

**Multi-Track Year-Round Education:
Boon or Barrier to Academic Achievement?**

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Executive Summary

In September 2004, Wake County, North Carolina proposed the conversion of 36 traditional elementary schools to mandatory multi-track year-round schedules. The proposal failed largely due to parental concerns about academic achievement. This statistical analysis sheds light on academic achievement by comparing academic indicators at traditional elementary schools to those at multi-track year-round elementary schools in a large California data sample. When demographic characteristics are controlled, traditional schools were likely to produce higher average test scores in 2002 and 2003. These results indicate that the concerns of Wake County parents are justified, but further analysis is needed.

Introduction

In September 2004, the Wake County, North Carolina Board of Education considered the best way to address school overcrowding in Wake elementary schools. Due to rapid population growth, a state-mandated class size reduction policy, and protracted school construction, county planners anticipate an over-enrollment of 4,100 students in 2005-06.¹ One proposal to alleviate overcrowding was the temporary conversion of 36 elementary schools from traditional schedules to multi-track year-round schedules. The proposal provoked a public outcry from parents. As a result of the parental opposition, Wake County decided against year-round schools and instead opted to address school overcrowding by purchasing modular classrooms. This decision was made despite the \$20 million projected cost savings of year-round school conversion.²

Parental resistance to compulsory year-round schools was based largely on two concerns: family scheduling problems and questions about academic achievement at compulsory multi-track year-round schools.³ Parents' concerns about academics were understandable based on the conflicting results produced by studies on year-round schools and academic achievement.⁴ This study helps to resolve these conflicts by comparing elementary school academic achievement at multi-track year-round schools and traditional schools. The results of this study are used to make recommendations to the Wake County School Board.

A number of studies demonstrate that student academic achievement is lower at year-round schools than at traditional schools.⁵ Lower academic achievement at year-round schools is often attributed to the existence of student ability groups (tracks) that segregate students based on demographic factors and achievement levels.⁶ Substantial differences frequently exist between the quality of teachers and other resources allocated to each track, and these differences can produce disparate learning environments. Contrary to these findings, other studies show higher achievement at year-round schools. Authors of these studies conclude that achievement is higher because students at year-round schools do not need to spend as much time reviewing material as students in traditional calendars with long summer breaks.⁷ Thus, students in year-round schools may be able to retain more material and learn new material at a faster pace. Additional potential advantages of year-round education include improved teacher and student attendance and lower dropout rates.⁸ To further complicate this question of academic achievement, many studies find no significant achievement differences between year-round and traditional schools.⁹

The current literature fails to adequately address issues of educational equality. Factors such as school racial composition, location, and average student socio-economic status may substantially impact student achievement at both year-round and traditional schools. Demographic factors may in fact be more important in determining student success than school calendar type. However, few studies include such factors in their analyses.

Another problem with the current literature on year-round schools is the lack of distinction between multi-track and single-track year-round schools. Multi-track schools divide students into groups or 'tracks' (usually four) of students that attend school on a rotational schedule. In a four-track school, three tracks of students attend while the fourth track is on vacation. When the fourth track returns to school, another track goes on vacation. Vacations at multi-track year-round schools are much shorter in length, than the traditional school summer vacation. Single-track year-round schools also operate on year-round schedules, with numerous short breaks. In single-track schools, all students attend school at the same time and take vacations at the same time. In most cases, multi-track year-round schools are implemented to increase school capacity.¹⁰ In contrast, single-track year-round schools are usually implemented for academic reasons. All year-round schools and traditional schools require the same number of instructional minutes each school year.¹¹

Wake County has considered and rejected many proposals for mandatory multi-track year-round (henceforth referred to as 'multi-track' schools). It is likely that such proposals will be considered again if Wake County continues to experience rapid growth.¹² Most research indicates that conversion to multi-track schedules can result in considerable cost savings for districts.¹³ Although transition costs and operating costs for multi-track schools are substantial, the per-pupil costs are typically lower compared to

traditional schools.¹⁴ However, cost savings should not come at the expense of academic excellence. This study compares average academic achievement at multi-track year-round schools to traditional schools by examining a large data sample of both types of elementary schools. The results provide additional information for Wake County policy makers.

