be improved by a different calendar configuration. Quantitative skills have been measured by the Texas Assessment of Academic Skills in a comparison of student performance in Texas year-round schools with Texas traditional calendar schools.

The impact of year-round education upon student achievement should be either solidly established as valuable, or denied as inconsequential since the implementation of the year-round calendar configuration disrupts the pattern of life for those in the educational community. Virtually everyone in the community, including students, faculty, administration, and parents, is impacted by the change from a traditional calendar to an extended calendar school year. The shift in calendar configuration from traditional to year-round schedules presents a challenge for the continuation of teacher education during the summer months. The year-round school calendar also impacts childcare, student summer jobs, teacher summer jobs, church summer activities, business summer employment, and community businesses. The year-round calendar may deprive parents and their children of the enjoyment of family time together in a long summer vacation. Families that have children on both the year-round and the traditional calendar experience childcare conflicts and disruptions to their lifestyle. Teachers who wish to work on advanced degrees during the summer are limited to night classes. While proponents of year-round education cite numerous advantages to this change in calendar configuration, the general public continues to voice serious concerns about the departure from the traditional school calendar.

Texas families and community members need validation supported by evidence that a year-round calendar would significantly increase student achievement to offset the disruption to their established lifestyle. A Texas statewide study that measures the impact of student achievement in mathematics, as measured by the TAAS test, should reach across the variety of demographic student environments in Texas. The Texas Assessment of Academic Skills test was developed in Texas for the diverse ethnic populations of Texas students with a deliberate attempt to eliminate cultural bias from the test. This Texas statewide comparison study offered additional data regarding the impact of year-round education on student achievement in mathematics as measured by the TAAS test.

Statement of the Problem

This study compared the 1998 Texas Assessment of Academic Skills (TAAS) mathematics scores of Texas year-round calendar schools with traditional calendar schools to determine the effect of calendar configuration on student achievement gains. The problem of this study was to determine, "Can a significant statistical difference, between Texas year-round schools and Texas traditional calendar schools, be documented in student mathematics achievement as measured by the Texas Assessment of Academic Skills Test?"

Purpose of the Study

The purpose of this study was to investigate the relationship between year-round calendar configuration and student achievement. This study investigated whether year-round education had an effect on Texas school district student populations regarding academic success in mathematics. This study was unique because it compared student achievement in mathematics of all year-round and traditional calendar schools in Texas. Demographic factors including school size, economic disadvantaged, ethnic distribution, special education, and mobility were included in the research data because these factors impact student learning.

Student academic achievement should be a primary focus of education; consequently, it is relevant to assess the impact of calendar configuration upon student achievement gain. The purpose of this study was to examine the possible impact of year-round education on student academic performance in order to inform the educational community, and to assist Texas school districts in decision-making regarding program implementation. School districts are composed of a variety of demographic student environments including socioeconomic level and ethnicity; therefore, it is important to determine if the year-round calendar configuration is best suited for a particular demographic population.

Since this study compared all the year-round and traditional calendar schools in Texas, the impact of year-round education on student achievement of a particular minority population can be investigated in those schools that are predominantly one ethnic population. As research data reveals a pattern, school districts may consider this study as a measure of the correlation of calendar configuration to student achievement gains. Researchers have determined that summer learning loss, for low socioeconomic and minority students, is most severe in reading (Goren & Carriendo, 1986). The research of Kneese and Knight indicated that year-round education is most advantageous in reading for "at-risk" and economically disadvantaged students (Kneese & Knight, 1995). Therefore, this study proposed to analyze the impact of a year-round calendar education program on Texas student achievement in mathematics. As administrators in

Texas school districts assess the potential of increased student achievement through the vehicle of year-round education, research data that compares student achievement as measured by the Texas TAAS test is a significant consideration.

Significance of the Study

This study has compared the 1998 Texas Assessment of Academic Skills (TAAS) math scores of year-round calendar schools with traditional calendar schools to determine the effect of calendar configuration on student achievement. Information gained from this study may be valuable in the assessment of the potential use of year-round education as a vehicle for increased student achievement. Identification of student populations and academic achievement is even more significant in the determination of demographic areas that might be most effectively served by an extended calendar. This study is important in that it is one of only a few comparison studies in year-round education using the Texas Assessment of Academic Skills examination as a basis for evaluation. This study is unique as a statewide study that compares all Texas year-round schools with all traditional calendar schools during the 1998 school year.

Winters (1994) reviewed nineteen studies related to achievement of students enrolled in year-round education programs; however, only three of the Texas studies used the TAAS test as the assessment measure. Winters (2000) expanded her review of studies related to student achievement in year-round education, and only the following studies used the TAAS test as the assessment measure: Elsberry (Austin), Stripling (Waco), Dunn (Austin, Conroe, and Waxahachie), Woolley (Waco), Curry (Austin), Brinson (Ft. Worth), and Shook, (Socorro). The Socorro Independent School District in

El Paso, Texas was the largest Texas study using the TAAS test as the measurement instrument. The population studied was the Socorro district and the comparison group included the district, region, and state TAAS score averages. This study currently under consideration has considered an even larger sample size by comparing the 1998 TAAS mathematics scores of Texas year-round schools with 1998 TAAS mathematics scores of Texas traditional calendar schools.

Society may accept necessary changes in order to accomplish its objectives; however, if any societal change is imposed upon the family, educators must be prepared to knowledgeably address anticipated results. If year-round education is imposed upon Texas families, educators must be prepared to cite research data that affirms a positive increase in student achievement as measured by the Texas TAAS test. The 24th Annual Gallup/ Phi Delta Kappa Poll of the public's attitude toward the public schools found that 73 percent of Americans favored leaving the school calendar at about 180 days. They supported leaving the long summer vacation intact as opposed to dividing the school year into smaller segments with frequent, shorter breaks (Elam, Rose, and Gallup 1992). An extended school calendar effects summer vacations, winter childcare, and individual scheduling for the immediate family as well as the extended family members. Public support in favor of the year-round school calendar configuration for Texas schools could be gained through the presentation of statistical data validating improved student achievement in mathematics as measured by the TAAS test. If this comparison study has revealed a lack of statistical evidence for improved student achievement impacted by a year-round calendar configuration, educators may face greater challenges in convincing their constituents of the academic value of year-round education. The impact of year-round education upon student achievement is relevant to decisions regarding the implementation and continuation of year-round schools in Texas.

Definition of Terms

- Academic Excellence Indicator System (AEIS) - The Texas Education Agency method to index campuses and districts for evaluation when controlled for enrollment, ethnicity, economic disadvantage, language proficiency, student mobility, and student wealth.
- Cohort Analysis - Research design that examines data for a set of participants who share several common characteristics, specifically a particular treatment. Socioeconomic status, ability levels, ethnicity, and gender may also be considered.
- Criterion-referenced Test – A comparison between an individual's performance to that of a defined ability or skill. The test score is interpreted by the determination of the percentage correct in the criterion domain that an individual can master. Criterion-referenced tests yield more meaningful interpretable data than norm-referenced tests (Popham, 1993).
- Descriptive Statistics – Purpose is simply to make sense out of raw data, using measures of central tendency such as the mean and standard deviation.
- Dual Track – One traditional calendar track and one year-round track.
- Hawthorn Effect – improvement as the result of the new implementation of a program, rather than the effect of the program itself.

- Inferential Statistics – Purpose is to infer from the data of the sample to the general population.
- Intersession – Designated days students or teachers are not in school (literally, between sessions). Intersession is the interval between formal instructional sessions that is optionally used for vacation or the provision of instructional services such as remediation or enrichment. It becomes the period for rescheduled summer school.
- Limited English Proficient (LEP) - Students that speak a language other than English as their "first" language and are designated by TEA guidelines as requiring special services to assist with language barriers and to accommodate the proficient acquisition of the English language.
- Multi-track – Student body is divided into 3, 4, or 5 tracks. Instructional and vacation periods of each track are staggered so that at least one group is on vacation at all times. It can increase student capacity from 25 to 50 percent, alleviates the need to build costly buildings, and saves on operating costs.
- Norm-referenced Test – A comparison between an individual's score and that of a norm group that tends to eliminate test items aligned with key classroom content because these tests are designed to eliminate test items on which most students succeed.
- Session – Denotes an instructional period of time in a year-round education school. In a 45-15 plan, a session would be one 45-day instructional period.
- Single-track - A year-round calendar configuration in which all students are on the same calendar, in school at the same time, and on vacation at the same time.

- Texas Association for Year-round Education (TAYRE) - 302 Laurel Drive, Friendswood, Texas 77546.
- Texas Assessment of Academic Skills (TAAS) - Texas mandated public school assessment examination for all students in public schools.
- Texas Learning Index (TLI) – a longitudinal index that reports TAAS scores in reading and mathematics, and allows measurement of a student's progress across grade levels.
- Traditional Education - The operation of schools on a nine-month formal teaching / learning schedule, normally August to May or September to June.
- Year-round Education - Reorganization of the traditional school calendar to spread the formal education process throughout the school year with shorter breaks between learning frames than the traditional three-month summer break. The long three-month summer vacation is divided up into a number of shorter vacations observed more evenly throughout the year; and the summer vacation is less than eight weeks. Year-round education allows for multi-tracking for a more efficient use of school buildings. An extended year calendar from 180 to 240 days per year is desired.
- Year-round Education (extended year) – extended learning time whereby a student may attend as many as 265 days of school annually.
- Year-round Education (reorganized year) – a rearrangement of the school calendar with no increase in learning time, either through the number of school days or in the length of school days.

CHAPTER 2

SYNTHESIS OF LITERATURE

Historical Overview of Year-round Education

Historically, year-round education has been undeniably alluring (like the Sirens' songs); but the sea of private and public education is scattered with the wreckage of year-round education programs that have lost their way. Since the middle of the 1600s, a purpose for implementation of year-round education in America has been to promote educational excellence (Glines, 1995). Improved student achievement has been the focus of summer enrichment activities and a modified school calendar for more effective remediation and acceleration. In 1645, Dorchester, Massachusetts initiated a twelve-month year-round education program to provide summer enrichment. In 1684, Hopkins Grammar School of Boston promoted continued student learning in the summer by requiring students to attend twelve months of the year (Lane, 1932). In 1789, Massachusetts passed a state mandate requiring a twelve-month school calendar, for townships of more than one hundred families, as a promotion of educational excellence.

The early forerunners of the twenty-first century year-round school began in the 1840s. Large urban areas had schools open throughout the year, but most cities did not require students to attend year-round. Detroit was open 259 days; Philadelphia, 252 days; Buffalo, 250; New York City, 245 days; Chicago, 240 days; and Cleveland, 215 days. The roots of our contemporary church “Vacation Bible Schools” originated in 1866 when a year-round school was started in the First Church in Boston, Massachusetts. Curriculum included arts and crafts, recreation, and religious training (Lane, 1932).

An early model of contemporary year-round education was a 1904 four-quarter schedule in Bluffton, Indiana. Generally regarded as the "first" year-round school, the Bluffton school system designed a voluntary quarterly calendar configuration designed to improve student learning and to reduce classroom crowding (Glines & Bingle, 1992). The school year had four twelve-week quarters, and most students attended three of the four quarters. The voluntary system created financial problems for the district and caused difficulties in planning and management. When the Bluffton superintendent, Dr. William Wirt, moved to Gary Indiana in 1908, the quarterly calendar configuration was abandoned (Glines & Bingle, 1992).

From 1910-1928, year-round education was used for European immigrant children to learn English faster and provide vocational training in Texas, New Jersey, North Dakota, Nebraska, Tennessee and Pennsylvania. Newark, New Jersey designed a year-round program in 1912 to provide acceleration for students to advance more rapidly according to their ability (Glines, 1995). The entire district in Newark, New Jersey operated on a four-quarter system from 1921-1931. The purposes of the Newark four-quarter system were for English language instruction to immigrants, remediation, and acceleration (Glines & Bingle, 1992).

The first mandated K-12 year-round education program was implemented in Aliquippa, Pennsylvania during 1928-1938. The purpose was to alleviate overcrowding until new construction was available. Aliquippa's four-quarter model was designed to manage the explosion in student population caused by the Jones and Loughlin Steel Corporation. The early years of the Depression brought an end to the four-quarter system in both Newark, New Jersey and Aliquippa, Pennsylvania (National Education Association, 1987).

Texas was also one of those states involved in early year-round education during the period from 1910-1938. "Various forms of year-round and extended calendars were used to increase space, improve the quality of education, provide a setting in which European immigrant children could learn English and offer twelve-month access to vocational training" (NAYRE, 2000). Extended school calendar configurations ceased during the World War II period of 1935-1945, as uniformity became the symbol of the nation.

When Hayward, California opened its 50-15 (days on versus days off rotation) year-round education program at Park Elementary School in 1968, the modern era of year-round education ignited. Hayward has the longest-running program in the nation (NAYRE, 7). Francis Howell School District in St. Charles, Missouri introduced the first multi-track calendar in the nation, now commonly called a 45-15 calendar. "That same year, the Wilson Campus School at Mankato, Minnesota State University implemented the personalized continuous year 12-month calendar" (NAYRE, 2000).

The Valley View district in Romeoville, Illinois introduced a multi-track 45-15 plan for K-12 in 1970. California's La Mesa-Spring Valley District (K-8) and the Chula Vista District (K-6) launched California as a national leader in year-round education 45-

15 programs in 1971. Patterned after the successful Valley View schedule in Illinois, this example became a model for thirteen other California year-round plans initiated by 1974. Year-round studies, proposed plans, and implementation projects continued throughout the 1970's and 1980's (NAYRE, 2000).

The year-round public school calendar system was supported in 618 schools with 520,323 students in 115 districts and 19 states by 1990. In 1991, 859 schools and 733,660 students in 152 districts and 22 states were enrolled in year-round education. Year-round education continued to increase across the nation as 1,567,920 students enrolled in 2,017 schools, 301 districts, and 26 states in 1993. Year-round school enrollment of total students dropped slightly in 1994 to 1,419,280 in 1,913 schools; but the number of districts increased to 369 in 32 states. 2,214 schools in 414 districts participated in year-round education in 35 states by 1995; and the total student enrollment was 1,640,929. Year-round education experienced its eleventh consecutive year of growth in 1996 with 1,754,947 students in 2,368 schools, 447districts, and 37 states attending year-round schools. In 1997, year-round education increased to 2,400 schools in 460 districts and 38 states for a grand total of 1,766,642 students. During the 1998 school year, 1,934,060 students were enrolled on a year-round schedule. The number of states involved remained at 38, but the number of districts and schools grew to 496 and 2,681 respectively (NAYRE, 2000). The number of students on a year-round schedule broke the 2 million mark in the 1999 school year. Dr. Charles Ballinger announced on February 14, 1999, in his annual report to the Association on the Status of Year-round Education, that 39 states, in 2,856 schools, in 456 school districts, had 2,040,611 students enrolled in year-round education (Ballinger, 1999). As of March 19, 2000, forty-three states with 561 districts and 2,880 schools have 2,063, 217 students enrolled in year-round education (NAYRE, 2000).

Table 1

Year-round National Public School Calendar System (YRE)

School Year	States	Districts	Schools	Students
1989	16	95	494	428,961
1990	19	115	618	520,323
1991	22	152	859	733,660
1993	26	301	2,017	1,567,920
1994	32	369	1,913	1,419,280
1995	35	414	2,214	1,640,929
1996	37	447	2,368	1,754,947
1997	38	460	2,400	1,766,642
1998	38	496	2,681	1,934,060
1999	39	546	2,986	2,040,611
2000	43	561	2,880	2,063,217

(NAYRE, 2000)

The number of year-round students in the United States is close to 3.5% of the total number of K-12 students nationwide. The number of U.S. year-round schools is well over two and a half times the number of charter schools; 2 ½ times larger than the Success for All movement; 2 ½ times larger than the number of Accelerated Schools; and 11 times larger than the Coalition for Essential Schools. This context places year-round education in the lead of educational reform (Ballinger, 1999). If Ballinger is correct in his assertion that year-round education is in the lead of educational reform, then research evaluating the effectiveness of year-round education on the improvement of student achievement is imperative. The purpose of this statewide Texas study has been to compare the effectiveness of year-round education on student achievement in mathematics as measured by the TAAS standardized criterion referenced test. This Texas statewide comparison group study proposed to compare mathematics scores of year-round calendar students with mathematics scores of students involved in a traditional calendar setting to determine if year-round education positively impacted Texas student achievement in mathematics as measured by the Texas Assessment of Academic Skills Test.

Opportunities for continuous lifelong learning are becoming essential as the world edges into the 21st Century. Year-round education is a philosophy - a concept - related to the present quality of life, and provides opportunities for continuous learning (Stover, 1989). Memory loss and continual learning are important considerations of a school calendar configuration. The New York State Board of Regents conducted a study in 1978, and found that advantaged students acquired one year and three months worth of knowledge during a regular school year. Students on their own gained another one month's of knowledge during the summer months. A disadvantaged student acquired an average of one year and one month of knowledge during the school year. That same student then lost three to four months of knowledge during the summer. At the end of seven years, the advantaged student scored at the ninth grade level. The disadvantaged student scored at the fourth grade level (New York State Education Department, 1978). Rearranging a school calendar may possibly offer students a more paced delivery of instruction. A continuous learning pattern may reduce the time spent in academic review (NAYRE, 1990).

Year-round schools that adopt a single-track agenda provide a schedule which minimizes memory loss and enhances student learning (Kneese, 1996). The first month of any given academic school year is often spent in review. The effects of the traditional summer vacation on retention of student learning was presented through an NAYRE abstract cumulative research on the effects of summer vacation on achievement test scores:

> A review of 39 studies indicated that achievement test scores decline over summer vacation. The results of the 13 most recent studies were combined using meta-analytic procedures. The meta-analysis indicated that the summer loss equaled about one month on a grade-level equivalent scale, or one tenth of a standard deviation relative to spring test scores. The effect of summer break was more detrimental for math than for reading and most detrimental for math computation and spelling… Suggested explanations for the findings include the differential availability of opportunities to practice different academic material over summer (with reading practice more available than math practice) and differences in the material's susceptibility to memory decay (Cooper, 1995).

Year-round education eliminates the three-month interruption of student learning during the summer; therefore, advocates of year-round education assume that the length of time for review is reduced and student recall of learning is increased. Traditional calendar schools lose significant instructional time reviewing information and going back over instructional concepts learned the previous year. The extended calendar distributes learning segments and shorter vacation periods. Year-round education potentially increases the opportunity for students to enjoy continuous learning. Students may possibly remain more enthusiastic and interested in education due to intersessions and vacations spread throughout the year as opposed to the traditional calendar with nine months of school and one long summer break (Brekke, 1991). Hopefully, teacher and student burnout is reduced. The extended calendar is considered by the National Education Association to be academically sound in that student achievement is consistently maintained or increased (NEA, 1987). The extended calendar potentially increases the opportunity for students to receive remediation during intersessions, when the need arises, rather than waiting for summer school (Ballinger et al., 1987; Howell, 1988). Students with special needs may benefit from a continuity of programs with short intersession breaks. All of these factors may possibly contribute to a positive school climate and improved student achievement. Supporters of year-round education claim all of these factors as significant student achievement benefits of the extended calendar configuration.

Calendar Configurations

Year-round education is a school calendar configuration that (1) breaks up the long three-month vacation of the farm calendar, and (2) provides additional learning opportunities for students during the school year intersession breaks. In Texas, students attend school the same number of days as under the farm calendar, generally 175 to 180 days.

> Year-round education reorganizes the school year to provide more continuous learning by dividing the long summer vacation into shorter, more frequent breaks. It does not eliminate the summer vacation, but merely reduces it. Year-round education is an alternative schedule for learning. Students in a year-round program attend the same classes and receive the same amount of instruction as students on a nine-month calendar (usually 180 days), although in a few YRE schools, the school year has been lengthened. The year-round calendar is organized into instructional blocks and vacation periods that are evenly distributed across 12 months (NAYRE, 2000).

Throughout American history, the school calendar has existed in the same form for nearly 79 years. Proponents of year-round education insist that the traditional calendar for our education system reflects the values and needs of an agrarian society. They believe that our highly industrialized and information-based society of today no longer has a need for a long summer break in its educational system.

Tradition creates an obstacle when striving to identify what educational methods are best. It is hard to visualize a school calendar without long summer breaks, but if American schools had always been engaged in a year-round calendar, it would probably be hard to visualize a school calendar that shuts down student academic learning for three months a year. Charles Ballinger, Executive Director of the National Association for Year-round Education, repeats the following question in most of his speeches and research articles. "If year-round education were the traditional calendar and had been for a hundred years, and if someone were to suggest a 'new' calendar whereby school students would be exempt from formal instruction for up to three months at a time, would the American public, or would I allow, even consider, such a scheme?" (Ballinger, 1987).

Year-round education calendars have a variety of tracks and calendar configurations. Fifty-five percent (1,380 schools) of all schools have used the single track which provides continuous formal instruction and learning throughout the twelve-month year and divides the long summer vacation period into several shorter periods during the year. All the students have the same calendar plan. The most frequently used calendar and track configuration is the 60-20 four-track calendar which has been used by schools to potentially increase student attendance capacity as much as 33%. The second most used configuration is the 45-15 one-track calendar that has been used by schools to provide consistent year-round learning.

Table 2

Examples of Year-round Calendar Configuration Tracks

Single Track (55% of all Schools)

Single Track	45	15 xxx	45	15 xxx	45	15 xxx	45	15 xxx

45 = Days in School 15 = Days on Vacation (xxx)

Table 3

Example of Multi-track

Multi-track - Four Tracks

Student Group	Sept.	Oct	Nov.	Dec	Jan.	Feb.	March	April	May	June	July	Aug.
#1				xx x				xxx				xxx
#2			xxx				xxx				xxx	
#3		xx x				xxx				xxx		
#4	xxx				xx x				xxx			

Blank Blocks = Days in School xxx = Days on Vacation

Through year-round education, schedule variations in our present school system could be more easily obtained. William D. Gee recommended using the year-round calendar with the Copernican Plan of classes that meet for 90 days instead of the traditional semester. He claimed that the educational success of the school district in Jefferson County, Colorado was linked to its year-round education program.

However, the vast variety of year-round calendar plans is one of the obstacles to an accurate comparison of student achievement in year-round education versus student achievement in traditional calendar education. A complex variety of year-round calendars complicates a comparison of student achievement in year-round versus traditional calendar education; therefore a large population of both year-round and traditional calendar schools in comparison groups should improve accuracy of findings.

Calendar Plans **-** Calendar configurations for the year-round calendar include:

- 45-15 Single-track Plan: The most frequently used and easiest calendar to implement at the elementary or high school level. Six hundred schools used this configuration, or a modified version of it, in 1997 (Ballinger, 1997). The year is divided into four nine-week terms that are separated by a three-week intercession or vacation period, and the students attend school 180 days. All students are on the same calendar or track with the same vacation periods. This plan has been widely implemented in Texas public schools.
- 45-15 Multi-track or Staggered Plan: The plan is used to solve overcrowding by increasing the building capacity by 20-50%. This contributes to most efficient building use. Students are divided into two to four groups with each group starting its 45-15 day track calendar at different times during the year. By staggering the tracks, the building is used more days per year, and students still attend school 180 days. This plan has been widely implemented in California public schools.
- 60-15 Plan (Orchard Plan): Students have 12 weeks school terms followed by three weeks vacation, totaling 180 school days. This allows for a common three weeks

summer vacation for all tracks, and five tracks provide up to 25% increase in capacity. This plan has also been popular in California.

- 60-20 Plan (Trimester): Students have a twelve-week school term followed by a four-week vacation, totaling 180 school days. The four-track plan, used by 521 schools, is the second most popular plan in the United States. Capacity up to 33% increase can be obtained by use of this plan (NAYRE, 1997).
- 90-30 Plan: Two 90-day semesters are separated by a 30 day vacation period twice a year during the traditional winter holiday period and spring vacation.
- Quarter Plan: The calendar is divided into four 12-week periods: fall, winter, spring, and summer. Students are assigned to three of the quarters, and may voluntarily attend the fourth quarter. Students that attend three of the quarters are in school 180 days; and the students that elect to attend the fourth quarter are in school 240 days. The curriculum is organized so that each course begins and ends with each 12-week period.
- Concept 6 Plan: The school calendar is divided into six learning blocks of approximately 41 days each and involving three tracks of students. Each track of students attends two learning blocks in succession followed by a block of vacation. Modified Concept 6 offers 4 vacations of approximately 20 days each. This plan is limited to 163 instructional days, resulting in a lengthened instructional day. The plan increases the attendance capacity up to 50% more students, and has also been popular in California (NAYRE, 1995).

Impact of Year-round Education on Student Learning

In August of 1981, Terrell H. Bell appointed a commission to study the quality of education in America. The resulting report, entitled *A Nation at Risk,* was released in April 1983. It presented some disturbing findings concerning time spent on instruction in America's schools (Gardner, 1983). A study of the school week found that some schools provided students with only seventeen hours of actual academic instruction. The average American school provided about twenty-two hours of academic instruction. Comparison studies of U. S. schools with England, Japan, and other industrialized countries revealed that some academic high school students spend 8 hours a day and 220 days a year at school. The typical U.S. school day lasts 6 hours and 180 days a year. This contrast in length and number of school days prompted the commission to recommend "more effective use of the existing school day, a longer school day, or a lengthened school year" (Mazzarella, 1984).

The Commission on Excellence based its recommendations on the premise that more time in school would produce more learning. Learning for American youth was viewed as critical for two purposes. First, Commission members felt that the United States had been losing its “preeminence in commerce, industry, science, and technological innovation” (Mazzarella, 1984). The Commission asserted that more learning is necessary to “keep and improve on the slim competitive edge we still retain in world markets because knowledge, learning, information, and skilled intelligence are the new materials of international commerce” (Mazzarella, 1984). The commission developed a second purpose for educators who were less than enthusiastic about a vision that viewed economic superiority for America as the primary goal of education. The more intrinsic goal was to develop the intellectual, moral and spiritual strength essential for a democratic society and to foster a common culture. The Commission affirmed that "all children by virtue of their own efforts, competently guided, can hope to attain the mature and informed judgment needed to secure gainful employment and to manage their own lives, thereby serving not only their own interests but also the progress of society itself" (Gardner, 1983).

Few would argue with the premise that more effective study produces more effective achievement, but the relationship between the amount of time spent in school and achievement does not necessarily correlate for improvement. Extension of the school day or school year for the purpose of increasing student learning is still a matter of debate. The Gardner Commission requested a number of research papers from experts in the field of education, several of which dealt with the impact of time spent in school on student learning. Donald Holsinger reviewed studies by the International Association for the Evaluation of Educational Achievement. Examination of student achievement in twenty-two developed countries concluded that time given to instruction and opportunity to learn are the key factors in high achievement scores. "The more time spent studying a subject (in hours per week or total years), the higher the scores" (Holsinger, 1982). In contradiction to the findings of *A Nation at Risk,* the International Association for the Evaluation of Educational Achievement reported, "among the more advanced countries, there are no marked deviations, high or low, in the pattern of achievement test scores"

(Holsinger, 1982). The school systems in advanced countries are fairly equal, in spite of the differences in the length of the school day as reported by Gardner.

Proponents of year-round schools and traditional calendar schools have attested to the distinct advantages of each. Charles Ballinger, as a proponent of year-round education, said that it has proven itself because achievement scores are equal to or better than comparable traditional calendar education (Ballinger, 1987). Los Angeles Unified School District, Houston, Oxnard, California, and Provo, Utah, have all shown a higher gain in achievement scores (Ballinger, 1987). Year-round education is a very influential part of public education in the United States. "What is the effect of year-round education upon the academic level of student learning?" is the most relevant question asked regarding extended calendar versus traditional calendar education.

Flexible 12-month calendars can be better tailored to fit the personal needs and preferences of each family unit by permitting vacation and other non-school activities to be scheduled throughout the year. The calendar is arranged in smaller instructional blocks, with each block followed by either a vacation or learning intersession. The traditional farm calendar three-month summer vacation break is divided up into several vacation breaks spread evenly throughout the school year. The term "vacation," however, is a misnomer. These breaks, called "intersessions" in a year-round program can provide additional instructional time for students throughout the year.

The intersession can be very valuable because student learning difficulties can be appropriately remedied after a few weeks, rather than months, of failure. Greater retention of instruction results in shortened and more concentrated teaching periods

(Yelland, 1988). Intersessions lend themselves as instructional periods that can be used for remedial intervention (Ballinger, 1987). Gifted and talented students may also benefit from intersession periods that provide extensions of the curriculum and opportunities for students to develop independence as learners (VanTassel-Baska, 1989).

The strength of year-round education can be attributed to the opportunity to intervene during the academic year with remediation, acceleration and enrichment activities. Remediation can occur throughout the year by using more frequent vacation periods, rather than limiting it to summer school after nine months of failure and frustration. Intersessions lend themselves as instructional periods that can be used for remedial interventions (Ballinger, 1988). Year-round education programs extend the learning opportunities available to all students by keeping school doors open more days of the year (usually 240, compared with 180), and by improving the learning choices in creative ways by using the summer climate months and multiple intersessions. Improved student achievement, decreased student dropout rates, increased student and staff motivation, higher attendance rates, and positive student self-esteem have often been attributed to an extended calendar (Ballinger, 1987). Creative school districts offer communities and families true freedom of choice, wherever year-round education has been understood as a philosophy, not just a method of housing students or saving money.

> If YRE can be understood as a philosophy, as a means for assisting the improvement of the quality of life for individual persons and for society as a whole, the concept will continue to grow as a viable alternative which can enhance the potential of learning and living in communities. For now, YRE, accepted in a win/win spirit, can personalize learning opportunities for all who choose to participate in the

> continuous programs which the concept can provide during the closing years of the 20th Century (Glines, 1987).

Nancy Karweit, author of another commissioned paper, reviewed studies of effective use of time in schools. Researchers cited in this study concluded, "what does affect achievement is *time* students spend *actively engaged in successful completion of a learning task.*" They called this productive time Academic Learning Time. The Beginning Teacher Evaluation Study, conducted at Far West Laboratories, asserted that "more time produces more learning" (Karweit, 1982). Karweit, however, was struck by the small, modest gains in student learning. She asked, "How much extra time would have to be allocated to second-grade reading to raise test scores by a quarter of one standard deviation?" (Karweit, 1982). The increase would be equivalent to 25 points on a standardized SAT-type test with a score range of 200 to 800 points. Karweit concluded that 60 extra minutes per day must be allocated to reading comprehension alone to produce such a small gain. She concluded that only one to ten percent of the variance in achievement scores was impacted by the variable of engaged time-on-task. Karweit's finding led to a troubling question: "Can feasible increases in time spent in school produce substantial effects in achievement?" (Karweit, 1982). The quality of time spent in study impacted student learning to a greater extent that the number of hours spent in school. The use of year-round school intersessions for remediation and enrichment has a potential for improving student achievement only if "*student time is spent actively engaged in successful completion of a learning task"* (Karweit, 1982).

Thomas Good and Gail Heinkel authored another commissioned paper that surveyed the connection between various classroom characteristics and student achievement. Good and Heinkel supported Karweit's conclusions; and, additionally, concluded that the appropriateness and the quality of engaged time-on-task are also variables that impact student learning (Good & Heinkel, 1982). Caldwell, Huitt, and Graeber concluded in their 1982 research survey that engaged time and academic learning time most strongly correlate with student achievement. The *quality* of time spent is even more significant in the impact on student learning than the *quantity* of time spent (Caldwell, Huitt, and Graeber, 1982).

Stuck and Wyne conducted a 1982 literature survey and drew a similar conclusion, "As the level of time becomes more refined, moving from the most inclusive (attendance time) to the least inclusive (academic learning time), the correlations between time and learning become stronger." Stuck and Wyne emphasized beginning and ending lessons precisely on time; reducing transition time between tasks; minimizing waste time; and closely monitoring student learning. They recommended that teachers improve the quality of instruction: show students clearly what they are expected to learn, select appropriate level of difficulty for student tasks, and require frequent responses and samples of student work (Stuck and Wyne, 1982). The changes suggested by Stuck and Wyne were likely the sorts of changes that the Gardner Commission had in mind when it recommended "more effective use of the existing school day."

The Commission recommended a more effective use of the school day as well as to lengthen the time in school. Richard Rossmiller, chairman of the Department of

Educational Administration at the University of Wisconsin, emphasized that before educators start extending the school day or year, they ought to make better use of the time they have. In a research study, he showed how a typical school year of 1,080 hours may result in as few as 364 hours of time-on-task (Rossmiller, 1983). Rossmiller subtracted ten percent of the school year for absenteeism, professional development, and inclement weather. Next, he subtracted the whopping forty-percent of the school day that some researchers allocate to non-instructional activities such as attendance taking, lunch, recess, and moving between classes. Then he subtracted another twelve percent of class time for disciplining students, passing out materials, and establishing order. Finally, he subtracted twenty-five percent of actual instruction time for the off-task time of the average student. He left a grand total of 364 hours allocated to instruction out of the 1,080 hours spent in school (Rossmiller, 1983).

In addition to his findings on wasted time, Rossmiller suggested that the relationship between achievement and time-on-task may have been overstated. He conducted a study of third grade students in four Wisconsin elementary schools, following their progress through fifth grade. Student time-on-task was observed and tracked over a period of time. The Stanford Achievement Test measured student achievement. Rossmiller concluded that only about two percent of the variance in scores in reading was correlated with time-on-task. Rossmiller concluded, "A reasonable question at this point is: To what extent is the percentage of time-on-task related to a student's performance as measured by the Stanford Achievement Tests? The answer is: Not very much!" (Rossmiller, 1983).

When evaluating proposals to actually extend the school year through a year-round calendar that uses the intersessions and breaks for student learning, the most relevant research would be comparison of achievement based on school years of different lengths. Significant and consistent research findings are lacking in part because of the limited variability in length of the school year nationwide. A difference of only about ten days exists between the shortest and longest school year among the states. Rossmiller said extension of the school day or school year is politically impossible because the public will not stand for the mammoth increase in taxes (Rossmiller, 1983).

A study of Alan Odden of the United States Education Commission estimated that extending the school day to eight hours or lengthening the school year from 180 to 200 days would cost the nation in excess of $20 billion annually. The cost effectiveness of extending school time has been questioned. A study of the Institute for Research in Educational Finance and Governance suggested that extending school time might be too expensive in relation to the effects it produces (Levine, H., 1993). Lengthening the school day or the school year may result in some achievement gains, especially for low achievers. The implications of the research indicated that even if all the intersession breaks of a year-round calendar were used for remediation of student learning, the achievement gains would be small and probably very expensive.

Additional research is needed to determine whether significant increases in quality time spent in school (more than ten additional days per year) will positively impact student learning. *Prisoners of Time*, a report of the National Education Commission on Time and Learning, concluded:

> By relying on time as the metric for school organization and curriculum, we have built a learning enterprise on a foundation of sand, on five premises we know to be false. The first is the assumption that students arrive at school ready to learn in the same way, on the same schedule, all in rhythm with each other. The second is the notion that academic time can be used for nonacademic purposes with no effect on learning. Next is the pretense that because yesterday's calendar was good enough for us, it should be good enough for our children – despite major changes in the larger society. Fourth is the myth that schools can be transformed without giving teachers the time they need to retool themselves and reorganize their work. Finally, we find a new fiction: it is reasonable to expect 'world class academic performance from our students within the time-bound system that is already failing them.' These five assumptions are a recipe for a kind of slow-motion social suicide (NECTL, 2000).

"Spending more time in the classroom probably will result in some gains in achievement, especially for low achievers…Yet research suggests that achievement gains will not be dramatic and they will be expensive. The cost will be heavy to produce relatively small gains in achievement scores" (Mazzarella, 1984).

One of the most noticeable educational benefits of the year-round school is the opportunity for enrichment, remediation, and acceleration (NASSP, 1998). However, schools adopt extended year calendars for a variety of reasons including alleviating overcrowding. School districts, faced with large school construction needs, could gain one classroom at no cost for each two rooms that are built by implementing four-track year-round schools. In 1991, seventy-five percent of all year-round schools were multi-track with one group of students always on vacation. Multi-track schools were responses to facility and economic concerns. In 1992, this number decreased to 54 % (Ballinger, 1992). In 1993, forty-nine percent were multi-track (NAYRE, 1992). At the 1993 National Association for Year-round Education meeting, financial savings were no longer the primary topic of discussion. The emphasis switched to advocating year-round schools as a way to improve instruction and student achievement.

National Studies Relating to Student Achievement in Year-round Education

Arizona, Alabama, Florida, Georgia, Missouri, Mississippi, New Jersey, North Carolina, Ohio, and Utah

Dr. Douglas E. Roby conducted a 1992 comparison study in West Carrollton, Ohio School District for his doctoral dissertation at the University of Dayton, Ohio. This study was a comparison of reading and mathematics achievement of students attending a year-round school versus achievement of students attending a nine-month traditional calendar school. The population for the study was sixth grade students in a 45/15 single-track elementary school. The comparison group was sixth grade students, in a traditional calendar elementary school, matched on socioeconomic status, ethnicity, and academic aptitude as measured by the Cognitive Abilities Test. The data collection was the mean NCE scores on the 1992 Iowa Test of Basic Skills. The inferential analyses (ANCOVA), with a constant verbal cognitive ability covariate, resulted in findings that a statistically significant difference in reading and math achievement favored year-round students. The sample size was small, but the results of this comparison study reflected higher student achievement in reading and math of year-round students (Roby, 1992).

Dr. Wallace D. Campbell investigated a 1993 University of Dayton, Ohio doctoral dissertation comparison group study evaluating the effectiveness of year-round schooling for academically at-risk students. The population for this study was thirty at-risk second grade students at Schnell Elementary School, a 45/15 single track year-round school in

West Carrollton, Ohio ISD. The comparison group was 30 Chapter I students matched from four traditional calendar elementary schools in the West Carrollton, Ohio School District. The data collection was based on the raw scores and the NCE scores from the Gates-MacGintie Reading Test. The descriptive analysis was the mean gain; and the inferential analyses were the paired sample t-tests. Statistical significance was not found in the small mean gains for the year-round students on the reading test scores. However, the qualitative analysis showed positive academic achievement results for academically at-risk students (Campbell, 1993).

Dr. Ruben Barron investigated the effects of year-round education on achievement in bilingual schools in his 1993 doctoral dissertation at Northern Arizona University. The population for the study included both second and fifth grade students in a year-round elementary school. The comparison group was second and fifth grade students in a traditional calendar elementary school in the same district. The data used for comparison was based on test scores for 1989-92 on the California Test of Basic Skills. Inferential analyses (MANOVA) produced results favoring the traditional calendar for bilingual students during the first year and the year-round calendar during the third year. Bilingual reading and mathematics scores in both traditional and year-round schools were mixed during the three-year period. Spanish-speaking students in the traditional calendar school scored significantly higher in reading and mathematics than year-round students during the first year of the study. Year two produced no significant differences in reading and math scores in the two schools. “By year 3, the year-round students scored significantly higher than students in the traditional calendar” (Barron, 1993). Barron noted that many uncontrolled variables may have contributed to the results since both English and Spanish-speaking students showed variances not attributable to the school calendar setting (Barron, 1993).

Dr. Diane Fardig, Educational Researcher for Orange County Public Schools in Orlando, Florida, presented a 1993 Year-round Education Program Evaluation Report. The population studied included three elementary schools for kindergarten through fifth grades on a 60/15 year-round track. The comparison group was descriptive analyses with average mean percentiles. The data was cross sectional and longitudinal for Stanford Achievement Test scores for grades two, three, four, and five from 1990-1993. Comparison of the average mean percentiles of the year-round schools' scores with the district average mean percentile scores indicated that year-round average scores were significantly higher than district average scores on all Stanford Achievement Test subtests in 1991-1993, grades two and four (Fardig, 1993).

> The longitudinal results of the three years of achievement scores following the baseline year did not indicate a trend in achievement, however…Although the test results were positive, there could be any number of uncontrolled variables accounting for the differences, beyond the school year calendar. Furthermore, the results mirror research findings from other studies that demonstrate a 'dip' in the scores at the third year of testing, perhaps due to a Hawthorne effect (Kneese, 2000).

This was not a reasonable test for generalization since any number of uncontrollable variables could have skewed the comparison of the three year-round school's scores to the district's average scores.