The first Wake County multi-track year-round elementary school opened in 1991.¹⁵ The county currently has 11 multi-track elementary schools, all of which operate as magnet schools.¹⁶ These schools each have a base enrollment area and accept applications for the remaining enrollment spots.¹⁷ Students living within the base enrollment areas are automatically assigned to particular magnet schools. Students outside the base enrollment areas must apply in order to attend. Thus, the majority of the students at each of these magnet schools attend voluntarily.

Wake County schools do not comprise an appropriate sample for examining compulsory year-round schools because all of the multi-track year-round schools in Wake County are magnet schools. Magnet schools with predominantly voluntary enrollment policies often produce higher academic performance. However, higher academic performance is often attributable to more motivated student populations and more involved parents rather than differences in educational quality.¹⁸ For this reason, Wake County schools were not the subject of the analysis and California schools were used instead.

In 2002, California had the greatest number and highest percentage of year-round schools of any state. Twenty-two percent of all schools in California were year-round in 2002.¹⁹ Twelve-hundred seventy-four (82 percent) of the 1,560 year-round schools were at the elementary school level.²⁰ Nine-hundred and sixteen (59 percent) of the year-round schools were multi-track and enrolled a total of 978,133 students.²¹ The large number and percentage of California multi-track schools facilitates a thorough study of the differences between school calendar types. In contrast to Wake County's multi-track schools, California multi-track year-round schools are not limited exclusively to magnet schools. Most California students are assigned to multi-track schools rather than choosing to attend.²² Thus, academic achievement differences cannot be attributed to school choice. The California sample provides a large data pool, the ability to control for key demographic factors, and clear measures of academic achievement.

Methodology

My statistical analyses compared characteristics (such as racial composition and average class sizes) of multi-track and traditional schools.²³ Single-track schools were not included in this study because they would not help solve Wake County's overcrowding problem. Academic achievement at multi-track and traditional schools was examined while holding demographic characteristics constant (Refer to Appendices A-0 for all variables, explanations, and statistical output).²⁴ This comparison allows researchers to predict actual achievement differences between the two types of schools. Finally, the California data set was restricted to schools that resemble Wake County public non-magnet schools in order to understand how academic achievement in Wake County might differ between compulsory multi-track and traditional schools.²⁵ These restrictions were imposed to make the study more generalize-able to Wake County.

The 2002 and 2003 California data used for this analysis is available on the California Department of Education website.²⁶ The following school types were excluded from the California sample: single-track year-round schools, high schools, middle schools, stand-alone kindergartens and any schools that offered only first grade and kindergarten.²⁷ Any alternative schools were also removed from the data set.²⁸ Additionally, schools that did not have at least ten valid Academic Performance Index (API) test scores were eliminated.²⁹ The final remaining sample consisted of 4,181 traditional and multi-track schools.

It is difficult to accurately measure academic achievement and growth in achievement. California has opted to measure academic achievement and growth with the Academic Performance Index (API). This study measured academic achievement using four distinct indicators. These indicators were: 2002 API scores, 2003 API scores, change in API from 2002 to 2003, and attainment (or non-attainment) of school target growth (according to the California state definition).³⁰ By measuring academic achievement

in four different ways, the study captures static academic achievement in both 2002 and 2003, short-term academic progress, and academic achievement as defined by the state of California.

The API is a numeric index (or scale) that ranges from a low of 200 to a high of 1000. A school's API score is an indicator of a school's performance level.³¹ The API combines the results of several standardized tests into a single indicator.³² Change from 2002 to 2003 is computed by subtracting the score in 2002 from the score in 2003. The attainment of school target growth is calculated in the following way. If a school attained an average API of 800 in 2003, it automatically met target growth. Schools that did not attain an average score of 800 in 2003 met the target only if their average 2003 API increased by five percent of the difference between 800 and its 2002 API score.

Results

The initial analyses showed noticeable differences in academic achievement between multi-track and traditional schools. Both 2002 and 2003 APIs were significantly statistically higher at traditional schools, although the average score change from 2002 to 2003 was higher at multi-track schools.³³

School Calendar	Average 2002 School API Score	Average 2003 School API Score	Average 2002-2003 Score Change
Multi-track	634	671	38
Traditional	718	747	30

The analyses further indicated that multi-track schools were significantly more likely to meet the school target than traditional schools. The seeming contradictions between scores, score change, and target attainment may be partially attributable to a range restriction effect where it is more difficult to increase average scores as the initial averages approach the maximum score of 1000. These results do not factor in differences in the demographics of the school that may impact academic achievement.