Joseph F. Haenn managed a 1995 comparison group study of fourth and fifth grade students in two year-round education schools in Durham, North Carolina Public Schools. The year-round student test scores were compared to the traditional calendar student scores and North Carolina State averages on End of Grade test scores from 1994-95. The intersessions provided extended learning opportunities through enrichment and remediation activities. Inferential data analyses (Analysis of Variance) supported the conclusion that year-round education had a significant positive effect on student achievement in both School A and School B during their first year of operation.

> Students at School A outperformed the expected gains in reading (4.4 points versus the expected 4 scale score points) and in math (7.2 scale score points versus the expected 6 points). Students at School B also made impressive gains in reading (4.3 points versus the expected 4 points) and math (8.6 points versus the expected 6 points)" (Haenn, 1995).

Students enrolled in the year-round schools on a voluntary basis, and the socioeconomic status and the ethnic status was more disadvantaged in the year-round schools.

Dr. Peggy Sorensen's 1995 doctoral dissertation, at Brigham Young University, Utah, was a comparison group study of 23 modified 45-15 year-round and traditional calendar schools. Eleven year-round education schools and twelve traditional calendar schools in Jordan School District were compared on Stanford Achievement Test scores for 1991-93. The data analysis was a mixed model Analysis of Variance (ANOVA) inferential analysis of test scores. The multi-track 45-15 calendar was implemented in the Jordan School District to relieve overcrowding, and there were eight less days of instruction in the modified calendar. The students in the year-round calendar program performed as well in language, reading and mathematics as traditional calendar schools with similar demographics. The conclusion of this study was that student achievement in the year-round program equaled student achievement in traditional calendar schools (Sorensen, 1995).

Dr. C. B. Cason investigated the impact of year-round education on student achievement in a 1995 doctoral dissertation for the University of Alabama, Birmingham. The population of the study included fourth grade year-round students on elementary campuses in Alabama, Florida, and Mississippi. Fourth graders in matched traditional calendar elementary campuses in the same districts served as the comparison group. Descriptive analyses (mean scaled scores) and inferential analyses (ANOVA) were used as data analysis from 1991-92. The three-state average of means demonstrated that the year-round schools showed an increase in both reading and math SAT test scores in a comparison of the two years prior to year-round calendar implementation with the two years after implementation of year-round education. The matched traditional calendar schools showed a drop in reading and math scores for the corresponding time period" (Cason, 1995).

Management and Evaluation Associates submitted a 1996 Trenton, New Jersey Public Schools evaluation report on the first year of their year-round education program. The population studied was year-round students in grades kindergarten through five at Joyce Kilmer and Mott Elementary. The comparison group was year-round education program students compared with all district traditional calendar students. Data was collected on the Metropolitan Achievement Test with mean NCE scores. A descriptive analyses was completed on the Mean Rank Scores. The mean NCE scores for year-round students during the first year of implementation were significantly higher than the mean NCE scores of the traditional calendar students in all subjects and grades. Mathematics scores were generally higher than reading, comprehension, and language scores (Evaluation Report, 1996). The students' participation in the year-round program on a voluntary basis, and uncontrolled extraneous variables were limitations to this study (Kneese, 2000).

Prohm and Baenen, Evaluation and Research Department of the Wake County Public School System in Raleigh, North Carolina, submitted a March, 1996 report on the effectiveness of multi-track year-round schools in the district. Seven year-round schools were implemented in the district, but only three multi-track schools met the three-year implementation criteria for the study (Kneese, 2000). The population studied was the three year-round multi-track schools implemented in 1992-1993. The comparison group was the traditional calendar schools in the district. The data was the North Carolina End of Grade test scores for 1992-1995. The descriptive analyses was based on the percentage of mastery and comparison of scale score change and effectiveness index. The findings for the study were, "Generally student achievement at multi-track schools is above the Wake County Public School System average and at expected levels relative to achievement of similar students at other schools in the system" (Prohm and Baenen, 1996). Year-round education was implemented in the Wake County Public School System to relieve overcrowding, but student achievement in both reading and math was improved in the three multi-track year-round schools.

Dr. Harris Cooper, of the University of Missouri, produced a 1996 research synthesis of 39 studies. Thirteen of the most recent studies were analyzed by a meta-analysis search of the ERIC and PsycLIT databases. The reference sections of recent reports were searched for relevant information, and active researchers were asked to submit relevant articles. This research synthesis revealed that achievement test scores for all students decline over summer vacation, especially in math. Low socioeconomic students declined more in reading. The study concluded that summer vacation negatively affects student learning, particularly the learning of lower-class students (Cooper, Nye, Charlton, Lindsay & Greathouse, 1996).

Fay H. Frye, principal of Stoneville Elementary, investigated a 1996 fifth grade year-round versus traditional calendar comparison study in Rockingham County Consolidated Schools, North Carolina. The populations for the comparison groups included all fifth grade students in four year-round schools matched with fifth grade students in traditional calendar schools in the district. Data was collected on standardized achievement test (EOC) scores in reading and math during the years 1993-94, 1994-95, and 1995-96. The inferential analysis was a t test on gain scores. Students were carefully matched on IQ scores, sex, ethnicity, and lunch status so the variables were well controlled. The findings for the Rockingham comparison of growth for the set of matched student data revealed that year-round students achieved larger growth scores from year-to-year than traditional calendar students. "In all schools with both year-round and traditional programs, all year-round students outperformed all traditional students in both math and reading. In all but one comparison, the difference was statistically significant" (Frye, 1996).

Dr. Pam Consolie investigated achievement in a year-round elementary school as a 1999 doctoral dissertation at the University of Georgia. Fifth grade year-round students were compared with fifth grade traditional calendar students in College Park Elementary School, matched on socioeconomic and minority status. Data was collected on the 1998 Iowa Test of Basic Skills achievement test scores. Inferential analyses with an independent t test were utilized for analysis of data. Year-round students outperformed traditional calendar students on both reading and math scores on the ITBS. The comparison revealed statistically significant differences, but this study is surrounded with limitations such as the small sample size. Also, it was not determined if the groups were initially equal since only post-test data was analyzed. Additionally, the year-round school spent additional time on language arts instruction so the curriculum between the year-round and traditional calendar school was different (Consolie, 1999).

Some national studies of year-round and traditional calendar schools indicate that year-round calendar schools are equal to or better than traditional calendar schools. Table 11 also indicates that some studies show that at-risk students and bilingual students are especially benefited by a year-round calendar. Four studies have mixed results or indicate that there is no significant change in academic improvement between year-round and traditional schools. The population of most studies was limited to one school district. Dr. Cooper's research synthesis of 39 studies is of special importance. One significant rational for year-round calendar schools is that students forget a portion of the information that they learned during the traditional school months during the 10-12 week summer break period of time.

Table 4

Year-round School Results: National Studies

City	State	Researcher	Reading	Math	All Test	Mixed Results	Special Areas
W. Carrollton	Ohio	Dr. D. E. Roby	+	+			
W.Carrollton	Ohio	W. D.Campbell					AR +
	Arizona	Dr. R. Barron		+	+ /NS	Mixed	Bi +
Orlando	Florida	Dr. Fardig				Mixed	
Durham	N. Carolina	J. F. Haenn	+	+			
Jordon	Utah	Dr. P. Sorensen			NS		
Ala.,Fla.,Miss	3 States	Dr. C.B. Cason	+	+			
Trenton	New Jersey	Evaluation Assoc.	+	+	+		
Raleigh	N.Carolina	Prohm	+	+	NS		
Rockingham County	N. Carolina	F.H.Frye	+	+	+		
College Park	Georgia	Dr.P.Consolie	+	+	+		
39 studies	Mo.	Dr. H. Cooper	Summer negative effect				

\+ =Year-round calendar positive results Bi = Bilingual students
\- = Year-round calendar negative results NS = No Significant Change
AR= At-risk students positive results

Studies Relating to Student Achievement

California Year-round Education

The California term "year-round school" refers to the definition in California Education Code Section 37600. A year-round calendar was designed containing four tracks, three of which were in session at any one time. The California state legislature, in passing 37600 - 37620 code sections, provided school districts experiencing increased enrollment with the opportunity to maximize the use of existing school facilities. The legislation did not address the impact on the curriculum and instructional program. The only positive attribute of the program was the ability of the facility to accommodate an additional twenty-five percent more students.

> It is the intent and purpose of the Legislature in enacting this chapter to authorize public school districts of any type or class to establish, maintain, and operate their educational program under a continuous school program, to be conducted throughout the entire school year.
>
> The Legislature is especially concerned and aware of the mounting costs of acquisition and construction of school sites and facilities, and is, therefore, desirous of providing a procedure whereby those fiscal burdens may be reduced by increased utilization of existing plants and facilities.
>
> The Legislature is also interested in providing for the replacement of the present system of lengthy summer vacations with shorter periodic vacation periods, which will result in a reduction of the student's summer vacation "learning loss" (California Education Code 37600, 2000).

Year-round education programs in California were considered an expedient way to accommodate flourishing enrollments, particularly among large minority-populated urban school districts. "Year-round programs were typically placed in the fastest growing districts within the state in the fastest growing regions within those districts" (Quinlan, 1987). The 45/15 plan, with instructional blocks of 45 days followed by 15 days of vacation, was the most popular plan in California. Little was asked, during the early years, about the educational impact on student achievement of the year-round programs.

All of the year-round schools in California were included in a 1987 study conducted by Quinlan, George and Emmett. This study conducted for the California State Department of Education shed some light on the enigmatic relationship between year-round education and achievement. "Research revealed that California year-round schools have improved but consistently score below traditional schools, even traditional schools with similar student populations. Additionally, when single-track and multi-track schools were considered separately, the data showed that single-track schools perform better than their traditional counterparts, while multi-track schools perform worse" (Weaver, 1993). The proportions of low SES and limited or non-English speaking students were significantly higher in the multi-track year-round schools than in traditional schools throughout the state. The multi-track year-round schools performed below traditional calendar schools in both reading and mathematics using the California Assessment Program from 1983 through 1985. These results were not surprising based on the significant demographic differences between the year-round groups and the traditional groups. Quinlan, George and Emmett reported that the single-track year-round schools had similar demographics to the traditional calendar schools. They reported that the single-track year-round school students scored as well as traditional school students when the groups were controlled based on demographic differences. The results of the 1987 study by Quinlan, George and Emmett reported no significant differences in CAP reading and mathematics achievement between traditional and year-round calendar schools (Quinlan, George & Emmett, 1987).

Park School in Hayward, California is the longest running year-round school in the United States. New Jersey State Department of Education conducted a study on Park School in 1978. They found that there were no measurable achievement gains on Park School year-round students until the fourth year of implementation (Merino, 1983). Park School's central location in Hayward and its year-round calendar (June-July) attracted students from different parts of the district. The student population included representatives from every racial group with 25% of the students residing outside the school attendance area. Most of Park's students were fluent and English-proficient students, but 187 of the 651 students were limited in English proficiency. Based on the June, 1999 Park School Accountability Report Card, Park students' achievement scores in reading, language, and math were equal to or above district scores in 11 of 15 areas, grades 2 – 6. The Stanford Achievement Tests were administered to Park students in Grades 2 – 6 in May 1999, and the National Percentile results are reported below (Duarte-Armas, 1999).

Table 5

National Percentile Results

	Total Reading		Total Language		Total Math	
	School	District	School	District	School	District
Grade 2	38	39	43	40	48	39
Grade 3	38	36	46	42	28	39
Grade 4	34	36	44	43	25	35
Grade 5	42	34	53	41	37	35
Grade 6	47	40	57	46	50	46

(Duarte-Armas, 1999)

Norman Brekke, Superintendent of Oxnard, California School District, conducted one of the few longitudinal studies evaluating year-round education. A large sample size was used with the comparison group evaluating state averages in grades 3, 6, and 8 with the same grades in Oxnard School District system-wide multi-track year-round program. The comparison study in Oxnard, California used the mean scaled scores on the California Assessment Program (CAP) from 1981-1982 through 1989 -1992 with descriptive analysis bar charts for gain scores. Although Oxnard multi-track year-round schools did not achieve levels equivalent to state levels, the CAP scaled scores of year-round students rose at a rate higher than scores of students statewide (Brekke, 1992). Over a nine year period, grade three reading scaled scores rose 61 points in year-round schools and 25 points in traditional schools. Mathematics scores rose 44 points in year-round schools and 19 points in traditional schools. Written expression rose 41 points in year-round schools and 21 points in traditional schools. In grade six, the more dramatic comparison result gains were in reading year-round school scores which rose 47 points while traditional schools rose 9 points. Mathematics rose 47 points in year-round schools and 5 points in traditional schools. Written expression rose 34 points in year-round schools and 15 points in traditional schools. "Oxnard's Chapter I scores consistently exceed the statewide averages for those students in every subject area tested" (Brekke, 1990). In summary, Oxnard year-round students significantly improved achievement in reading, math, and written expression over a nine-year period. Progress has been made to close the disparity that existed in the early 1980s between Oxnard student achievement scores and California statewide averages.

San Diego Unified School District implemented multi-track year-round education at six elementary schools in 1972 to alleviate overcrowding. In 1992 there were 25 single-track and 12 multi-track schools in operation. Thirty-four of these schools were elementary and 3 were middle schools. Between 1984 and 1990, the San Diego Unified School District tested grades three and six with the California Assessment Program (CAP) and grade five with the California Test of Basic Skills (CTBS). The fifth-grade objective stated that the percentage of fifth-grade students above the fiftieth percentile would maintain or improve from 1982 to the current year. In reviewing test scores in the fall of 1990, it was noted that a greater percent of year-round schools (87%) than traditional schools (71%) had achieved the grade five objectives. A comparison of grade three and grade six CAP achievement test scores registered a higher percent of year-round schools that maintained or improved test score objectives in reading and mathematics (Alcorn, 1992).

In 1991, the San Diego Unified School District objectives for test scores in year-round and traditional schools were analyzed. The year-round schools were on the single or multiple tracks for ten years. The CAP test results for grades three and six were analyzed in reading, language and math for the six, three, and one-year intervals. The fifth grade CTBS test results were reviewed for grades five for eight, four, and one-year intervals. The result of this study was that there was no significant difference in traditional and year-round school comparisons when both the difference in the scaled score change was 2.0 or less and the difference in the percent of objectives achieved was 10 percent or less. Twenty-seven comparisons were compiled which included three grades (third, fifth, and sixth) in three subjects (reading, language and math) at three intervals (total, mid-point and most recent year). The results included seventeen year-round schools exceeded traditional schools, one traditional school exceeded year-round school scores, and nine comparisons made no difference. The test (CAP or CTBS), the subjects being tested (reading, language, math), and the intervals (8,6,4,3,or 1 year) indicated year-round schools exceeded traditional schools or made no significant difference except in language during fifth grade at the one year interval where year-round schools decreased more than traditional schools. The most significant difference was in math during third grade. There was no significant difference in sixth grade reading or fifth grade language (Alcorn, 1992).

Dr. Bruce Isamu Matsui conducted a 1992 Southern California comparison study of 8th grade students who attended a year-round schedule for eight years compared to students who attended a traditional schedule for eight years. Descriptive analyses and inferential analysis t-tests were used for the CAP test 1984-1985 and 1987-1988. The variable of the impact of year-round education on subgroups of varying socioeconomic levels was investigated. Socioeconomic level had a high correlation with student achievement, but the implementation of year-round education did not effect achievement rates either positively or negatively. The California Achievement Test was used for data collection in 1990; and the findings showed no significant differences in student achievement as the result of the implementation of year-round education programs (Matsui, 1992).

The Spring 1992 evaluation report of Mueller Elementary School's multi-track year-round education program in Chula Vista, California revealed improvement in student achievement, particularly in math. Stanford Achievement Test scores for grades 1-6 on a 60/15 multi-track year-round program at Mueller Elementary were compared with the Chula Vista City School District average scores. The descriptive analysis compared mean differences in achievement test scores. Mueller's Stanford Achievement Tests and Stanford Achievement Tests (8) Limited English Proficient scores in all academic areas were lower than the district average scores from 1987-1991. However, Mueller gained 5.2 points in math after the implementation of the year-round program while the district average lost 2.7 points. The district average loss in reading was 3 points while Mueller's loss was 2 points after implementation of the year-round program. The exception was in 1992 when Mueller's loss in reading was –2.5 points lower than the district average, but Mueller's average was 1.7 points higher in math (Collins, 1993).

Dr. Leslie Six, researcher and consultant of Chula Vista, California, presented a January 1993 review of thirteen studies relating to the achievement of year-round students. Six reported that studies prior to 1982 did not show consistent student achievement favoring either year-round or traditional calendar schools. Six reviewed thirteen studies conducted between 1985 and 1992. He reported that seven of the studies found statistically significant improved student achievement in year-round schools (Six, 1993).

High school student achievement in year-round education was measured in a Fall, 1993 comparison group study of grades 9-12, conducted by Dr. Zengshu Chen of Chula Vista, California. Sweetwater Union High School students on a 45/15 single track year-round schedule were matched on SES factors with Southwest High School in Sweetwater Union District on a traditional calendar schedule. Data was collected from scores from the following measurement instruments: California Test of Basic Skills (1984-90), Stanford Achievement Test (1991-93), California Assessment Program (1988-1990), and the Scholastic Aptitude Test (1988-1992). Data analysis included inferential analyses of paired sample t tests and descriptive analyses for the mean scores. The California Test of Basic Skills mean scores were higher ($p<.02$) for year-round students one year after implementation of the year-round program (1984-1990). Year-round student mean scores were lower ($p<.001$) on the Stanford Achievement Test one year (1991) after implementation; but year-round student scores surpassed traditional calendar student scores with no statistical significance by the third year (1993). The mean scores of the Scholastic Aptitude Test were lower both pre and post year-round education program implementation, with no statistical significance. The California Assessment Program mean scores were lower each year of comparison (1988-1990). The percentage of growth in academic achievement was greater for the year-round students than the traditional calendar students after program implementation (Chen, 1993).

Palmdale School District in Palmdale, California was the site for a Spring 1994 control group study, grades 1-8 in a 60/15 multi-track program, matched on ethnicity, SES and baseline scores. Dr. Judy Fish, Assistant Superintendent of Palmdale School District, and Dr. Patricia Gandara of the University of California conducted an experiment using inferential data analyses with generalized block design to measure academic achievement in an extended year school calendar. The California Test of Basic Skills was used as the measurement instrument for achievement during Spring, 1989 through Spring, 1992. All three schools involved in the control group study “were able to demonstrate increases in academic achievement” (Fish and Gandara, 1994).

The San Diego City Schools conducted a 1994 comparison study of student achievement in nine elementary schools and one middle school with ten matched traditional calendar schools. Dr. Fass-Holmes and Dr. Gates prepared the report based on data collection of ASAT scores for first language English students, APRENDA scores for limited English proficient students, and NCE scores to determine above the 50th percentile scores for the comparison groups. Data was obtained only for non-mobile students so generalizations should not be made for total student populations. Descriptive analyses and inferential analyses (nonparametric tests) were used for data analyses. "Selected single track year-round schools had equal or better student achievement than the matched traditional schools in terms of higher percentages of the selected students at the elementary level (Grades 2-6)" (Fass-Holmes, 1994). Single-track year-round schools had higher percentages of the second - sixth grade students scoring at or above the fiftieth percentile on the Abbreviated Stanford Achievement Test in 1992-1993. The single-track year-round schools had improved scores with a higher percentage of fifth grade African American students scoring at or above the fiftieth percentile on the 1992-93 ASAT. The mean GPA scores at the two middle schools were comparable (Fass-Holmes and Gates, 1994).

Dr. Walter Winters, research psychologist and educational consultant of San Diego, California, presented a September 1995 report that reviewed nineteen studies relating to the achievement of students in year-round schools. The nineteen studies were completed since 1991, had been involved in year-round education for at least two years, and included statistics based upon at least three testing points. The complex test results were mixed, but Winters concluded that 54 of 64 possible categories were favorable for student achievement in year-round education (Winters, 1995).

Nineteen studies, completed or reported since 1991, were reviewed in the 1995 edition of Winters' "A Review of Recent Studies Relating to the Achievement of

Students Enrolled in Year-round Education Programs." The studies were conducted in the states of California, Texas, Florida, Ohio, Virginia and Georgia. Achievement tests utilized in the various studies included the following: Texas Assessment of Academic Skills; Tests of Achievement and Proficiency; California Assessment Program; Abbreviated Stanford Achievement Test; Stanford Achievement Test; California Achievement Test; California Test of Basic Skills; Iowa Test of Basic Skills; Sequential Tests of Educational Progress; Science Research Associates; and the Gates-MacGintie Reading Tests. The nineteen studies included sixty-four possible comparison categories for year-round education versus nine-month calendar programs. Year-round education students outperformed their nine-month calendar counterparts in fifty-four or 84% of the categories. Three (5%) of the 64 categories were rated minus for year-round education, and seven (11%) were mixed results (Winters, 1995). Since these nineteen studies were conducted in six different states, comparing achievement in the areas of math and reading, and were measured by eleven different achievement tests (mixed norm referenced and criterion referenced), the results are mixed.

Dr. Carolyn Calvin Kneese conducted a Fall 1996 comparison study of student learning differences in year-round schools versus traditional calendar schools in Alameda Unified School District, Alameda, California. "This was a program evaluation of a single-track year-round program to determine if 5th and 7th grade students in year-round education sustained greater academic growth than did their peers in paired traditional calendar schools from 1992-96" (Kneese, 1996). Data was collected on the Rasch scores at the district level. Mean scaled scores for descriptive analyses of effects of core subject and socioeconomic levels were used. ANOVA was used for the inferential analysis. Student achievement gains favoring year-round education were statistically significant in about half of the comparisons. Student achievement gains were most significant for high SES students in math. The results found year-round education to produce positive effects on student achievement; but student achievement gains in year-round education were somewhat less effective during the third year of implementation (Kneese, 1996).

Major differences existed in the background characteristics of California year-round and traditional calendar schools. Multi-track year-round schools predominately served lower socioeconomic communities, a higher proportion of minority students and families receiving AFDC, and almost double the number of limited- or non-English-speaking students as the traditional calendar schools. During the 1980s the multi-track year-round schools performed below the level predicted for them on the basis of these background characteristics. “When the single-track and multi-track year-round schools were examined separately, it was found that the single-track schools had background characteristics similar to statewide averages and were performing at or slightly above the level predicted based on their background characteristics” (Quinlan, 1987). Many of the year-round schools in California are not achieving at anticipated academic levels, but this situation may be related to the special needs of the population served in year-round schools and the demographics of the communities in which year-round schools have been placed.

A significant study regarding the benefits of year-round education has been conducted in California. California has a large number of year-round schools, and also has some of the longest running year-round schools. The California state study, along with the work of Dr. Carolyn Kneese and Norman Brekke, supported the benefits of the year-round calendar school for students with special needs such as English as a Second Language, economic disadvantaged, and Chapter I. When the academic performance results of year-round schools were compared with traditional calendar schools, the results were sometimes less than positive. However, when longitudinal studies of year-round schools compared student progress within a school, from one year to the next, academic achievement was frequently positive. The California study of year-round schools indicated an equal or positive benefit in a comparison with traditional schools; but more importantly, revealed positive academic achievement in longitudinal studies comparing student achievement within the same school over a period of years.

Table 6

Year-round School (YRE) Results: California (Ca.)Studies

City	State	Researcher	Reading	Math	All Test	Mixed Results	Special Areas
Hayward	Ca.	New Jersey Dept.	NS		=+		
Hayward	Ca.	Duarte-Armas			+		
All State S	Ca.	Quinlan	Multi-track - / Single-track +				ESL +
Oxnard	Ca.	Brehlle	+	+	Achievement		
Oxnard	Ca.	N. Brekke	Lower YRE scores but the rate of increase is higher				Ch. +

City	State	Researcher	Reading	Math	All Test	Mixed Results	Special Areas
San Diego	Ca.	Alcorn	+	+	17 YRE + of 27 schools		
	Ca.	B. I. Matsui			NS		
Chula Vista	Ca.	Collins	-	+			
13 studies	Ca.	Dr. L. Six			Mixed findings 7+ of 13		
Sweetwater	Ca.	Z. Chen	Lower YRE scores but higher growth				
Palmdale	Ca.	J. Fish			Increased Achievement		
San Diego	Ca.	Fass-Holmes			YRE had better scores		
19 Studies	6 states	Dr.W.Winters	54 of 64 categories + / 3 categories - / and 7 mixed				
Alameda	Ca.	Dr. C. Kneese			+	Mixed	SES+ESL+

\+ =Year-round calendar positive results NS = No Significant Change
\- =Year-round calendar negative results Ch. = Chapter I students
= + =Equal to or above ESL = English as a Second Language students
SES = Socioeconomic status (economic disadvantaged students)

Texas Year-round Education Student Achievement Studies

Education reform has been responsible for a dramatic increase in the popularity of year-round education in Texas public schools in the 1990s. This concept is a non-traditional approach to education in order to increase the proficiency of education in the United States (Ballinger, Kirschenbaum, and Poimbeauf, 1987). Texas and California have been the two largest proponents of year-round education. In 1997, California had 1,170,195 students and Texas had 161,734 students in year-round education. California's largest year-round district, Los Angeles Unified School District, had 282,234 students.

Texas's largest year-round district, Socorro, had 21,181 students. An increase in interest and popularity for the extended school calendar occurred during the past decade. In increasing numbers, districts were slowly experimenting with the implementation of year-round education. Some districts chose to implement the concept with entire schools; others used campus attendance zones. Some districts paired schools of traditional track and year-round track so that parents and students could have a choice of either a year-round or traditional school. In spite of increased popularity, few empirical research studies documenting effects on student achievement have been conducted. According to the Texas Education Agency's Non-Traditional School Development Department, there have been few reports tracking the results in student achievement in Texas year-round schools (Pringle, 1997).

Texas became involved in year-round education in 1990 with the first year-round school in Conroe, Texas. By 1993, Texas had the second largest number of year-round schools (172) and the third largest student enrollment (65,534) in the United States. "Although the first year-round education program implemented in California was for the purpose of improving academic achievement, most of the year-round programs in the state were designed to alleviate overcrowding" (Quinlan, 1987). Year-round schools in California were primarily multi-track for financial purposes to alleviate overcrowding (California Education Code, Section 37600). Ninety-one percent (156 of 175) of Texas schools were single track. Two studies by Kneese investigated the general impact of year-round education as well as its impact on at-risk students. The single-track year-round students in Conroe, Texas, whether the total sample or the at-risk sub-sample, performed substantially better on the posttest achievement measures. Conclusions indicate small to medium positive increases in academic achievement for all students in single-track year-round education (Kneese, 1994). Kneese included six research syntheses and thirty individual studies, all completed or reported in the 1990s, in her 2000 research synthesis of year-round education as it relates to student achievement. One of her four findings, as a result of the research synthesis, included the statement, "Single-track was generally implemented for purposes of achievement, whereas multi-track was generally implemented for purposes of overcrowding" (Kneese, 2000). This information may indicate that the primary interest in year-round education for Texas was to increase academic performance in continuous learning, rather than facilities and finances.

The dramatic increase in year-round education programs in Texas through 1997 was consistent with a national trend. The number of year-round school districts increased in Texas from 22 districts in 1992 to 63 districts in 1997. Then the number of year-round school districts in Texas decreased to 61 districts in 1998, 56 districts in 1999, and 46 districts in 2000. The number of year-round campuses increased from 163 in 1992-93 to 337 campuses in 1998. Then the number of year-round campuses dropped to 274 in 1999 and 158 in 2000. The number of students enrolled in year-round education increased from 25, 782 in 1992 to 187,774 in 1998. Then the number of year-round students dropped to 151,924 in 1999 and 82,410 students in 2000. In Texas, there were 359 campuses and 159,885 students involved in year-round education in 1997 (Pringle, 1997). "All of San Antonio Independent School Districts' 60,000 students started on a year-round calendar for the 1997-98 school year, making it the largest year-round school system in Texas. The number of children on a year-round calendar in Texas increased from 159,885 in 1997 to 187,774 in 1998," said Pat Pringle, an associate commissioner with the Texas Education Agency (Wertheimer, 1998).

Table 7

Texas Year-round Public School Calendar System (YRE)

	Districts	Schools	Students
1992	22	unknown	25,782
1993	45	163	62,675
1994	58	228	95,092
1995	67	313	152,761
1996	63	351	182,118
1997	63	359	159,885
1998	61	337	187,774
1999	56	274	151,924
2000	46	158	82,410

(Texas Education Agency, 2000)

Texarkana Independent School District compared reading and math results on the California Achievement Test for Grades K-5 for two consecutive years, 1992-93 and 1993-94. Descriptive analyses included scaled scores, percentile ranks, and grade equivalents. Year-round students scored significantly higher on the California Achievement Test than traditional calendar students with the average scaled score 75 points higher in reading and 54 points higher in math. The year-round school test scores were consistently higher for both economically disadvantaged and non-economically disadvantaged students from all attendance zones in the district (Paslay, 1992).

Positive results were reported for year-round education students in the 1992 McCasland study conducted at Carlisle Elementary School in Plano, Texas. McCasland used the Cognitive Abilities Test (CogAT), the Iowa Test of Basic Skills (ITBS), and the norm-referenced assessment program of Texas (NAPT) as measurement instruments. Year-round students in grades 3 and 4 realized greater gains in language, social studies, and math than traditional calendar counterparts. Plano Independent School District fourth grade traditional calendar students experienced losses in all subject areas district-wide, but year-round education Grade 4 students demonstrated gains (McCasland, 1992).

A 1992 San Antonio comparison group study of sixth grade year-round education students with sixth grade year-round traditional calendar students did not reveal a significant difference in year-end scores. This study used descriptive analysis frequency and percentage, and inferential analysis t-tests. The year-round school's student scores remained more constant from beginning to mid-term to year's end scores. The traditional calendar students showed a significant drop in year's end scores so they did not sustain the quality of grades from the beginning of the year. The year-round student scores may reflect a more constant learning process while traditional student scores may reflect burnout at the end of the school year. This San Antonio study was limited to voluntary sixth grade year-round students as compared to traditional calendar sixth grade students so generalizations cannot be inferred (Ritter, 1992).

The San Antonio Independent School District decided it could not have year-round education unless all schools had the same schedule. So instead of "dropping YRE," all of its 94 schools have a two-week break after every nine weeks of classes. Summer vacation is two months instead of three. San Antonio school officials hope to prove that year-round education makes a difference in student achievement.

Disadvantaged and English as a Second Language students may especially benefit from year-round continuous learning (Weaver, 1992). San Antonio officials hope to conduct longitudinal studies that span at least four years of implementation. Eventually, research studies should be conducted that track year-round education students from kindergarten until twelfth grade (Wertheimer, 1998).

A 1991 study at Crockett Intermediate School in Conroe, Texas analyzed the impact of year-round education on retention of learning. Loyd (1991) reported significant gains for Crockett Intermediate School in Conroe, Texas as measured by the California Achievement Test (CAT). Grade six year-round education students showed seven months more growth in reading and four months more growth in math in the 1991-92 school year than traditional calendar students. According to scores on the California Achievement Test (CAT), year-round students showed seven more months growth in reading and four more months growth in math over the course of one school year. Year-round students earned 5% more A's than traditional calendar students in all subjects. The grade point average for year-round students in all subjects was 3.0 as compared to 2.9 for traditional calendar students. Generalization was not possible from this study, limited by a lack of longitudinal data and a small number of students (54), but the improvement for year-round education students during one year was significant (Loyd, 1991).

A Spring 1994 study in Conroe, Texas Independent School District, conducted by Dr. Carolyn Calvin Kneese, compared fourth, fifth, sixth, and tenth grade students on a 30/10 single track year-round schedule with traditional calendar students in the same grades. The data collection was based on the gain scores on the NAPT for 1992-93.

Descriptive analyses were used with the mean gain scores. T tests for related samples with Bonferroni correction were used for inferential analyses. Effect size analysis was also used as part of the data analysis. The study assessed the impact of year-round education on the general student population and on the at-risk sub-sample. The controlled variables included the same number of school days, the same number of days prior to testing, approximately the same class size, and no utilization of intersession. A stringent matching procedure matched equal groups on socioeconomic level, gender, ethnicity, and initial ability. The year-round students, both the at-risk subsample and the total sample, performed significantly better on the achievement posttests than traditional calendar students. The achievement gain differences were attributed to learning loss over the summer for traditional calendar students (Kneese, 1999).

Dr. Kneese submitted her doctoral dissertation based on this same study in Conroe, Texas Independent School District. The data collection was based on the Normal Curve Equivalent Scores on the NAPT test in 1993. Descriptive analyses with means and standard deviations, and inferential analyses with t tests for related samples with Bonferroni correction was used for data analysis. The findings were small positive increases in achievement scores for all students involved in single-track year-round education. Both at-risk and low socioeconomic year-round students consistently demonstrated higher student achievement gains than traditional calendar students.

> Year-round education appears to be especially effective for at-risk students in reading…Both statistical and practical significance were found in student achievement favoring the year-round education calendar … Due to stringent matching procedure, groups were equal on initial ability, SES level, and gender and ethnicity in most cases" (Kneese, 1995).

A 1995 study conducted by Kneese and Knight investigated the impact of the year-round calendar on achievement, and the degree to which it differentially affects students. Kneese and Knight (1995) reported some positive achievement benefits for all year-round education students in a study conducted in Conroe Independent School District. Significantly higher results were reported for students "at-risk" when year-round education students and traditional calendar students were matched from the same campus and same grade level. Students enrolled in single-track year-round third, fourth, fifth, and sixth grade classes were individually matched with students in traditional calendar classes in the same school on both reading and math.

> There were statistically significant differences in favor of the year-round classes in both math and reading achievement for all students, and especially for at-risk students. Statistical significance in favor of year-round education was also found in both reading and math for low socioeconomic schools. The year-round school also yielded practically significant results in 17 out of 20 data analysis comparisons, with effect sizes ranging from .21 to .88 (Kneese, 1995).

The study suggested that year-round education could make a difference for at-risk learners at lower SES campuses based on the consistently higher effect sizes found for these students. Year-round education did have a positive effect at higher SES schools with gradual increases in math and reading by grade level. Statistical significance in math scores was shown only at the low SES schools (Kneese and Knight, 1995).

Dr. Carolyn Calvin Kneese, University of Houston, conducted a meta-analysis review of research in which only studies conducted between 1982 and 1996 were considered. She established criteria for inclusion of a study in the review as follows:

(1) studies had to include student achievement as a dependent variable, (2) studies had to involve multi-track or single-track in year-round schools, (3) studies had to include a control or comparison group, (4) studies had to be in place for a minimum of one year, (5) studies had initial differences in student achievement measured in a pretest-posttest gain score design, (6) studies included both longitudinal and cross-sectional analysis, and (7) studies reported results of statistical analyses. Fifteen studies were included in the review, and the findings "determined that year-round education had an overall positive but very small effect on academic achievement. Single track year-round schools had significantly greater increases in academic achievement than multi-track year-round schools" (Kneese, 1996). The meta-analysis did not resolve the dilemma of inconclusive results in the body of year-round research, but provided a direction for future research. Many limitations were found in the fifteen research studies because a variety of independent variables were not reported in all of the studies: student demographics, initial student ability, class size, number of school days, span of years of implementation, intersession utilization, and nature of the curriculum (Kneese, 1996) .

While the "courting" with year-round education became intense elsewhere in Texas, popularity was fading in North Texas. Plano and Irving school districts abandoned year-round calendars during the 1995-96 school year. Dallas had 24 year-round schools in 1997-98, and dropped to 21 year-round schools with 12,669 students enrolled in 1998-99 (TAYRE, 1998-99). The number of year-round schools in Dallas Independent School District decreased to 10 by the end of the 1999-2000 school year. During a telephone interview on June 16, 2000, Andre Hillburn of the Teaching and

Learning Division of the Dallas Independent School District, updated the status of year-round education in Dallas.

> The *School Community Council* and parents were surveyed to decide whether to continue to have year-round education on their campuses. The campuses that had 50-75% vote to return to the traditional school calendar, did so. No district-wide study on year-round schools has been conducted during the past two years because the Dallas Board of Education voted to discontinue year-round schools in 1999. However, in the 1999-2000 school year, the board rescinded the 1999 vote, and continued the existing 10 year-round schools in response to community request. In the 2001 school year, only 7 year-round schools will continue in Dallas Independent School District. One year-round school will become an "Edison Project" administrated school, and two other campuses were selected by the community and parents to return to the traditional calendar year (Hillburn, 2000).

Fort Worth had 27 year-round schools in 1997-98; however, all but nine of the year-round schools in Fort Worth decided to return to the traditional schedule for 1998-99. Nine schools in the Fort Worth school district offered year-round education for the 1998-99 school year, and another eight had an extended calendar under a special initiative from Superintendent Thomas Tocco (Autrey,1998).

Arlington Independent School District chose to end year-round education for the 1998-99 school year. Interest in Arlington's program had dwindled over time. A program that once offered year-round education at three elementary schools and one junior high had dropped off to leave Bebensee Elementary with 129 year-round students as the sole participants. "Because the district offered the program as a 'school within a school' concept - meaning that both a traditional agrarian-based calendar and a year-round program were offered in the same building - the program cost $60,000 more than the traditional calendar school alone. Additional staff and facilities were required to operate two separate school calendars, simultaneously. After the traditional calendar school closed in June, the year-round school continued to operate throughout the summer months. “According to the school district, the TAAS scores of the year-round students were not significantly higher than those of students using the traditional calendar” (Autrey, 1998). According to Wertheimer, year-round education was set up to fail in North Texas because only a few schools in each district tried it. These schools had a struggle to get textbooks on time and to get other district-wide services. The perception was that the year-round schools were opened, but not supported by district officials. Proponents of year-round education claim that support from district officials is the key to a successful year-round school program. Wertheimer addressed the issue with intense emotion, “you either need to focus on it or can it. We were put out there, sink or swim” (Wertheimer, 1998).

Texas Year-round Education Student Achievement Studies

TAAS as the Measurement Instrument

Sparked by the 1983 National Commission on Excellence Report, Texas public school educators increased their search for strategies that would promote increased student achievement. This educational reform movement prompted the creation of a 1984 blue ribbon commission appointed by Governor Mark White (Governor's Commission on Education Reform, 1984). The nationally recognized businessman Ross Perot was selected as the chairman of this commission. Systematic changes were mandated for increased student achievement and were measured by a more rigorous standardized examination, the Texas Assessment of Academic Skills (TAAS). This exam was implemented in the 1990-91 school year, and emphasized math, reading and writing. The power behind the test was the mandate by the Texas legislature requiring that every student in Texas pass it prior to graduation from high school.

Student achievement measured by test results for students participating in year-round education is limited due to the recent implementation of both year-round schools in Texas and the Texas Assessment of Academic Skills exam. Texas studies assessing the effects of year-round education on student achievement involved Austin ISD, Conroe ISD, Cypress Fairbanks ISD, Fort Worth ISD, Waco ISD, and Waxahachie ISD. However, these studies did not include an assessment of the effect of year-round districts on student achievement as measured by the TAAS test.

A 1992 study of year-round schools in Waco, Texas analyzed the first year of year-round schools by comparing the reading, writing, and mathematics Texas Assessment of Academic Skills (TAAS) scores. Third grade year-round students had a writing scaled score of 101 points higher than those of traditional calendar students. This result was statistically significant at the .05 level of probability. Reading scores were 40 points higher and mathematics scores were 28 points higher in year-round schools than in traditional calendar students. Fifth grade year-round students scored 96 points higher in writing, 121 points higher in reading and 127 points higher in mathematics than the traditional calendar students. Disadvantaged year-round students (race, age, at-risk, Chapter 1 eligibility, limited-English proficiency, and socioeconomic status) scored better in both third grade and fifth grade in all three testing areas. However, the differences were not statistically significant (Elsberry, 1992).

Cypress Fairbanks ISD (Willis, 1993) found significant positive gains for at-risk students in year-round schools. Students at a campus with a very high mobility rate showed a significant increase in TAAS scores, but benefits were not significant for the general population of this district. A study conducted by Arthur Anderson and Company for the Cypress-Fairbanks ISD in May 1993 reported that the primary advantages of year-round education were described as improved quality of education and decreased costs. Standardized test scores remained the same or increased slightly after implementation of year-round education in Cypress-Fairbanks.