There were a number of statistically significant descriptive contrasts between multi-track and traditional schools, some of which are shown in the following table.³⁴

School Calendar	Average school enrollment	Average % of teachers with full credentials	Average % of parents with high school degree or less	Average % of parents with college degree or higher	Average % of students who are Asian	Average % of students who are Hispanic	Average % of students who are Black	Average % of students who are White	Average % of students eligible for free or reduced price lunch
Multi-track	947	87%	63%	16%	5%	65%	8%	19%	74%
Traditional	513	92%	44%	31%	9%	38%	7%	40%	49%

In addition to these results, multi-track schools were also more likely to be urban and less likely to be located in the suburbs, towns, or rural areas than traditional schools. This data provides a descriptive profile of schools with multi-track year-round calendars and traditional calendars.

Secondary statistical analysis used the demographic differences between multi-track and traditional schools to better clarify the relationship between academic achievement differences and school calendar.³⁴ The following school-level demographic factors were included in the analysis: student socio-economic status, teacher qualifications, parent education level, racial composition, location, class size, and school size.³⁵ No parent education data was available for Wake County.³⁶

In 2002, the type of school calendar predicted the average API score even with all of the demographic variables held constant. When all the demographic factors were considered, students at traditional schools scored an average of 9.13 points higher than students at multi-track schools.³⁷ When the California data was restricted to schools that resembled Wake County schools, students at traditional schools scored an average of 9.55 points higher than students at multi-track schools.³⁸

The results were similar in 2003. Holding all the demographic factors constant, traditional schools were likely to score nearly 10 points higher than multi-track year-round schools.³⁹ When the data was limited by Wake County demographics, students at traditional schools scored 10.68 points higher than multi-track schools in 2003.⁴⁰

However, the type of school calendar did not predict API change between 2002 and 2003.⁴¹ There was also no statistical difference between 2002-2003 API change between multi-track and traditional schools when filtered to match Wake County parameters.⁴²

The final indicator was the attainment of school target API growth in 2003. When the demographic factors were controlled, school calendar type did not influence whether or not schools met the state target.⁴³ When the schools in the data set were limited in order to resemble Wake County schools, the type of school calendar did not significantly affect the attainment or non-attainment of target growth as determined by the state of California.⁴⁴

Although the preliminary analysis indicates that students in multi-track schools were more likely than students in traditional schools to improve their scores or attain the statewide target, multi-track schools also had more room to improve their scores due to lower 2002 scores. The additional room for improvement may account for the disappearance of academic achievement differences when other factors are included in the analyses.

In each of the analyses, socio-economic status was the greatest or second greatest predictor of academic achievement. As the percent of students eligible for free or reduced price lunch increased, the average academic achievement decreased across all 4 academic achievement indicators. This was true for the unfiltered California data and when the data was restricted to Wake County characteristics.

Conclusions and Limitations

The results of this study suggest that students at traditional elementary schools academically outperform students at multi-track elementary schools. Therefore, the concerns of Wake County parents about academic achievement and multi-track schools are justified according to this analysis. School calendar type appeared to influence average API scores in both 2002 and 2003. When demographic and descriptive factors were held constant, traditional schools still scored 9 to 11 points higher than multi-track year round schools in both 2002 and 2003. This score difference between traditional and multi-track schools may seem inconsequential out of a possible score range of 800 (from 200-1000). However, the 9 to 11 point difference is large enough to merit further investigation.

The API score differences found in this analysis may indicate potential problems with the educational systems at multi-track year-round schools. There are a number of reasons that may cause academic achievement to be lower at multi-track schools. Students may actually need *more* review time with frequent breaks rather than one long summer vacation. Some authors suggest that most learning loss occurs within the first two-weeks of non-learning. With numerous short breaks, total learning loss may be greater at multi-track schools.⁴⁵ Furthermore, the cycle of learning is disrupted more frequently in year-round schools. Teachers in multi-track schools pack up all their supplies when their student track goes on vacation.⁴⁶ These frequent changes may be disruptive to both students and teachers, and the lack of stability may be reflected in student academic achievement.⁴⁷ Maintenance of school facilities which operate at capacity can fall behind schedule more easily than at traditional schools. Aging or run-down schools can cause student performance to suffer.⁴⁸ Another possibility is that teachers in multi-track schools may be more likely to burn-out and the quality of teaching may suffer.⁴⁹ Within multi-track schools, teachers may also have less time to pursue additional professional development opportunities which are available during the summer at traditional schools.⁵⁰ Finally, overall academic achievement at multi-track schools may be lower because the tracks are segregated in a manner which prevents low-performing students from studying with their higher-performing peers.⁵¹