Fort Worth Independent School District implemented twenty-three year-round schools during the 1992-93 and 1993-94 years. During 1992-93, two campuses adopted a year-round education calendar: B.H. Carroll Center and W.J. Turner Elementary School. Ten more year-round campuses were added in 1993-94: Alice Carlson, Hubbard, North Hi Mount, and Versia Williams elementary schools. Middle schools included J.P. Elder, Kirkpatrick, Stripling, and Meadowbrook and alternative schools included Jo Kelly School and Lena Pope School. In 1994-95, Fort Worth had eleven year-round education elementary campuses, as well as twelve other year-round education campuses (Ballinger, 1995). Elementary schools included Nathan Howell, Springdale, VanZandt-Guinn, Glen Park and Bonnie Brae. Middle schools adopting the year-round education calendar included Forest Oak and Riverside. Additional schools implementing the year-round calendar included Horizons, the International Newcomer Academy, Middle Level

Learning, and Pathway (Stegall, 1994). Eight schools were the subject of *An Examination of Year-round Education in Fort Worth Independent School District:* Alice Carlson, Hubbard, North Hi Mount, and Versia Williams Elementary Schools and Elder, Kirkpatrick, Meadowbrook, and Stripling Middle Schools. "The year-round education schedule was patterned after a 45-15 day model. The intersessions were designed to provide students opportunities for enrichment or academic improvement" (Stegall, 1994). During 1993-94, sixty-three percent of Fort Worth year-round schools had a higher percentage of Hispanic students, limited English proficient students, and economically disadvantaged students compared to traditional calendar schools (Stegall, 1994).

Three thousand students from eight different campuses were examined for the 1994 Fort Worth study. The TAAS performance results of 1994 exceeded the 1993 TAAS results for most campuses. Six of the eight campuses showed an increase in the percent of students who met ""Minimum Expectations"" between the 1992-93 and 1993-94 administrations of TAAS Reading. Three of the eight campuses showed an increase in the percent of students who met "Minimum Expectations" between the 1992-93 and 1993-94 administrations of TAAS Writing. Five of the eight campuses showed an increase in the percent of students who met "Minimum Expectations" between the 1992-93 and 1993-94 administrations of TAAS Math. Seven of the eight campuses showed an increase in the percent of students who met "Minimum Expectations" between 1992-93 and 1993-94 on "All Tests Taken" on the TAAS (Stegall, 1994). The year-round education campuses showed a greater increase in the percentage of students meeting "Minimum Expectations" on "All Tests Taken" than the traditional campuses.

The 1994 examination report on year-round education in Fort Worth Independent School District revealed that 88 percent of the eight year-round campuses showed an increase in students who met "Minimum Expectations" on the TAAS. Year-round education campuses showed a greater increase than traditional schools in the percentage of students meeting "Minimum Expectations" on "All Tests Taken." The traditional campuses had 9.7 percent increase while extended calendar campuses had 15.37 percent increase in the percentage of students passing. The traditional calendar students had 9.75 percent change in passing rates while the year-round students had 15.37 percent change in passing rate. Thirty-eight percent of year-round campuses showed an increase in students who met "Minimum Expectations" in writing tests. Sixty-three percent of year-round campuses showed an increase in students who met "Minimum Expectations" in math tests. Seventy-five percent of year-round campuses showed an increase in students who met "Minimum Expectations" in reading tests.

The Fort Worth, Texas Independent School District Department of Research and Evaluation issued a 1996-97 report on year-round schools. Paul Brinson and Sharon Coulter investigated the comparison group study. Twenty-eight year-round campuses versus comparable traditional calendar campuses were selected from the Texas Education Agency 1993-94 Accountability Manual. The data collected included the 1994-1997 TAAS scores with the descriptive analysis based on the percent of increase passing. "In comparing 1994 through 1997 TAAS results, in general, there has been little difference between year-round and comparable traditional schools student performance on TAAS in reading, math, and writing. Student participation was voluntary so generalization to the district or other populations was not valid" (Brinson and Coulter, 1997). The three Fort Forth Independent School District studies revealed significant increases in student achievement as measured by the TAAS during the early years of implementation. However, the comparison of student performance on TAAS five years after implementation (1997) in reading, math, and writing showed little difference between year-round and comparable traditional schools (Brinson and Coulter, 1997).

Dr. Eddie R. Dunn studied the effect of calendar configuration on achievement gain of elementary students for his 1996 doctoral dissertation. Three elementary schools in Austin, Conroe, and Waxahachie Independent School Districts were used in this comparison group study. In these districts, one hundred nineteen year-round education students were compared to four hundred ninety six traditional calendar students, matched on the variables of district, gender, race, and need. TAAS reading and math subtests for 1993, 1994, and 1995 were used for data collection. Inferential analyses were used with the General Linear Model Design on gain scores. The findings in this study were mixed. Generally, year-round calendar students performed better in reading, but traditional calendar students performed better in math. Year-round Hispanic, female, and low socioeconomic students on free and reduced lunch demonstrated gains in reading for two consecutive years. The use of intersession in regard to academic achievement varied in each of the three districts studied (Dunn, 1996).

Dr. Rosanne Stripling and Diane Stanley investigated the effectiveness and efficiency of year-round education in Waco Independent School District during 1994-1995. The population studied included grades four, five, and eight from eight year-round elementary schools and grades six, seven, and eight from one year-round middle school. The comparison group was grades four and five from traditional calendar elementary schools, and grades six, seven, and eight were matched from four traditional calendar middle schools. The data was based on the 1995 TAAS scores, and the 1994 TAAS Texas Learning Index scores were used as covariates. Data analysis included inferential analyses on the ANCOVA and descriptive analyses on the mean Texas Learning Index gain. The findings were mixed, "Year-round education produced mixed results in student achievement: positive gains in mathematics at the elementary level; negative gains in mathematics at the middle school level; and no gains in reading achievement" (Stripling, 1995). Students on the traditional calendar experienced thirteen more days of instruction prior to testing, and factors other than the year-round calendar were not controlled (Stripling, 1995).

A 1996 study of 775 fifth grade students from 15 Waco, Texas elementary schools concluded that participation in a year-round school does not affect an elementary school student's performance in reading as measured by the TAAS. The experimental group was 292 fifth graders in Waco year-round schools. The control group was 483 fifth graders at traditional calendar schools (Woolley, 1996). The Waco study included the following limitations: (1) longitudinal results of the TAAS test for other years were not included; (2) number of years of student participation in year-round education was not considered; (3) impact of intersessions was not known; (4) calendar option was a choice for both students and teachers; and (5) student ability was not considered. Participation in a year-round school did not affect an elementary school student's performance in reading or mathematics as measured by the TAAS (Woolley, 1996). The results of this study appeared to indicate that a year-round school has neither positive nor negative impact on student academic achievement.

However, the consideration of demographics in Waco school district did indicate an impact of the year-round calendar on student achievement. The option of attending either a year-round or traditional school was available to all of the students in Woolley's year-round study. Interesting results were revealed when the socioeconomic groups were divided into subpopulations. More African Americans and fewer Hispanics were included in the control traditional calendar group than in the experimental year-round calendar group. More of the students in the traditional school were of a higher socioeconomic level compared to the year-round students. African American and Hispanic students in Waco Independent School District had averaged lower academic performance scores than Anglo students as measured by the TAAS test. The socioeconomic status (SES) distribution was also uneven. The academic performance of low socioeconomic status (SES) students was lower (63.91 Texas Learning Index) than the scores of higher (65.36 TLI) socioeconomic students. Based on demographics, the traditional calendar students were expected to have higher TAAS scores than the year-round students. Surprisingly, the reading scores between the year-round students (72.56 TLI) and traditional calendar students (73.66) were not significantly different. The year-round math scores (64.15 TLI) were insignificantly higher than the traditional calendar math scores (64.14 TLI). There was no significant difference between the mean reading and mean math scores between the year-round and traditional calendar students (Woolley, 1996). Since the socioeconomic level of the students in traditional calendar schools was higher than the socioeconomic level of the year-round students, significantly higher scores were anticipated from the traditional calendar students. The TAAS reading and math scores did not result in significant differences between year-round and traditional calendar students; therefore, a positive effect on student achievement resulted from the year-round calendar in Woolley's study.

Austin Independent School District has been involved in a single-track plan of year-round education for seven years.   In the 1996 school year, eleven elementary schools and one middle school adopted the year-round schedule. Students were in school for approximately 60 days and then out of school for 20 days of intersession in which instructional activities were offered. An evaluation of student achievement as measured by the Texas Assessment of Academic Skills scores showed steady improvement for the year-round schools since 1993. In the 1996-97 school year, economically disadvantaged African American and Hispanic students generally achieved higher TAAS scores in year-round schools than in Title I schools, or in the district in general (Curry, 1997).

Texas Year-round Education Historical Case Study

Student Achievement Measured by the TAAS

Socorro Independent School District

Socorro Independent School District successfully implemented a year-round education calendar in 1991. In 1996, Socorro ISD Superintendent R. Jerry Barber, reported that Socorro Independent School District had substantially improved every aspect of their educational program. Socorro is a progressive and high-performing school district. Substantial improvements are particularly important since the district is 90 percent Mexican-American and 70 percent economically disadvantaged. Their students scored at or above state average on all mandated tests. Their dropout rate was less than one percent and 65 percent of their graduates attended college. As a group, Socorro students earned the highest scores on the TAAS of any district in the county. Several campuses have earned national recognition for their programs.

Socorro Independent School District was Texas' largest year-round education school district until all of San Antonio's 60,000 students started on a year-round calendar for the 1997-98 school year. Socorro is located in the eastern and southeastern portion of El Paso County, Texas. It serves the city of Socorro, Horizon City, and the eastern portion of the city of El Paso. The district covers 136 square miles. The northern boundary of the district is the Texas/New Mexico state line and the southern boundary is Mexico (Shook, 1998). Dismal academic performance and a severe building facilities crunch prompted this Texas school district to adopt a multi-track year-round school calendar (Higginbotham, 1996).

Socorro Independent School District is the Texas "Cinderella" success story for year-round education. The district is ranked as one of the poorest in the United States. Eighty percent of the 20,000 students in this suburban El Paso district are eligible for free or reduced-price lunches: 90 percent are Hispanic. Some students live in hand-built houses that lack electricity or running water. During the past decade, Mexican immigration and the development of new middle-class subdivisions have boosted enrollment by 1,500 to 2,000 students. Available funding has allowed the district to build only one school a year, leaving Socorro with a serious overcrowding problem. In the late 1980s, district officials saw the crunch developing and realized they needed to take action. They were also struggling with a second serious concern: academic doldrums. Fewer than 30 percent of students in some schools were achieving mastery levels in the Texas annual assessment exam. Overall failure rates were high and attendance was poor.

In October 1990, the Board of Trustees of Socorro Independent School District appointed a task force to study the issue of year-round education. The district continued to struggle with overcrowded schools due to accelerated growth in the district. In September of 1990, Socorro opened its school doors to 13,020 students, more than 10 percent increase of almost 1,400 students. When a high growth factor, 10 percent average across the district, was coupled with a lack of adequate state funding, decisions that affected the instructional program became very complex (Socorro, 1991). In the spring of 1991, the task force submitted its recommendations for the implementation of year-round education to the board of trustees. The board of trustees considered that year-round education was implemented in schools for two primary reasons:

(1) educational benefits manifested in improved student achievement

(2) increased building capacity that produced financial savings in building costs

By the spring of 1991, Socorro Independent School District had invested over $73 million in school buildings that were used only nine months a year. With year-round education, Socorro had the potential of using these buildings to their maximum capacity while improving the educational program and reducing costs.

Socorro has continued to be one of the fastest growing school districts in Texas. The district has increased the efficiency of the facilities by implementing multi-track year-round education, thus serving 2,000 more students than the schools were built to accommodate (Shook, 1998). With the district's four-track program, one building can be eliminated from the building program for each three buildings used on multi-track year-round education. The district has three phantom schools -- schools that will never be built because the four-track program replaced the need for three new building constructions (Shook, 1998).

In addition to the financial benefits, Socorro's year-round education has produced student achievement benefits. More than half of the students increased the number of days in school by attending the intersession program. During the vacation time acceleration, remediation, and enrichment activities were offered on all campuses. A student who needed extra time on task had the opportunity to get help when it was needed. Students have been exposed to more of the curriculum because teachers reported that they were spending less time with review and reteaching (Shook, 1998). The effective use of the intersession program has been the key to improved student learning as demonstrated on the mathematics TAAS scores in Socorro's year-round schools.

Socorro Independent School District discarded the last of the old farm calendar in 1993 and committed totally to year-round education. In a three-year comparison of TAAS scores in Socorro, scores have risen significantly. The fifth grade percentage of mastery in TAAS math scores for 1994-1997 were reported as follows: 1994-95 {71%}; 1995-96 {77%}; and 1996-97 {82%} (Shook, 1998). A report based on disaggregated data, comparing economically disadvantaged and Hispanic students in Socorro with state averages, proved that the Socorro students outscored their counterparts throughout the state. The Socorro TAAS Scores Comparison to State Averages from AEIS reports for fifth grade math in the spring of 1997 are as follows: Hispanic state math {81.5%} vs. Hispanic Socorro math {82.4%}; economically disadvantaged state math {78.7%} vs. economically disadvantaged Socorro math {82.4%}. Socorro's use of the intersessions for acceleration, remediation, and enrichment improved student achievement in mathematics as measured by the TAAS test.

Table 8

Socorro Independent School District TAAS Scores Comparison to State Averages

	State	Socorro
Hispanic	81.5%	82.4%
Economically Disadvantaged	78.7%	82.4%

Based on the 1996 Texas Accountability Rating System, all of the district schools met the standards defined as acceptable. Four schools exceeded the minimum standard and were identified as recognized. One school received the top recognition as exemplary.

Socorro found one solution to both their problems: multi-track year-round education. Since 1990, academic results, attendance, and dropouts rates have shown dramatic improvement. Administrators attribute this improvement, in part, to the year-round calendar. Two East Side schools in the Socorro District, Slider Middle School and Montwood High School, were designated Blue Ribbon Schools by the Texas Education Agency in 1995-96 (El Paso Times, 1997). The Federal Department of Education named Socorro High School a National Blue Ribbon School in the Spring of 1998: an academic honor extended to only 266 secondary schools nationwide (Shook, 1998).

Texas has more year-round schools than any other state, except California. The main purpose for year-round schools in Texas is academic improvement. Studies have shown that special need populations (economic disadvantaged, at-risk, mobile, English as a Second Language, and minority ethnic students) have especially benefited from year-round schools (Curry, Wolley, Dunn, Willis, Neese and Waco). The studies that involve larger populations (Brinson, Kneese, Stripling, Curry and Dunn) indicate year-round schools have an equal or greater benefit for student success. Longitudinal studies that compared student success prior to becoming a year-round school, with student success years after becoming a year-round school, showed the greatest benefit measured by student achievement. Year-round schools, when compared to traditional schools, showed less success.

Table 9

Year-round School (YRE) Results: Texas Studies

City	State	Researcher	Reading	Math	All Test	Mixed Results	Special Areas
Texarkana	Tx.	Paslay			All YRE +		
Conroe	Tx.	Loyd	+	+			
Plano	Tx.	McCasland	+	+	All YRE +		
Texarkana	Tx.		+	+			
Conroe	Tx.	Dr..C. Kneese	+	+	+		AR+
15 studies	Tx.	Dr..C. Kneese			NS		
San Antonio	Tx.	Ritter			NS		ESL+
Waco	Tx.		+	+			SES+
Cypress Fairbanks	Tx.	Willis	NS / +		=+		AR+ / Mob +
Ft. Worth	Tx.	Brinson	+	+	+		
Austin, Conroe, Waxahachie	Tx.	Eddie Dunn	+	-	mixed		H+ SES+
Waco	Tx.	Stripling	NS	+	mixed		
Socorro	Tx.	Shook	+	+	+		
Waco	Tx.	Wolley	NS	NS			SES+
Austin	Tx.	Curry				+	AA+ H+
Ft. Worth	Tx.	Brinson			NS		

+ =Year-round calendar positive results H = Hispanic
- = Year-round calendar negative results ESL = English as a second language
= + =Equal to or above NS = No Significant Change
AR= At-risk students positive results Mob =High mobility students
SES = Socioeconomic status (economic disadvantaged students)

Summary

The year-round school is not a phenomenon limited to the decades of the 1980s and 1990s. Since the middle of the 1600s, improved student achievement has been the focus of year-round education in America. An extended school calendar has included summer enrichment activities, remediation, and acceleration for the purpose of educational excellence. The precedence for the twenty-first century year-round school began with experimentation with the school calendar in the 1840s.

The mandate for improved student achievement, as measured by a standardized Texas Assessment of Academic Skills test, triggered a mushroom effect of innovative alternative models of the traditional public school in Texas. Year-round education has been one of the innovative models that mushroomed in the 1990s. Surprisingly, prior to this current study under consideration, an analysis of the effect of year-round education upon student achievement, as measured by the TAAS, was very limited. A statewide Texas study of the effect of year-round education upon student achievement has been non-existent. Since the implementation of year-round education disrupts the pattern of life for the educational community, the positive impact of year-round education upon student achievement should be validated by solid research data.

Two primary definitions of year-round education have dominated the literature. One concept, generally known as the *extended year*, significantly extended student learning time beyond the normal 180 days. The second concept, generally known as the *reorganized year*, simply rearranged the school calendar with no increase in the number or length of school days. The primary difference between the year-round calendar and the traditional school calendar was the length and arrangement of vacation periods. The traditional calendar generally had one long summer vacation of ten to twelve weeks. The year-round calendar had a summer vacation of less than eight weeks, with extra vacation breaks equally spread throughout the school year.

The year-round calendar generally consisted of either a multi-track calendar or a single-track calendar. A multiplicity of designs existed within the framework of the two strands of year-round calendars. Multi-track calendars were very popular in California, and were implemented for the purpose of reducing overcrowded facilities. Single-track calendars were very popular in Texas, and were frequently implemented for the purpose of improving student achievement in response to the state mandated norm-referenced Texas Assessment of Academic Skills test. The single-track year-round calendar appealed to those school districts and campuses that experienced low performance on the TAAS, based on student demographics.

Research can be compiled to support or refute the positive impact of year-round education on student achievement. Research findings documented in the literature dating back to the 1970s and 1980s have been mixed with regard to the impact of year-round education on student achievement. Research compiled in the 1990s, reporting the effects of year-round education on student achievement, often concluded that year-round education produced student achievement gains "generally equal to and in many cases better than the traditional calendar structure" (Grotjohn & Banks, 1993; Curry, Washington, & Zyskowski, 1997; Winters, 1995; Six, 1993; Chen, 1993; Haenn, 1996). Albeit a differential effect, by subject and by varying student demographics, exists when the data is disaggregated" (Kneese, 2000). These research findings may have indicated a positive impact on student achievement gains under a year-round calendar program, but did not necessarily isolate the year-round calendar as the factor of causation.

This current statewide Texas study will consider the impact of year-round education on specific types of students such as economically disadvantaged, ethnic populations, special education students, and high mobility students. The purpose of this study has been to inform the educational community, and to assist Texas school districts in valid decision-making concerning the implementation of year-round education.

CHAPTER 3

RESEARCH METHODOLOGY AND PROCEDURES

Introductory Statement

According to the National Association for Year-round Education, the number of schools in the United States implementing year-round calendar configurations is at an all-time high with over 2,880 schools in 561 school districts and forty three states enrolling over 2,063,217 students (NAYRE, 2000). The dramatic increase in year-round education (YRE) programs in Texas until 1998 has been consistent with the national trend. The number of year-round school districts has increased in Texas from 22 districts in 1992 to 61 districts in 1998. The number of students enrolled in year-round education has increased from 25,782 in 1992 to 159,885 in 1997. In Texas, there were 359 campuses and 159,885 students involved in year-round education in 1997 (Pringle, 1997). This study included the 61 Texas districts currently participating in year-round education, 337 campuses, and 187,774 students involved in year-round education for the 1997-98 school year (Texas Education Agency, 1998). This study included the data gathered from all elementary schools in Texas school districts for a comparison study concerning the impact of year-round education on elementary student achievement in mathematics as measured by the TAAS examination.

The purpose of this study was to determine the impact of year-round education upon student achievement. Specifically, this study investigated the possibility of a correlation between students' participation in a year-round school track and their academic achievement in mathematics. This study also investigated the interaction effects between mathematics achievement and school size, economic disadvantage, ethnic distribution, special education, and mobility.

Research Questions

- Are there academic achievement differences between schools with year-round calendars and schools with traditional calendars?
- Are there academic achievement differences, impacted by various enrollment sizes, between year-round calendar schools and traditional calendar schools?
- Are there academic achievement differences between year-round calendar schools and traditional calendar schools with high ratios of economically disadvantaged students?
- Are there academic achievement differences between year-round calendar schools and traditional calendar schools with high ratios of African-American students?
- Are there academic achievement differences between year-round calendar schools and traditional calendar schools with high ratios of Hispanic students?
- Are there academic achievement differences between year-round calendar schools and traditional calendar schools with high ratios of White students?
- Are there academic achievement differences between year-round calendar schools and traditional calendar schools with high ratios of special education students?

- Are there academic achievement differences between year-round calendar schools and traditional calendar schools with high ratios of high mobility students?

Hypothesis Statement

The Texas Assessment of Academic Skills (TAAS) is an established and reliable Texas assessment instrument of the achievement of basic academic skills in reading, writing, and math. The math subtest was selected as the comparison instrument because achievement in mathematics is the subject of serious concern for American success in the emerging global economy. Limited studies have been conducted with the conclusion that year-round education does have a positive effect on student achievement in reading for economically disadvantaged students. Similar studies on the effect of year-round education on student achievement in mathematics are mixed and less conclusive. Comparison of data collected from the Academic Excellence Indicator System (AEIS) and the subtest of math of the TAAS test was used in this current study to address the following hypothesis.

There will be no statistically significant correlation between elementary campus math achievement and the composite set of predictor variables with:

1. Calendar arrangement between year-round and traditional calendar schools
2. School size between year-round and traditional calendar schools
3. Economic disadvantaged students between year-round and traditional calendar schools

4. Ethnic Distribution of African American students between year-round and traditional calendar schools
5. Ethnic Distribution of Hispanic students between year-round and traditional calendar schools
6. Ethnic Distribution of White students between year-round and traditional calendar schools
7. Special education students between year-round and traditional calendar schools
8. Mobility of students between year-round and traditional calendar schools

Population

The population was the spring 1998 Texas elementary campus TAAS scores from all Texas Independent School Districts as listed by the Texas Education Agency in the *Texas School Directory 1997-1998*, ascertained as of March, 1999. During the 1998 school year, there were 3,872 elementary instructional campuses. A sub-population included all of the 240 instructional elementary year-round calendar schools in Texas during the 1998 school year. A second sub-population was all of the 3,632 traditional calendar schools in Texas in the 1998 school year.

Sample

Texas year-round elementary schools in the time period of the 1997-1998 school year were included in the study. A systematic sample of the sub-population of year-round calendar schools included every third school on the list of year-round schools by

Texas Education Agency. The 186 schools that were involved in year-round education during the 1997 and 1998 school years were sampled. The first name was determined by a random selection of the first 3 names. In addition, a systematic sample of the sub-population of traditional calendar elementary schools included every 60th traditional school in the Texas Education Agency's (TEA) list of schools in *The Texas School Directory: 1997-1998.* The first name was determined by a random selection of the first 60 names. If the 60th name was not a year-round school, the previous name on the list was selected. For all statistical analysis, the campus (not the student) scores were the units of analysis.

Procedure for Collecting Data

Data was collected for each participant school by recording from Texas Education Agency's TAAS examination sub-tests of math. The TAAS exam in the 1998 school year was administered in the fall of 1998. The participants included students in the third, fourth, and fifth grade. The data was collected from the Texas Education Agency's Academic Excellence Indicator System (A.E.I.S.) for the 1998 school year. In addition, all the demographic variables were gathered from A.E.I.S. The economic data, ethnicity, and special education information were measured as the percent of students on the campuses. Three ethnic variables were applied that represent the dominant ethnic groups in Texas. The list of year-round calendar schools was taken from the Texas Education Agency's Department of School Finance and Support. This study is composed of 56 samples from traditional elementary schools and 60 samples from year-round elementary schools for a total of 116 samples. Each sample has individual scores in each of the variables. The constant variable is the aggregation of math scores from the Texas Assessment of Academic Skills (TAAS). Eight predictor variables of this study include the academic calendar, size of schools, percent of economically disadvantaged, African American ethnicity, Hispanic ethnicity, White ethnicity, special education population, and mobility of students.

The method used to select the 116 samples was a simple random method and systematic random method. Simple random was used to select the first sample of each population category. The remainder of each category was selected by systematic random. Two hundred and forty Texas schools were on a year-round calendar in the 1998 school year. In order to lessen the possibility of the Hawthorn Effect of a first year program, the population of year-round schools was selected by those year-round schools in operation during both the 1997 and the 1998 school years. One hundred and eighty-six schools were included in the year-round calendar population category. A simple random sample was taken from the first three numbers in order to select the first year-round school on Texas Education Agency's list of year-round schools during both the 1997 and the 1998 school years. Every third school on the list was systematically selected thereafter. The sample included sixty year-round schools that had Academic Excellence Indicators (AEIS) in the reports produced by Texas Education Agency.

During the 1998 school year, there were 3,872 public elementary schools in Texas. The year-round schools were separated out from the list of elementary public schools, leaving a population of traditional calendar schools. The number of traditional calendar elementary schools was divided by 60 in order to include approximately an equivalent number of samples of traditional calendar schools and year-round schools. The first traditional calendar school was selected by a simple random drawing from the first 60 numbers in a hat. The school drawn then became the first school in the sample. Thereafter, every 60^{th} name was systematically sampled. If the 60^{th} name was a year-round school, the school name just prior to the 60^{th} name was selected. Fifty-six samples of traditional schools were selected. In the multiple regression model, the year-round schools were assigned a value of *one*, and the traditional calendar schools were assigned a value of *zero*.

Instruments

Standardized achievement was measured by the Texas Assessment of Academic Skills (TAAS) test. TAAS test scores have been shown to evidence a high level of validity in that they measure what the test has been designed to measure. These test scores are considered reliable because they have stability and provide consistent results each time the test is administered. The test is the Texas Education Agency mandated public school assessment examination for all students in grades 3 – 12 in Texas public schools.

Texas professional educators selected from across the state for each grade level and subject area, test development specialists, and TEA staff members collaboratively developed, reviewed and modified objectives, targets, specifications and test items. Field tests were conducted for the TAAS before implementation of the examination. Standards for TAAS are based upon State Board of Education policy that established a minimum passing standard for the math subtest of 70%.

The TAAS math subtest is administered in the third, fourth, fifth, sixth, seventh, eighth, and tenth grades. Public high school students must pass the 10^{th} grade exit level exam in order to receive a Texas high school diploma. The validity of the TAAS is content-based. The instrument is designed to test mastery of academic skills specific for each test objective. The TAAS test scores are a part of a biennial report to the Texas Legislature on the state of education in Texas. The Texas Learning Index (TLI) of the TAAS program provides for correlation between a student's grade level and the result necessary on the TAAS to be on track for passing the exit level exam in the 10^{th} grade in high school. A TLI rating of 5 – 10 means a fifth grade student has obtained a 70% passing score. A 10 - 70 passing score means that a 10^{th} grade student has successfully met the TAAS requirements for receiving a high school diploma. The data was retrieved from the Academic Excellence Indicator System (AEIS) report for each school in the study.

Method of Study

Design and Statistical Treatment

Statistical treatment of the data was measured by a multiple regression analysis in the academic area of math. This treatment used the Texas Assessment of Academic Skills scores of year-round education schools and traditional calendar schools as the dependent variable. The regression analysis employed a multiple block design with predictors entered in several stages:

- In block one, only the calendar arrangements were entered.

- In block two, the school size listed by Texas Education Agency was entered.
- In block three, the economic disadvantaged data was entered.
- In block four, the African American ethnic distribution data was entered.
- In block five, the Hispanic ethnic distribution data was entered
- In block six, the White ethnic distribution data was entered.
- In block seven, special education data was entered.
- In block eight, mobility data was entered.

Two treatment levels exist in this study: year-round calendar or traditional calendar. Eight blocks were constructed: school size, economic disadvantaged, African American ethnic distribution, Hispanic ethnic distribution, White ethnic distribution, special education, and mobility blocks. Participating schools were blocked for these variables because these variables have been shown to potentially have an effect upon student achievement. In order to determine the effects of calendar configurations upon student achievement gain, it was necessary to control the possible effects of these variables. By blocking participants for school size, economically disadvantaged, African American ethnic distribution, Hispanic ethnic distribution, White ethnic distribution, special education, and mobility, a more reliable estimation of the effects of calendar configuration upon student achievement gains was attained.

Organization of the Study

A comparison was made between traditional calendar school TAAS math scores and year-round calendar school TAAS math scores. In addition, differences in TAAS math scores were compared across variation in school size, the economic level, and ethnicity of the campus. The Texas Assessment of Academic Skills examination scores for 1998 were compared to see if there was any relationship between academic improvement and year-round calendar configuration.

Limitations

- This study was limited to the number of schools within the state of Texas.
- The number of year-round schools in the state of Texas limited this study.
- This study was limited by the lack of information regarding student ability that impacts student achievement in mathematics.
- This study was limited to student achievement data in mathematics as measured by the TAAS in a 1998 single year study rather than a longitudinal study.
- This study was limited to student achievement in mathematics.

Summary

This study used the population of the 3,872 Texas elementary campuses from Texas Independent School Districts in 1998. Data was collected for each school's third, fourth, and fifth grade math sub-tests. The data was collected from the Texas Education Agency's Academic Excellence Indicator System (AEIS) for the 1998 school year, including all demographic variables gathered from the AEIS report. Statistical treatment of the data was measured by a multiple regression analysis in the academic area of math. The treatment used the Texas Assessment of Academic Skills scores of year-round education schools and traditional calendar schools as the dependent variable. The regression analysis employed a multiple block design with predictors entered in several stages. Participating schools were blocked for the variables that potentially had an effect upon student achievement: school size, economic disadvantaged, African American ethnic distribution, Hispanic ethnic distribution, White ethnic distribution, special education, and mobility blocks. A comparison study was made between traditional calendar elementary school TAAS math scores and year-round calendar elementary school TAAS math scores to determine if interaction effects between academic improvement and year-round calendar configuration existed.

CHAPTER 4

RESULTS AND DISCUSSION

Introduction

The purpose of this study was to describe the relationship between year-round calendar configuration and student achievement. Specifically, this study investigated the relationship between student participation in year-round education and academic achievement in mathematics. SSPS was used as the software to enhance the quality of the calculations.

A multiple regression model was selected as an appropriate model to determine if any difference existed between the academic math scores of year-round calendar schools and traditional calendar schools. This multiple regression model fit the equation: $Y = B1\ X1 + B2\ X2 + B3\ X3 + B4\ X4 + B5\ X5 + B6\ X6 + B7\ X7 + B8\ X8$. The means between variables was followed by the means of each variable within the year-round schools compared with the means of each variable within each traditional school. This was followed by the multiple regression of all variables. To help establish causes, the difference was tested between multiple R's. A forward solution was used to establish relationships that could cause the variation between math scores. This was followed by a stepwise solution to indicate the changes as each variable was added to the regression. Finally, a comparison of Frequencies was considered to see if there was a normal flow of samples within each variable.

Means of All Variables

The first step was to determine the mean of the variables. The math score had a mean score of 83.82. The mean number of students per school was 545.30. A mean percent of 64.88 students were economically disadvantaged; and a mean percent of 11.67 students were in special education programs. There was a mean percent of 17.02 African Americans, 47.22 percent of Hispanic Americans, and a mean percent of 33.80 White Americans. A mean average of 24.51 percent of the students was categorized as mobile during the year. Mobility was the number of students that entered or left the school campus during the school year. These are the means of the combination of year-round and traditional schools.

Table 10

Means – All Variables

	Mean	Standard Deviation	N
Hispanic	47.2164	33.8478	116
White	33.8052	32.3259	116
Economic Disadvantaged	64.8802	28.6176	116
African American	17.0233	25.2151	116
Math Score	83.8273	9.7128	116
Mobility	24.5129	8.1927	116
Special Education	11.6681	3.8921	116
Size of School	545.3017	226.9272	116
Year-round vs. Traditional	.5172	.5019	116

Means of Variables for Year-round and Traditional Schools

The means of the variables of the year-round schools, from smallest to largest, include: special education students (11.55), African American students (15.68), White students (23.64), student mobility (26.07), Hispanic students (58.54), economic disadvantaged students (72.54), and math scores (80.85). The mean size of the schools is 580.42.

The means of the variables of the traditional calendar schools, from smallest to largest, include: special education students (11.80), African American students (18.46), student mobility (22.84), Hispanic students (35.08), White students (44.70), economic disadvantaged students (56.67), and math scores (87.01). The mean size of those schools is 507.68.

Table 11

Year-round vs. Traditional Calendar School Means (See Appendix B)

Averages															
87.01	80.85	507.68	580.42	56.67	72.54	18.46	15.68	35.08	58.54	44.70	23.64	11.80	11.55	22.84	26.07
Math	Math	Size	Size	Econ	Econ	Afri	Afri	Hisp	Hisp	White	White	Sp.Ed	Sp.Ed	Mobile	Mobile
Trad	YRE	Trad	YRE	Trad	YRE	Trad	YRE	Trad	YRE	Trad	YRE	Trad	YRE	Trad	YRE

Comparison of Year-round vs. Traditional Calendar School Means

The mean for each variable within the traditional schools and within the year-round schools is as follows in the table below. Using this table, year-round schools, when compared to the means of traditional schools, show year-round schools to be lower in math scores (6.16 percent) than traditional schools. They have less African American students (2.78%), White students (21.06%), and special education students (.25%).

Year-round schools are higher in population size (71.37students), economic disadvantaged students (15.87%), Hispanic students (23.46%), and mobility (3.23%).

Table 12

Comparison of Means of Year-round and Traditional Calendar Schools

Variables		Math	Size	Economic	African	Hispanic	White	Special Ed.	Mobility
Traditional	Average	87.01	507.68	56.67	18.46	35.08	44.70	11.80	22.84
Year-round	Average	80.85	579.05	72.54	15.68	58.54	23.64	11.55	26.07
Difference in YRE		-6.16	+71.37	+15.87	-2.78	+23.46	-21.06	-.25	+3.23

Year-round education schools in Texas have lower math scores, higher student enrollment, more economic disadvantaged students, more mobility in their student body, and less special education students. They also have less African American and white students and more Hispanic students. Traditional schools have higher math scores, lower student enrollment, less economic disadvantaged students, less mobility in the student body, and more special education students. Traditional schools also have more African American and White students, and less Hispanic students. This table reveals a picture of the differences between year-round and traditional schools during the 1998 school year. The table, however, does not show a cause and effect relationship.

Multiple Regression Model

In order to find the differences between year-round and traditional calendar schools, the multiple regression model was selected as the best model to determine if there was any difference between the academic math scores of the year-round calendar schools and academic math scores of traditional calendar schools. The raw score regression coefficients are found from a table of dependent and independent variables. In multiple linear regression, there is a single criterion variable (Y). In this case, the single criterion variable is the TAAS Math Test scores from year-round and traditional calendar schools. The regression constant is the math scores. The multiple regression equation contains a regression coefficient for each predictor variable and the regression constant. The standardized coefficients and multiple predictor variables in this study include: beta 1 - the calendar arrangements; beta 2 - the size of the school; beta 3 - the percent of disadvantaged students; beta 4 - the percent of African American students; beta 5 - the percent of Hispanic students; beta 6 - the percent of White American students; beta 7 - the percent of special education students, and beta 8 - the percent of student mobility. When using multiple regression in applied situations, a common form of the regression equation is the raw score form because the actual scores of the predictor variables are used. In determining R and R square, the multiple correlation coefficient is a Pearson Product –moment correlation coefficient between the criterion variable (Y) and the predicted score on the criterion variable (Y). This is a linear combination of the predictor variables.

The following is the solution for eight predictor variables.

Table 13

Model: All Variables Entered

Model	Variables Entered	Method
1	Mobility, Size of School, Hispanic, Year-Round vs. Traditional, Special Education, African American, Economic Disadvantged, White	Enter

a. All Requested Variables Entered. b. Dependent Variable: Math Score

A multiple regression of all variables in the table below gives the R Square as .402. The result of an Adjusted R square is given for the sample size of .357. The more conservative Adjusted R Square adjusts for the sample size. The slight difference between the R and the R squared is due to the relatively large number of observations and the small number of predictor variables. This indicates that 35.7% of the change in math scores was a result of including all variables of school calendar variation, size of school, economic disadvantaged, African American, Hispanic, White, special education services and mobility. Using the raw score formula for the correlation coefficient, the correlation .634 is found. The multiple R equals the square root of the sum of the products of the beta coefficients multiplied by the correlation between the criterion variable and the respective predictor variable. Therefore the correlation (R) between the criterion variable (Y) and the linear combination of the predictor variables (X1-8) is .634. The square of the multiple correlation coefficient (R squared) is interpreted in the same way as the square of the bivariate correlation coefficient (R2). The (R squared) is the proportion of the variation in the criterion variable that can be attributed to the variation of the combined predictor variables. In this case, .634 squared equals .402. Therefore, approximately 40 percent of the variation in the math scores can be attributed to the variation in the combination of the variables. The multiple R is the correlation coefficient between the scores on the criterion variable Y, and the predicted scores for the criterion variable Y using the linear combination of the predictor variables. For multiple correlation, the null hypothesis that the multiple correlation in the population equals zero can be tested. The underlying distribution of the test statistic is the F distribution with k and n-k-1 degrees of freedom. The computed value of this test statistic F does not exceed the critical value of F at the given level of significance. The conclusion is that a relationship exists in the population between the criterion variable and the linear combination of the predictor variables.

Table 14

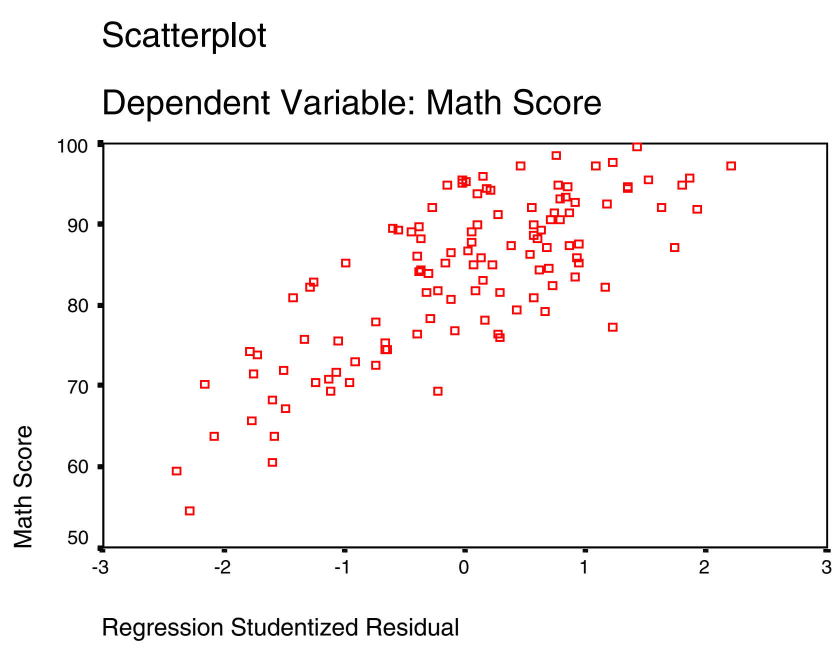
Model Summary of All Predictors

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.634	.402	.357	7.7857

a. Predictors: (Constant), Mobility, Size of School, Hispanic, Year-round versus Traditional, Special Education, African American, Economic Disadvantaged, and White
b. Dependent Variable: Math Score

Observation of the scatterplot indicates a linear direction. A relationship exists between the variables.

Figure 1. Scatterplot of All Variables



Determination is made whether the multiple R is statistically significant. The test significance to find the F is used to test the null hypothesis that there is no significant difference. The F is found to be 8.997. The underlying distribution of this test statistic is the F distribution with 8 and 107 degrees of freedom. Assuming alpha =. 05, we find the critical value to be a table value of 2.02. Since the computed value of F exceeds the critical value, the null hypothesis that there is no difference would be rejected. The associated probability statement would be, "The probability that R = .402 would have occurred by chance, if the null hypothesis were true, is less than .05." On the table, the "significant F = .000" indicates that the probability is actually less than .000. Thus, the correlation between the criterion variable (Y) and the combined predictor variables (X1, X2,X3, X4, X5, X6, X7, andX8), is different from zero in the population. In the analysis of variance (ANOVA), it is shown to be significant because the significant level is less than p =. 05.

Table 15

ANOVA: All Variables Entered

Model		Sum of Squares	d	Mean Square	F	Sig.
1	Regression	4363.034	8	545.379	8.997	.000
	Residual	6485.998	107	60.617		
	Total	10849.032	115			

a. Predictors: (Constant), Mobility, Size of School, Hispanic, Year-round vs. Traditional, Special Education, African American, Economic Disadvantaged, White
b. Dependent Variable: Math Score

The next step is to determine the significance of the predictor variables. In the table below, the variables that are significant at the p =. 05 level includes the year-round and traditional calendar students (.014) and the African American students (.044). They are the two variables below the .05 significant level. The next variables in order of significance are Hispanic students (.126), White students (.304), mobility of students (.398), special education students (.620), economic disadvantaged students (.664), and size of school (.924). Math, the constant dependent variable, has a significant level of .0.

Table 16

Coefficients: All Variables

		Nonstandardized Coefficients		Standardized Coefficients	t	Sig.
Model		B	Std. Error	Beta		
	(Constant)	118.338	19.063		6.208	.000
	Year-round vs. Traditional	-3.980	1.601	-.206	-2.486	.014
	Size of School	-3.328E-04	.003	-.008	-.096	.924
	Economic Disadvantaged	-2.406E-02	.055	-.071	-.436	.664
	African American	-.378	.185	-.982	-2.042	.044
	Hispanic	-.284	.184	-.990	-1.543	.126
	White	-.197	.191	-.656	-1.033	.304
	Special Education	-.133	.214	-.053	-.620	.537
	Mobility	-.108	.128	-.091	-.849	.398

Dependent Variable: Math Score

A procedure for deciding on the number of predictor variables to retain in the regression equation was to test the difference between the multiple R with k1 predictors, and the multiple R with k2 predictors where the k2 predictors were a subset of the k1 predictors. The table showed that the year-round versus traditional calendar schools and the percent of African American students had a significant level at the p = .05 level. The test statistic was found by using the F. The underlying distribution of this test statistic was the F distribution with (k1-k2) and (n-k1-1) degrees of freedom. The second model, therefore, included the variables that were less than p =. 05. These variables included African American students and year-round versus traditional calendar configuration.

Table 17

Regression: African Americans and Calendar Configurations

Variables Entered/Removed

Model	Variables Entered	Variables Removed	Method
1	African American, Year-round Vs Traditional	.	Enter

a. All requested variables entered
b. Dependent Variable: Math Score

The new model had an R square of .268, and an Adjusted R square of .255. This means that 25.5 percent of the difference was found in these two variables.

Table 18

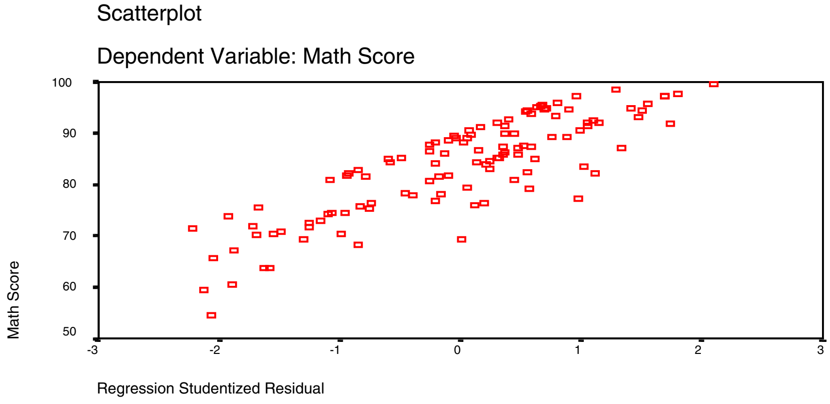
Model Summary: African American

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.517	.268	.255	8.3850

a. Predictors: (Constant), African American, Year-round Versus Traditional
b. Dependent Variable: Math Score

Observation of the scatterplot indicated a linear direction.

Figure 2. Scatterplot: African American and Calendar Configurations



The new F was 20.654. Determination was made whether the multiple R was statistically significant. The null hypothesis that there was no significant difference was tested with the test significance to find the F. to be 20.654. The underlying distribution of this test statistic was the F distribution with (k1-k2) 6 and (n-k1-1) 107 degrees of freedom. Assuming alpha = .05, calculations found that the critical value was a table value of 2.17. Since the computed value of F (3.99) exceeded the critical value of (2.17), the null hypothesis that there was no difference should be rejected. The associated probability statement would be that the probability that R 2 = .268 would have occurred by chance, if the null hypothesis were true, was less than .05. On the table, the "significant F = .000" indicated that the probability was actually less than .000. Thus, the conclusion was that in the population, the correlation between the criterion variable (Y) and the combined predictor variables (Year-round, traditional and African American) was different from zero. In the analysis of variance (ANOVA), it was shown to be significant because the significant level was less than .05 p.

Table 19

ANOVA: African American and Calendar

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2904.259	2	1452.130	20.654	.000
	Residual	7944.773	113	70.308		
	Total	10849.032	115			

a. Predictors: (Constant), African American, Year-round Versus Traditional
b. Dependent Variable: Math Score
Regression – Hispanic, African American and Calendar

The African American and calendar variables were two predictor variables that accounted for 26.8 percent of the 40.2 percent of the variance in the criterion variable. The next meaningful variable added was Hispanic students.

Table 20

Hispanic, African American and Calendar Model

Variables Entered

Variables Entered	Variables Removed	Method
Hispanic, Year-round Vs Traditional, African American	.	Enter

a. All requested variables entered.
b. Dependent Variable: Math Score

The mean percent of Hispanics was 47.21. The Hispanic standard deviation was 33.84.

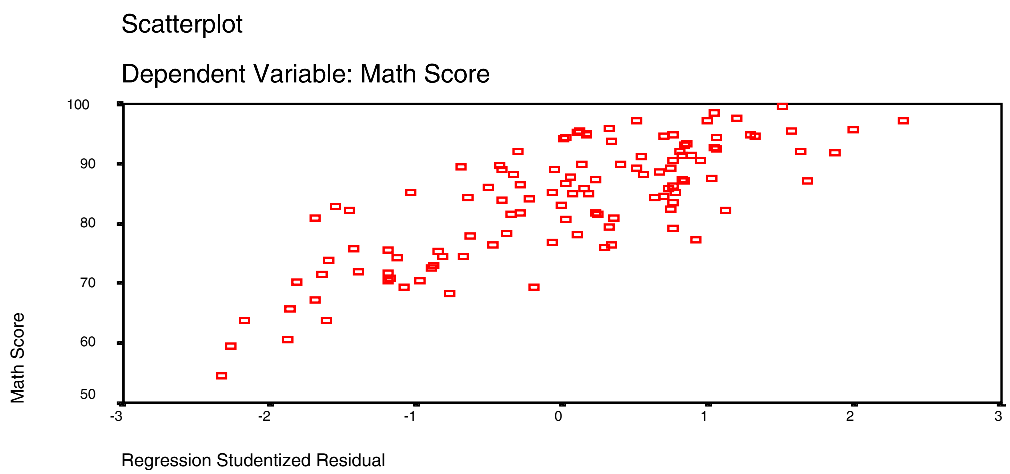
Table 21

Descriptive Statistics: Hispanic, African American, and Calendar

	Mean	Std. Deviation	N
Math Score	83.8273	9.7128	116
Year-round Vs Traditional	.5172	.5019	116
African American	17.0233	25.2151	116
Hispanic	47.2164	33.8478	116

A scatterplot indicated a linear effect.

Figure 3. Scatterplot: Hispanic, African Americans, and Calendar



The R and R squared was very meaningful. The R squared was now .383 with an adjusted conservative R squared of .367. The R squared with all the variables was .402 while the conservative Adjusted R squared was .357. The percent of variance with all variables within the criterion variable was within 10-19 percent of the variance of the criterion variable with the Hispanic, African American, and calendar year variables.

Table 22

Model Summary: Hispanic, African American, Calendar

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.619	.383	.367	7.7278

a. Predictors: (Constant), Hispanic, Year-round Vs Traditional, and African American
b. Dependent Variable: Math Score

Determination was made whether the difference between the two multiple R's was statistically significant. To test the null hypothesis that there was no significant difference, the test of significance was used to find the F between the two multiple R's. The F was found to be .6800. The underlying distribution of this test statistic was the F distribution. The critical value of this test statistic in the table was 2.29, assuming that alpha = .05, the critical value of F for 5 and 107 degrees of freedom. Since the computed value F = .6800 did not exceed the critical value of F (2.29), the null hypothesis was not rejected. Thus, the conclusion was that the three variables (Hispanic, African American, and calendar configuration) were as effective as all eight predictor variables, and that it was unnecessary to include any more predictor variables.

Continuing with Stepwise

Variables continued to be added to stepwise to determine how much weight a variable added. Each additional variable overlapped as the difference between math scores had already been accounted for. The scatterplot indicated a linear effect on all the following models in the stepwise configurations. The variables were added to stepwise according to the impact on level of significance. They were in order with the White student enrollment followed by the mobility, special education, economic disadvantaged, and size of enrollment. When the variables were added one at a time, the following table indicated how the R square changed.

Table 23

R Squares

Variable	R Square
Calendar	.101
African American	.268
Hispanic	.383
White	.388
Mobility	.398
Special Education	.401
Economic Disadvantaged	.402
Size	.402

White students were added, the R Square was .388, and the Adjusted R square for the sample size was .366. This indicated that 38.8 percent of the variation was accounted for with the variables of calendar, African American , Hispanic, and White students.

Table 24

Model Summary: White, Hispanic, African American, Calendar

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.623	.388	.366	7.7310

a. Predictors: (Constant), White, Year-round vs. Traditional, African American, and Hispanic
b. Dependent Variable: Math Score

In the ANOVA with these variables, the F was the computed value of 17.629 and a table value of 2.45 with a significant level of .000.

Table 25

ANOVA: White, Hispanic, African American, Calendar

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4214.729	4	1053.682	17.629	.000
	Residual	6634.303	111	59.768		
	Total	10849.032	115			

a. Predictors: (Constant), White, Year-round vs. Traditional, African American, Hispanic
b. Dependent Variable: Math Score

The coefficient table indicated that both calendar and African American were significant at the .05 level. The remainder variables were not significant as they were above the .05 significance level.

Table 26

Coefficients: White, Hispanic, African American, Calendar

		Non-standardized Coefficients		Standardized Coefficients	t	Sig.
Model		B	Std. Error	Beta		
1	(Constant)	111.440	17.280		6.449	.000
	Year-round Vs Traditional	-4.269	1.553	-.221	-2.749	.007
	African American	-.384	.177	-.996	-2.166	.032
	Hispanic	-.278	.174	-.970	-1.602	.112
	White	-.169	.178	-.564	-.952	.343

a. Dependent Variable: Math Score

As mobility of students was added, the R Square was .398. The Adjusted R square for the size of the sample was .371. This indicated that 39.8 percent of the variation was accounted for with the variables of calendar, African American, Hispanic, White students and mobility.

Table 27

Model Summary: Mobility, White, Hispanic, African American, Calendar

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.631	.398	.371	7.7043

a. Predictors: (Constant), Mobility, Hispanic, Year-round vs. Traditional, African American, White
b. Dependent Variable: Math Score

In the ANOVA with these variables, the computed F value was 14.556 and the table value of 2.29 with a significant level of .000.

Table 28

ANOVA: Mobility, White, Hispanic, African American, Calendar

Model		Sum of Squares	df	Mean Square	F	Sig.
	Regression	4319.854	5	863.971	14.556	.000
	Residual	6529.178	110	59.356		
	Total	10849.032	115			

a. Predictors: (Constant), Mobility, Hispanic, Year-round Vs Traditional, African American, White
b. Dependent Variable: Math Score

The coefficient table indicated that calendar and African American was significant at the p =. 05 significance level. The remainder variables were not significant as they were above the p =. 05 significance level.

Table 29

Coefficients: Mobility, White, Hispanic, African American, and Calendar

		Nonstandardized Coefficients		Standardized Coefficients	t	Sig.
Model		B	Std. Error	Beta		
1	(Constant)	119.012	18.136		6.562	.000
	Year-round vs Traditional	-4.083	1.554	-.211	-2.627	.010
	African American	-.411	.178	-1.067	-2.311	.023
	Hispanic	-.318	.176	-1.109	-1.811	.073
	White	-.223	.182	-.743	-1.228	.222
	Mobility	-.143	.108	-.121	-1.331	.186

a. Dependent Variable: Math Score

As the variable of special education students was added, the R Square was .401. The Adjusted R square for the size of the sample was .368. This indicated that 40.1 percent of the variation was accounted for with the variables of calendar, African American , Hispanic, White students, mobility, and special education.

Table 30

Model Summary: Special Ed., Mobility, White, Hispanic, African American, Calendar

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.633	.401	.368	7.7208

In the ANOVA with these variables, the computer value of F was 12.166 and the table value was 2.17 with a significant level of .000.

Table 31

ANOVA: Special Education, Mobility, White, Hispanic, African American, Calendar

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4351.424	6	725.237	12.166	.000
	Residual	6497.608	109	59.611		
	Total	10849.032	115			

The coefficient table indicated that calendar and African American were significant at the p =. 05 level of significance.

Table32

Coefficients: Special Education, Mobility, White, Hispanic, African American, Calendar

		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Model		B	Std. Error	Beta		
1	(Constant)	117.895	18.240		6.464	.000
	Year-round Vs Traditional	-3.954	1.567	-.204	-2.523	.013
	African American	-.385	.182	-1.000	-2.122	.036
	Hispanic	-.295	.179	-1.028	-1.647	.102
	White	-.192	.187	-.638	-1.024	.308
	Mobility	-.137	.108	-.115	-1.262	.209
	Special Education	-.147	.202	-.059	-.728	.468

a. Dependent Variable: Math Score

The R Square changed to 402 as the variable of economic disadvantaged students was added. The Adjusted R square for the size of the sample was .363. This indicated that 40.2 percent of the variation was accounted for with the variables of calendar, African American, Hispanic, White students, mobility, economic disadvantaged, and special education.

Table 33

Model Summary: Economic Disadvantaged, Special Education, Mobility, White, Hispanic, African American, and Calendar

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.634	.402	.363	7.7499

a. Predictors: (Constant), Economic Disadvantaged, Special Education, African American, Year-round vs. Traditional, Mobility, White, Hispanic
b. Dependent Variable: Math Score

In the ANOVA with these variables, the computed F was 10.376 and the critical table value of 2.09 with a significant level of .000.

Table 34

ANOVA: Economic Disadvantaged, Special Education, Mobility, White, Hispanic, African American, and Calendar

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4362.480	7	623.211	10.376	.000
	Residual	6486.552	108	60.061		
	Total	10849.032	115			

a. Predictors: (Constant), Economic Disadvantaged, Special Education, African American, Year-round vs. Traditional, Mobility, White, and Hispanic
b. Dependent Variable: Math Score

The coefficient table indicated that calendar and African American variables were significant at the .05 level. The remainder variables were not significant as they were above the .05 significant level.

Table 35

Coefficients: Economic Disadvantaged, Special Education, Mobility, White, Hispanic, African American, and Calendar

		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Model		B	Std. Error	Beta		
1	(Constant)	117.859	18.308		6.437	.000
	Year-round Vs Traditional	-4.002	1.577	-.207	-2.537	.013
	African American	-.376	.183	-.977	-2.052	.043
	Hispanic	-.282	.182	-.983	-1.549	.124
	White	-.195	.188	-.647	-1.034	.303
	Mobility	-.108	.127	-.091	-.853	.396
	Special Education	-.128	.207	-.051	-.617	.538
	Economic Disadvantaged	-2.332E-02	.054	-.069	-.429	.669

a. Dependent Variable: Math Score

As the variable of school size students was added, the R Square was .402. The Adjusted R square for the size of the sample was .363. This indicated that 40.2 percent of the variation was accounted for with the variables of calendar, African American , Hispanic, White students, mobility, special education, economic disadvantaged, and size. As there was no difference in the R Square when size was added, this indicated that there were no additional variations that were not already overlapped with other variables.

Table 36

Model Summary: Size, Economic Disadvantaged, Special Education, Mobility, White, Hispanic, African American, Calendar

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.634	.402	.363	7.7499

a. Predictors: (Constant), Economic Disadvantaged, Special Education, African American, Year-round vs. Traditional, Mobility, White, and Hispanic
b. Dependent Variable: Math Score

In the ANOVA with these variables, the computed F was 10.376 and the table value of 2.09 with a significant level of .000.

Table 37

ANOVA: Economic Disadvantaged, Special Education, Mobility, White, Hispanic, African American, and Calendar

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	4362.480	7	623.211	10.376	.000
	Residual	6486.552	108	60.061		
	Total	10849.032	115			

a. Predictors: (Constant), Economic Disadvantaged, Special Education, African
b. American, Year-round vs. Traditional, Mobility, White, Hispanic
Dependent Variable: Math Score

The coefficient table indicated that calendar and African American were significant at the .05 level. The remainder variables were not significant as they were above the .05 significance level.

Table 38

Coefficients: Economic Disadvantaged, Special Education, Mobility, White, Hispanic, African American, and Calendar

	Unstandardized Coefficients		Standardized Coefficients		t	Sig.
Model		B	Std. Error	Beta		
1	(Constant)	117.859	18.308		6.437	.000
	Year-round Vs Traditional	-4.002	1.577	-.207	-2.537	.013
	African American	-.376	.183	-.977	-2.052	.043
	Hispanic	-.282	.182	-.983	-1.549	.124
	White	-.195	.188	-.647	-1.034	.303
	Mobility	-.108	.127	-.091	-.853	.396
	Special Education	-.128	.207	-.051	-.617	.538
	Economic Disadvantaged	-2.332E-02	.054	-.069	-.429	.669

a. Dependent Variable: Math Score

By observing the change as variables were added in order of importance in the coefficient table of all variables, the more significant variables were calendar, African American, and Hispanic students. Other variables overlapped these variables. The percent of change as variables were added indicated a higher percent of change with calendar, African American and Hispanic. White, mobility, special education, economic disadvantaged and size had a lower percent of change.

Table 39

Combination and Order A: R Squares Change

Variable	R Square	Percent of Change
Calendar	.101	10.1
African American	.268	16.7
Hispanic	.383	11.5
White	.388	.5
Mobility	.398	1
Special Education	.401	.3
Economic Disadvantaged	.402	.1
Size	.402	0

Other Step Wise Configurations

When variables were placed in the formulas in a different order this indicated some of the overlap in variation. In the table below, the variables were placed in the table in order of year-round calendar, size, economic disadvantaged, African American, Hispanic, White, special education, and mobility. In this configuration calendar, economic disadvantaged, African American and Hispanic students indicated a higher significance level than size, White, special education and mobility. Economic disadvantaged students were significant in this order.

Table 40

Combination and Order B

Model Configuration Variables in the Order of Year-round Calendar, Size, Economic Disadvantaged, African American, Hispanic, White, Special Education, and Mobility.

Variables	R Square	ANOVA-F	ANOVA -Sig.	B	T	Sig
Calendar	.101	12.858	.000	-6.161	-3.568	.000
Size	.102	6.392	.002	-7.17	-1.85	.852
Economic Disadvantaged	.279	14.46	.000	-.149	-5.253	.000
African American	.369	16.256	.000	-121	-3.985	.000
Hispanic	.390	14.08	.000	-8.15	-1.939	.055
White	.396	11.921	.000	-.190	-1.038	.302
Special Education	.398	10.206	.000	-.125	-.588	.558
Mobility	.402	8.997	.000	-.108	-.849	.398

Variables when compared only with the math scores and not in combination of other variables indicate a significant level for calendar, African American, and Hispanic. Additionally, White, economically disadvantaged and mobility of students are significant. This indicates overlapping of White, economically disadvantaged, and mobility with the calendar, African American and Hispanic.

Table 41

Model of independent variables by themselves with the Math dependent variable

Variables	R Square	ANOVA-F	ANOVA - Sig.	B	T	Sig
Calendar	.101	12.858	.000	-6.161	-3.586	000
Size	.005	.522	.471	-2.89	-.723	.471
Economic Disadvantaged	.242	36.48	.000	-.167	-6.040	.000
African American	.152	20.399	.000	-.150	-4.517	.000
Hispanic	.058	7.013	.009	-6.91	-2.648	.009
White	.290	46.468	.000	.162	6.817	.000
Special Ed.	.004	.417	.520	-.151	.645	.520
Mobility	.161	21.836	.000	-.475	-4.673	.000

By entering a variety of combinations we have a different overlapping of variables. The economic disadvantaged variable overlaps with the African American and Hispanic variables. The economic disadvantaged variable overlaps negatively with the white variable. That is the African American and Hispanic students are economically disadvantaged while the white students are economically advantaged.

Table 42

Combination and Order C

Predictors	R Square	Adjusted R Square	Percent Change in R Square
Special Education, Size of School	.006	-.011	0.6
Special Education, Size of School, White	.305	.286	29.9
Special Education, Size of School, White, Calendar	.325	.300	2.
Special Education, Size of School, White, Calendar, Economic Disadvantaged	.328	.297	0.3
Special Education, Size of School, White, Calendar, Economic Disadvantaged, Mobile	.344	.307	1.6
Special Education, Size of School, White, Calendar, Economic Disadvantaged, Mobile, Hispanic	.379	.339	3.5
Special Education, Size of School, White, Calendar, Economic Disadvantaged, Mobile, Hispanic, African American	.402	.357	2.3

By reversing the order of variables and entering a different variety of combinations, we have a different overlapping of variations. The biggest change in the following table was the economic disadvantaged students by 24.2. Special education, size of school, and mobility are 2 or less percent change. Hispanic and African American, White, and calendar are all 2-6 percent change. This would indicate an over lap of economic disadvantaged with 24.2 of the total 40.2 percent of variation of all variables.

Table 43

Combination and Order D

Special Education, Size, Economic Disadvantaged, Mobility, Calendar, White, Hispanic, African American

Variables	R Square	Adjusted R Square	Change in R Square
Special Education	.004	-.005	0.4
Special Education, Size	.006	-.011	0.2
Special Education, Size, Economic Disadvantaged,	.248	.228	24.2
Special Education, Size, Economic Disadvantaged, Mobility	260	234	1.2
Special Education, Size, Economic Disadvantaged, Mobility, Calendar	.291	.259	3.1
Special Education, Size, Economic Disadvantaged, Mobility, Calendar, White	.344	.307	5.3
Special Education, Size, Economic Disadvantaged, Mobility, Calendar, White, Hispanic	.379	.339	3.5
Special Education, Size, Economic Disadvantaged, Mobility, Calendar, White, Hispanic, African American	.402	.357	2.3

Observing the two highest percent of change, we find overlapping. The change of variation in white when it is added first is 29 percent and when economic disadvantaged is added prior to ethnic variables it is 24.2 percent. In combination “A” African American is 16.7 percent and Hispanic acounts for 11.5 percent. In combination B economic disadvantaged is17.7 percent and African American is 9 percent. In combination “C” white is 29.9 percent while all the rest are under 4 percent. In combination “D” economic disadvantaged is24.2 percent and white is 5.3 percent. When white is high all the other variables are low. When economic disadvantaged is high, most other variables are low. When African American and Hispanic are high, most other variables are low.

Table 44

Change in R Square in Combination and Order tables

Variables	Self	A	B	C	D
Calendar	10.1	10.1	. 10.1	2	3.1
Size	0.5	0	. 0.1	.02	0.2
Economic Disadvantaged	24.2	.1	. 17.7	.03	24.2
African American	15.2	16.7	9	2.3	2.3
Hispanic	5.8	11.5	2.1	3.5	3.5
White	29	.5	0.6	29.9	5.3
Special Education	0.4	.1	0.2	0.4	0.4
Mobility	16.1	1	0.4	1.6	1.2

Range of Variables

The range of variables among the traditional and year-round schools varies. Traditional math scores vary 30.2 percent (68.2-98.4 percent) while year-round scores vary 45 percent (54.4-99.5 percent). The size of traditional schools have a range which varies 934 students (60-984) while year-round schools vary by 1,119 students (91-1210). The traditional school's economic disadvantaged students vary 98.8 percent (0-98.8 percent) while the year-round schools vary by 98.6 percent (0-98.6 percent). The traditional calendar schools vary by 97.1 percent (0-97.1 percent) with African American students. The year-round schools vary by 89.2 percent (0-89.2 percent) with the African American students. The traditional calendar schools vary by 97.8 percent (1.5-99.3 percent) with Hispanic students. The year-round schools vary by 93.5 percent (5.9-99.4 percent) with the Hispanic students. The traditional calendar schools vary by 95.3 percent (0-95.3 percent) with White students. The year-round schools vary by 88 percent (0-88 percent) with the White students. The traditional calendar schools vary by 18.2 percent (4.1-22.3 percent) with special education students. The year-round schools vary by 15.1 percent (4.4-19.5 percent) with the Special education students. The traditional calendar schools vary by a 36.2 percent (10.8-47 percent) mobility rate. The year-round schools vary by a 37.5 percent (5.9-43.4 percent) mobility rate.

Table 45

Range of all Variables by Calendar Configuration

Variable	Math	Math	Size	Size	Econ	Econ	Afri	Afri	Hisp	Hisp	White	White	Sp.Ed.	Sp.Ed.	Mobile	Mobile
Type	Trad	YRE	Trad	YRE	Trad	YRE	Trad	YRE	Trad	YRE	Trad	YRE	Trad	YRE	Trad	YRE
Low	68.2	54.5	60	91	0	0	0	0	1.5	5.9	0	0	4.1	4.4	10.8	5.9
High	98.4	99.5	984	1210	98.8	98.6	97.1	89.2	99.3	99.4	95.3	88	22.3	19.5	47	43.4
Range	30.2	45	934	1119	98.8	98.6	97.1	89.2	97.8	93.5	95.3	88	18.2	15.1	36.2	37.5

Comparison of Range of Year-round and Traditional Calendar

Schools by Variables

When one looks across the range of year-round and traditional schools there is an indication where there may be a concentration of the variables. Below is a comparison of year-round and traditional calendar schools by variables. The following charts are rank ordered from the lowest percentage or number at the left to the highest percentage or number to the right of the chart. These charts indicate weather the difference between variables in year-round and traditional calendar schools are consistent from the low end to the high end or if there is a particular section which is not consistent and therefore may have more weight in the variation of year-round and traditional schools. As the range of variables are observed there is a relationship with the chart on comparison of means.

Table 46

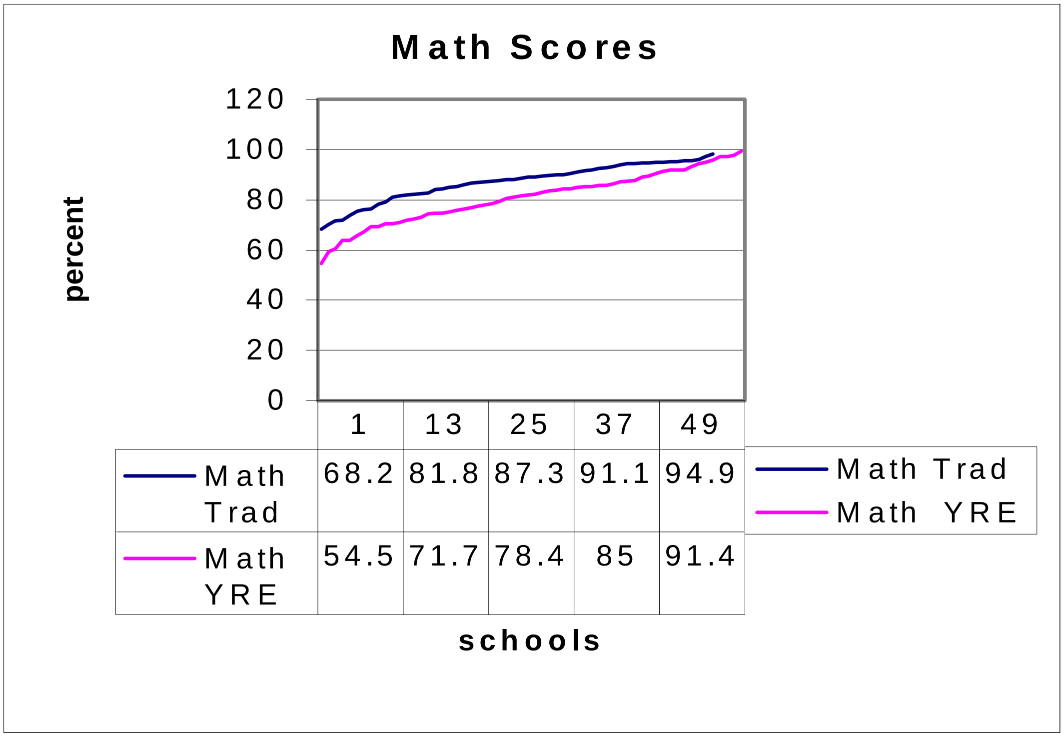
Comparison of Year-round and Traditional Calendar Schools Means

Variables		Math	Size	Economic Dis.	African	Hispanic	White	Special Ed.	Mobility
Traditional	Average	87.01	507.68	56.67	18.46	35.08	44.70	11.80	22.84
Year-round	Average	80.85	579.05	72.54	15.68	58.54	23.64	11.55	26.07
Difference in YRE		-6.16	+71.3	+15.87	-2.78	+23.46	-21.06	-.25	+3.23

Math Scores

Year-round schools have an mean average of 6.16 percent lower math scores than traditional schools. Observation of the math chart indicates that math scores are 13.7 percentage points apart on the low end of the math score range in year-round and traditional schools with year-round score being the lowest score at 54.5 and traditional being the highest score at 68.2. The medium math scores are closer together at 8.9 percentage points. At the high end of the range the gap is closed at 3.5 % difference. At the low end of the range of math scores year-round schools are not as close as at the high end of the range. Year-round schools have better scores at the high end of the range of math schools.

Figure 4. Line Chart Range Comparison of Year-round and Traditional Calendar Math Scores

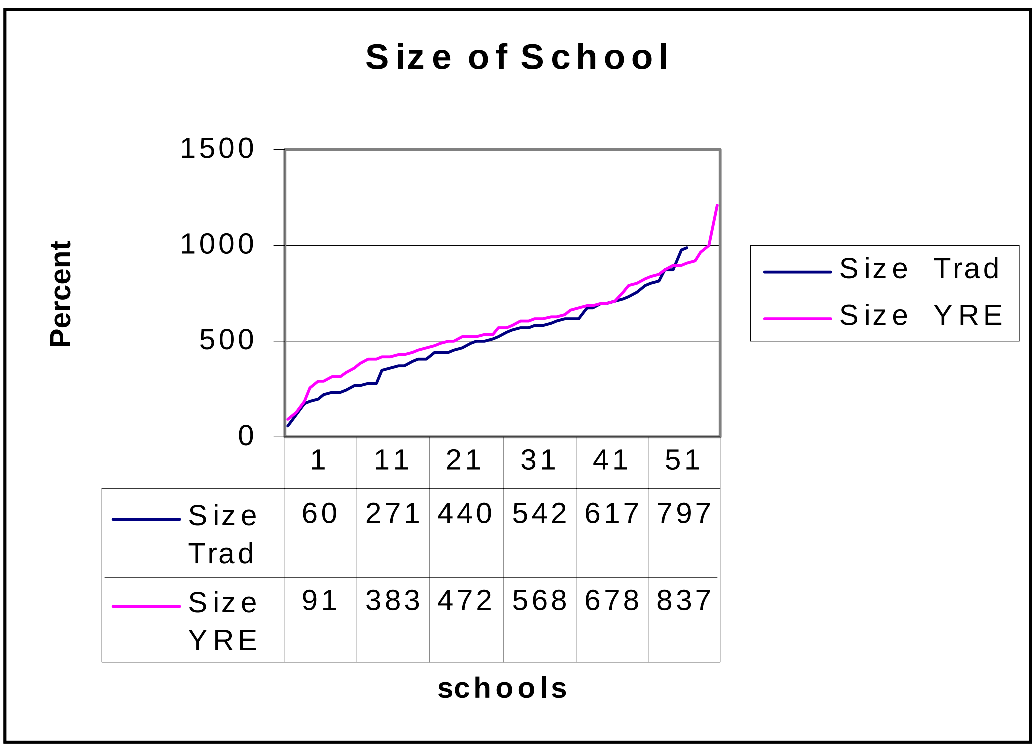


	1	13	25	37	49
Math Trad	68.2	81.8	87.3	91.1	94.9
Math YRE	54.5	71.7	78.4	85	91.4

Size of School

Year-round schools have an average of 71.37 more students than traditional schools. In schools with the smallest populations, year-round schools have 31 more students than traditional schools. In the 31st school in both rankings, year-round has only 26 more students. In the 51st schools in the rankings, there are 40 more students in year-round schools. However, in the second of the five points there are 112 more students in year-round schools than in traditional schools. Also, the highest year-round school (1,119 students) has 185 more students compared to the highest traditional school (934 students). Other than the second and last section of the range, the other points of the range are from 26-61.

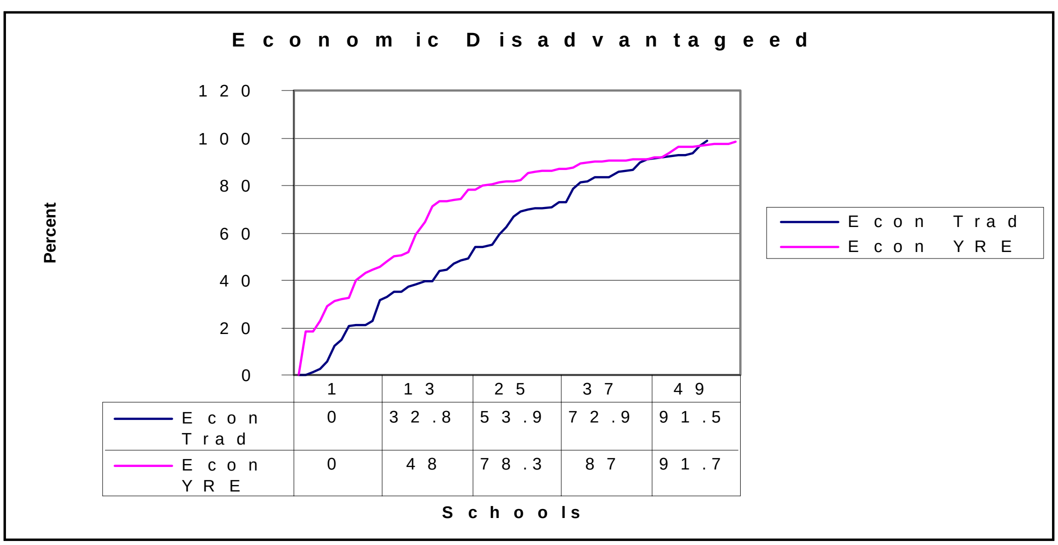
Figure 5. Line Chart Range Comparison of Year-round and Traditional Calendar Size of School



Economic Disadvantaged

Year-round schools have 15.87 percent more economic disadvantaged students than traditional schools. Both year-round and traditional schools have some campuses that have no economic disadvantaged students. In the second point, in the range categories, year-round schools have 15.2 percent more economic disadvantaged students. At the median school in the rank of each group, year-round has 28.4 percent more students than traditional schools. However, at the highest percentage end, on school number 49 in each group, year-round has only .2 percent higher economic disadvantaged students. Year-round and traditional schools have a high percent of economic disadvantaged students in a few schools. However, year-round schools consistently have a higher percent of economic disadvantaged students than traditional schools.

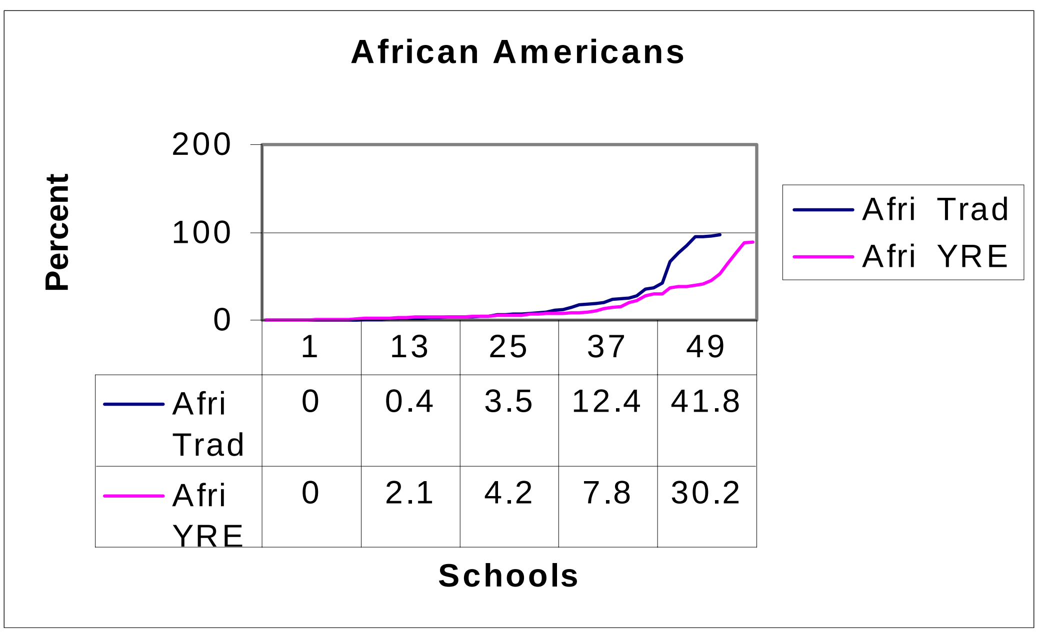
Figure 6. Line Chart Range Comparison of Year-round and Traditional Calendar Economic Disadvantaged



African American Students

In a comparison of year-round and traditional schools, both groups have less than 4.2 percent students in the lower half of the ranking order. However in the highest fifth, there is an uneven spread as both year-round and traditional schools have 30.2 percent or more African American students. The year-round schools have 30.2 percent while the traditional schools have 49 percent or more in this section. Year-round schools have a mean average of 2.78 percent less African American students than traditional schools. However, the African American students are largely grouped in one fifth of the schools; and in that top fifth, the year-round schools have 11.6 percent less African American students at school ranked number 49.