It is impossible to account for every potential factor in any single study. Distinct curriculums and cultural differences between California and Wake County might result in different conclusions than those reached in this study. In addition, the analyses of test scores and particularly target growth attainment may differ between North Carolina and California because each state has different

achievement tests and measures target attainment differently. By restricting the California data to demographics present in Wake County, the results are made more applicable to the county. The large number of schools in the California data set allows Wake County policy makers to observe differences in school calendar data that may not be observable with a smaller North Carolina sample.

One of the major limitations of this study is its reliance on tests scores as the sole measure of academic achievement.⁵² Clearly, test scores should not be the only way of evaluating schools or students. Both California and North Carolina emphasize standardized test scores for the purpose of accountability, but this fact should not preclude the evaluation of other academic indicators. For instance, average GPA, student and parent-reported satisfaction with schools, teacher-evaluations of student effort, teacher and student attendance rates, and dropout rates would provide more clarity for policy makers. Another limitation to this study is the statewide open enrollment policy of California schools. Although there is little data available on open enrollment patterns, one California education official indicated that the policy was not likely to effect enrollment patterns at traditional or multi-track schools specifically.

Recommendations for Wake County

While this analysis shows interesting academic achievement differences between school types, there are many other considerations for Wake County besides a 9 to 11 point difference in test scores. Wake County should consider conducting additional studies of existing non-magnet multi-track schools. These studies should address additional academic skills not captured by test scores. Further evaluation of academic achievement using different indicators would allow Wake County to determine if multi-track schools would meet specific county educational goals. According to the Wake County 2004-05 Student Assignment Plan, current county goals include providing every student a safe school environment, minimizing travel, maximizing assignment stability, improving student performance and planning for future growth.⁵³ In order to assess whether multi-track schools can help the district to achieve these goals, Wake County needs to gather more information about academic achievement in these schools. Future academic achievement analyses using test scores should also be continued for a longer period of time than 2 years. It may be possible to see additional achievement patterns or more distinct trends over several years that cannot be observed from one year to the next.

It would helpful to have more information on the differences between academic achievement of students in multi-track schools and students in modular classrooms to better understand the policy implications in Wake County. Further research should also examine how building maintenance and segregated tracks influence student performance in multi-track and traditional schools. After conducting a thorough analysis of multi-track schools and academic achievement, Wake County should perform a rigorous cost-benefit analysis of multi-track schools and other policy options such as the purchase of modular classrooms. The cost-benefit analysis should also incorporate direct and indirect financial costs, scheduling issues, and effects on teachers. This type of analysis would allow Wake County to address all policy concerns in one model. My analysis of California schools provides a starting point for this type of study in Wake County.

Additionally, Wake County should examine how resources can be better allocated to schools with many disadvantaged students. Both the literature and the results of this study indicate that socio-economic status has a major impact on academic achievement. Schools with high percentages of economically disadvantaged students may need different support systems, such as free tutoring within the school. The district may also benefit from offering incentives to experienced teachers who are willing to work in schools with high percentages of economically disadvantaged students.

In order to accommodate the burgeoning student population in Wake County schools, the school board decided in September to purchase modular classrooms rather than convert 36 schools to year-round calendars.⁵⁴ The purchase may be an appropriate temporary short-term solution to overcrowding. In the long-term, Wake County will need to examine multi-track schooling. It would be advantageous to have a well-researched position on multi-track schools for future policy consideration. Wake County has an immediate demand for evaluation of policy options to alleviate overcrowding.

Appendix A: Demographic Factors for California

- Average class size kindergarten through 3rd grade
- Average class size 4th through 6th grade
- Total student enrollment at school
- Percent of teachers with full credentials
- Percent of parents with some college
- Percent of parents with a college degree or higher
- Percent of students eligible for free or reduced price lunch
- Percent of students who are Asian
- Percent of students who are Hispanic/Latino
- Percent of students who are Black
- Percent of students who are Pacific Islander
- Percent of students who are Filipino
- Percent of students who are Native American/Alaska Natives
- Percent of students who are Multi-racial

Appendix B: Collapsed Variables

- Percent of parents who did not graduate high school or attain an equivalent degree
- Percent of parents who obtained a high school degree
 - **Collapsed into: Percent of parents with a high school degree or less**

- Percent of parents who obtained a college degree
- Percent of parents who attended graduate school and/or obtained a graduate degree
 - **Collapsed into: Percent of parents with a college degree or higher**

- Large city
- Mid-size city
 - **Collapsed into: Urban area**

- Urban fringes of a large city
- Urban fringes of a mid-size city
 - **Collapsed into: Suburban area**

- Large town
- Small town
- Rural, outside Metropolitan Statistical Area
- Rural, inside Metropolitan Statistical Area
 - **Collapsed into: Town or Rural area**

Appendix C: Wake County Demographic Parameters

(Includes the 44 Wake County Schools listed in Appendix D)

Wake County		
	Minimum	Maximum
School size	369	988
Average class size kindergarten - 3 rd grade	21	25.5
Average class size 4 th - 6 th grade	20.5	27.5
Percent of teachers with full credentials	86	100
Percent of students eligible for free/reduced price lunch	21	55
Percent of students who are White	35.77	83.64
Percent of students who are Black	22.76	55.5
Percent of students who are Asian	3.25	18.01
Percent of students who are Hispanic/Latino	7.32	24.46

Appendix D: Schools Included in Wake County Data

Data was limited to elementary schools (excluding magnet schools).

Apex Elementary
Aversboro Elementary
Baileywick Road Elementary
Ballentine Elementary
Baucom Elementary
Brassfield Elementary
Brentwood Elementary
Carver Elementary
Cary Elementary
Creech Road Elementary
Davis Drive Elementary
Fuquay-Varina Elementary
Green Hope Elementary
Hilburn Drive Elementary
Hodge Road Elementary
Holly Springs Elementary
Jeffreys Grove Elementary
Kingswood Elementary
Knightdale Elementary
Lacy Elementary
Lead Mine Elementary
Leesville Road Elementary
Lockhart Elementary
Lynn Road Elementary
Middle Road Elementary
North Ridge Elementary
Northwoods Elementary
Olive Chapel Elementary
Pleasant Union Elementary
Rand Road Elementary
Reedy Creek Elementary
Rolesville Elementary
Salem Elementary
Smith Elementary
Stough Elementary
Swift Creek Elementary
Vance Elementary
Vandora Springs Elementary
Wakefield Elementary
Weatherstone Elementary
Wildwood Forest Elementary
Willow Springs Elementary
Yates Mill Elementary
York Elementary

**Appendix E: Description of California Formula to Determine
Academic Proficiency Index (API) Target Growth**

Schools must meet their annual school-wide API growth target as well as API growth targets for each numerically significant ethnic/racial and socio-economically disadvantaged subgroup at the school. The annual growth target for a school is 5 percent of the distance between a school's API Base and the statewide performance target of 800. The minimum growth target is one point. A school with an API of 800 or more must maintain its API of at least 800. For subgroups, the annual growth target is 80 percent of the school-wide target in most cases.

A "numerically significant" subgroup is defined as having at least 100 or more students with valid STAR scores OR 30 or more students with valid STAR scores who make up at least 15 percent of the total valid STAR scores. Subgroup API information is calculated for the following categories:

- African American or Black (not of Hispanic origin)
- American Indian or Alaska Native
- Asian
- Filipino
- Hispanic or Latino
- Pacific Islander
- White (not of Hispanic origin)
- Socio-economically disadvantaged

"Socio-economically disadvantaged" is defined as a student whose parents both have not received a high school diploma OR a student who participates in the free or reduced price lunch program (also known as the National School Lunch Program).