Figure 7. Line Chart Range Comparison of Year-round and Traditional Calendar African American

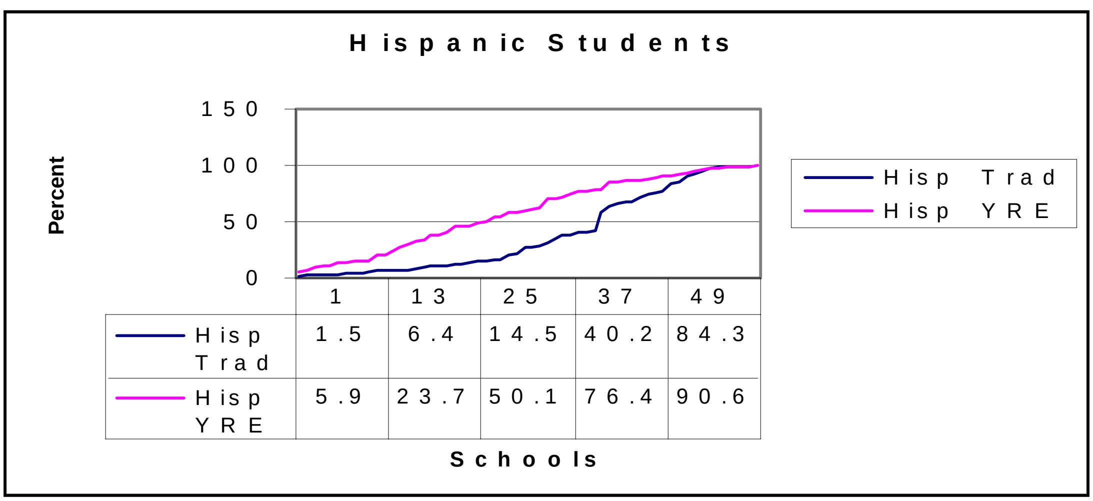


	1	13	25	37	49
Afri Trad	0	0.4	3.5	12.4	41.8
Afri YRE	0	2.1	4.2	7.8	30.2

Hispanic Students

Year-round schools have a mean of 23.4 percent more Hispanic students than traditional schools. Year-round schools have 4.4 percent more Hispanic students than traditional schools at the number one ranking level of both groups. Year-round schools have 35 percent more students at the 25th ranking number and 6.3 percent more students at the 49th school ranking number. The Hispanic student chart is the opposite of the African American chart in that the concentration of Hispanic students are more spread out rather than clustered together in large schools. They are also opposite as year-round and traditional schools increase in the percentage of Hispanic students, they gradually come to the same percentage at the top of the range (99.4 year-round and 99.3 traditional schools). The African Americans have a bubble of most of the students in the top fifth of the schools and abruptly come closer together at the top of the range (year-round 89.2 and traditional 97.1)

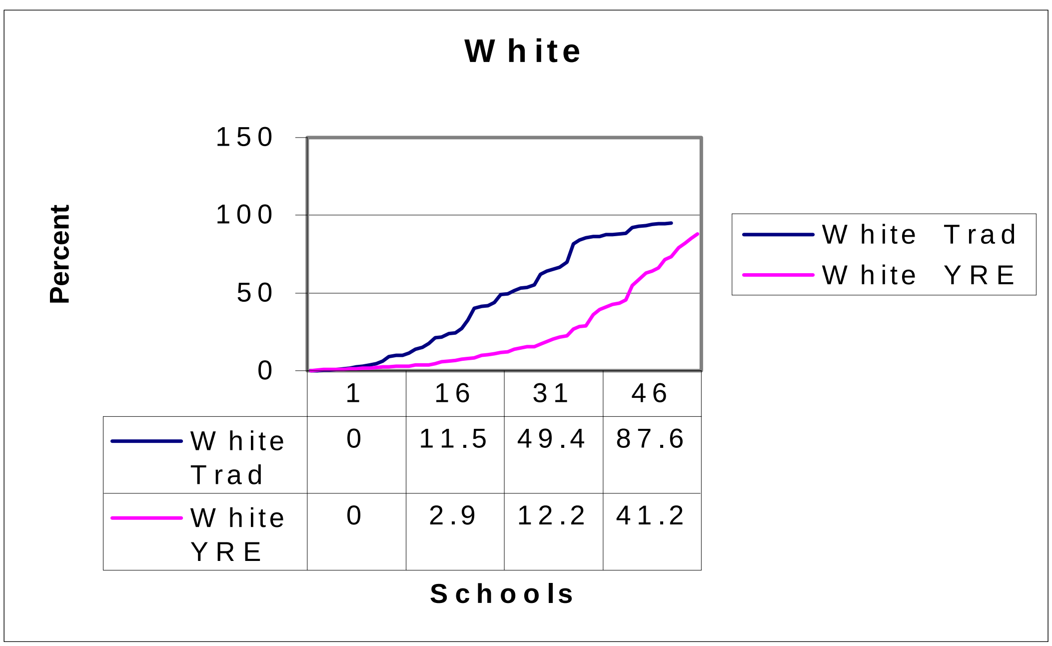
Figure 8. Line Chart Range Comparison of Year-round and Traditional Calendar Hispanic



White Students

Year-round schools have 21.1 percent less White students than traditional schools. The year-round schools have 8.6 percent less White students than traditional schools at the 16th ranking school. Year-round schools have 46.4 percent less white students than traditional schools at the 46th ranking school. Consistently fewer White students are in year-round schools than in traditional schools. The widest gap is in the middle two thirds of the chart that indicates more than double the percent of White students in traditional schools than year-round schools. On the bottom end of the range, there are schools in both variables, which have no White students. On the top end of the range, there are 88 percent of the year-round schools and 95.3 percent that are White students.

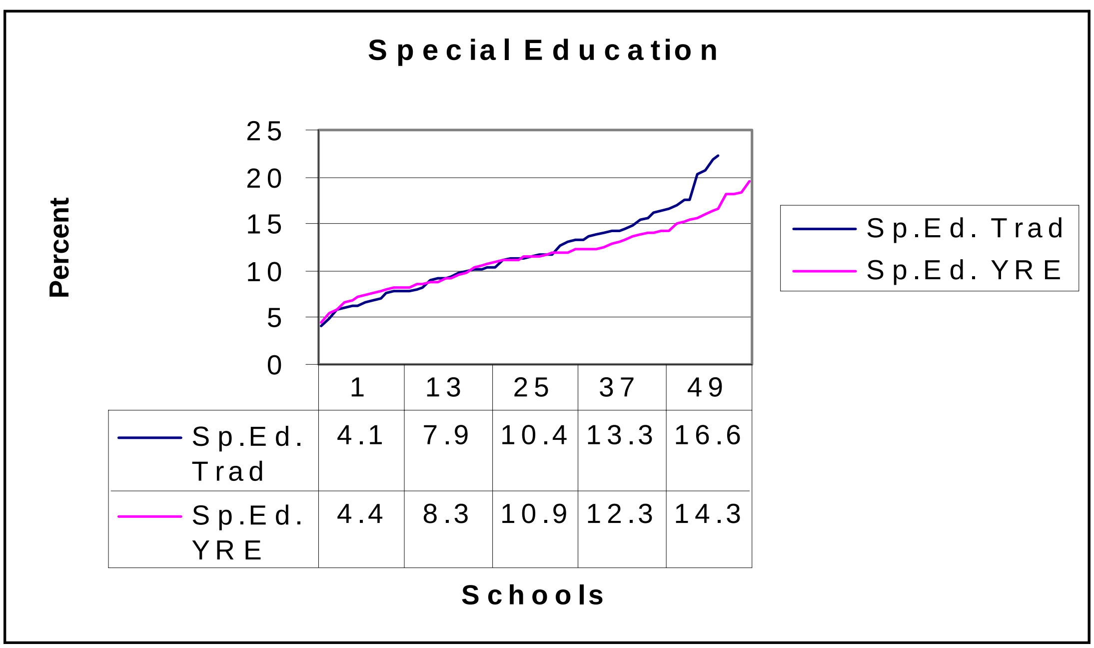
Figure 9. Line Chart Range Comparison of Year-round and Traditional Calendar White Students



Special Education Students

Special education services are provided at about the same rate in both year-round and traditional schools. Year-round schools have only 0.3 percent less special education students than traditional schools. Year-round schools parallel traditional schools in the first four of five divisions of the ranking with only one percent difference. However, at the top fifth of the ranks, there is a slight increase in traditional schools. It is important to notice that even though the math mean score is 6.2 percent lower in year-round schools, there is a slightly lower percent (.3 percent) of special education services provided in year-round schools. In 1998, special education students did not have to be tested by the Texas Assessment of Academic Skills (TAAS) evaluation; therefore, special education students' math TAAS scores were not a part of the study.

Figure 10. Line Chart Range Comparison of Year-round and Traditional Calendar Sp. Ed.

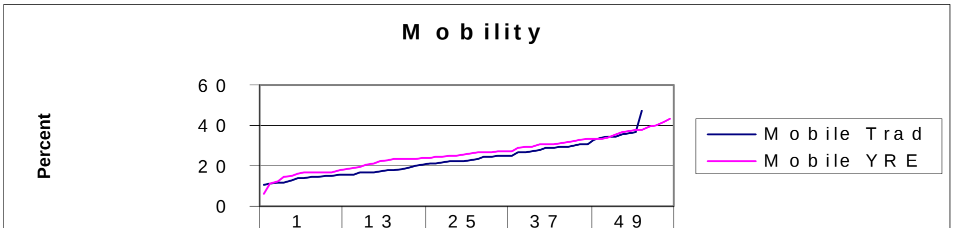


	1	13	25	37	49
Sp.Ed. Trad	4.1	7.9	10.4	13.3	16.6
Sp.Ed. YRE	4.4	8.3	10.9	12.3	14.3

Mobility

Year-round schools have a mean of 3.2 percent more mobility in their student body than traditional schools. Year-round schools have more mobility in their student body than traditional schools in almost all levels except the very bottom and very top of the ranks. Year-round schools (5.9 percent) have 4.9 percent less mobility than traditional schools (10.8 percent) at the lowest rank level 1 and at the very top of the ranking levels (year-round 43.4 percent and traditional 47 percent).

Figure 11. Line Chart Range Comparison of Year-round and Traditional Calendar Mobility



	1	13	25	37	49
Mobile Trad	10.8	15.5	21	25.2	32.9
Mobile YRE	5.9	18.6	23.9	27.3	33.6

When comparing year-round and traditional schools in Texas, the following observations are made. Year-round schools have 6.2 percent lower mean math score with 71.4 more students on campus. Year-round schools are demographically composed of 15.9 percent more economically disadvantaged students, 25 percent less special education students, 3.2 percent more student mobility, 23.5 percent more Hispanic students, 21.1 percent less white students, and 2.8 percent less African American students.

Relationship of Math Scores as Each of the Variables Increase in

Each Calendar Configuration

In the previous sections, differences have been noted in each variable in year-round and traditional schools. The year-round schools were lower in math scores (-6.2 percentage points), African Americans (-2.8 percent), White students (-21.1 percent), and special education students (-0.3 percent). Year-round schools were higher in size (71.4 students), economic disadvantaged (15.9 percent), Hispanic students (23.7 percent), and mobility (3.2 percent).

In this section, year-round and traditional schools will be observed by comparing the bottom half of the range of each variable with the top half and with math scores. This comparison will enable one to see what happens to math scores as each variable increases. Each variable was ranked and then divided after the 28th sample. The lower percentage group will be referred to as A and the higher percentage group will be referred to as B.

Size of School

Larger B year-round schools have a mean of 748.78 students with a mean math score of 81.4 percent. Smaller A year-round schools have a mean of 388 students with a mean math score of 80.3 percent. Schools that have a mean of 0.9 times larger have math scores 1.1 percent higher. Larger B traditional schools have a mean of 687.7 students with a mean math score of 86.23 percent. Smaller A traditional schools have a mean of 327.7 students with a mean math score of 87.80. Schools that have a mean of 1.09 times more students have 1.01 percent lower math scores. As student population increases in year-round schools math scores increase.As traditional schools increase, math scores decrease.

Table 47

Size and Economic Disadvantaged (Comparison of small and large sections in year-round and traditional schools)

	Size-YRE	Math-YRE	Math-Trad.	Size-Trad.	Economic-YRE	Math-YRE	Math-Trad.	Economic-Trad.
Large-B Group Mean	748.781	81.352	86.225	687.678	90.806	76.605	84.171	82.3714
Small-A Group Mean	388	80.282	87.803	327.678	51.664	85.707	89.857	30.975
Difference	360.781	1.070	-1.578	360.000	39.142	-9.101	-5.685	51.396
Percent of change from smallest half to the largest half.	0.929	0.013	-0.017	1.098	0.757	-0.106	-0.063	1.659

Economically Disadvantaged Students

Large "B" year-round schools have a mean of 90.80 percent of such students with a mean math score of 76.605. Smaller "A" year-round schools have a mean of 51.66 percent of such students with a mean math score of 85.70. "B" schools that have a mean of .75 times more students like these, have math scores 10.8 lower. Larger "B" traditional schools have a mean of 82.37 percent of such students with a mean math score of 84.171. Smaller "A" traditional schools have a mean of 30.975 percent of such students with a mean math score of 89.85. Schools that have a mean of 1.65 times more such students have math scores 5.6 percent lower. Year-round schools do not retain math scores as well as traditional schools as the percent of economically disadvantaged students increases. The math scores of year-round schools (9.1percent) have a 4.2 percentage point drop more than traditional schools with (5.6 percent) as the number of economically disadvantaged students increases.

African American Students

"B" year-round schools have a mean of 27.5 percent of such students with a mean math score of 78.7. Smaller "A" year-round schools have a mean of 2.2 percent of African American students with a mean math score of 83.3. "B" schools have a mean of 11.5 times more students of this ethnicity, and have math scores 4.6 percent lower. As year-round schools have a larger percent of African American students, the math scores decrease 4.6 percent. Larger "B" traditional schools have a mean of 35.4 percent of such students with a mean math score of 85.8 percent. Smaller "A" traditional schools have a mean of 1.5 percent of such students with a mean math score of 88.3 percent. Schools that have a mean of 21.9 percent more such students have math scores 2.5 percent lower. As a traditional school has a larger percent of African American students, the math scores decrease 2.5. The African American math scores of year-round schools do not retain their scores as well as traditional schools when the percent of such students increases.

Table 48

African American and Hispanics (Comparison of small and large sections in year-round and traditional schools)

	African-YRE	Math-YRE	Math-Trad	African-Trad	Hispanic-YRE	Math-YRE	Math-Trad	Hispanic-Trad
Group B mean	27.4812	78.7062	85.7785	35.375	83.9968	79.3928	86.0107	61.8071
Group A means	2.192	83.306	88.25	1.55	29.446	82.521	88.017	8.36
Difference	25.2892	-4.5997	-2.4714	33.825	54.5508	-3.1281	-2.0062	53.4471
Percent of change from smallest to largest	11.5370	-0.0552	-0.0280	21.8225	1.8525	-0.0379	-0.0227	6.3931

Hispanic American Students

"B" year-round schools have a mean of 83.99 percent of such students with a mean math score of 79.392. Smaller "A" year-round schools have a mean of 29.446 percent of such students with a mean math score of 82.521. "B" schools have a mean of 1.852 times more Hispanic students, and have math scores .037 lower. As a year-round school has a larger percent of Hispanic students, the math scores decrease .037. "B" traditional schools have a mean of 61.807 percent of such students with a mean math score of 86.010. Smaller "A" traditional schools have a mean of 8.36 percent of such students with a mean math score of 88.017. Schools that have a mean of 6.393 times more such students have math scores .022 lower. As a traditional school has a larger percent of Hispanic students, the math scores decrease 2.2 percent. Year-round schools do not retain Hispanic students' math scores as well as traditional calendar schools by 1.1 percent.

White American Students

"B" year-round schools have a mean of 41.1 percent of White students with a mean math score of 84.9. Smaller "A" year-round schools have a mean of 3.7 percent of such students with a mean math score of 76.3 percent. "B" schools have a mean of 10.1 times more White students and have math scores 11percent higher. As a year-round school has a larger percent of White students, the math scores increase 11percent. Larger "B" traditional schools have a mean of 75.6 percent of such students with a mean math score of 90.3 percent. Smaller "A" traditional schools have a mean of 13.8 percent of such students with a mean math score of 83.7. "B" schools that have a mean of 4.5 times more White students have math scores 7.9 percent higher. As a traditional school has a larger percent of White students, the math scores increases 7.9 percent. As the percent of white students is increased year-round schools (8.6 percent) increase math scores by 2 percent more than traditional schools (6.6 percent.

Table 49

White and Special Education (Comparison of small and large sections in year-round and traditional schools)

	White-YRE	Math-YRE	Math-Trad	White-Trad	Sp. Ed.-YRE	Math-YRE	Math-Trad	Sp. Ed.-Trad
Group B mean	41.07	84.87	90.32	75.63	14.1187	80.04	87.81	15.26
Group A Mean	3.71	76.26	83.71	13.78	8.61	81.784	86.21	8.32
Difference	37.36	8.61	6.61	61.8	5.51	-1.75	1.60	6.93
Percent of change from smallest to largest	10.08	0.11	0.08	4.48882	0.64	-0.02	0.02	0.83

Special Education Students

"B" year-round schools have a mean of 14.1 percent of such students with a mean math score of 80. Smaller "A" year-round schools have a mean of 8.6 percent of such students with a mean math score of 81.8 percent. "B" schools which have a mean of .6 times more special education students have math scores 1.8 percent lower. As a year-round school has a larger percent of special education students, the math scores increase 02.1percent. Larger "B" traditional schools have a mean of 15.3 percent of such students with a mean math score of 87.8. Smaller "A" traditional schools have a mean of 8.3 percent of such students with a mean math score of 86.2 percent. “B” schools which have a mean of .8 times more such students have math scores 1.8 percent higher. As a traditional school has a larger percent of special education students, the math scores increase 1.8 percent. Year-round schools decrease and traditional schools increase in math scores as the percent of special education students increases.

Mobility of Students

Table 50

Mobility of Students (Comparison of small and large sections in year-round and traditional)

	Mobility-YRE	Math-YRE	Math-Trad.	Mobility-Trad.
Group B mean	32.15	77.45	84.16	29.32
Group A Mean	19.13	84.74	89.86	16.37
Difference	13.02	-7.28	-5.71	12.94
Percent of change from smallest to largest	0.68	-0.09	-0.06	0.79

Considering the mobility of students, “B” year-round schools have a mean of 32.1 percent of such students with a mean math score of 77.5 percent. Smaller “A” year-round schools have a mean of 19.1 percent of such students with a mean math score of 84.7. B Schools which have a mean of .68 times more students like these and have math scores 8.5 percent lower. As a year-round school has a larger percent of mobile students the math scores decrease 8.5 percent. Larger “B” traditional schools have a mean of 29.3 percent of such students with a mean math score of 84.1 percent. Smaller “A” traditional schools have a mean of 16.4 percent of mobility students with a mean math score of 89.9 percent. “B” Schools which have a mean of 7.9 percent times more such students have math scores 6.3

percent lower. As a traditional school has a larger percent of mobile students, the math scores decrease 6.3 percent. The math scores of year-round schools drop 1.5 percent more than traditional schools as the percent of mobile students increases.

Conclusion

As a year-round school size is larger, the math scores increase 1.08percent. As a traditional school size is larger, the math scores are lower 1 percent. As a year-round school has a larger percent of economic disadvantaged students, the math scores decrease 10.8 percent. As a traditional school has a larger percent of economically disadvantaged students, the math scores decrease 6 percent. As a year-round school has a larger percent of African American students, the math scores decrease 5 percent. As a traditional school has a larger percent of African American students, the math scores decrease .028. As a year-round school has a larger percent of Hispanic students, the math scores decrease 3.7 percent. As a traditional school has a larger percent of Hispanic students, the math scores decrease 2.2 percent. As a year-round school has a larger percent of White students, the math scores increase 11 percent. As a traditional school has a larger percent of White students, the math scores increases 7.9 percent. As a year-round school has a larger percent of special education students, the math scores increase 2.1 percent. As a traditional school has a larger percent of special education students, the math scores increase 1.8 percent. As a year-round school has a larger percent of mobile students, the math scores decrease 8.5 percent. As a traditional school has a larger percent of mobile students, the math scores decrease 6.3 percent. Year-round schools do not perform as well academically as traditional schools in most areas.

Relationship of Math Scores as the Variables in Each

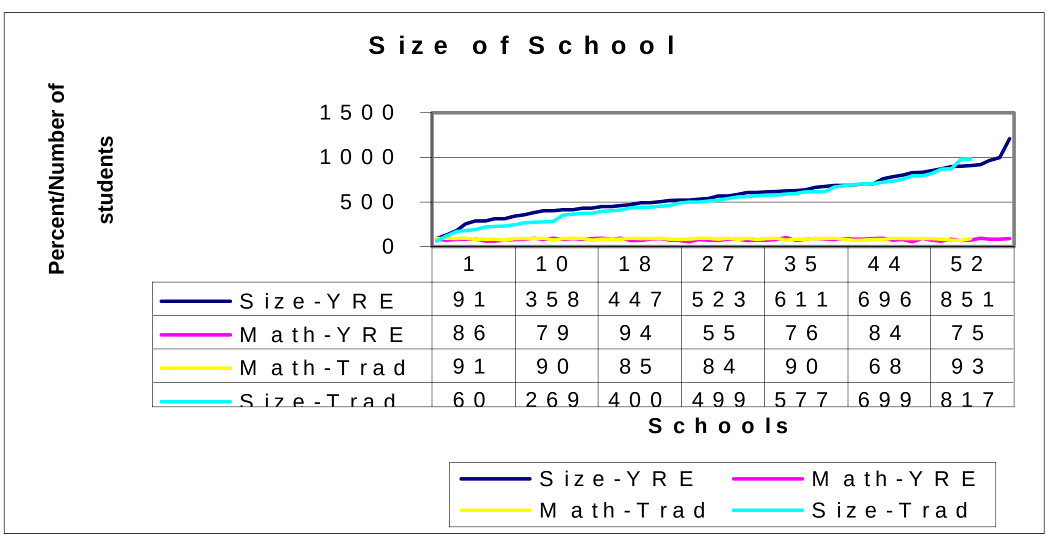
Calendar Configuration was Increased (see Appendix A)

This section compared the year-round and traditional math scores in each variable as that variable increased. This comparison allowed individuals to see if there was any significant math variation when year-round and traditional calendar schools were compared together along with the other variables. Each variable increased from low to high, with the matching math score of each sample.

Size of School

As the size of the year-round schools increased, there was an increase in math scores of one percent. As the size of the traditional schools increased, there was a decrease in math scores of one percent. The mean math score difference (6.16 percentage points) between year-round and traditional calendar schools was maintained throughout the range.

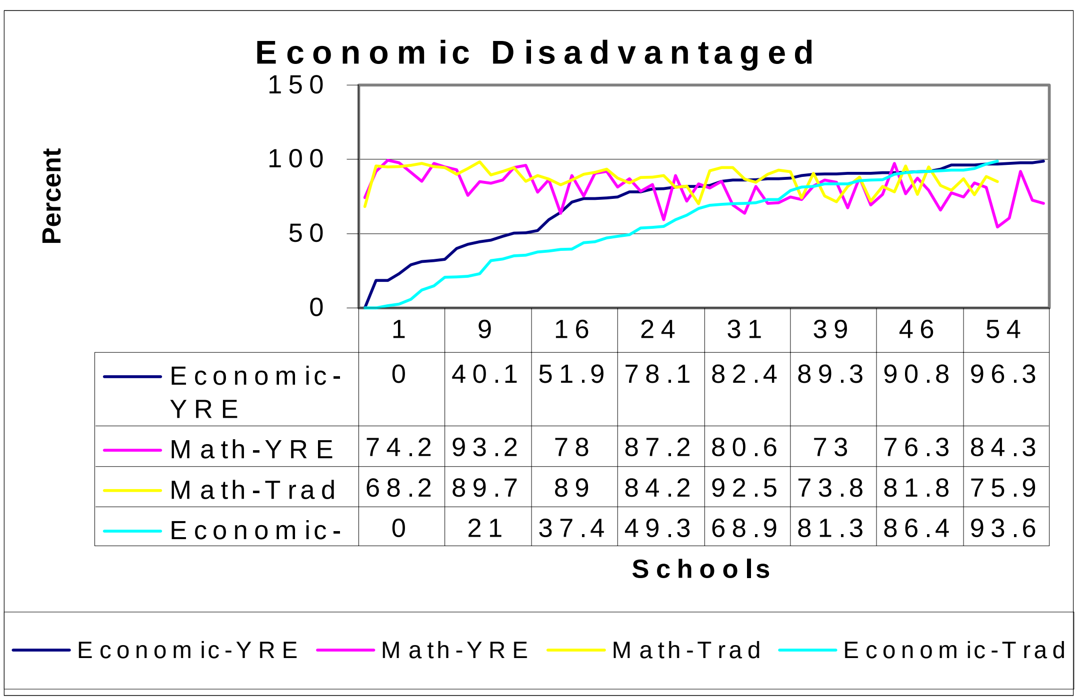
Figure 12. Size of School Increased



Economic Disadvantaged

As the percent of economic disadvantaged students increased, there was no significant difference in year-round and traditional schools math scores other than the mean 6.16 percent. On sample numbers 1, 9, 24 and 54, year-round schools were 3-8 percentage points higher than traditional schools. On sample numbers 16, 31, 39 and 46 year-round schools were 5-12 percentage points lower.. Year-round schools varied more along the range than traditional schools. Year-round schools varied from 11.9 percent below to 8.4 percent above the corresponding traditional school samples along the range. Though individual schools varied a great deal, the variation was consistent throughout the range.

Figure 13 Economic Disadvantaged Increased

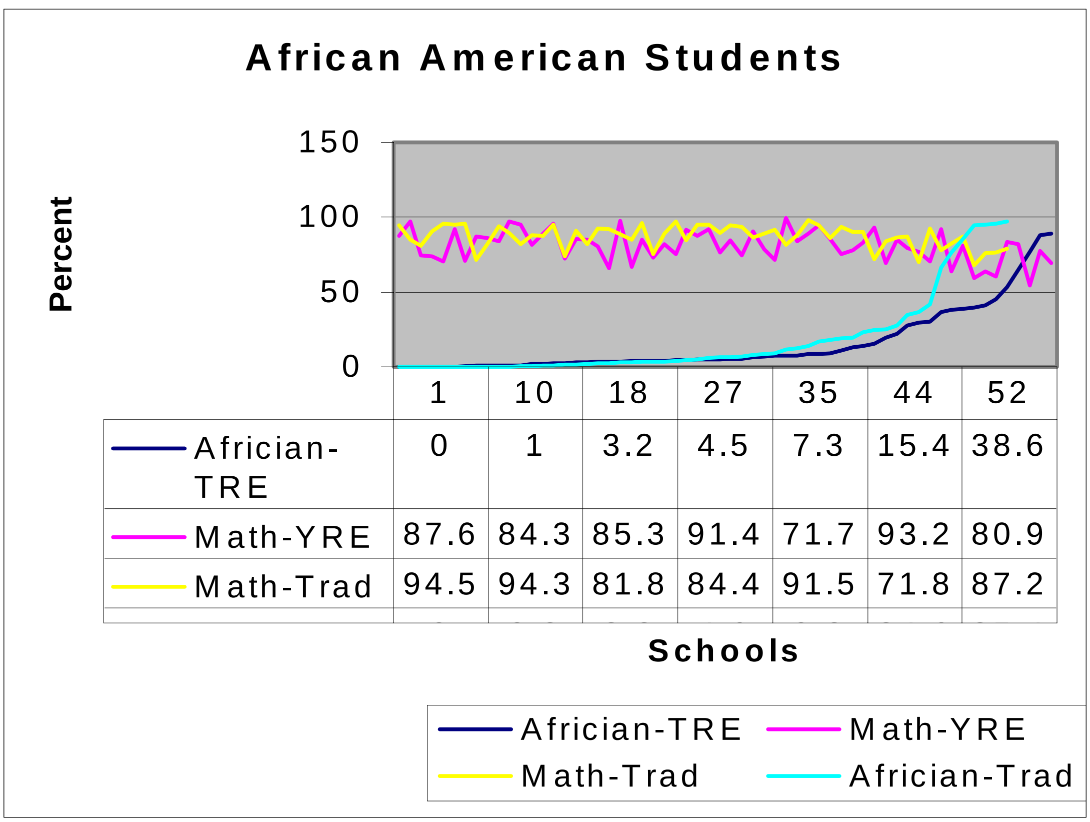


	1	9	16	24	31	39	46	54
Economic-YRE	0	40.1	51.9	78.1	82.4	89.3	90.8	96.3
Math-YRE	74.2	93.2	78	87.2	80.6	73	76.3	84.3
Math-Trad	68.2	89.7	89	84.2	92.5	73.8	81.8	75.9
Economic-	0	21	37.4	49.3	68.9	81.3	86.4	93.6

African Americans

As the percent of African American students increased, there was no significant difference in year-round and traditional schools' math scores other than the mean 6.16 percent. The exception effected the highest 10 schools in the range. On sample numbers 18, 27, and 44, year-round schools were 3 - 21 percentage points higher than traditional schools. On sample numbers 1, 10, 35, and 52, year-round schools were 6 - 19.8 percent lower. Year-round schools varied more along the range than traditional schools. As the percent of African Americans increased, the math scores gradually decreased in both year-round and traditional schools.

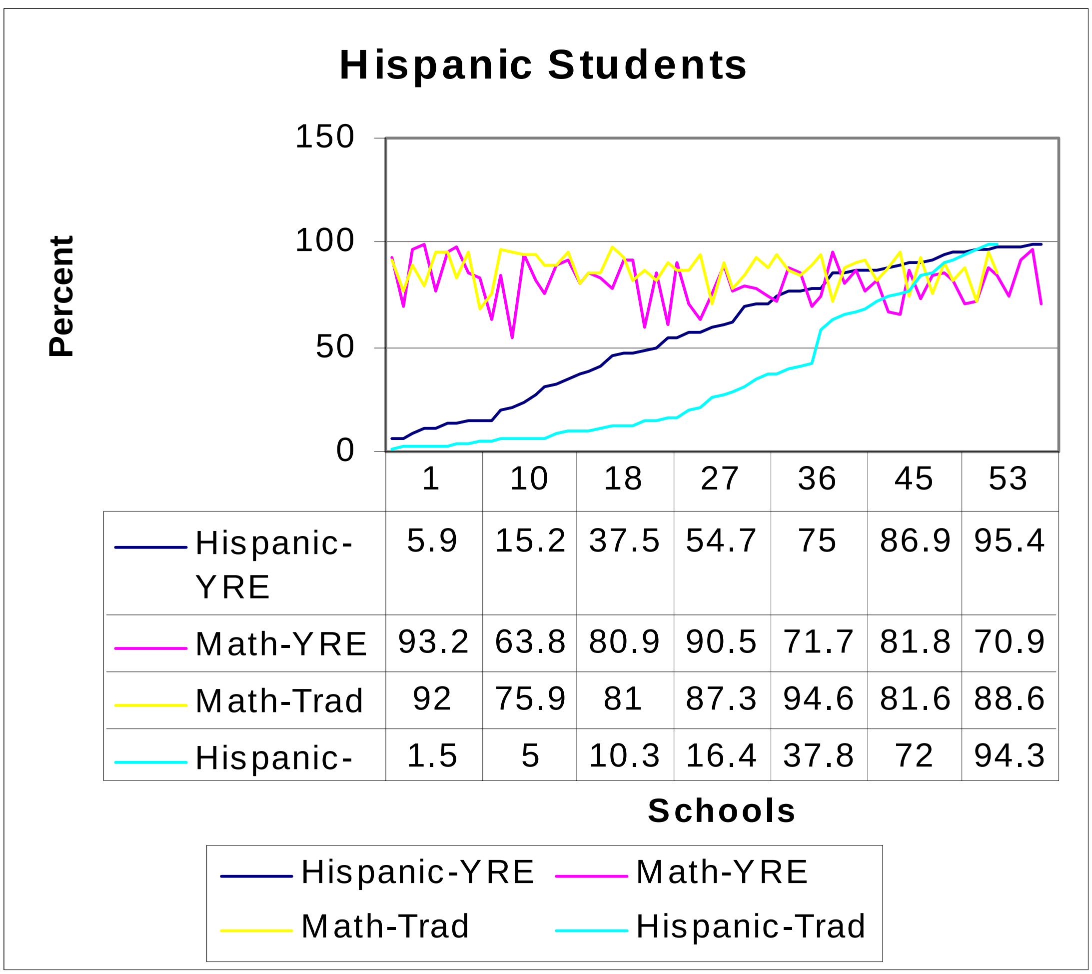
Figure 14. African American Students Increased



Hispanic Students

As the percent of Hispanic students increased in year-round schools, the math scores decreased. As the percent of Hispanic students increased in traditional schools, the math scores decreased. Year-round schools outperformed traditional schools in samples 1 and 27. Year-round schools under-performed traditional schools in sample numbers 10, 18, 36, 45, and 53. Year-round schools under-performed traditional schools, especially as the percent of Hispanic students increased in both schools.

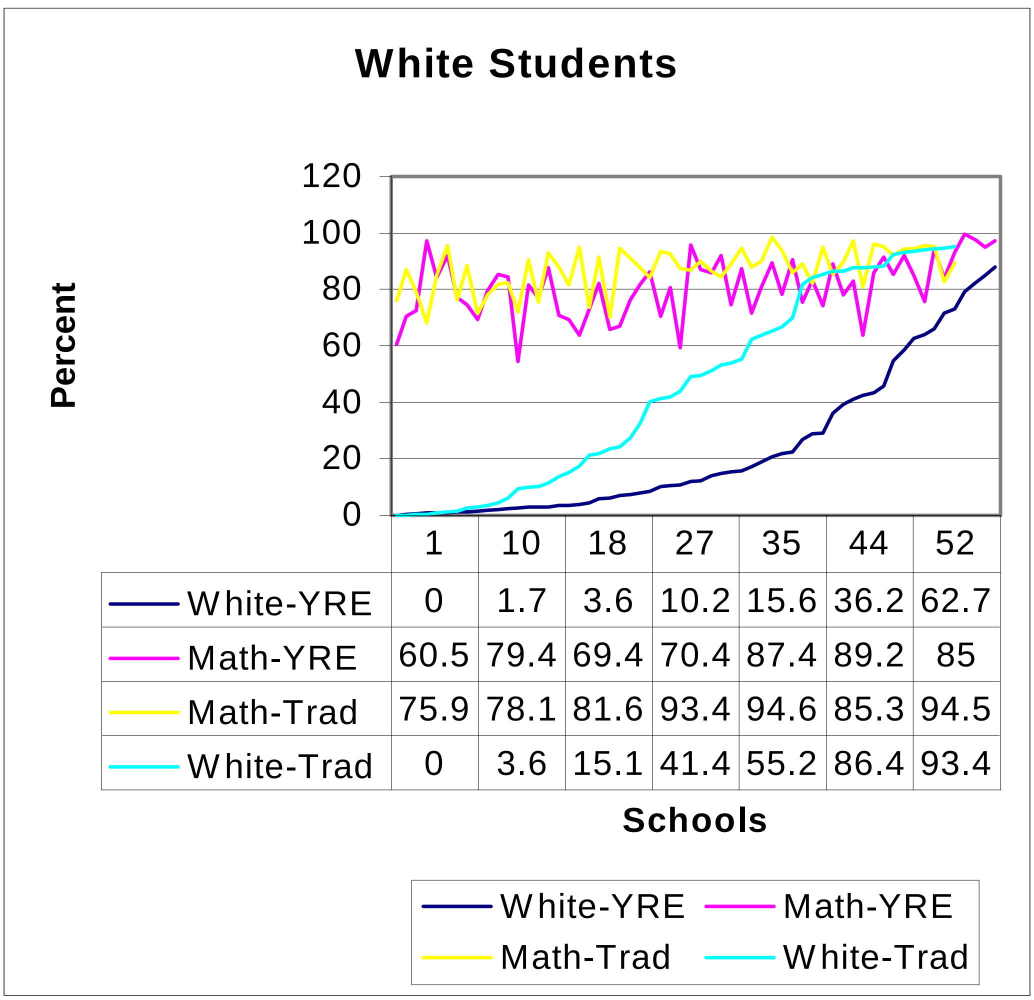
Figure 15. Hispanic Students Increased



White Students

As the percent of White students increased in year-round schools, the math scores increased. As the percent of White students increased in traditional schools, the math scores increased. Year-round schools out-performed traditional schools in sample numbers 10 and 44. Year-round schools under-performed traditional schools in sample numbers 1,18, 27, 35 and 52. Year-round schools under-performed in more sample schools than traditional schools.

Figure 16. White Students Increased

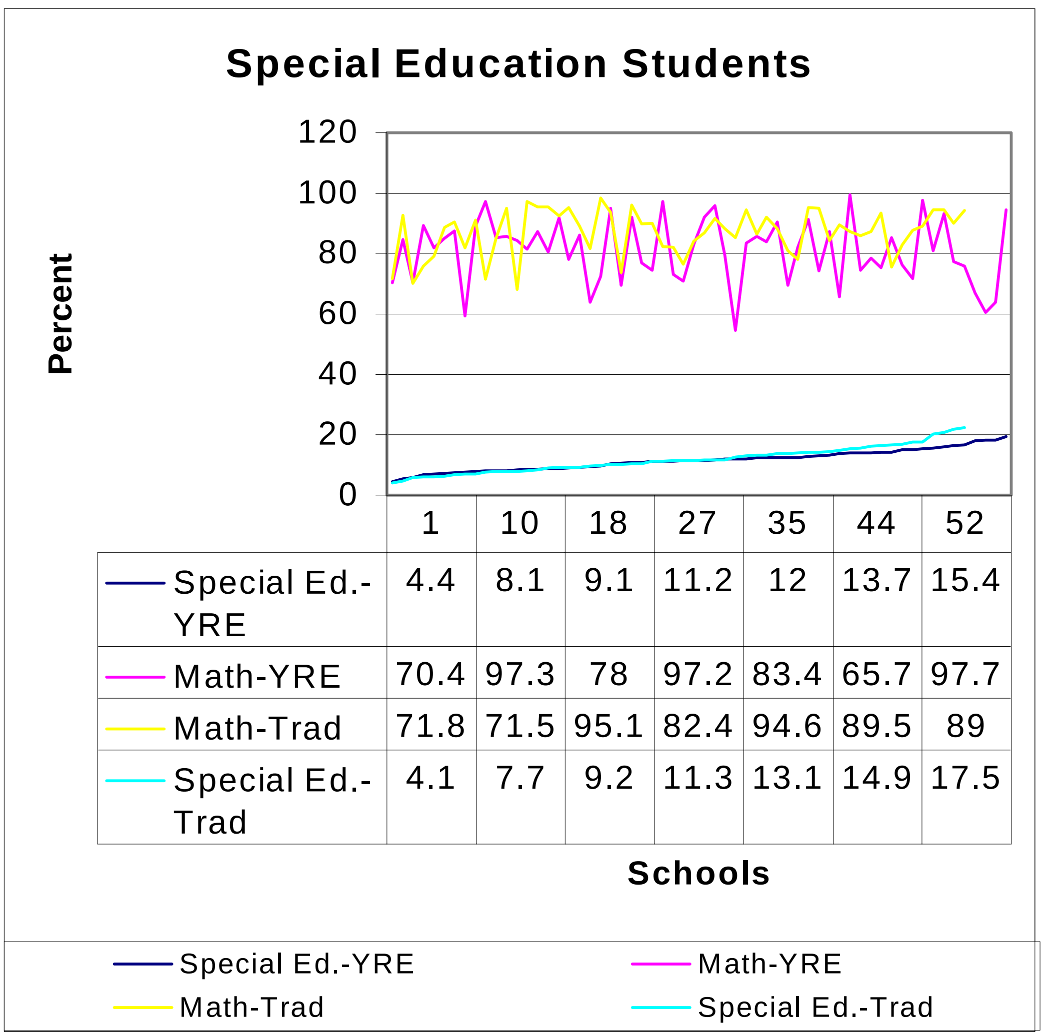


	1	10	18	27	35	44	52
White-YRE	0	1.7	3.6	10.2	15.6	36.2	62.7
Math-YRE	60.5	79.4	69.4	70.4	87.4	89.2	85
Math-Trad	75.9	78.1	81.6	93.4	94.6	85.3	94.5
White-Trad	0	3.6	15.1	41.4	55.2	86.4	93.4

Special Education

As the percent of special education students increased in year-round schools, the math scores decreased. As the percent of Special Education students increased in traditional schools, math scores decreased. Year-round schools outperformed traditional schools in sample numbers 10, 27 and 52. They under-performed in sample numbers 1, 18, 35 and 44. Both year-round and traditional schools varied more than twenty-six percent in math.