Appendix F: Profile of Multi-Track and Traditional Schools

Group Statistics													95% Confidence Interval of the Difference	
	School Calendar Type	N	Mean	Std. Deviation	Std. Error Mean	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
API 2003 Score	Multi-track Year Round	661	671.374	74.394	2.894	55.639	0.000	-23.109	1,080.475	0.000	-75.936	3.286	-82.384	-69.489
	Traditional	3,479	747.310	91.851	1.557									
API 2002 Score	Multi-track Year Round	640	634.417	83.078	3.284	44.904	0.000	-22.419	1,031.133	0.000	-83.282	3.715	-90.571	-75.992
	Traditional	3,401	717.699	101.268	1.736									
Actual Change from 2002 to 2003 API	Multi-track Year Round	640	37.775	20.707	0.819	12.205	0.000	8.675	1,019.135	0.000	8.007	0.923	6.196	9.818
	Traditional	3,401	29.768	24.877	0.427									
Attainment (or Non-Attainment) of School Target?	Multi-track Year Round	640	0.953	0.212	0.008	44.466	0.000	3.868	1,098.476	0.000	0.037	0.010	0.018	0.056
	Traditional	3,401	0.916	0.278	0.005									
% of Students Eligible for Free/Reduced Price Lunch	Multi-track Year Round	661	73.932	27.838	1.083	21.475	0.000	20.891	978.411	0.000	25.019	1.198	22.669	27.369
	Traditional	3,479	48.913	30.180	0.512									
% of Students Who Are LEP	Multi-track Year Round	661	5.015	3.777	0.147	33.287	0.000	-2.081	2,434.624	0.038	-0.448	0.215	-0.870	-0.026
	Traditional	3,479	5.463	9.281	0.157									
Average Class Size Kindergarten - 3rd Grade	Multi-track Year Round	660	19.176	1.251	0.049	30.526	0.000	3.019	1,369.857	0.003	0.178	0.059	0.062	0.294
	Traditional	3,430	18.997	1.960	0.033									
Average Class Size 4th - 6th Grade	Multi-track Year Round	651	29.237	2.708	0.106	60.448	0.000	8.843	1,302.966	0.000	1.127	0.127	0.877	1.377
	Traditional	3,329	28.109	4.074	0.071									

Group Statistics													95% Confidence Interval of the Difference	
	School Calendar Type	N	Mean	Std. Deviation	Std. Error Mean	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
% of Teachers with Full Credentials	Multi-track Year Round	661	87.263	11.403	0.444	15.075	0.000	-10.252	909.031	0.000	-4.933	0.481	-5.877	-3.989
	Traditional	3,479	92.196	11.008	0.187									
% of Teachers with Emergency Credentials	Multi-track Year Round	661	9.685	9.336	0.363	88.422	0.000	12.195	837.927	0.000	4.704	0.386	3.947	5.461
	Traditional	3,479	4.981	7.679	0.130									
% of Parents with a High School Degree or Less	Multi-track Year Round	631	63.491	22.268	0.886	43.289	0.000	19.486	979.223	0.000	19.346	0.993	17.398	21.294
	Traditional	3,348	44.145	25.865	0.447									
% of Parents with Some College	Multi-track Year Round	631	20.778	11.031	0.439	0.002	0.963	-7.368	3,977.000	0.000	-3.668	0.498	-4.643	-2.692
	Traditional	3,348	24.446	11.550	0.200									
% of Parents with a College Degree or Higher	Multi-track Year Round	631	15.702	13.914	0.554	251.134	0.000	-22.617	1,460.529	0.000	-15.688	0.694	-17.049	-14.328
	Traditional	3,348	31.390	24.159	0.418									
% of Students Who Are Asian	Multi-track Year Round	663	5.023	7.955	0.309	77.137	0.000	-9.817	1,465.060	0.000	-3.747	0.382	-4.495	-2.998
	Traditional	3,518	8.770	13.289	0.224									
% of Students Who Are Hispanic	Multi-track Year Round	663	64.729	26.929	1.046	6.876	0.009	22.752	970.974	0.000	26.244	1.153	23.980	28.508
	Traditional	3,518	38.485	28.857	0.487									
% of Students Who Are Black	Multi-track Year Round	663	8.291	9.596	0.373	0.011	0.917	2.646	4,179.000	0.008	1.295	0.489	0.335	2.254
	Traditional	3,518	6.997	11.888	0.200									
% of Students Who Are White	Multi-track Year Round	663	18.531	20.873	0.811	245.409	0.000	-22.995	1,205.432	0.000	-21.789	0.948	-23.648	-19.930
	Traditional	3,518	40.320	29.102	0.491									

Group Statistics	School Calendar Type	N	Mean	Std. Deviation	Std. Error Mean	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
													Lower	Upper
% of Students Who Are Pacific-Islander	Multi-track Year Round	663	0.548	0.782	0.030	13.138	0.000	-3.405	1,317.372	0.001	-0.124	0.036	-0.195	-0.052
	Traditional	3,518	0.672	1.188	0.020									
% of Students Who Are Filipino	Multi-track Year Round	663	1.829	2.760	0.107	12.306	0.000	-3.188	1,391.815	0.001	-0.416	0.130	-0.672	-0.160
	Traditional	3,518	2.245	4.411	0.074									
% of Students Who Are Native American/Alaska Native	Multi-track Year Round	663	0.575	0.821	0.032	50.991	0.000	-10.171	4,178.900	0.000	-0.819	0.081	-0.977	-0.661
	Traditional	3,518	1.394	4.389	0.074									
% of Students Who Are Multi-Racial	Multi-track Year Round	663	0.474	1.584	0.062	82.381	0.000	-8.364	1,526.969	0.000	-0.643	0.077	-0.794	-0.493
	Traditional	3,518	1.117	2.739	0.046									
School Enrollment	Multi-track Year Round	663	947.213	288.479	11.204	32.097	0.000	36.691	819.192	0.000	433.826	11.824	410.618	457.035
	Traditional	3,518	513.386	224.131	3.779									

Appendix F (continued): Categorical variables

Crosstab Target Attainment			Attainment (or Non-Attainment) of School Target		Total
			Did not meet target	Met target	
School Calendar Type	Multi-track Year Round	Count	30	610	640
		Expected Count	50	590	640
	Traditional	Count	286	3,115	3,401
		Expected Count	266	3,135	3,401
Total		Count	316	3,725	4,041
		Expected Count	316	3,725	4,041

Chi-Square Tests Target Attainment	Value	df	Asymp. Sig. (2- sided)	Exact Sig. (2- sided)	Exact Sig. (1- sided)
Pearson Chi-Square	10.351	1.000	0.001		
Continuity Correction(a)	9.841	1.000	0.002		
Likelihood Ratio	11.665	1.000	0.001		
Fisher's Exact Test				0.001	0.000
Linear-by-Linear Association	10.348	1.000	0.001		
N of Valid Cases	4,041.000				

Crosstab Urban			Urban		Total
			Not Urban	Urban	
School Calendar Type	Multi-track Year Round	Count	289	374	663
		Expected Count	392	271	663
	Traditional	Count	2,182	1,336	3,518
		Expected Count	2,079	1,439	3,518
Total		Count	2,471	1,710	4,181
		Expected Count	2,471	1,710	4,181

Chi-Square Tests Urban	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	78.427	1.000	0.000		
Continuity Correction(a)	77.666	1.000	0.000		
Likelihood Ratio	77.091	1.000	0.000		
Fisher's Exact Test				0.000	0.000
Linear-by-Linear Association	78.408	1.000	0.000		
N of Valid Cases	4,181.000				

Crosstab Suburban			Suburban		Total
			Not Suburban	Suburban	
School Calendar Type	Multi-track Year Round	Count	383	280	663
		Expected Count	360	303	663
	Traditional	Count	1,886	1,632	3,518
		Expected Count	1,909	1,609	3,518
Total		Count	2,269	1,912	4,181
		Expected Count	2,269	1,912	4,181

Chi-Square Tests Suburban	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	3.886	1.000	0.049		
Continuity Correction(a)	3.720	1.000	0.054		
Likelihood Ratio	3.901	1.000	0.048		
Fisher's Exact Test				0.051	0.027
Linear-by-Linear Association	3.885	1.000	0.049		
N of Valid Cases	4,181.000				

Crosstab Town or Rural			Town or Rural		Total
			Not Town or Rural	Town or Rural	
School Calendar Type	Multi-track Year Round	Count	654	9	663
		Expected Count	574	89	663
	Traditional	Count	2,968	550	3,518
		Expected Count	3,048	470	3,518
Total		Count	3,622	559	4,181
		Expected Count	3,622	559	4,181

Chi-Square Tests Town or Rural	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	98.167	1.000	0.000		
Continuity Correction(a)	96.939	1.000	0.000		
Likelihood Ratio	143.562	1.000	0.000		
Fisher's Exact Test				0.000	0.000
Linear-by-Linear Association	98.144	1.000	0.000		
N of Valid Cases	4,181.000				