Figure 17. Special Education Increased

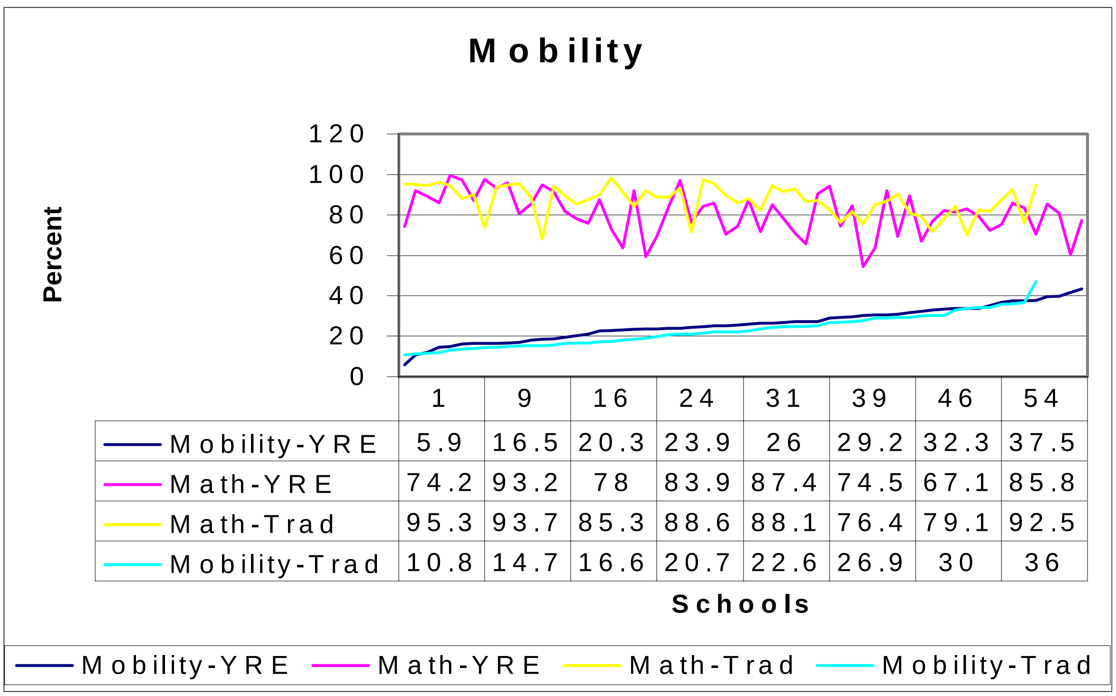


	1	10	18	27	35	44	52
Special Ed.-YRE	4.4	8.1	9.1	11.2	12	13.7	15.4
Math-YRE	70.4	97.3	78	97.2	83.4	65.7	97.7
Math-Trad	71.8	71.5	95.1	82.4	94.6	89.5	89
Special Ed.-Trad	4.1	7.7	9.2	11.3	13.1	14.9	17.5

Student Mobility

As the percent of student mobility increased in year-round schools, the math scores decreased. As the percent of student mobility increased in traditional schools, math scores decreased. Year-round schools under-performed in all samples along the range. Math scores varied all along the range, although higher math scores occurred in the lower mobility of students.

Figure 18: Increase in Mobility



	1	9	16	24	31	39	46	54
Mobility-YRE	5.9	16.5	20.3	23.9	26	29.2	32.3	37.5
Math-YRE	74.2	93.2	78	83.9	87.4	74.5	67.1	85.8
Math-Trad	95.3	93.7	85.3	88.6	88.1	76.4	79.1	92.5
Mobility-Trad	10.8	14.7	16.6	20.7	22.6	26.9	30	36

Year-round schools performed lower academically than traditional schools in most samples and variables. This was to be expected, however, since there was a higher number of economically disadvantaged students in year-round schools. This factor influenced all of the variables.

CHAPTER 5

FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

The purpose of this study was to determine the correlation between school calendar configurations and student achievement in mathematics as measured by the Texas Assessment of Academic Skills Test. This study investigated the statistically significant correlation between elementary campus mathematics achievement and the composite set of predictor variables: calendar arrangement, school size, economic disadvantaged, ethnic distribution, special education, and mobility. I found that a statistical difference between the academic math achievement of year-round students and the academic math achievement of traditional students existed. I expected to find a difference in the academic achievement of year-round versus traditional calendar schools. However, I expected the difference to show that the academic math achievement of year-round students was equal to, or better than, the academic math achievement of traditional calendar students. Contrary to my expectations, the findings of my research revealed that the 1998 mathematics TAAS scores of Texas year-round schools were lower than the math TAAS scores of traditional calendar schools. Nonetheless, the difference in scores was due largely to the different demographic student population of year-round schools as opposed to traditional schools. Additional statewide Texas studies could help clarify the impact of these demographic variables; and thereby, produce a more definitive conclusion to the issue concerning the effect of year-round education upon mathematics achievement in the public school system.

I expected the mathematics scores of year-round schools to be equal to, or better than, the math scores of traditional calendar schools because a majority of the national studies indicated a positive impact of year-round education upon student achievement. National studies conducted by Consolie, Cason, Sorensen, and Roby indicated that student achievement in year-round schools was equal to, or better than, traditional schools (table 4). Additionally, the majority of California and Texas studies indicated that year-round education had a positive impact upon student achievement. Studies conducted with California schools indicated that the year-round students had academic achievement equal to, or better than, than traditional calendar students (Table 6). The California studies were very influential because California had the largest number of year-round schools in the nation, and it also had one of the very first and longest running year-round schools in the present year-round school movement. When the New Jersey public schools were interested in the implementation of year-round education, they reviewed California's research. The findings showed that the effect of year-round education upon reading scores was not significant, but the mathematics achievement scores were equal to, or better than, the math scores of traditional schools. The majority of the research studies of Winters, Alcorn, and Six found year-round schools in California to be equal to, or better than, traditional schools.

In the 1990's, Texas public schools joined the year-round education movement in response to the California year-round research. In due course, Texas year-round studies indicated that year-round schools had equal, or better, student academic achievement than traditional schools. The studies of Loyd, McCasland, Kneese, Brinson, and Shook indicated that year-round students had equal to, or better than, academic achievement than students enrolled in traditional calendar schools. As a result of these studies, year-round schools in Texas increased in student enrollment to 187,000 in 1998. Accordingly, the district-wide year-round education program in Socorro, Texas served as a model for many other year-round schools in Texas. The research of this year-round school district, with its three National Blue Ribbon schools, certainly indicated that year-round student achievement was equal to, or better than, traditional school student achievement. The Socorro Independent School District implemented year-round education in 1991, and has the largest number of students enrolled in year-round schools in Texas. Socorro's student enrollment was ninety percent Hispanic and seventy percent economic disadvantaged; yet, the 1998 Hispanic TAAS scores (81.5 percent) were .9 percent above the state average. The economic disadvantaged TAAS scores (82.4 percent) were 3.7 percent above the state average. Subsequently, I expected the statewide investigation of student mathematics achievement, as measured by the TAAS, to disclose equal or higher math achievement scores for year-round students. Certainly, I did not expect the math achievement scores of year-round students to fall so many points (6.16%) below the statewide scores of traditional calendar students.

The most surprising aspect of this statewide study was the consistently significant correlation between mathematics achievement scores, the ethnic distribution of African American and Hispanic populations, the White student population, and the economic disadvantaged population. The findings that the economic disadvantaged variable was primarily responsible for the difference between mathematics achievement in year-round and traditional calendar schools parallel the findings of Woolley's Waco study. The economic disadvantaged variable was reflected in the Hispanic and African American student population in both Texas and Waco year-round schools. The Hispanic and African American student populations were even more economically disadvantaged in year-round schools than in the traditional calendar schools. The White student population was even more economically advantaged in the traditional schools than in the year-round schools. The lower math scores of the students in year-round schools also correlated with the higher percentage of economic disadvantaged students in the year-round schools. The higher math scores of the students in traditional schools also correlated with the economic advantaged students in those schools. Although the predominantly Hispanic and African American year-round students had lower TAAS math scores than the predominantly White traditional calendar students, the economic disadvantaged variable, rather than ethnicity or calendar configuration, was primarily responsible for the difference in math test scores. I expected to find that math test scores of year-round schools are equal to, or better than, the math scores of traditional calendar schools. The economic disadvantaged variable impacted the academic achievement in mathematics to such a degree that the null hypotheses proved false in a comparison of math scores between the two sets of schools. The comparison study resulted in a six-point differentiation between the TAAS mathematics scores of the school sets.

The following null hypotheses were addressed in this study. There will be no statistically significant correlation between elementary campus math achievement and the composite set of predictor variables:

1. Calendar arrangement (year-round versus traditional) will not significantly effect elementary academic achievement in mathematics.
2. School size will not significantly effect elementary academic achievement in mathematics.
3. Economic disadvantage will not significantly effect elementary academic achievement in mathematics
4. Ethnic distribution of the African American population will not significantly effect elementary academic achievement in mathematics.
5. Ethnic distribution of the Hispanic population will not significantly effect elementary academic achievement in mathematics.
6. Ethnic distribution of the White population will not significantly effect elementary academic achievement in mathematics.

7. Special education enrollment will not significantly effect elementary academic achievement in mathematics.
8. Student mobility will not significantly effect elementary academic achievement in mathematics.

These hypotheses were separated as both findings of independent variables and findings of these variables in multiple regression.

Findings

The findings of this study were expressed in a multiple regression statistic. The regression analysis employed was a multiple block design with predictors entered in several stages. These stages indicated interaction effects between mathematics achievement and demographic variables. When the variables were entered in the multiple block design, only the calendar configuration variable and the African American variable were statistically significant. When calculating the calendar variable alone it was found to be significant. When the African American variable was added to the calendar variable, it was also found to be significant at the p=.05 level of significance. However, when additional variables were added, they were found to be not significant at the p=.05 level of significance. Other multiple regression stepwise block designs were calculated. When these designs were correlated, the following findings impacted the calendar variables and helped to determine specific relationships that overlapped and impacted the calendar results.

The first finding of this study indicated that calendar configuration was statistically significant at the p=.05 level of probability. By itself, the year-round calendar configuration was accountable for 10.1 percent of the variation of 6.16 points on the TAAS test or slightly more than ½ point (.6). The school calendar variable was influenced by demographic variables of the student population. In other stepwise configurations, the findings indicated that when calendar configuration was inputted after the variables of ethnicity, economic disadvantage, and mobility, the calendar variable dropped to a two percent accountability for variation which was now only 1/10 (.0012) of one point on the TAAS test. Although this difference was statistically significant (.01 at the .05 probability level), for all practical purposes, it was not significant enough for the average student body to disrupt society by making the transition from traditional calendar to year-round calendar schools. However, year-round schools did perform better than traditional schools when specific demographic variables, especially the economic disadvantaged variable, were factored into the comparison. Even though year-round calendar schools had lower TAAS math scores than traditional calendar schools, the demographic variables influenced the overall outcome. The first finding lead into an investigation considering the impact of calendar configuration upon the mathematics achievement of specific demographic groups of students.

The second finding indicated that of the seven variables that impacted the calendar configurations, the African American variable was statistically significant at the p=.05 level. The African American (16.7) and calendar variables were two predictor variables that accounted for 26.8 percent of the 40.2 percent of the variance in the criterion variable. This finding was also indicated in Woolley's Waco study where African Americans and Hispanics were of a lower socioeconomic status and had lower average academic scores. The significant impact of the African American variable appeared to be unusually large, particularly considering the lower percentage of African American students involved in the study. When looking at the range of schools, ordered by the percentage of African Americans students in schools, the majority of African American students were skewed at the upper end of the range. Very few African Americans were in the lower two quadrants of the range. About two percent of the student populations enrolled in year-round and traditional schools were African American students). The third quadrant still showed few (three percent) African American students in year-round schools. However, the fourth quadrant of the range contained forty-two percent African American students. The grouping of this variable could cause the impact of the variable to be scrutinized and questioned.

Hence, additional study is warranted before major conclusions could be drawn concerning the impact of this variable. An observation of the change in R square, in other stepwise multiple regression combinations of variables, indicated that the African American variable overlapped with the variables of economic disadvantage and White ethnicity. When the economic disadvantaged variable was considered, the African American variable was reduced almost in half (from 16.7 percent to 9 percent). When this variable was inputted after all the other variables, the responsibility for variance dropped to only two-percent (2.3). Therefore, the major responsibility for the difference in the mathematics scores of year-round African American students was correlated with the economic disadvantaged variable within the top range of the African American population, rather than the ethnicity variable.

The third finding revealed that the majority of Texas students in year-round schools were Hispanic (58%) in 1998. Studies by Ritter (San Antonio), Dune (Austin, Conroe, and Waxahachie), Curry (Austin), Barron (Arizona), Quinlan (state of California), and Kneese (Alameda, Calif.) found that year-round schools under certain conditions offered a special benefit to E.S.L. (English as a Second Language) and bilingual students. Although, Hispanic students were not necessarily enrolled in ESL and Bilingual programs, a higher percentage of Hispanic students were enrolled in these programs than were the African American or White ethnic variables. Texas schools had a higher percentage of Hispanic students enrolled in year-round schools than traditional schools. I expected to find that Hispanic students in year-round schools had higher mathematics scores than those enrolled in traditional schools. However, the economic disadvantaged and African American variables overshadowed the Hispanic variables and the result was lower mathematics scores in year-round schools. The Hispanic ethnicity variable was not the major factor in the difference between year-round and traditional calendar mathematics scores. When the Hispanic variable was entered first (before other variables) in the stepwise program, it then became statistically significant (at the $p=.05$ level). The Hispanic variable by itself was responsible for 3/10 of one-point lower math scores than

traditional schools (5.8 percent of 6.1 points). However, the Hispanic variable became insignificant when added stepwise after the other variables were entered especially the economic disadvantaged variable. The Hispanic variable also had a very high positive correlation with the economic disadvantaged variable (61.5 percent correlation). The percent of economic disadvantaged student enrollment increased parallel to the percent of increase in Hispanic student enrollment. Significantly more economic disadvantaged Hispanic students were enrolled in year-round schools while the more economic advantaged students were enrolled in traditional schools.
Schools that contained more economically disadvantaged students (76.6) had a mean math score (three percent) lower than the Hispanic schools (79.3). These statistics lead to the conclusion that the mathematics TAAS scores in year-round calendar schools were lower because of the economic disadvantaged variable. The economic disadvantaged variable overshadowed the Hispanic ethnic variable.

The fourth finding showed that there was a negative correlation (-82.8 percent) between the White variable and the economic disadvantaged variable. The economic advantage of the White students was responsible for a major portion of the academic success of the traditional calendar schools over the year-round calendar schools. The lack of economic advantaged students in year-round schools accounted for the lower math achievement scores in those schools. Almost twice the percent of White students were enrolled in traditional calendar schools (44%White) as were enrolled in year-round schools (23 % White). The percentage of White students was statistically significant when entered independently. The White ethnicity variable maintained a large responsibility (R square of 29) for the difference between year-round and traditional school test scores. However, when the White block was added stepwise after economic disadvantage, it became responsible for only about one-sixth of that difference (R square of 5.3). About eighty percent of the White variable influence was absorbed by the economic advantage of the White students. When the White variable was inputted after the two other ethnic variables (African American and Hispanic), and prior to economic disadvantaged, it remained about the same (R square of .5). These results indicated that the African American and Hispanic ethnicity variables overlapped with the economic disadvantaged variable. The importance (concerning scores) of the African American and Hispanic variables overlapped in an opposing manner with the White variable. Likewise, the economic disadvantaged variable overlapped in an opposing manner with the White variable. A high negative correlation (-82.8 percent) existed between the White variable and the economic disadvantaged variable. A negative correlation existed between the Hispanic and White variables (-70%) correlation and the African American and White (-34%) variables. The conclusion was that the difference in academic success between the White students in traditional and year-round schools was explained by the low proportion of the economic disadvantaged variable within the White variable, rather than the White ethnic variable itself.

The fifth finding revealed that the economic disadvantaged variable accounted for the major difference between year-round and traditional calendar school test scores. The economic disadvantaged variable accounted for lower student test scores (76 percent in year-round schools) than any of the other variables considered. Year-round schools were composed of an average of 73 percent economic disadvantaged students while an average of 57 percent of the student population in traditional schools was economically disadvantaged. There were 28 percent more economic disadvantaged students were enrolled in year-round schools than in traditional schools. The economic disadvantaged variable was responsible for the major difference between math test scores in year-round and traditional schools.

The following year-round education studies indicated a special benefit of year-round schools for at-risk or economically disadvantaged students: Campbell (Carrollton, Ohio), Kneese (Alameda, California and Conroe, Texas), Willis (Cypress Fairbanks), Ritter (San Antonio), Dune (Austin, Conroe, and Waxahachie), Wolley (Waco), and Curry (Austin). W. D. Campbell found in his study of West Carrollton, Ohio that year-round schools had a special benefit for at-risk students; and, many at-risk students came from low economic backgrounds. Dr. C. Kneese found in her study of Alameda, California and Conroe, Texas that low economic disadvantaged students, as well as students who had English as a second language, benefited from year-round schools. The Socorro Independent School District comparison of TAAS math scores from 1994 – 1997 showed eleven percentage points of increase during the three-year period. Subsequently, a desegregated data comparison report of economic disadvantaged students proved that the Socorro students outscored their counterparts throughout Texas. N. Brekke, in the Oxnard, California study, had an important insight that even though the test scores were lower in year-round schools, the "rate of increase" in test scores was higher in year-round schools, and economic disadvantaged students (Chapter I) especially benefited from such a calendar arrangement. When comparing the benefits of year-round schools versus the benefits of traditional calendar schools, it is important to make a longitudinal comparison of student test scores over a period of years. The comparison should measure the improvement of a particular set of students, comparing from the point where they began to the point where they have progressed.

The percent of economic disadvantaged students, entered independently as a variable, was statistically significant at the p=.05 level and was responsible for twenty-four percent of the difference in math test scores between year-round and traditional schools. The half of the Texas schools that had the greater number of economically disadvantaged students (77 points) dropped nine points on the TAAS test when compared to the half of the schools with fewer economically disadvantaged students (86 points). Considering that 73 percent of the year-round students were economically disadvantaged lead to the question, "How low would the mathematics TAAS scores of traditional calendar schools be if 73 percent of their students were economically disadvantaged?" The research data indicates that the mathematics TAAS scores would drop parallel to the increase in enrollment of economic disadvantaged students. Economic disadvantaged, at-risk, and English as a second language (E.S.L) students will benefit from the year-round calendar configuration, which allows for more frequent breaks throughout the year and a shortened summer break. Many Texas school districts have compromised and implemented some of the beneficial features of the year-round school calendar within their traditional calendar. They have included more frequent breaks during the school year in the form of more holiday vacation days and extra fall, winter, and spring breaks.

The sixth finding showed that student mobility, entered independently to stepwise, was statistically significant at the p=.05 level. Student mobility was responsible for 16.1 percent (1 point) of the six-point difference in math test scores. Mobility had a large correlation (63 percent) to the economic disadvantaged variable. When mobility was added to stepwise after the economic disadvantaged variable, that 16.1 percent dropped to only 1.2 percent responsibility (0.07 of a point). There was a high correlation (.61) between mobility and economic disadvantaged students. When the mobility variable was added to stepwise after the ethnic variables, and prior to the economic disadvantaged variable, mobility still maintained only 1 percent responsibility. Mobility was one of the prevalent traits of economic disadvantaged students.

Surprisingly, the correlation between the Hispanic ethnicity and mobility variables (16 percent) was lower than the correlation of mobility with the African American variable (40 percent). The White variable had a negative correlation of (-50 percent). African American students move more frequently than Hispanic students, and White students move least often.

One reason that year-round schools had lower scores was correlated with the mobility variable (- 40 percent) of the economic disadvantaged students (- 49 percent). The more of these demographic variables that were prevalent within a group of students, the lower the TAAS scores. Students who moved frequently had a greater tendency to be economically disadvantaged, and had lower academic performance. Year-round schools had a higher percent of mobility in students. Year-round schools were just as effective in helping these students perform at their ability levels as the traditional schools.

The seventh finding indicated that the special education variable was not statistically significant, either by itself (0.4 percent responsibility), or following other variables. About the same were enrolled in traditional schools (11.8). I expected to find a higher percentage of special education students in the year-round schools correlated with the lower math TAAS scores. Special education services were provided when the achievement level of a student fell significantly below the ability level of that student. If the ability of a student was low and the achievement level was also low, that student would not necessarily qualify for special education services. The inference imbedded in this finding is that the average ability level for academic performance is lower in year-round schools than in traditional schools. The students' lower cognitive ability, limited English proficiency, emotional distress caused by frequent mobility, or other factors may influence student ability for academic achievement. Year-round schools have more students in this category. Therefore, these students may be producing academic achievement commiserate with their potential equal to, or better than, the students enrolled in traditional schools.

The eighth finding revealed an additional surprise that the size of a school was not statistically significant, either by itself (0.5 percent) or combined with other variables. The average year-round school (579) had 71 more students than traditional schools (508). Nevertheless, the correlation with math scores (- .06), as well as the R square in relationship with other variables, was negligible in the school size variable.

Conclusions

The null hypothesis that there will be no statistically significant correlation between elementary campus math achievement and the composite set of predictor variables was rejected. The school size and special education variables did not have a statistically significant correlation to calendar arrangement. However, economic disadvantage, mobility and ethnic distribution did have a statistically significant correlation to math achievement.

A comparison of the combination of variables that were entered in the multiple regression, lead to the findings of this study. The findings concluded that White students, economic disadvantaged students, and the combination of minority African American and Hispanic students were overlapping variables that were responsible for the differences in math scores between year-round and traditional calendar schools. The minority ethnic variables overlapped with the economic disadvantaged variable and the White variable. The economic disadvantaged variable overlapped with the minority ethnic variables and the White variable. The White variable overlapped with both the ethnic minority variable and the economic disadvantaged variable. Calendar variations accounted for only 2.0 of the 40.2 percent variation when preceded by White, economic disadvantaged and African American and Hispanic ethnic variables. Calendar variation represented one-tenth of one point on the math score (2% of the 6.16% math score) difference between year-round and traditional math scores. The very small variation in the TAAS math scores between year-round and traditional schools demonstrated that the academic difference between school calendars was not significant. Other unidentified variables may be responsible for the remaining variation. The null hypothesis that there will be no statistically significant correlation between elementary campus math achievement and the composite set of predictor variables was rejected because the economic disadvantaged variable and the ethnic distribution variable significantly correlated with elementary mathematics achievement as measured by the TAAS test.

Meaning of the Study

Even though the findings indicated a statistically significant difference between year-round and traditional schools, the difference in demographic population enrollment between the two school calendars accounted for most of the difference. The economically disadvantaged variable overlapped the ethnicity variables of year-round schools. This factor indicated that the students in year-round schools were more economically disadvantaged than those students enrolled in traditional schools. The African American students enrolled in a particular school accounted for the most significant difference between year-round and traditional schools. However, the findings also indicated that the African Americans were skewed at the top of the range; thereby, impacting the significance of the finding and exaggerating the significance of the variable. The year-round schools had more Hispanic and economically disadvantaged students than traditional schools. These variables significantly overlapped; thereby, indicating that economic disadvantage rather than ethnicity was the variable most responsible for the lower math TAAS scores. The largest change in R square (29.2) in all the combinations of multiple regression statistics occurred in the White variable. This was expected because the White variable impacted and overlapped the minority ethnicity variable and the economic disadvantage variables in a negative correlation.

Suggestions for Future Study

The most relevant suggestion for future study is to investigate the correlation between academic achievement and the economic disadvantage and ethnic distribution variables on a statewide basis. An investigation considering the effect of the African American ethnic distribution on academic achievement of year-round schools is warranted. When the range of schools, ordered by the percentage of African American students in a school, was examined statistically, a large number of the African American students were skewed at the upper end of the range with few in the middle or lower end of the range. A study with the African American students more evenly distributed throughout the range should give a more accurate reflection of the ethnic distribution variable. A future study will need to focus on those campuses that have a larger proportion of African American students enrolled in year-round schools so that the majority of African American students will not be skewed at the upper end of the range in year-round schools verses traditional calendar schools.

A second recommendation for future research includes a longitudinal statewide study of Texas year-round schools comparing student achievement on the TAAS prior to, and following, the adoption of the year-round calendar. Such an investigation should determine if schools targeted for adoption of the year-round calendar are designated as “low-performing” schools. Research should duplicate this study for a period of at least three years, or work backward in year-round school research for a period of three years.

A third recommendation for future investigations includes the variable of student ability prior to the adoption of the year-round calendar. The academic ability of students was not considered as a variable in this study. In order to produce more accurate results, a future study should consider the student academic ability variable based on school wide cognitive ability test scores. Such a study would be limited to those schools that have documented cognitive ability tests scores for the students. Year-round and traditional schools should be paired according to cognitive ability and TAAS scores. Such findings might reveal a more accurate picture of the impact of year-round education upon student academic performance.

Conclusion

The rapid expansion of year-round education warrants the continuation of statewide longitudinal studies to align the impact of year-round education with student learning. The theory that a school year with more frequent and shorter vacations will improve student learning should be validated if that is the primary objective for making the transition to a different school calendar configuration. A change from the traditional to a year-round calendar impacts the entire business, social, religious and educational community. Single-track year-round schools are generally implemented in Texas for the purpose of improving academic achievement. Therefore, school boards and school administrators need to make decisions regarding adoption of school calendars based on research findings.

The demographics of Texas year-round schools are different from the demographics of Texas traditional calendar schools. Year-round calendar schools have lower math scores (6.16%) than traditional schools, fewer African American students (2.78%), and fewer White students (21.06%). Year-round schools are higher in population size (71 more students), economic disadvantage (15.87% higher), Hispanic (23.46% higher), and mobility (3.23% higher). The economic disadvantaged variable overlaps the minority ethnic variables in year-round schools, verifying that minority students are more economically disadvantaged. Compared to traditional schools, there are twenty-eight percent more economically disadvantaged students in year-round schools. Year-round schools have been deemed very successful in improving academic achievement for minority and economically disadvantaged students in communities like Socorro, Texas. However, my statewide study does not show that academic achievement in year-round schools is higher than academic achievement in traditional calendar schools. The demographics of a community, the purpose for which year-round schools are implemented, and community support all factor into the academic success of year-round schools.

The findings of future statewide studies may show that academic achievement in year-round schools is equal to, or better than, traditional calendar schools if all the demographic variables are identified. An unknown variable concerns the degree of education experience of the teachers and administrative teams in year-round versus traditional calendar schools.

This study revealed a statistically significant difference between academic achievement in year-round and traditional schools. Even with the identified variables taken into consideration, the difference between year-round and traditional schools is one-tenth of one percent of a math TAAS score. Even with the calendar variable included in the last block of variables, it still has a statistical level of .01, which makes it statistically significant at the .05 level of significance. Year-round schools in Texas were created primarily for a different purpose than the year-round schools in California. Texas and California have a statewide testing program; consequently, superintendents and principals customize their curriculum around the state test. The most significant criteria that identify the success of Texas principals and superintendents is exemplary student achievement as measured by the TAAS test. Texas administrators are not nearly as interested in year-round schools for economic efficiency and maximum usage of school buildings as they are interested in improved academic achievement reflected in higher TAAS scores. Many year-round schools in Texas were created as a vehicle to improve the state TAAS test scores for their district or campus. A district that contemplates changing to a year-round calendar, in light of community concerns connected with the change in school calendar must offer a very important reason for the change. Many Texas schools that changed to a year-round calendar had serious concerns with low academic performance reflected in low TAAS scores. Many of these schools were in economic disadvantaged districts or attendance zones.

Studies across the nation have indicated that year-round schools offer benefits to economic disadvantaged students. Although some Texas year-round schools have abandoned the regular year-round tracks, many schools have compromised between the year-round and traditional calendar by having long spring, fall, winter, and holiday breaks with testing periods ending before the winter break. Three to four weeks of summer vacation time has been moved into the traditional school calendar, thereby providing entire districts to have the beneficial features of year-round schools without upsetting public relations within the community.

APPENDIX A

DATABASE LEGEND

Database Legend

YRE	Year-round calendar
Trad.	Traditional Calendar
0	Traditional calendar
1	Year-round calendar
Math	TAAS Math score
Size	Size of school student enrollment
Economic	Economic disadvantaged
African	African American ethnicity
Hispanic	Hispanic American ethnicity
White	White American ehnicity
Sp. Ed. Or Special Ed.	Special Education Services provided for students
Mobility	Mobility of students in or out of the school during the year

APPENDIX B

YEAR-ROUND AND TRADITIONAL SCHOOLS LISTED BY NUMBER

Year-round and Traditional School Listed by School Number

Traditional Schools

School	Calendar	Math	Size	Economic	African	Hispanic	White	Special Ed.	Mobility
1	0	94.5	183	35	0	6.6	93.4	20.8	11.5
2	0	92.5	797	68.9	41.8	12.4	41.9	9.2	36
3	0	94.9	440	92	5.9	75.2	17.5	14.3	47
4	0	81.8	491	86.4	2.2	92.3	4.5	6.9	34.3
5	0	87.3	870	48.2	34.9	16.4	44	15.4	35.6
6	0	85.3	221	35.3	3.2	10.4	86.4	12.7	16.6
7	0	89.9	374	43.9	19.8	16	63.9	11.2	17.3
8	0	85	400	98.8	0	99.3	0.8	7.8	29
9	0	73.8	235	81.3	1.3	77.4	21.3	10.2	14.5
10	0	94.9	673	1.5	4.8	2.8	85.3	7.9	15
11	0	89.9	269	72.9	23.4	27.1	49.4	21.9	14
12	0	75.9	377	93.6	95	5	0	6.1	36.8
13	0	79.1	712	92.6	97.1	2.7	0.3	6.2	30
14	0	86.8	463	38.2	27.9	20.1	49.2	11.7	29.1
15	0	93.4	794	47.1	19.3	34.9	41.4	16.4	21
16	0	98.4	279	22.9	14.3	12.2	65.2	10	17.6
17	0	96	565	5.5	3.5	6.4	88	10.3	11.9
18	0	84.4	523	70.9	4.6	40.9	53.3	14.5	32.9
19	0	81.6	721	83.5	11.7	72	15.1	9.8	27.3
20	0	91.5	617	78.8	9.2	67.9	21.9	11.7	24.7
21	0	94.6	513	69.8	17.3	58.5	24.2	13.1	24.3
22	0	81	195	59.5	0	10.3	87.7	13.8	29.4
23	0	92	271	32.8	2.6	1.5	92.3	13.3	19.1
24	0	88.1	444	85.6	12.4	73.9	13.7	13.7	22.6
25	0	84.2	499	49.3	25.3	31.1	40.3	11.6	18.4
26	0	68.2	699	0	94.8	4.7	0.4	7.9	15.5
27	0	88.6	351	96.9	3.1	94.3	2.6	6.3	20.7
28	0	87.2	680	92.8	85.4	14.4	0.1	16.2	25.2
29	0	71.8	702	86	24.6	63.2	9.3	4.1	30.4
30	0	93.7	616	21.1	7.1	21.1	66.6	10.1	14.7
31	0	92.8	817	72.9	2.3	84.3	11.5	4.8	24.8
32	0	94.6	362	70.2	6.6	37.8	55.2	20.4	13
33	0	91.1	758	44.6	1.5	67.3	27.4	7.1	17.9
34	0	95.5	731	91	0.1	98.8	1.1	9	22
35	0	82.8	611	39.4	0.2	4.1	94.8	16.9	26.6
36	0	82.4	408	92.4	76.5	13	6.1	11.3	34.2
37	0	90.5	60	81.7	0	90	10	6.7	29.3
38	0	89	984	37.4	8.8	8.5	81.9	9.3	15.4

School	Calendar	Math	Size	Economic	African	Hispanic	White	Special Ed.	Mobility
39	0	86.5	599	70.3	8	40.2	51.4	13.2	25
40	0	94.3	502	20.5	0.2	6.4	93.2	22.3	15.7
41	0	82.2	572	62.2	0.3	14.5	84.3	11.4	23.6
42	0	87.7	228	53.9	0.9	66.2	32.5	17.5	16.8
43	0	89.5	577	31.7	0.2	2.6	95.3	14.9	16.5
44	0	89.7	442	21	6.3	6.6	86.4	10.4	22
45	0	88.1	246	54.1	0.4	37.4	62.2	11.8	13.7
46	0	86	404	39.6	18.3	10.9	69.8	15.6	22
47	0	70.1	977	66.8	36.7	26.6	23.7	5.9	33.7
48	0	76.4	590	91.5	95.6	2.4	1.5	11.4	26.9
49	0	97.3	582	12.2	4	6.2	87.6	8.1	21.6
50	0	95.3	542	2.6	0.9	2.8	94.5	14.2	10.8
51	0	75.5	283	83.4	3.5	85.5	10.2	16.6	27.8
52	0	78.1	558	89.8	66.5	28.5	3.6	14	30.4
53	0	89	171	55	3.5	42.1	53.8	17.5	19.8
54	0	71.5	875	83.4	0.1	96.8	2.9	7.7	21
55	0	95.5	457	0	0	4.2	94.1	8.3	15.1
56	0	95.1	120	15	0	10	88.3	9.2	11.3
Trad-Averages		87.01	507.68	56.67	18.46	35.08	44.70	11.80	22.84
		Math	Size	Economic	African	Hispanic	White	Special Ed.	Mobility

Year-round Schools

School	Calendar	Math	Size	Economic	African	Hispanic	White	Special Ed.	Mobility
1	1	85.3	256	85.2	3.9	93.8	2	8.2	39.5
2	1	81.5	534	74.5	2.1	94.9	2.8	8.6	33.6
3	1	72.5	537	97.8	2.4	96.8	0.7	9.7	35.3
4	1	70.9	608	87	0.7	95.4	3.6	11.5	27.2
5	1	60.5	313	97.4	45.4	54.6	0	18.2	41.6
6	1	79.4	358	91.9	27.9	69.6	1.7	12	33.7
7	1	54.5	523	97.1	76.9	20.7	2.5	12	30.3
8	1	67.1	520	90.6	3.8	88.3	6.9	18.1	32.3
9	1	65.7	568	93.5	3.7	89.1	6.2	13.7	27.3
10	1	71.7	519	81.7	7.3	75	17.3	15.2	26.4
11	1	85.8	702	48	2.8	50.1	43.4	12.3	25.1
12	1	74.5	785	87.3	5.6	78.7	15.5	14	29.2
13	1	76.3	611	90.8	5.2	86.6	7.4	15.1	24.5
14	1	75.7	909	42.9	4.3	30.4	64	16.6	21.1
15	1	91.4	705	28.9	4.5	46.5	45.8	12.9	18.8
16	1	92	837	18.5	5.1	34.3	58.5	10.8	10.9
17	1	85.3	1000	31	3.2	38.4	54.8	14.3	17.9
18	1	75.3	851	73.6	11	59.1	26.7	14.2	36.8
19	1	99.5	627	18.5	7.5	10.8	79.3	13.9	15
20	1	84.5	965	90.3	5.4	92.2	2.4	5.5	29.6
21	1	63.8	875	86.1	38.1	57.6	3.9	9.5	30.6
22	1	70.4	901	86.9	30.2	57.5	10.2	4.4	37.9
23	1	76.9	689	91.1	29.9	61.8	2.9	10.9	32.8
24	1	77.3	183	96.2	88	10.9	1.1	16.5	43.4
25	1	78	617	51.9	13.1	46.2	39.2	9.1	20.3
26	1	87.2	638	78.1	0.8	86.5	12.2	8.6	16.4
27	1	84.3	696	96.3	1	98	0.9	8.3	24.7
28	1	70.47	630	98.6	0.2	99.4	0.3	5.9	25.1
29	1	87.6	678	90.7	0	96.9	2.9	7.5	22.5
30	1	95.8	921	50.5	2.3	85.6	11.9	11.7	16.7
31	1	97.3	761	90.9	0	99.2	0.8	8.1	16.3
32	1	86.2	895	59.4	0.9	90.1	8.5	9.2	14.7
33	1	63.8	289	64.4	41.2	15.2	42.6	18.3	23.2
34	1	89.2	417	81.3	2.2	61.2	36.2	7.9	12.2
35	1	91.9	1210	74	36.7	46.6	14.8	8.8	30.7
36	1	83.9	587	45.8	7.8	19.6	71.7	12.3	23.9
37	1	85	496	44.6	22	14.5	62.7	7.3	26.4
38	1	74.5	313	96.2	0	98.4	1.3	11.2	25.5
39	1	74.2	131	0	0	71	29	13	5.9
40	1	92	430	97.7	0.2	98.4	0.9	11.6	23.4
41	1	80.9	339	96.8	38.6	37.5	18.9	15.6	39.8

42	1	85.8	91	90.2	9.1	76.7	14	8.2	37.5
School	Calendar	Math	Size	Economic	African	Hispanic	White	Special Ed.	Mobility
43	1	97.7	462	22.9	3.7	13.2	82.3	15.4	16.4
44	1	89.3	690	71	8.6	32.3	20.6	6.7	31.7
45	1	97.2	383	31.9	1	8.9	88	11.2	23.9
46	1	94.9	404	32.4	1.2	13.1	85.1	10.4	18.6
47	1	80.6	403	82.4	3.5	85.6	10.6	8.7	16.9
48	1	94.4	447	50.3	8.7	23.7	66	19.5	29.1
49	1	59.4	827	80.4	39.8	48.9	10.9	7.7	23.6
50	1	81.8	802	86.2	4.2	86.9	7.9	6.9	19.6
51	1	69.4	472	85.8	89.2	6.6	3.6	10.6	30.9
52	1	82.2	416	89.7	64.7	27.4	5.8	12.5	33.3
53	1	90.5	503	73.6	6.6	54.7	22.5	12.3	27.3
54	1	69.4	494	90.7	19.8	77.9	1.6	12.3	23.6
55	1	73	608	89.3	3.9	90.6	4.4	11.2	22.9
56	1	78.4	429	78.3	7.2	70.2	21.7	14	26.7
57	1	93.2	663	40.1	15.4	5.9	73.2	16.1	16.5
58	1	83.1	451	79.8	14.2	41	41.2	11.5	33.6
59	1	83.4	568	81.7	53.2	15	28.7	12	37.6
60	1	87.4	288	91.7	4.9	76.4	15.6	13.2	26
YRE- Averages		80.85	580.42	72.54	15.68	58.54	23.64	11.55	26.07
		Math	Size	Economic	African	Hispanic	White	Special Ed.	Mobility

APPENDIX C

MEAN OF VARIABLES

Means of Variables of Year-round and Traditional Calendar Schools

(Variables are sorted from smallest to greatest.)

Math	Math	Size	Size	Econ	Econ	Afri	Afri	Hisp	Hisp	White	White	Sp.Ed	Sp.Ed	Mobile	Mobile
Trad	YRE	Trad	YRE	Trad	YRE	Trad	YRE	Trad	YRE	Trad	YRE	Trad	YRE	Trad	YRE
68.2	54.5	60	91	0	0	0	0	1.5	5.9	0	0	4.1	4.4	10.8	5.9
70.1	59.4	120	131	0	18.5	0	0	2.4	6.6	0.1	0.3	4.8	5.5	11.3	10.9
71.5	60.5	171	183	1.5	18.5	0	0	2.6	8.9	0.3	0.7	5.9	5.9	11.5	12.2
71.8	63.8	183	256	2.6	22.9	0	0	2.7	10.8	0.4	0.8	6.1	6.7	11.9	14.7
71.8	63.8	183	256	2.6	22.9	0	0	2.7	10.8	0.4	0.8	6.1	6.7	11.9	14.7
73.8	63.8	195	288	5.5	28.9	0	0.2	2.8	10.9	0.8	0.9	6.2	6.9	13	15
75.5	65.7	221	289	12.2	31	0	0.2	2.8	13.1	1.1	0.9	6.3	7.3	13.7	16.3
75.9	67.1	228	313	15	31.9	0.1	0.7	4.1	13.2	1.5	1.1	6.7	7.5	14	16.4
76.4	69.4	235	313	20.5	32.4	0.1	0.8	4.2	14.5	2.6	1.3	6.9	7.7	14.5	16.4
78.1	69.4	246	339	21	40.1	0.2	0.9	4.7	15	2.9	1.6	7.1	7.9	14.7	16.5
79.1	70.4	269	358	21.1	42.9	0.2	1	5	15.2	3.6	1.7	7.7	8.1	15	16.7
81	70.5	271	383	22.9	44.6	0.2	1	6.2	19.6	4.5	2	7.8	8.2	15.1	16.9
81.6	70.9	279	403	31.7	45.8	0.3	1.2	6.4	20.7	6.1	2.4	7.9	8.2	15.4	17.9
81.8	71.7	283	404	32.8	48	0.4	2.1	6.4	23.7	9.3	2.5	7.9	8.3	15.5	18.6
82.2	72.5	351	416	35	50.3	0.9	2.2	6.6	27.4	10	2.8	8.1	8.6	15.7	18.8
82.4	73	362	417	35.3	50.5	0.9	2.3	6.6	30.4	10.2	2.9	8.3	8.6	16.5	19.6
82.8	74.2	374	429	37.4	51.9	1.3	2.4	8.5	32.3	11.5	2.9	9	8.7	16.6	20.3
84.2	74.5	377	430	38.2	59.4	1.5	2.8	10	34.3	13.7	3.6	9.2	8.8	16.8	21.1
84.4	74.5	400	447	39.4	64.4	2.2	3.2	10.3	37.5	15.1	3.6	9.2	9.1	17.3	22.5
85	75.3	404	451	39.6	71	2.3	3.5	10.4	38.4	17.5	3.9	9.3	9.2	17.6	22.9
85.3	75.7	408	462	43.9	73.6	2.6	3.7	10.9	41	21.3	4.4	9.8	9.5	17.9	23.2
86	76.3	440	472	44.6	73.6	3.1	3.7	12.2	46.2	21.9	5.8	10	9.7	18.4	23.4
86.5	76.9	442	494	47.1	74	3.2	3.8	12.4	46.5	23.7	6.2	10.1	10.4	19.1	23.6
86.8	77.3	444	496	48.2	74.5	3.5	3.9	13	46.6	24.2	6.9	10.2	10.6	19.8	23.6
87.2	78	457	503	49.3	78.1	3.5	3.9	14.4	48.9	27.4	7.4	10.3	10.8	20.7	23.9
87.3	78.4	463	519	53.9	78.3	3.5	4.2	14.5	50.1	32.5	7.9	10.4	10.9	21	23.9
87.7	79.4	491	520	54.1	79.8	4	4.3	16	54.6	40.3	8.5	11.2	11.2	21	24.5
88.1	80.6	499	523	55	80.4	4.6	4.5	16.4	54.7	41.4	10.2	11.3	11.2	21.6	24.7
88.1	80.9	502	534	59.5	81.3	4.8	4.9	20.1	57.5	41.9	10.6	11.4	11.2	22	25.1
88.6	81.5	513	537	62.2	81.7	5.9	5.1	21.1	57.6	44	10.9	11.4	11.5	22	25.1
89	81.8	523	568	66.8	81.7	6.3	5.2	26.6	59.1	49.2	11.9	11.6	11.5	22	25.5
89	82.2	542	568	68.9	82.4	6.6	5.4	27.1	61.2	49.4	12.2	11.7	11.6	22.6	26
89.5	83.1	558	587	69.8	85.2	7.1	5.6	28.5	61.8	51.4	14	11.7	11.7	23.6	26.4
89.7	83.4	565	608	70.2	85.8	8	6.6	31.1	69.6	53.3	14.8	11.8	12	24.3	26.4
89.9	83.9	572	608	70.3	86.1	8.8	7.2	34.9	70.2	53.8	15.5	12.7	12	24.7	26.7
89.9	84.3	577	611	70.9	86.2	9.2	7.3	37.4	71	55.2	15.6	13.1	12	24.8	27.2
90.5	84.5	582	617	72.9	86.9	11.7	7.5	37.8	75	62.2	17.3	13.2	12.3	25	27.3
91.1	85	590	627	72.9	87	12.4	7.8	40.2	76.4	63.9	18.9	13.3	12.3	25.2	27.3
91.5	85.3	599	630	78.8	87.3	14.3	8.6	40.9	76.7	65.2	20.6	13.7	12.3	26.6	29.1

Math	Math	Size	Size	Econ	Econ	Afri	Afri	Hisp	Hisp	White	White	Sp.Ed	Sp.Ed	Mobile	Mobile
Trad	YRE	Trad	YRE	Trad	YRE	Trad	YRE	Trad	YRE	Trad	YRE	Trad	YRE	Trad	YRE
92	85.3	611	638	81.3	89.3	17.3	8.7	42.1	77.9	66.6	21.7	13.8	12.3	26.9	29.2
92.5	85.8	616	663	81.7	89.7	18.3	9.1	58.5	78.7	69.8	22.5	14	12.5	27.3	29.6
92.8	85.8	617	678	83.4	90.2	19.3	11	63.2	85.6	81.9	26.7	14.2	12.9	27.8	30.3
93.4	86.2	673	689	83.4	90.3	19.8	13.1	66.2	85.6	84.3	28.7	14.3	13	29	30.6
93.7	87.2	680	690	83.5	90.6	23.4	14.2	67.3	86.5	85.3	29	14.5	13.2	29.1	30.7
94.3	87.4	699	696	85.6	90.7	24.6	15.4	67.9	86.6	86.4	36.2	14.9	13.7	29.3	30.9
94.5	87.6	702	702	86	90.7	25.3	19.8	72	86.9	86.4	39.2	15.4	13.9	29.4	31.7
94.6	89.2	712	705	86.4	90.8	27.9	22	73.9	88.3	87.6	41.2	15.6	14	30	32.3
94.6	89.3	721	761	89.8	90.9	34.9	27.9	75.2	89.1	87.7	42.6	16.2	14	30.4	32.8
94.9	90.5	731	785	91	91.1	36.7	29.9	77.4	90.1	88	43.4	16.4	14.2	30.4	33.3
94.9	91.4	758	802	91.5	91.7	41.8	30.2	84.3	90.6	88.3	45.8	16.6	14.3	32.9	33.6
95.1	91.9	794	827	92	91.9	66.5	36.7	85.5	92.2	92.3	54.8	16.9	15.1	33.7	33.6
95.3	92	797	837	92.4	93.5	76.5	38.1	90	93.8	93.2	58.5	17.5	15.2	34.2	33.7
95.5	92	817	851	92.6	96.2	85.4	38.6	92.3	94.9	93.4	62.7	17.5	15.4	34.3	35.3
95.5	93.2	870	875	92.8	96.2	94.8	39.8	94.3	95.4	94.1	64	20.4	15.6	35.6	36.8
96	94.4	875	895	93.6	96.3	95	41.2	96.8	96.8	94.5	66	20.8	16.1	36	37.5
97.3	94.9	977	901	96.9	96.8	95.6	45.4	98.8	96.9	94.8	71.7	21.9	16.5	36.8	37.6
98.4	95.8	984	909	98.8	97.1	97.1	53.2	99.3	98	95.3	73.2	22.3	16.6	47	37.9
	97.2		921		97.4		64.7		98.4		79.3		18.1		39.5
	97.3		965		97.7		76.9		98.4		82.3		18.2		39.8
	97.7		1000		97.8		88		99.2		85.1		18.3		41.6
	99.5		1210		98.6		89.2		99.4		88		19.5		43.4
Averages															
87.01	80.85	507.68	580.42	56.67	72.54	18.46	15.68	35.08	58.54	44.70	23.64	11.80	11.55	22.84	26.07
Math	Math	Size	Size	Econ	Econ	Afri	Afri	Hisp	Hisp	White	White	Sp.Ed	Sp.Ed	Mobile	Mobile
Trad	YRE	Trad	YRE	Trad	YRE	Trad	YRE	Trad	YRE	Trad	YRE	Trad	YRE	Trad	YRE

APPENDIX D

RELATIONSHIP OF MATH SCORES PERCENTAGE INCREASE IN EACH VARIABLE BY COMPARING YEAR-ROUND TO TRADITIONAL SCHOOLS FOR ALL RANKED SAMPLES

Percentage increase in each variable in made by comparing YRE to Traditional Schools for all ranked samples. Each variable was ranked and then divided after the 28th sample. The lower percentage group is referred to as A and the higher percentage group is referred to a B.

Group A (Size and Econimic Disadvantaged)

A-Group	Size-YRE	Math-YRE	Math-Trad	Size-Trad	Economic-YRE	Math-YRE	Math-Trad	Economic-Trad
	91	85.8	90.5	60	0	74.2	68.2	0
	131	74.2	95.1	120	18.5	92	95.5	0
	183	77.3	89	171	18.5	99.5	94.9	1.5
	256	85.3	94.5	183	22.9	97.7	95.3	2.6
	288	87.4	81	195	28.9	91.4	96	5.5
	289	63.8	85.3	221	31	85.3	97.3	12.2
	313	60.5	87.7	228	31.9	97.2	95.1	15
	313	74.5	73.8	235	32.4	94.9	94.3	20.5
	339	80.9	88.1	246	40.1	93.2	89.7	21
	358	79.4	89.9	269	42.9	75.7	93.7	21.1
	383	97.2	92	271	44.6	85	98.4	22.9
	403	80.6	98.4	279	45.8	83.9	89.5	31.7
	404	94.9	75.5	283	48	85.8	92	32.8
	416	82.2	88.6	351	50.3	94.4	94.5	35
	417	89.2	94.6	362	50.5	95.8	85.3	35.3
	429	78.4	89.9	374	51.9	78	89	37.4
	430	92	75.9	377	59.4	86.2	86.8	38.2
	447	94.4	85	400	64.4	63.8	82.8	39.4
	451	83.1	86	404	71	89.3	86	39.6
	462	97.7	82.4	408	73.6	75.3	89.9	43.9
	472	69.4	94.9	440	73.6	90.5	91.1	44.6
	494	69.4	89.7	442	74	91.9	93.4	47.1
	496	85	88.1	444	74.5	81.5	87.3	48.2
	503	90.5	95.5	457	78.1	87.2	84.2	49.3
	519	71.7	86.8	463	78.3	78.4	87.7	53.9
	520	67.1	81.8	491	79.8	83.1	88.1	54.1
	523	54.5	84.2	499	80.4	59.4	89	55
	534	81.5	94.3	502	81.3	89.2	81	59.5
Mean of A-Group	388	80.282143	87.8035714	327.67857	51.664286	85.707143	89.857143	30.975
Average -typed	388	80.282	87.803	327.678	51.664	85.707	89.857	30.975

Group B (Size and Economic Disadvantaged)

B-Group	Size-YRE	Math-YRE	Math-Trad	Size-Trad	Economic-YRE	Math-YRE	Math-Trad	Economic-Trad
	537	72.5	94.6	513	81.7	71.7	82.2	62.2
	568	65.7	84.4	523	81.7	83.4	70.1	66.8
	568	83.4	95.3	542	82.4	80.6	92.5	68.9
	587	83.9	78.1	558	85.2	85.3	94.6	69.8
	608	70.9	96	565	85.8	69.4	94.6	70.2
	608	73	82.2	572	86.1	63.8	86.5	70.3
	611	76.3	89.5	577	86.2	81.8	84.4	70.9
	617	78	97.3	582	86.9	70.4	89.9	72.9
	627	99.5	76.4	590	87	70.9	92.8	72.9
	630	70.47	86.5	599	87.3	74.5	91.5	78.8
	638	87.2	82.8	611	89.3	73	73.8	81.3
	663	93.2	93.7	616	89.7	82.2	90.5	81.7
	678	87.6	91.5	617	90.2	85.8	75.5	83.4
	689	76.9	94.9	673	90.3	84.5	71.5	83.4
	690	89.3	87.2	680	90.6	67.1	81.6	83.5
	696	84.3	68.2	699	90.7	87.6	88.1	85.6
	702	85.8	71.8	702	90.7	69.4	71.8	86
	705	91.4	79.1	712	90.8	76.3	81.8	86.4
	761	97.3	81.6	721	90.9	97.3	78.1	89.8
	785	74.5	95.5	731	91.1	76.9	95.5	91
	802	81.8	91.1	758	91.7	87.4	76.4	91.5
	827	59.4	93.4	794	91.9	79.4	94.9	92
	837	92	92.5	797	93.5	65.7	82.4	92.4
	851	75.3	92.8	817	96.2	77.3	79.1	92.6
	875	63.8	87.3	870	96.2	74.5	87.2	92.8
	895	86.2	71.5	875	96.3	84.3	75.9	93.6
	901	70.4	70.1	977	96.8	80.9	88.6	96.9
	909	75.7	89	984	97.1	54.5	85	98.8
	921	95.8			97.4	60.5		
	965	84.5			97.7	92		
	1000	85.3			97.8	72.5		
	1210	91.9			98.6	70.47		
Large-A Group Mean	748.781	81.3521	86.225	687.678	90.806	76.605	84.171	82.371
Small-B Group Mean	388	80.282	87.803	327.678	51.664	85.707	89.857	30.975
Difference	360.781	1.070	-1.578	360.000	39.142	-9.101	-5.685	51.396
Percent of change from smallest half to the largest half.	0.929	0.013	-0.017	1.098	0.757	-0.106	-0.063	1.659

Group A (African Americans and Hispanics)

Africian-TRE	Math-YRE	Math-Trad	Africian-Trad	Hispanic-YRE	Math-YRE	Math-Trad	Hispanic-Trad
0	87.6	94.5	0	5.9	93.2	92	1.5
0	97.3	85	0	6.6	69.4	76.4	2.4
0	74.5	81	0	8.9	97.2	89.5	2.6
0	74.2	90.5	0	10.8	99.5	79.1	2.7
0.2	70.47	95.5	0	10.9	77.3	94.9	2.8
0.2	92	95.1	0	13.1	94.9	95.3	2.8
0.7	70.9	95.5	0.1	13.2	97.7	82.8	4.1
0.8	87.2	71.5	0.1	14.5	85	95.5	4.2
0.9	86.2	82.8	0.2	15	83.4	68.2	4.7
1	84.3	94.3	0.2	15.2	63.8	75.9	5
1	97.2	89.5	0.2	19.6	83.9	97.3	6.2
1.2	94.9	82.2	0.3	20.7	54.5	96	6.4
2.1	81.5	88.1	0.4	23.7	94.4	94.3	6.4
2.2	89.2	87.7	0.9	27.4	82.2	94.5	6.6
2.3	95.8	95.3	0.9	30.4	75.7	89.7	6.6
2.4	72.5	73.8	1.3	32.3	89.3	89	8.5
2.8	85.8	91.1	1.5	34.3	92	95.1	10
3.2	85.3	81.8	2.2	37.5	80.9	81	10.3
3.5	80.6	92.8	2.3	38.4	85.3	85.3	10.4
3.7	65.7	92	2.6	41	83.1	86	10.9
3.7	97.7	88.6	3.1	46.2	78	98.4	12.2
3.8	67.1	85.3	3.2	46.5	91.4	92.5	12.4
3.9	85.3	96	3.5	46.6	91.9	82.4	13
3.9	73	75.5	3.5	48.9	59.4	87.2	14.4
4.2	81.8	89	3.5	50.1	85.8	82.2	14.5
4.3	75.7	97.3	4	54.6	60.5	89.9	16
4.5	91.4	84.4	4.6	54.7	90.5	87.3	16.4
4.9	87.4	94.9	4.8	57.5	70.4	86.8	20.1
2.1928571	83.306071	88.25	1.55	29.446429	82.521429	88.017857	8.3607143
Total of A Group							
2.192	83.306	88.25	1.55	29.446	82.521	88.017	8.36

Group B (African Americans and Hispanics)

Africian-TRE	Math-YRE	Math-Trad	Africian-Trad	Hispanic-YRE	Math-YRE	Math-Trad	Hispanic-Trad
5.1	92	94.9	5.9	57.6	63.8	93.7	21.1
5.2	76.3	89.7	6.3	59.1	75.3	70.1	26.6
5.4	84.5	94.6	6.6	61.2	89.2	89.9	27.1
5.6	74.5	93.7	7.1	61.8	76.9	78.1	28.5
6.6	90.5	86.5	8	69.6	79.4	84.2	31.1
7.2	78.4	89	8.8	70.2	78.4	93.4	34.9
7.3	71.7	91.5	9.2	71	74.2	88.1	37.4
7.5	99.5	81.6	11.7	75	71.7	94.6	37.8
7.8	83.9	88.1	12.4	76.4	87.4	86.5	40.2
8.6	89.3	98.4	14.3	76.7	85.8	84.4	40.9
8.7	94.4	94.6	17.3	77.9	69.4	89	42.1
9.1	85.8	86	18.3	78.7	74.5	94.6	58.5
11	75.3	93.4	19.3	85.6	95.8	71.8	63.2
13.1	78	89.9	19.8	85.6	80.6	87.7	66.2
14.2	83.1	89.9	23.4	86.5	87.2	91.1	67.3
15.4	93.2	71.8	24.6	86.6	76.3	91.5	67.9
19.8	69.4	84.2	25.3	86.9	81.8	81.6	72
22	85	86.8	27.9	88.3	67.1	88.1	73.9
27.9	79.4	87.3	34.9	89.1	65.7	94.9	75.2
29.9	76.9	70.1	36.7	90.1	86.2	73.8	77.4
30.2	70.4	92.5	41.8	90.6	73	92.8	84.3
36.7	91.9	78.1	66.5	92.2	84.5	75.5	85.5
38.1	63.8	82.4	76.5	93.8	85.3	90.5	90
38.6	80.9	87.2	85.4	94.9	81.5	81.8	92.3
39.8	59.4	68.2	94.8	95.4	70.9	88.6	94.3
41.2	63.8	75.9	95	96.8	72.5	71.5	96.8
45.4	60.5	76.4	95.6	96.9	87.6	95.5	98.8
53.2	83.4	79.1	97.1	98	84.3	85	99.3
64.7	82.2			98.4	74.5		
76.9	54.5			98.4	92		
88	77.3			99.2	97.3		
89.2	69.4			99.4	70.47		
Group B (Large) Mean							
27.4812	78.7062	85.778	35.375	83.996	79.392	86.010	61.807
Group A (Small)Mean							
2.192	83.306	88.25	1.55	29.446	82.521	88.017	8.36
Difference							
25.289	-4.599	-2.471	33.825	54.550	-3.128	-2.006	53.447
% difference From smallaest							
11.537	-0.0552	-0.028	21.822	1.852	-0.037	-0.022	6.393

Group A (White and Special Education)

White-YRE	Math-YRE	Math-Trad	White-Trad	Special Ed.-YRE	Math-YRE	Math-Trad	Special Ed.-Trad
0	60.5	75.9	0	4.4	70.4	71.8	4.1
0.3	70.47	87.2	0.1	5.5	84.5	92.8	4.8
0.7	72.5	79.1	0.3	5.9	70.47	70.1	5.9
0.8	97.3	68.2	0.4	6.7	89.3	75.9	6.1
0.9	84.3	85	0.8	6.9	81.8	79.1	6.2
0.9	92	95.5	1.1	7.3	85	88.6	6.3
1.1	77.3	76.4	1.5	7.5	87.6	90.5	6.7
1.3	74.5	88.6	2.6	7.7	59.4	81.8	6.9
1.6	69.4	71.5	2.9	7.9	89.2	91.1	7.1
1.7	79.4	78.1	3.6	8.1	97.3	71.5	7.7
2	85.3	81.8	4.5	8.2	85.3	85	7.8
2.4	84.5	82.4	6.1	8.2	85.8	94.9	7.9
2.5	54.5	71.8	9.3	8.3	84.3	68.2	7.9
2.8	81.5	90.5	10	8.6	81.5	97.3	8.1
2.9	76.9	75.5	10.2	8.6	87.2	95.5	8.3
2.9	87.6	92.8	11.5	8.7	80.6	95.5	9
3.6	70.9	88.1	13.7	8.8	91.9	92.5	9.2
3.6	69.4	81.6	15.1	9.1	78	95.1	9.2
3.9	63.8	94.9	17.5	9.2	86.2	89	9.3
4.4	73	73.8	21.3	9.5	63.8	81.6	9.8
5.8	82.2	91.5	21.9	9.7	72.5	98.4	10
6.2	65.7	70.1	23.7	10.4	94.9	93.7	10.1
6.9	67.1	94.6	24.2	10.6	69.4	73.8	10.2
7.4	76.3	91.1	27.4	10.8	92	96	10.3
7.9	81.8	87.7	32.5	10.9	76.9	89.7	10.4
8.5	86.2	84.2	40.3	11.2	74.5	89.9	11.2
10.2	70.4	93.4	41.4	11.2	97.2	82.4	11.3
10.6	80.6	92.5	41.9	11.2	73	82.2	11.4
3.707	76.263	83.707	13.778	8.610	81.784	86.210	8.328
Mean							
3.707	76.263	83.707	13.778	8.61	81.784	86.21	8.328

Group B (White and Special Education)

White-YRE	Math-YRE	Math-Trad	White-Trad	Special Ed.-YRE	Math-YRE	Math-Trad	Special Ed.-Trad
10.9	59.4	87.3	44	11.5	70.9	76.4	11.4
11.9	95.8	86.8	49.2	11.5	83.1	84.2	11.6
12.2	87.2	89.9	49.4	11.6	92	86.8	11.7
14	85.8	86.5	51.4	11.7	95.8	91.5	11.7
14.8	91.9	84.4	53.3	12	79.4	88.1	11.8
15.5	74.5	89	53.8	12	54.5	85.3	12.7
15.6	87.4	94.6	55.2	12	83.4	94.6	13.1
17.3	71.7	88.1	62.2	12.3	85.8	86.5	13.2
18.9	80.9	89.9	63.9	12.3	83.9	92	13.3
20.6	89.3	98.4	65.2	12.3	90.5	88.1	13.7
21.7	78.4	93.7	66.6	12.3	69.4	81	13.8
22.5	90.5	86	69.8	12.5	82.2	78.1	14
26.7	75.3	89	81.9	12.9	91.4	95.3	14.2
28.7	83.4	82.2	84.3	13	74.2	94.9	14.3
29	74.2	94.9	85.3	13.2	87.4	84.4	14.5
36.2	89.2	85.3	86.4	13.7	65.7	89.5	14.9
39.2	78	89.7	86.4	13.9	99.5	87.3	15.4
41.2	83.1	97.3	87.6	14	74.5	86	15.6
42.6	63.8	81	87.7	14	78.4	87.2	16.2
43.4	85.8	96	88	14.2	75.3	93.4	16.4
45.8	91.4	95.1	88.3	14.3	85.3	75.5	16.6
54.8	85.3	92	92.3	15.1	76.3	82.8	16.9
58.5	92	94.3	93.2	15.2	71.7	87.7	17.5
62.7	85	94.5	93.4	15.4	97.7	89	17.5
64	75.7	95.5	94.1	15.6	80.9	94.6	20.4
66	94.4	95.3	94.5	16.1	93.2	94.5	20.8
71.7	83.9	82.8	94.8	16.5	77.3	89.9	21.9
73.2	93.2	89.5	95.3	16.6	75.7	94.3	22.3
79.3	99.5			18.1	67.1		
82.3	97.7			18.2	60.5		
85.1	94.9			18.3	63.8		
88	97.2			19.5	94.4		
Group –B							
41.071	84.868	90.321	75.625	14.118	80.0375	87.817	15.264
Group –A							
3.707	76.263	83.707	13.778	8.61	81.784	86.21	8.328
Difference							
37.364	8.6057	6.6144	61.847	5.5087	-1.7465	1.6078	6.9362
Percent of change							
10.079545	0.1128	0.0790	4.4888	0.6398	-0.0213	0.0186	0.8328

Group A (Mobility)

Mobility-YRE	Math-YRE	Math-Trad	Mobility-Trad
5.9	74.2	95.3	10.8
10.9	92	95.1	11.3
12.2	89.2	94.5	11.5
14.7	86.2	96	11.9
15	99.5	94.6	13
16.3	97.3	88.1	13.7
16.4	87.2	89.9	14
16.4	97.7	73.8	14.5
16.5	93.2	93.7	14.7
16.7	95.8	94.9	15
16.9	80.6	95.5	15.1
17.9	85.3	89	15.4
18.6	94.9	68.2	15.5
18.8	91.4	94.3	15.7
19.6	81.8	89.5	16.5
20.3	78	85.3	16.6
21.1	75.7	87.7	16.8
22.5	87.6	89.9	17.3
22.9	73	98.4	17.6
23.2	63.8	91.1	17.9
23.4	92	84.2	18.4
23.6	59.4	92	19.1
23.6	69.4	89	19.8
23.9	83.9	88.6	20.7
23.9	97.2	93.4	21
24.5	76.3	71.5	21
24.7	84.3	97.3	21.6
25.1	85.8	95.5	22
19.125	84.7392	89.86785	16.371
Mean -A			
19.125	84.739	89.867	16.371

Group B (Mobility)

Mobility-YRE	Math-YRE	Math-Trad	Mobility-Trad
25.1	70.47	89.7	22
25.5	74.5	86	22
26	87.4	88.1	22.6
26.4	71.7	82.2	23.6
26.4	85	94.6	24.3
26.7	78.4	91.5	24.7
27.2	70.9	92.8	24.8
27.3	65.7	86.5	25
27.3	90.5	87.2	25.2
29.1	94.4	82.8	26.6
29.2	74.5	76.4	26.9
29.6	84.5	81.6	27.3
30.3	54.5	75.5	27.8
30.6	63.8	85	29
30.7	91.9	86.8	29.1
30.9	69.4	90.5	29.3
31.7	89.3	81	29.4
32.3	67.1	79.1	30
32.8	76.9	71.8	30.4
33.3	82.2	78.1	30.4
33.6	81.5	84.4	32.9
33.6	83.1	70.1	33.7
33.7	79.4	82.4	34.2
35.3	72.5	81.8	34.3
36.8	75.3	87.3	35.6
37.5	85.8	92.5	36
37.6	83.4	75.9	36.8
37.9	70.4	94.9	47
39.5	85.3		
39.8	80.9		
41.6	60.5		
43.4	77.3		
Group A mean			
32.1468	77.4521	84.1607	29.3178
Group B Mean			
19.125	84.739	89.867	16.371
Difference			
13.021875	-7.286	-5.706	12.946
Difference from smallest to largest			
0.680	-0.085	-0.063	0.790

APPENDIX E

RELATIONSHIP OF MATH SCORES AS EACH OF THE VARIABLES INCREASE

Relationship of Math Scores as Each of the Variable Increases

Size of School

Economic Disadvantaged

Size-YRE	Math-YRE	Math-Trad	Size-Trad	Economic-YRE	Math-YRE	Math-Trad	Economic-Trad
91	85.8	90.5	60	0	74.2	68.2	0
131	74.2	95.1	120	18.5	92	95.5	0
183	77.3	89	171	18.5	99.5	94.9	1.5
256	85.3	94.5	183	22.9	97.7	95.3	2.6
288	87.4	81	195	28.9	91.4	96	5.5
289	63.8	85.3	221	31	85.3	97.3	12.2
313	60.5	87.7	228	31.9	97.2	95.1	15
313	74.5	73.8	235	32.4	94.9	94.3	20.5
339	80.9	88.1	246	40.1	93.2	89.7	21
358	79.4	89.9	269	42.9	75.7	93.7	21.1
383	97.2	92	271	44.6	85	98.4	22.9
403	80.6	98.4	279	45.8	83.9	89.5	31.7
404	94.9	75.5	283	48	85.8	92	32.8
416	82.2	88.6	351	50.3	94.4	94.5	35
417	89.2	94.6	362	50.5	95.8	85.3	35.3
429	78.4	89.9	374	51.9	78	89	37.4
430	92	75.9	377	59.4	86.2	86.8	38.2
447	94.4	85	400	64.4	63.8	82.8	39.4
451	83.1	86	404	71	89.3	86	39.6
462	97.7	82.4	408	73.6	75.3	89.9	43.9
472	69.4	94.9	440	73.6	90.5	91.1	44.6
494	69.4	89.7	442	74	91.9	93.4	47.1
496	85	88.1	444	74.5	81.5	87.3	48.2
503	90.5	95.5	457	78.1	87.2	84.2	49.3
519	71.7	86.8	463	78.3	78.4	87.7	53.9
520	67.1	81.8	491	79.8	83.1	88.1	54.1
523	54.5	84.2	499	80.4	59.4	89	55
534	81.5	94.3	502	81.3	89.2	81	59.5
537	72.5	94.6	513	81.7	71.7	82.2	62.2
568	65.7	84.4	523	81.7	83.4	70.1	66.8
568	83.4	95.3	542	82.4	80.6	92.5	68.9
587	83.9	78.1	558	85.2	85.3	94.6	69.8
608	70.9	96	565	85.8	69.4	94.6	70.2
608	73	82.2	572	86.1	63.8	86.5	70.3
611	76.3	89.5	577	86.2	81.8	84.4	70.9
617	78	97.3	582	86.9	70.4	89.9	72.9
627	99.5	76.4	590	87	70.9	92.8	72.9
630	70.47	86.5	599	87.3	74.5	91.5	78.8
638	87.2	82.8	611	89.3	73	73.8	81.3
663	93.2	93.7	616	89.7	82.2	90.5	81.7

Size-YRE	Math-YRE	Math-Trad	Size-Trad	Economic-YRE	Math-YRE	Math-Trad	Economic-Trad
678	87.6	91.5	617	90.2	85.8	75.5	83.4
689	76.9	94.9	673	90.3	84.5	71.5	83.4
690	89.3	87.2	680	90.6	67.1	81.6	83.5
696	84.3	68.2	699	90.7	87.6	88.1	85.6
702	85.8	71.8	702	90.7	69.4	71.8	86
705	91.4	79.1	712	90.8	76.3	81.8	86.4
761	97.3	81.6	721	90.9	97.3	78.1	89.8
785	74.5	95.5	731	91.1	76.9	95.5	91
802	81.8	91.1	758	91.7	87.4	76.4	91.5
827	59.4	93.4	794	91.9	79.4	94.9	92
837	92	92.5	797	93.5	65.7	82.4	92.4
851	75.3	92.8	817	96.2	77.3	79.1	92.6
875	63.8	87.3	870	96.2	74.5	87.2	92.8
895	86.2	71.5	875	96.3	84.3	75.9	93.6
901	70.4	70.1	977	96.8	80.9	88.6	96.9
909	75.7	89	984	97.1	54.5	85	98.8
921	95.8			97.4	60.5		
965	84.5			97.7	92		
1000	85.3			97.8	72.5		
1210	91.9			98.6	70.47		

African AmericanStudents Hispanic Students

Africian-TRE	Math-YRE	Math-Trad	Africian-Trad	Hispanic-YRE	Math-YRE	Math-Trad	Hispanic-Trad
0	87.6	94.5	0	5.9	93.2	92	1.5
0	97.3	85	0	6.6	69.4	76.4	2.4
0	74.5	81	0	8.9	97.2	89.5	2.6
0	74.2	90.5	0	10.8	99.5	79.1	2.7
0.2	70.47	95.5	0	10.9	77.3	94.9	2.8
0.2	92	95.1	0	13.1	94.9	95.3	2.8
0.7	70.9	95.5	0.1	13.2	97.7	82.8	4.1
0.8	87.2	71.5	0.1	14.5	85	95.5	4.2
0.9	86.2	82.8	0.2	15	83.4	68.2	4.7
1	84.3	94.3	0.2	15.2	63.8	75.9	5
1	97.2	89.5	0.2	19.6	83.9	97.3	6.2
1.2	94.9	82.2	0.3	20.7	54.5	96	6.4
2.1	81.5	88.1	0.4	23.7	94.4	94.3	6.4
2.2	89.2	87.7	0.9	27.4	82.2	94.5	6.6
2.3	95.8	95.3	0.9	30.4	75.7	89.7	6.6
2.4	72.5	73.8	1.3	32.3	89.3	89	8.5
2.8	85.8	91.1	1.5	34.3	92	95.1	10
3.2	85.3	81.8	2.2	37.5	80.9	81	10.3
3.5	80.6	92.8	2.3	38.4	85.3	85.3	10.4
3.7	65.7	92	2.6	41	83.1	86	10.9
3.7	97.7	88.6	3.1	46.2	78	98.4	12.2
3.8	67.1	85.3	3.2	46.5	91.4	92.5	12.4
3.9	85.3	96	3.5	46.6	91.9	82.4	13
3.9	73	75.5	3.5	48.9	59.4	87.2	14.4
4.2	81.8	89	3.5	50.1	85.8	82.2	14.5
4.3	75.7	97.3	4	54.6	60.5	89.9	16
4.5	91.4	84.4	4.6	54.7	90.5	87.3	16.4
4.9	87.4	94.9	4.8	57.5	70.4	86.8	20.1
5.1	92	94.9	5.9	57.6	63.8	93.7	21.1
5.2	76.3	89.7	6.3	59.1	75.3	70.1	26.6
5.4	84.5	94.6	6.6	61.2	89.2	89.9	27.1
5.6	74.5	93.7	7.1	61.8	76.9	78.1	28.5
6.6	90.5	86.5	8	69.6	79.4	84.2	31.1
7.2	78.4	89	8.8	70.2	78.4	93.4	34.9
7.3	71.7	91.5	9.2	71	74.2	88.1	37.4
7.5	99.5	81.6	11.7	75	71.7	94.6	37.8
7.8	83.9	88.1	12.4	76.4	87.4	86.5	40.2
8.6	89.3	98.4	14.3	76.7	85.8	84.4	40.9
8.7	94.4	94.6	17.3	77.9	69.4	89	42.1
9.1	85.8	86	18.3	78.7	74.5	94.6	58.5
11	75.3	93.4	19.3	85.6	95.8	71.8	63.2
13.1	78	89.9	19.8	85.6	80.6	87.7	66.2
14.2	83.1	89.9	23.4	86.5	87.2	91.1	67.3

Africian-TRE	Math-YRE	Math-Trad	Africian-Trad	Hispanic-YRE	Math-YRE	Math-Trad	Hispanic-Trad
15.4	93.2	71.8	24.6	86.6	76.3	91.5	67.9
19.8	69.4	84.2	25.3	86.9	81.8	81.6	72
22	85	86.8	27.9	88.3	67.1	88.1	73.9
27.9	79.4	87.3	34.9	89.1	65.7	94.9	75.2
29.9	76.9	70.1	36.7	90.1	86.2	73.8	77.4
30.2	70.4	92.5	41.8	90.6	73	92.8	84.3
36.7	91.9	78.1	66.5	92.2	84.5	75.5	85.5
38.1	63.8	82.4	76.5	93.8	85.3	90.5	90
38.6	80.9	87.2	85.4	94.9	81.5	81.8	92.3
39.8	59.4	68.2	94.8	95.4	70.9	88.6	94.3
41.2	63.8	75.9	95	96.8	72.5	71.5	96.8
45.4	60.5	76.4	95.6	96.9	87.6	95.5	98.8
53.2	83.4	79.1	97.1	98	84.3	85	99.3
64.7	82.2			98.4	74.5		
76.9	54.5			98.4	92		
88	77.3			99.2	97.3		
89.2	69.4			99.4	70.47		

White American Students Special Education Students

White-YRE	Math-YRE	Math-Trad	White-Trad	Special Ed.-YRE	Math-YRE	Math-Trad	Special Ed.-Trad
0	60.5	75.9	0	4.4	70.4	71.8	4.1
0.3	70.47	87.2	0.1	5.5	84.5	92.8	4.8
0.7	72.5	79.1	0.3	5.9	70.47	70.1	5.9
0.8	97.3	68.2	0.4	6.7	89.3	75.9	6.1
0.9	84.3	85	0.8	6.9	81.8	79.1	6.2
0.9	92	95.5	1.1	7.3	85	88.6	6.3
1.1	77.3	76.4	1.5	7.5	87.6	90.5	6.7
1.3	74.5	88.6	2.6	7.7	59.4	81.8	6.9
1.6	69.4	71.5	2.9	7.9	89.2	91.1	7.1
1.7	79.4	78.1	3.6	8.1	97.3	71.5	7.7
2	85.3	81.8	4.5	8.2	85.3	85	7.8
2.4	84.5	82.4	6.1	8.2	85.8	94.9	7.9
2.5	54.5	71.8	9.3	8.3	84.3	68.2	7.9
2.8	81.5	90.5	10	8.6	81.5	97.3	8.1
2.9	76.9	75.5	10.2	8.6	87.2	95.5	8.3
2.9	87.6	92.8	11.5	8.7	80.6	95.5	9
3.6	70.9	88.1	13.7	8.8	91.9	92.5	9.2
3.6	69.4	81.6	15.1	9.1	78	95.1	9.2
3.9	63.8	94.9	17.5	9.2	86.2	89	9.3
4.4	73	73.8	21.3	9.5	63.8	81.6	9.8
5.8	82.2	91.5	21.9	9.7	72.5	98.4	10
6.2	65.7	70.1	23.7	10.4	94.9	93.7	10.1
6.9	67.1	94.6	24.2	10.6	69.4	73.8	10.2
7.4	76.3	91.1	27.4	10.8	92	96	10.3
7.9	81.8	87.7	32.5	10.9	76.9	89.7	10.4
8.5	86.2	84.2	40.3	11.2	74.5	89.9	11.2
10.2	70.4	93.4	41.4	11.2	97.2	82.4	11.3
10.6	80.6	92.5	41.9	11.2	73	82.2	11.4
10.9	59.4	87.3	44	11.5	70.9	76.4	11.4
11.9	95.8	86.8	49.2	11.5	83.1	84.2	11.6
12.2	87.2	89.9	49.4	11.6	92	86.8	11.7
14	85.8	86.5	51.4	11.7	95.8	91.5	11.7
14.8	91.9	84.4	53.3	12	79.4	88.1	11.8
15.5	74.5	89	53.8	12	54.5	85.3	12.7
15.6	87.4	94.6	55.2	12	83.4	94.6	13.1
17.3	71.7	88.1	62.2	12.3	85.8	86.5	13.2
18.9	80.9	89.9	63.9	12.3	83.9	92	13.3
20.6	89.3	98.4	65.2	12.3	90.5	88.1	13.7
21.7	78.4	93.7	66.6	12.3	69.4	81	13.8
22.5	90.5	86	69.8	12.5	82.2	78.1	14
26.7	75.3	89	81.9	12.9	91.4	95.3	14.2
28.7	83.4	82.2	84.3	13	74.2	94.9	14.3
29	74.2	94.9	85.3	13.2	87.4	84.4	14.5

White-YRE	Math-YRE	Math-Trad	White-Trad	Special Ed.-YRE	Math-YRE	Math-Trad	Special Ed.-Trad
36.2	89.2	85.3	86.4	13.7	65.7	89.5	14.9
39.2	78	89.7	86.4	13.9	99.5	87.3	15.4
41.2	83.1	97.3	87.6	14	74.5	86	15.6
42.6	63.8	81	87.7	14	78.4	87.2	16.2
43.4	85.8	96	88	14.2	75.3	93.4	16.4
45.8	91.4	95.1	88.3	14.3	85.3	75.5	16.6
54.8	85.3	92	92.3	15.1	76.3	82.8	16.9
58.5	92	94.3	93.2	15.2	71.7	87.7	17.5
62.7	85	94.5	93.4	15.4	97.7	89	17.5
64	75.7	95.5	94.1	15.6	80.9	94.6	20.4
66	94.4	95.3	94.5	16.1	93.2	94.5	20.8
71.7	83.9	82.8	94.8	16.5	77.3	89.9	21.9
73.2	93.2	89.5	95.3	16.6	75.7	94.3	22.3
79.3	99.5			18.1	67.1		
82.3	97.7			18.2	60.5		
85.1	94.9			18.3	63.8		
88	97.2			19.5	94.4		

Mobility of Students

Mobility-YRE	Math-YRE	Math-Trad	Mobility-Trad
5.9	74.2	95.3	10.8
10.9	92	95.1	11.3
12.2	89.2	94.5	11.5
14.7	86.2	96	11.9
15	99.5	94.6	13
16.3	97.3	88.1	13.7
16.4	87.2	89.9	14
16.4	97.7	73.8	14.5
16.5	93.2	93.7	14.7
16.7	95.8	94.9	15
16.9	80.6	95.5	15.1
17.9	85.3	89	15.4
18.6	94.9	68.2	15.5
18.8	91.4	94.3	15.7
19.6	81.8	89.5	16.5
20.3	78	85.3	16.6
21.1	75.7	87.7	16.8
22.5	87.6	89.9	17.3
22.9	73	98.4	17.6
23.2	63.8	91.1	17.9
23.4	92	84.2	18.4
23.6	59.4	92	19.1
23.6	69.4	89	19.8
23.9	83.9	88.6	20.7
23.9	97.2	93.4	21
24.5	76.3	71.5	21
24.7	84.3	97.3	21.6
25.1	85.8	95.5	22
25.1	70.47	89.7	22
25.5	74.5	86	22
26	87.4	88.1	22.6
26.4	71.7	82.2	23.6
26.4	85	94.6	24.3
26.7	78.4	91.5	24.7
27.2	70.9	92.8	24.8
27.3	65.7	86.5	25
27.3	90.5	87.2	25.2
29.1	94.4	82.8	26.6
29.2	74.5	76.4	26.9
29.6	84.5	81.6	27.3
30.3	54.5	75.5	27.8
30.6	63.8	85	29
30.7	91.9	86.8	29.1

Mobility-YRE	Math-YRE	Math-Trad	Mobility-Trad
30.9	69.4	90.5	29.3
31.7	89.3	81	29.4
32.3	67.1	79.1	30
32.8	76.9	71.8	30.4
33.3	82.2	78.1	30.4
33.6	81.5	84.4	32.9
33.6	83.1	70.1	33.7
33.7	79.4	82.4	34.2
35.3	72.5	81.8	34.3
36.8	75.3	87.3	35.6
37.5	85.8	92.5	36
37.6	83.4	75.9	36.8
37.9	70.4	94.9	47
39.5	85.3		
39.8	80.9		
41.6	60.5		
43.4	77.3		

APPENDIX F

YEAR-ROUND RESULTS CHART

Table 48

Year-round School (YRE) Results

YRE positive results = + YRE negative results = - NS = no significant change
Hispanic student = H + Bilingual positive = Bil+ African American =AA+
Chapter 1 = Ch + High Mobility =Mob+ Diss=Dissertation
Economic Disadvantaged = SES+ At risk positive = AR+
Limited English Proficiency = ESL + SES TRAD=Traditional Calendar school
Equal to or Above = =+

City	State	Researcher	Reading	Math	All Test	Mixed Results	Special Areas
National Studies							
W. Carrollton	Ohio	Dr. D. E. Roby	+	+			
W.Carrollton	Ohio	W. D.Campbell					AR +
	Arizona	Dr. R. Barron		+	+ /NS	Mixed	Bi +
Orlando	Florida	Dr. Fardig				Mixed	
Durham	N. Carolina	J. F. Haenn	+	+			
Jordon	Utah	Dr. P. Sorensen			NS		
Ala.,Fla.,Miss	3 States	Dr. C.B. Cason	+	+			
Trenton	New Jersey	Evaluation Asc.	+	+	+		
Raleigh	N.Carolina	Prohm	+	+	NS		
Rockingham County	N. Carolina	F.H.Frye	+	+	+		
College Park	Georgia	Dr.P.Consolie	+	+	+		
39 studies	Mo.	Dr. H. Cooper	Summer negative effect				
California Studies							
Hayward	Calif.	New Jersey Dept.	NS		=+		
Hayward	Calif.	Duarte-Armas			+		
All State Schools	Calif.	Quinlan	Multi-track - Single-track +				ESL +
Oxnard	Calif.	Brehlle	+	+	Achievement+		
Oxnard	Calif.	N. Brekke	Scores lower but rate of increase higher				Ch +
San Diego	Calif.	Alcorn	+	+	17 YRE + of 27 schools		

City	State	Researcher	Reading	Math	All Test	Mixed Results	Special Areas
	California	B. I. Matsui			no difference		
Chula Vista	California	Collins	-		Math +		
13 studies	California	Dr. L. Six			7+ of 13	Mixed findings	
Sweetwater	California	Z. Chen	Lower YRE scores but higher growth				
Palmdale	California	J. Fish			Increased Achievement		
San Diego	California	Fass-Holmes			YRE had better scores		
19 Studies	6 states	Dr.W.Winters	54 of 64 catagoties + and 3 catagories - and 7 mixed				
Alameda	California	Dr. C. Kneese			+	Mixed	SES+ ESL+
Texas Studies							
Texarkana	Tx.	Paslay			All YRE +		
Conroe	Tx.	Loyd	+	+			
Plano	Tx.	McCasland			All YRE +		
Texarkana	Tx.		+	+			
Conroe	Tx.	Dr..C. Kneese	+	+	+		AR+
15 studies	Tx.	Dr..C. Kneese			NS		
San Antonio	Tx.	Ritter			NS		ESL+
Texas TAAS	Tx.						
Waco	Tx.		+	+			SES+
Cypress Fairbanks	Tx.	Willis	NS / +		=+		AR+ / Mob +
Ft. Worth	Tx.	Brinson			+		
Austin, Conroe, Waxahachie	Tx.	Eddie Dunn	+	-	mixed		H+ SES+
Waco	Tx.	Stripling	NS	+	mixed		
Socorro	Tx.	Shook	+	+	+		
Waco	Tx.	Wolley	NS	NS			SES+
Austin	Tx.	Curry				+	AA+ H+
Ft. Worth	Tx.	Brinson			NS		

APPENDIX G

FREQUENCY TALBES

Math

Math		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	54.500	1	0.862	0.862	0.862
	59.400	1	0.862	0.862	1.724
	60.500	1	0.862	0.862	2.586
	63.800	2	1.724	1.724	4.310
	65.700	1	0.862	0.862	5.172
	67.100	1	0.862	0.862	6.034
	68.200	1	0.862	0.862	6.897
	69.400	2	1.724	1.724	8.621
	70.100	1	0.862	0.862	9.483
	70.400	1	0.862	0.862	10.345
	70.470	1	0.862	0.862	11.207
	70.900	1	0.862	0.862	12.069
	71.500	1	0.862	0.862	12.931
	71.700	1	0.862	0.862	13.793
	71.800	2	1.724	1.724	15.517
	72.500	1	0.862	0.862	16.379
	73.000	1	0.862	0.862	17.241
	73.800	1	0.862	0.862	18.103
	74.200	1	0.862	0.862	18.966
	74.500	2	1.724	1.724	20.690
	75.300	1	0.862	0.862	21.552
	75.500	1	0.862	0.862	22.414
	75.700	1	0.862	0.862	23.276
	75.900	1	0.862	0.862	24.138
	76.300	1	0.862	0.862	25.000
	76.400	1	0.862	0.862	25.862
	76.900	1	0.862	0.862	26.724
	77.300	1	0.862	0.862	27.586
	78.000	1	0.862	0.862	28.448
	78.100	1	0.862	0.862	29.310
	78.400	1	0.862	0.862	30.172
	79.100	1	0.862	0.862	31.034
	79.400	1	0.862	0.862	31.897
	80.600	1	0.862	0.862	32.759
	80.900	1	0.862	0.862	33.621
	81.000	1	0.862	0.862	34.483
	81.500	1	0.862	0.862	35.345
	81.600	1	0.862	0.862	36.207
	81.800	2	1.724	1.724	37.931
	82.200	2	1.724	1.724	39.655
	82.400	1	0.862	0.862	40.517
	82.800	1	0.862	0.862	41.379

Math		Frequency	Percent	Valid Percent	Cumulative Percent
	83.100	1	0.862	0.862	42.241
	83.400	1	0.862	0.862	43.103
	83.900	1	0.862	0.862	43.966
	84.200	1	0.862	0.862	44.828
	84.300	1	0.862	0.862	45.690
	84.400	1	0.862	0.862	46.552
	84.500	1	0.862	0.862	47.414
	85.000	2	1.724	1.724	49.138
	85.300	3	2.586	2.586	51.724
	85.800	2	1.724	1.724	53.448
	86.000	1	0.862	0.862	54.310
	86.200	1	0.862	0.862	55.172
	86.500	1	0.862	0.862	56.034
	86.800	1	0.862	0.862	56.897
	87.200	2	1.724	1.724	58.621
	87.300	1	0.862	0.862	59.483
	87.400	1	0.862	0.862	60.345
	87.600	1	0.862	0.862	61.207
	87.700	1	0.862	0.862	62.069
	88.100	2	1.724	1.724	63.793
	88.600	1	0.862	0.862	64.655
	89.000	2	1.724	1.724	66.379
	89.200	1	0.862	0.862	67.241
	89.300	1	0.862	0.862	68.103
	89.500	1	0.862	0.862	68.966
	89.700	1	0.862	0.862	69.828
	89.900	2	1.724	1.724	71.552
	90.500	2	1.724	1.724	73.276
	91.100	1	0.862	0.862	74.138
	91.400	1	0.862	0.862	75.000
	91.500	1	0.862	0.862	75.862
	91.900	1	0.862	0.862	76.724
	92.000	3	2.586	2.586	79.310
	92.500	1	0.862	0.862	80.172
	92.800	1	0.862	0.862	81.034
	93.200	1	0.862	0.862	81.897
	93.400	1	0.862	0.862	82.759
	93.700	1	0.862	0.862	83.621
	94.300	1	0.862	0.862	84.483
	94.400	1	0.862	0.862	85.345
	94.600	2	1.724	1.724	87.069
	94.900	3	2.586	2.586	89.655
	95.100	1	0.862	0.862	90.517
	95.300	1	0.862	0.862	91.379

Math		Frequency	Percent	Valid Percent	Cumulative Percent
	95.500	2	1.724	1.724	93.103
	95.800	1	0.862	0.862	93.966
	96.000	1	0.862	0.862	94.828
	97.200	1	0.862	0.862	95.690
	97.300	2	1.724	1.724	97.414
	97.700	1	0.862	0.862	98.276
	98.400	1	0.862	0.862	99.138
	99.500	1	0.862	0.862	100.000
	Total	116	100.000	100.000	

Size

VAR00012					
	Size	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	60	1	0.862	0.862	0.862
	91	1	0.862	0.862	1.724
	120	1	0.862	0.862	2.586
	131	1	0.862	0.862	3.448
	171	1	0.862	0.862	4.310
	183	2	1.724	1.724	6.034
	195	1	0.862	0.862	6.897
	221	1	0.862	0.862	7.759
	228	1	0.862	0.862	8.621
	235	1	0.862	0.862	9.483
	246	1	0.862	0.862	10.345
	256	1	0.862	0.862	11.207
	269	1	0.862	0.862	12.069
	271	1	0.862	0.862	12.931
	279	1	0.862	0.862	13.793
	283	1	0.862	0.862	14.655
	288	1	0.862	0.862	15.517
	289	1	0.862	0.862	16.379
	313	2	1.724	1.724	18.103
	339	1	0.862	0.862	18.966
	351	1	0.862	0.862	19.828
	358	1	0.862	0.862	20.690
	362	1	0.862	0.862	21.552
	374	1	0.862	0.862	22.414
	377	1	0.862	0.862	23.276
	383	1	0.862	0.862	24.138
	400	1	0.862	0.862	25.000
	403	1	0.862	0.862	25.862
	404	2	1.724	1.724	27.586
	408	1	0.862	0.862	28.448
	416	1	0.862	0.862	29.310
	417	1	0.862	0.862	30.172
	429	1	0.862	0.862	31.034
	430	1	0.862	0.862	31.897
	440	1	0.862	0.862	32.759
	442	1	0.862	0.862	33.621
	444	1	0.862	0.862	34.483
	447	1	0.862	0.862	35.345
	451	1	0.862	0.862	36.207
	457	1	0.862	0.862	37.069
	462	1	0.862	0.862	37.931

	Size	Frequency	Percent	Valid Percent	Cumulative Percent
	463	1	0.862	0.862	38.793
	472	1	0.862	0.862	39.655
	491	1	0.862	0.862	40.517
	494	1	0.862	0.862	41.379
	496	1	0.862	0.862	42.241
	499	1	0.862	0.862	43.103
	502	1	0.862	0.862	43.966
	503	1	0.862	0.862	44.828
	513	1	0.862	0.862	45.690
	519	1	0.862	0.862	46.552
	520	1	0.862	0.862	47.414
	523	2	1.724	1.724	49.138
	534	1	0.862	0.862	50.000
	537	1	0.862	0.862	50.862
	542	1	0.862	0.862	51.724
	558	1	0.862	0.862	52.586
	565	1	0.862	0.862	53.448
	568	2	1.724	1.724	55.172
	572	1	0.862	0.862	56.034
	577	1	0.862	0.862	56.897
	582	1	0.862	0.862	57.759
	587	1	0.862	0.862	58.621
	590	1	0.862	0.862	59.483
	599	1	0.862	0.862	60.345
	608	2	1.724	1.724	62.069
	611	2	1.724	1.724	63.793
	616	1	0.862	0.862	64.655
	617	2	1.724	1.724	66.379
	627	1	0.862	0.862	67.241
	630	1	0.862	0.862	68.103
	638	1	0.862	0.862	68.966
	663	1	0.862	0.862	69.828
	673	1	0.862	0.862	70.690
	678	1	0.862	0.862	71.552
	680	1	0.862	0.862	72.414
	689	1	0.862	0.862	73.276
	690	1	0.862	0.862	74.138
	696	1	0.862	0.862	75.000
	699	1	0.862	0.862	75.862
	702	2	1.724	1.724	77.586
	705	1	0.862	0.862	78.448
	712	1	0.862	0.862	79.310
	721	1	0.862	0.862	80.172
	731	1	0.862	0.862	81.034

	Size	Frequency	Percent	Valid Percent	Cumulative Percent
	758	1	0.862	0.862	81.897
	761	1	0.862	0.862	82.759
	785	1	0.862	0.862	83.621
	794	1	0.862	0.862	84.483
	797	1	0.862	0.862	85.345
	802	1	0.862	0.862	86.207
	817	1	0.862	0.862	87.069
	827	1	0.862	0.862	87.931
	837	1	0.862	0.862	88.793
	851	1	0.862	0.862	89.655
	870	1	0.862	0.862	90.517
	875	2	1.724	1.724	92.241
	895	1	0.862	0.862	93.103
	901	1	0.862	0.862	93.966
	909	1	0.862	0.862	94.828
	921	1	0.862	0.862	95.690
	965	1	0.862	0.862	96.552
	977	1	0.862	0.862	97.414
	984	1	0.862	0.862	98.276
	1000	1	0.862	0.862	99.138
	1210	1	0.862	0.862	100.000
	Total	116	100.000	100.000	

Economic Disadvantaged

Eco. Disadvantaged.		Frequency	Percent	Valid Percent	Cumulative Percent
VAR00013					
Valid	0.000	3	2.586	2.586	2.586
	1.500	1	0.862	0.862	3.448
	2.600	2	1.724	1.724	5.172
	5.500	1	0.862	0.862	6.034
	10.900	1	0.862	0.862	6.897
	12.200	1	0.862	0.862	7.759
	15.000	1	0.862	0.862	8.621
	18.500	2	1.724	1.724	10.345
	20.500	1	0.862	0.862	11.207
	21.000	1	0.862	0.862	12.069
	21.100	1	0.862	0.862	12.931
	22.900	2	1.724	1.724	14.655
	28.900	1	0.862	0.862	15.517
	31.000	1	0.862	0.862	16.379
	31.700	1	0.862	0.862	17.241
	31.900	1	0.862	0.862	18.103
	32.400	1	0.862	0.862	18.966
	32.800	1	0.862	0.862	19.828
	35.300	1	0.862	0.862	20.690
	37.400	1	0.862	0.862	21.552
	38.200	1	0.862	0.862	22.414
	39.400	1	0.862	0.862	23.276
	39.600	1	0.862	0.862	24.138
	40.100	1	0.862	0.862	25.000
	42.900	1	0.862	0.862	25.862
	43.900	1	0.862	0.862	26.724
	44.600	2	1.724	1.724	28.448
	45.800	1	0.862	0.862	29.310
	47.100	1	0.862	0.862	30.172
	48.000	1	0.862	0.862	31.034
	48.200	1	0.862	0.862	31.897
	49.300	1	0.862	0.862	32.759
	50.300	1	0.862	0.862	33.621
	50.500	1	0.862	0.862	34.483
	51.900	1	0.862	0.862	35.345
	53.900	1	0.862	0.862	36.207
	54.100	1	0.862	0.862	37.069
	55.000	1	0.862	0.862	37.931
	59.400	1	0.862	0.862	38.793
	59.500	1	0.862	0.862	39.655
	62.200	1	0.862	0.862	40.517
	64.400	1	0.862	0.862	41.379

Eco. Disadvantaged.		Frequency	Percent	Valid Percent	Cumulative Percent
	66.800	1	0.862	0.862	42.241
	68.900	1	0.862	0.862	43.103
	69.800	1	0.862	0.862	43.966
	70.200	1	0.862	0.862	44.828
	70.300	1	0.862	0.862	45.690
	70.900	1	0.862	0.862	46.552
	71.000	1	0.862	0.862	47.414
	72.900	2	1.724	1.724	49.138
	73.600	2	1.724	1.724	50.862
	74.000	1	0.862	0.862	51.724
	74.500	1	0.862	0.862	52.586
	78.100	1	0.862	0.862	53.448
	78.300	1	0.862	0.862	54.310
	78.800	1	0.862	0.862	55.172
	79.800	1	0.862	0.862	56.034
	80.400	1	0.862	0.862	56.897
	81.300	2	1.724	1.724	58.621
	81.700	3	2.586	2.586	61.207
	82.400	1	0.862	0.862	62.069
	83.400	2	1.724	1.724	63.793
	83.500	1	0.862	0.862	64.655
	85.200	1	0.862	0.862	65.517
	85.600	1	0.862	0.862	66.379
	85.800	1	0.862	0.862	67.241
	86.000	1	0.862	0.862	68.103
	86.100	1	0.862	0.862	68.966
	86.200	1	0.862	0.862	69.828
	86.400	1	0.862	0.862	70.690
	86.900	1	0.862	0.862	71.552
	87.000	1	0.862	0.862	72.414
	87.300	1	0.862	0.862	73.276
	89.300	1	0.862	0.862	74.138
	89.700	1	0.862	0.862	75.000
	89.800	1	0.862	0.862	75.862
	90.200	1	0.862	0.862	76.724
	90.300	1	0.862	0.862	77.586
	90.600	1	0.862	0.862	78.448
	90.700	2	1.724	1.724	80.172
	90.800	1	0.862	0.862	81.034
	90.900	1	0.862	0.862	81.897
	91.000	1	0.862	0.862	82.759
	91.100	1	0.862	0.862	83.621
	91.500	1	0.862	0.862	84.483
	91.700	1	0.862	0.862	85.345

Eco. Disadvantaged.		Frequency	Percent	Valid Percent	Cumulative Percent
	91.900	1	0.862	0.862	86.207
	92.000	1	0.862	0.862	87.069
	92.400	1	0.862	0.862	87.931
	92.600	1	0.862	0.862	88.793
	92.800	1	0.862	0.862	89.655
	93.500	1	0.862	0.862	90.517
	93.600	1	0.862	0.862	91.379
	96.200	1	0.862	0.862	92.241
	96.300	1	0.862	0.862	93.103
	96.800	1	0.862	0.862	93.966
	96.900	1	0.862	0.862	94.828
	97.100	1	0.862	0.862	95.690
	97.400	1	0.862	0.862	96.552
	97.700	1	0.862	0.862	97.414
	97.800	1	0.862	0.862	98.276
	98.600	1	0.862	0.862	99.138
	98.800	1	0.862	0.862	100.000
	Total	116	100.000	100.000	

African American

VAR00014					
African American		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0.000	10	8.621	8.621	8.621
	0.100	2	1.724	1.724	10.345
	0.200	5	4.310	4.310	14.655
	0.300	1	0.862	0.862	15.517
	0.400	1	0.862	0.862	16.379
	0.700	1	0.862	0.862	17.241
	0.800	1	0.862	0.862	18.103
	0.900	3	2.586	2.586	20.690
	1.000	2	1.724	1.724	22.414
	1.200	1	0.862	0.862	23.276
	1.300	1	0.862	0.862	24.138
	1.500	1	0.862	0.862	25.000
	2.100	1	0.862	0.862	25.862
	2.200	2	1.724	1.724	27.586
	2.300	2	1.724	1.724	29.310
	2.400	1	0.862	0.862	30.172
	2.600	1	0.862	0.862	31.034
	2.800	1	0.862	0.862	31.897
	3.100	1	0.862	0.862	32.759
	3.200	2	1.724	1.724	34.483
	3.500	4	3.448	3.448	37.931
	3.700	2	1.724	1.724	39.655
	3.800	2	1.724	1.724	41.379
	3.900	2	1.724	1.724	43.103
	4.000	1	0.862	0.862	43.966
	4.200	1	0.862	0.862	44.828
	4.300	1	0.862	0.862	45.690
	4.500	1	0.862	0.862	46.552
	4.600	1	0.862	0.862	47.414
	4.800	1	0.862	0.862	48.276
	4.900	1	0.862	0.862	49.138
	5.100	1	0.862	0.862	50.000
	5.200	1	0.862	0.862	50.862
	5.400	1	0.862	0.862	51.724
	5.600	1	0.862	0.862	52.586
	5.900	1	0.862	0.862	53.448
	6.300	1	0.862	0.862	54.310
	6.600	2	1.724	1.724	56.034
	7.100	1	0.862	0.862	56.897
	7.200	1	0.862	0.862	57.759
	7.300	1	0.862	0.862	58.621
	7.500	1	0.862	0.862	59.483

African American		Frequency	Percent	Valid Percent	Cumulative Percent
	7.800	1	0.862	0.862	60.345
	8.000	1	0.862	0.862	61.207
	8.600	1	0.862	0.862	62.069
	8.700	1	0.862	0.862	62.931
	8.800	1	0.862	0.862	63.793
	9.100	1	0.862	0.862	64.655
	9.200	1	0.862	0.862	65.517
	11.000	1	0.862	0.862	66.379
	11.700	1	0.862	0.862	67.241
	12.400	1	0.862	0.862	68.103
	13.100	1	0.862	0.862	68.966
	14.200	1	0.862	0.862	69.828
	14.300	1	0.862	0.862	70.690
	15.400	1	0.862	0.862	71.552
	17.300	1	0.862	0.862	72.414
	18.300	1	0.862	0.862	73.276
	19.300	1	0.862	0.862	74.138
	19.800	2	1.724	1.724	75.862
	22.000	1	0.862	0.862	76.724
	23.400	1	0.862	0.862	77.586
	24.600	1	0.862	0.862	78.448
	25.300	1	0.862	0.862	79.310
	27.900	2	1.724	1.724	81.034
	29.900	1	0.862	0.862	81.897
	30.200	1	0.862	0.862	82.759
	34.900	1	0.862	0.862	83.621
	36.700	2	1.724	1.724	85.345
	38.100	1	0.862	0.862	86.207
	38.600	1	0.862	0.862	87.069
	39.800	1	0.862	0.862	87.931
	41.200	1	0.862	0.862	88.793
	41.800	1	0.862	0.862	89.655
	45.400	1	0.862	0.862	90.517
	53.200	1	0.862	0.862	91.379
	64.700	1	0.862	0.862	92.241
	66.500	1	0.862	0.862	93.103
	76.500	1	0.862	0.862	93.966
	76.900	1	0.862	0.862	94.828
	85.400	1	0.862	0.862	95.690
	89.200	1	0.862	0.862	96.552
	94.800	1	0.862	0.862	97.414
	95.000	1	0.862	0.862	98.276
	95.600	1	0.862	0.862	99.138
	97.100	1	0.862	0.862	100.000
	Total	116	100.000	100.000	

Hispanic

VAR00015					
Hispanic		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.500	1	0.862	0.862	0.862
	2.400	1	0.862	0.862	1.724
	2.600	1	0.862	0.862	2.586
	2.700	2	1.724	1.724	4.310
	2.800	2	1.724	1.724	6.034
	4.100	1	0.862	0.862	6.897
	4.200	1	0.862	0.862	7.759
	4.700	1	0.862	0.862	8.621
	5.000	1	0.862	0.862	9.483
	5.900	1	0.862	0.862	10.345
	6.200	1	0.862	0.862	11.207
	6.400	2	1.724	1.724	12.931
	6.600	2	1.724	1.724	14.655
	8.500	1	0.862	0.862	15.517
	8.900	1	0.862	0.862	16.379
	10.000	1	0.862	0.862	17.241
	10.300	1	0.862	0.862	18.103
	10.400	1	0.862	0.862	18.966
	10.800	1	0.862	0.862	19.828
	10.900	1	0.862	0.862	20.690
	12.200	1	0.862	0.862	21.552
	12.400	1	0.862	0.862	22.414
	13.000	1	0.862	0.862	23.276
	13.100	1	0.862	0.862	24.138
	13.200	1	0.862	0.862	25.000
	14.400	1	0.862	0.862	25.862
	14.500	2	1.724	1.724	27.586
	15.000	1	0.862	0.862	28.448
	15.200	1	0.862	0.862	29.310
	16.000	1	0.862	0.862	30.172
	16.400	1	0.862	0.862	31.034
	19.600	1	0.862	0.862	31.897
	20.100	1	0.862	0.862	32.759
	20.700	1	0.862	0.862	33.621
	21.100	1	0.862	0.862	34.483
	21.900	1	0.862	0.862	35.345
	23.700	1	0.862	0.862	36.207
	26.600	1	0.862	0.862	37.069
	27.100	1	0.862	0.862	37.931
	27.400	1	0.862	0.862	38.793
	28.500	1	0.862	0.862	39.655

Hispanic		Frequency	Percent	Valid Percent	Cumulative Percent
	30.400	1	0.862	0.862	40.517
	31.100	1	0.862	0.862	41.379
	32.300	1	0.862	0.862	42.241
	34.300	1	0.862	0.862	43.103
	34.900	1	0.862	0.862	43.966
	37.400	1	0.862	0.862	44.828
	37.500	1	0.862	0.862	45.690
	37.800	1	0.862	0.862	46.552
	38.400	1	0.862	0.862	47.414
	40.200	1	0.862	0.862	48.276
	40.900	1	0.862	0.862	49.138
	41.000	1	0.862	0.862	50.000
	42.100	1	0.862	0.862	50.862
	46.200	1	0.862	0.862	51.724
	46.500	1	0.862	0.862	52.586
	46.600	1	0.862	0.862	53.448
	48.900	1	0.862	0.862	54.310
	50.100	1	0.862	0.862	55.172
	54.600	1	0.862	0.862	56.034
	54.700	1	0.862	0.862	56.897
	57.500	1	0.862	0.862	57.759
	57.600	1	0.862	0.862	58.621
	58.500	1	0.862	0.862	59.483
	59.100	1	0.862	0.862	60.345
	61.200	1	0.862	0.862	61.207
	61.800	1	0.862	0.862	62.069
	63.200	1	0.862	0.862	62.931
	66.200	1	0.862	0.862	63.793
	67.300	1	0.862	0.862	64.655
	67.900	1	0.862	0.862	65.517
	69.600	1	0.862	0.862	66.379
	70.200	1	0.862	0.862	67.241
	71.000	1	0.862	0.862	68.103
	72.000	1	0.862	0.862	68.966
	73.900	1	0.862	0.862	69.828
	75.000	1	0.862	0.862	70.690
	75.200	1	0.862	0.862	71.552
	76.400	1	0.862	0.862	72.414
	76.700	1	0.862	0.862	73.276
	77.400	1	0.862	0.862	74.138
	77.900	1	0.862	0.862	75.000
	78.700	1	0.862	0.862	75.862
	84.300	1	0.862	0.862	76.724
	85.500	1	0.862	0.862	77.586

Hispanic		Frequency	Percent	Valid Percent	Cumulative Percent
	85.600	2	1.724	1.724	79.310
	86.500	1	0.862	0.862	80.172
	86.600	1	0.862	0.862	81.034
	86.900	1	0.862	0.862	81.897
	88.300	1	0.862	0.862	82.759
	89.100	1	0.862	0.862	83.621
	90.000	1	0.862	0.862	84.483
	90.100	1	0.862	0.862	85.345
	90.600	1	0.862	0.862	86.207
	92.200	1	0.862	0.862	87.069
	92.300	1	0.862	0.862	87.931
	93.800	1	0.862	0.862	88.793
	94.300	1	0.862	0.862	89.655
	94.900	1	0.862	0.862	90.517
	95.400	1	0.862	0.862	91.379
	96.800	2	1.724	1.724	93.103
	96.900	1	0.862	0.862	93.966
	98.000	1	0.862	0.862	94.828
	98.400	2	1.724	1.724	96.552
	98.800	1	0.862	0.862	97.414
	99.200	1	0.862	0.862	98.276
	99.300	1	0.862	0.862	99.138
	99.400	1	0.862	0.862	100.000
	Total	116	100.000	100.000	

White

VAR00016					
White		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0.000	2	1.724	1.724	1.724
	0.100	1	0.862	0.862	2.586
	0.300	2	1.724	1.724	4.310
	0.400	2	1.724	1.724	6.034
	0.700	1	0.862	0.862	6.897
	0.800	2	1.724	1.724	8.621
	0.900	2	1.724	1.724	10.345
	1.100	1	0.862	0.862	11.207
	1.300	1	0.862	0.862	12.069
	1.500	1	0.862	0.862	12.931
	1.600	1	0.862	0.862	13.793
	1.700	1	0.862	0.862	14.655
	2.000	1	0.862	0.862	15.517
	2.400	1	0.862	0.862	16.379
	2.500	1	0.862	0.862	17.241
	2.600	1	0.862	0.862	18.103
	2.800	1	0.862	0.862	18.966
	2.900	3	2.586	2.586	21.552
	3.600	3	2.586	2.586	24.138
	3.900	1	0.862	0.862	25.000
	4.400	1	0.862	0.862	25.862
	4.500	1	0.862	0.862	26.724
	5.800	1	0.862	0.862	27.586
	6.100	1	0.862	0.862	28.448
	6.200	1	0.862	0.862	29.310
	6.900	1	0.862	0.862	30.172
	7.400	1	0.862	0.862	31.034
	7.900	1	0.862	0.862	31.897
	8.500	1	0.862	0.862	32.759
	9.300	1	0.862	0.862	33.621
	10.000	1	0.862	0.862	34.483
	10.200	2	1.724	1.724	36.207
	10.600	1	0.862	0.862	37.069
	10.900	1	0.862	0.862	37.931
	11.500	1	0.862	0.862	38.793
	11.900	1	0.862	0.862	39.655
	12.200	1	0.862	0.862	40.517
	13.700	1	0.862	0.862	41.379
	14.000	1	0.862	0.862	42.241
	14.800	1	0.862	0.862	43.103
	15.100	1	0.862	0.862	43.966
	15.500	1	0.862	0.862	44.828

White		Frequency	Percent	Valid Percent	Cumulative Percent
	15.600	1	0.862	0.862	45.690
	16.900	1	0.862	0.862	46.552
	17.300	1	0.862	0.862	47.414
	17.500	1	0.862	0.862	48.276
	18.900	1	0.862	0.862	49.138
	20.600	1	0.862	0.862	50.000
	21.300	1	0.862	0.862	50.862
	21.700	1	0.862	0.862	51.724
	21.900	1	0.862	0.862	52.586
	22.500	1	0.862	0.862	53.448
	23.700	1	0.862	0.862	54.310
	24.200	1	0.862	0.862	55.172
	26.700	1	0.862	0.862	56.034
	27.400	1	0.862	0.862	56.897
	28.700	1	0.862	0.862	57.759
	29.000	1	0.862	0.862	58.621
	32.500	1	0.862	0.862	59.483
	36.200	1	0.862	0.862	60.345
	39.200	1	0.862	0.862	61.207
	40.300	1	0.862	0.862	62.069
	41.200	1	0.862	0.862	62.931
	41.400	1	0.862	0.862	63.793
	41.900	1	0.862	0.862	64.655
	42.600	1	0.862	0.862	65.517
	43.400	1	0.862	0.862	66.379
	44.000	1	0.862	0.862	67.241
	45.800	1	0.862	0.862	68.103
	49.200	1	0.862	0.862	68.966
	49.400	1	0.862	0.862	69.828
	51.400	1	0.862	0.862	70.690
	53.300	1	0.862	0.862	71.552
	53.800	1	0.862	0.862	72.414
	54.800	1	0.862	0.862	73.276
	55.200	1	0.862	0.862	74.138
	58.500	1	0.862	0.862	75.000
	62.200	1	0.862	0.862	75.862
	62.700	1	0.862	0.862	76.724
	63.900	1	0.862	0.862	77.586
	64.000	1	0.862	0.862	78.448
	65.200	1	0.862	0.862	79.310
	66.000	1	0.862	0.862	80.172
	66.600	1	0.862	0.862	81.034
	69.800	1	0.862	0.862	81.897
	71.700	1	0.862	0.862	82.759

White		Frequency	Percent	Valid Percent	Cumulative Percent
	73.200	1	0.862	0.862	83.621
	79.300	1	0.862	0.862	84.483
	81.900	1	0.862	0.862	85.345
	82.300	1	0.862	0.862	86.207
	84.300	1	0.862	0.862	87.069
	85.100	1	0.862	0.862	87.931
	85.300	1	0.862	0.862	88.793
	86.400	2	1.724	1.724	90.517
	87.600	1	0.862	0.862	91.379
	87.700	1	0.862	0.862	92.241
	88.000	2	1.724	1.724	93.966
	88.300	1	0.862	0.862	94.828
	92.300	1	0.862	0.862	95.690
	93.200	1	0.862	0.862	96.552
	94.100	1	0.862	0.862	97.414
	94.500	1	0.862	0.862	98.276
	94.800	1	0.862	0.862	99.138
	95.300	1	0.862	0.862	100.000
	Total	116	100.000	100.000	

Special Education

VAR00017					
Sp. Ed.		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	4.100	1	0.862	0.862	0.862
	4.400	1	0.862	0.862	1.724
	4.800	1	0.862	0.862	2.586
	5.500	1	0.862	0.862	3.448
	5.900	2	1.724	1.724	5.172
	6.100	2	1.724	1.724	6.897
	6.200	1	0.862	0.862	7.759
	6.300	1	0.862	0.862	8.621
	6.700	2	1.724	1.724	10.345
	6.900	2	1.724	1.724	12.069
	7.100	1	0.862	0.862	12.931
	7.300	1	0.862	0.862	13.793
	7.500	1	0.862	0.862	14.655
	7.700	2	1.724	1.724	16.379
	7.800	1	0.862	0.862	17.241
	7.900	3	2.586	2.586	19.828
	8.100	2	1.724	1.724	21.552
	8.200	2	1.724	1.724	23.276
	8.300	2	1.724	1.724	25.000
	8.600	2	1.724	1.724	26.724
	8.700	2	1.724	1.724	28.448
	8.800	1	0.862	0.862	29.310
	9.000	1	0.862	0.862	30.172
	9.100	1	0.862	0.862	31.034
	9.200	3	2.586	2.586	33.621
	9.300	1	0.862	0.862	34.483
	9.500	1	0.862	0.862	35.345
	9.700	1	0.862	0.862	36.207
	9.800	1	0.862	0.862	37.069
	10.000	1	0.862	0.862	37.931
	10.100	1	0.862	0.862	38.793
	10.200	1	0.862	0.862	39.655
	10.300	1	0.862	0.862	40.517
	10.400	2	1.724	1.724	42.241
	10.600	1	0.862	0.862	43.103
	10.800	1	0.862	0.862	43.966
	10.900	1	0.862	0.862	44.828
	11.200	4	3.448	3.448	48.276
	11.300	1	0.862	0.862	49.138
	11.400	2	1.724	1.724	50.862
	11.500	2	1.724	1.724	52.586

Sp. Ed.		Frequency	Percent	Valid Percent	Cumulative Percent
	11.600	2	1.724	1.724	54.310
	11.700	3	2.586	2.586	56.897
	11.800	1	0.862	0.862	57.759
	12.000	3	2.586	2.586	60.345
	12.300	4	3.448	3.448	63.793
	12.500	1	0.862	0.862	64.655
	12.700	1	0.862	0.862	65.517
	12.900	1	0.862	0.862	66.379
	13.000	1	0.862	0.862	67.241
	13.100	1	0.862	0.862	68.103
	13.200	2	1.724	1.724	69.828
	13.300	1	0.862	0.862	70.690
	13.700	2	1.724	1.724	72.414
	13.800	1	0.862	0.862	73.276
	13.900	1	0.862	0.862	74.138
	14.000	3	2.586	2.586	76.724
	14.200	2	1.724	1.724	78.448
	14.300	2	1.724	1.724	80.172
	14.500	1	0.862	0.862	81.034
	14.900	1	0.862	0.862	81.897
	15.100	1	0.862	0.862	82.759
	15.200	1	0.862	0.862	83.621
	15.400	2	1.724	1.724	85.345
	15.600	2	1.724	1.724	87.069
	16.100	1	0.862	0.862	87.931
	16.200	1	0.862	0.862	88.793
	16.400	1	0.862	0.862	89.655
	16.600	2	1.724	1.724	91.379
	16.900	1	0.862	0.862	92.241
	17.500	2	1.724	1.724	93.966
	18.100	1	0.862	0.862	94.828
	18.200	1	0.862	0.862	95.690
	18.300	1	0.862	0.862	96.552
	19.500	1	0.862	0.862	97.414
	20.400	1	0.862	0.862	98.276
	21.900	1	0.862	0.862	99.138
	22.300	1	0.862	0.862	100.000
	Total	116	100.000	100.000	

Mobility

Mobility		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	5.900	1	0.862	0.862	0.862
VAR00018	10.800	1	0.862	0.862	1.724
	10.900	1	0.862	0.862	2.586
	11.300	1	0.862	0.862	3.448
	11.900	2	1.724	1.724	5.172
	12.200	1	0.862	0.862	6.034
	13.000	1	0.862	0.862	6.897
	13.700	1	0.862	0.862	7.759
	14.000	1	0.862	0.862	8.621
	14.500	1	0.862	0.862	9.483
	14.700	2	1.724	1.724	11.207
	15.000	2	1.724	1.724	12.931
	15.100	1	0.862	0.862	13.793
	15.400	1	0.862	0.862	14.655
	15.500	1	0.862	0.862	15.517
	15.700	1	0.862	0.862	16.379
	16.300	1	0.862	0.862	17.241
	16.400	2	1.724	1.724	18.966
	16.500	2	1.724	1.724	20.690
	16.600	1	0.862	0.862	21.552
	16.700	1	0.862	0.862	22.414
	16.800	1	0.862	0.862	23.276
	16.900	1	0.862	0.862	24.138
	17.300	1	0.862	0.862	25.000
	17.600	1	0.862	0.862	25.862
	17.900	2	1.724	1.724	27.586
	18.400	1	0.862	0.862	28.448
	18.600	1	0.862	0.862	29.310
	18.800	1	0.862	0.862	30.172
	19.100	1	0.862	0.862	31.034
	19.600	1	0.862	0.862	31.897
	19.800	1	0.862	0.862	32.759
	20.300	1	0.862	0.862	33.621
	20.700	1	0.862	0.862	34.483
	21.000	2	1.724	1.724	36.207
	21.100	1	0.862	0.862	37.069
	21.600	1	0.862	0.862	37.931
	22.000	3	2.586	2.586	40.517
	22.500	1	0.862	0.862	41.379
	22.600	1	0.862	0.862	42.241
	22.900	1	0.862	0.862	43.103
	23.200	1	0.862	0.862	43.966
	23.230	1	0.862	0.862	44.828

Mobility		Frequency	Percent	Valid Percent	Cumulative Percent
	23.400	1	0.862	0.862	45.690
	23.600	2	1.724	1.724	47.414
	23.900	2	1.724	1.724	49.138
	24.300	1	0.862	0.862	50.000
	24.500	1	0.862	0.862	50.862
	24.700	2	1.724	1.724	52.586
	24.800	1	0.862	0.862	53.448
	25.000	1	0.862	0.862	54.310
	25.100	2	1.724	1.724	56.034
	25.200	1	0.862	0.862	56.897
	25.500	1	0.862	0.862	57.759
	26.000	1	0.862	0.862	58.621
	26.400	2	1.724	1.724	60.345
	26.600	1	0.862	0.862	61.207
	26.700	1	0.862	0.862	62.069
	26.900	1	0.862	0.862	62.931
	27.200	1	0.862	0.862	63.793
	27.300	3	2.586	2.586	66.379
	27.800	1	0.862	0.862	67.241
	29.000	1	0.862	0.862	68.103
	29.100	2	1.724	1.724	69.828
	29.200	1	0.862	0.862	70.690
	29.300	1	0.862	0.862	71.552
	29.400	1	0.862	0.862	72.414
	29.600	1	0.862	0.862	73.276
	30.000	1	0.862	0.862	74.138
	30.300	1	0.862	0.862	75.000
	30.400	2	1.724	1.724	76.724
	30.600	1	0.862	0.862	77.586
	30.700	1	0.862	0.862	78.448
	30.900	1	0.862	0.862	79.310
	31.310	1	0.862	0.862	80.172
	32.300	1	0.862	0.862	81.034
	32.800	1	0.862	0.862	81.897
	32.900	1	0.862	0.862	82.759
	33.300	1	0.862	0.862	83.621
	33.600	2	1.724	1.724	85.345
	33.700	2	1.724	1.724	87.069
	34.200	1	0.862	0.862	87.931
	34.300	1	0.862	0.862	88.793
	35.300	1	0.862	0.862	89.655
	35.600	1	0.862	0.862	90.517
	36.000	1	0.862	0.862	91.379
	36.800	2	1.724	1.724	93.103
Mobility		Frequency	Percent	Valid Percent	Cumulative Percent

	37.500	1	0.862	0.862	93.966
	37.600	1	0.862	0.862	94.828
	37.900	1	0.862	0.862	95.690
	39.500	1	0.862	0.862	96.552
	39.800	1	0.862	0.862	97.414
	41.600	1	0.862	0.862	98.276
	47.000	1	0.862	0.862	99.138
	88.000	1	0.862	0.862	100.000
	Total	116	100.000	100.000	

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