Appendix G: California Data and 2002 API

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
API02	0.910	0.828	0.827	43.022

ANOVA						
Model		Sum of Squares	df	Mean Square	F	Sig.
API02	Regression	32,720,664.091	17	1,924,744.947	1,039.881	0.000
	Residual	6,818,818.316	3,684	1,850.928		
	Total	39,539,482.407	3,701			

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
API02	(Constant)	721.004	12.389		58.197	0.000
	School Calendar Type	9.126	2.410	0.033	3.787	0.000
	% of Students Eligible for Free/Reduced Price Lunch	-1.310	0.054	-0.395	-24.416	0.000
	Average Class Size Kindergarten - 3rd Grade	-1.286	0.441	-0.023	-2.915	0.004
	Average Class Size 4th - 6th Grade	1.277	0.227	0.048	5.629	0.000
	% of Teachers with Full Credentials	0.258	0.079	0.027	3.271	0.001
	% of Parents with Some College	0.251	0.074	0.028	3.383	0.001
	% of Parents with a College Degree or Higher	1.183	0.057	0.270	20.585	0.000
	% of Students Who Are Asian	0.442	0.067	0.056	6.621	0.000
	% of Students Who Are Hispanic	-0.882	0.056	-0.255	-15.838	0.000
	% of Students Who Are Black	-1.166	0.078	-0.133	-14.889	0.000
	% of Students Who Are Pacific-Islander	-0.249	0.672	-0.003	-0.371	0.711
	% of Students Who Are Filipino	-0.091	0.180	-0.004	-0.503	0.615
	% of Students Who Are Native American/Alaska Native	-0.922	0.197	-0.037	-4.679	0.000
	% of Students Who Are Multi-Racial	-0.638	0.289	-0.016	-2.208	0.027
	Urban	17.451	2.858	0.083	6.105	0.000
	Suburban	12.757	2.709	0.061	4.709	0.000
	School Enrollment	0.002	0.004	0.006	0.628	0.530

Appendix H: Wake County Parameters and 2002 API

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
API02	0.916	0.839	0.838	41.611

ANOVA						
Model		Sum of Squares	df	Mean Square	F	Sig.
API02	Regression	24463870	17	1439051.188	831.104	0.000
	Residual	4681959.7	2704	1731.494		
	Total	29145830	2721			

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
API02	(Constant)	752.376	17.297		43.496	.000
	School Calendar Type	9.548	2.675	.032	3.570	.000
	% of Students Eligible for Free/Reduced Price Lunch	-1.406	.064	-.418	-22.109	.000
	Average Class Size Kindergarten - 3rd Grade	-1.423	.595	-.020	-2.393	.017
	Average Class Size 4th - 6th Grade	.933	.291	.026	3.206	.001
	% of Teachers with Full Credentials	.129	.097	.013	1.335	.182
	% of Parents with Some College	.247	.086	.026	2.879	.004
	% of Parents with a College Degree or Higher	1.152	.065	.267	17.657	.000
	% of Students Who Are Asian	.470	.073	.061	6.440	.000
	% of Students Who Are Hispanic	-.850	.066	-.237	-12.798	.000
	% of Students Who Are Black	-.963	.100	-.098	-9.588	.000
	% of Students Who Are Pacific-Islander	.028	.777	.000	.035	.972
	% of Students Who Are Filipino	-.126	.195	-.005	-.650	.516
	% of Students Who Are Native American/Alaska Native	-1.712	.492	-.029	-3.478	.001
	% of Students Who Are Multi-Racial	-.775	.387	-.016	-2.001	.046
	Urban	20.477	3.721	.098	5.503	.000
	Suburban	16.595	3.605	.080	4.604	.000
	School Enrollment	-.011	.006	-.016	-1.759	.079

Appendix I: California Data and 2003 API

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
API03	0.902	0.814	0.814	40.466

ANOVA						
Model		Sum of Squares	df	Mean Square	F	Sig.
API03	Regression	27,052,273.007	17	1,591,310.177	971.798	0.000
	Residual	6,166,788.633	3,766	1,637.490		
	Total	33,219,061.640	3,783			

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
API03	(Constant)	755.816	11.527		65.571	0.000
	School Calendar Type	9.908	2.231	0.039	4.442	0.000
	% of Students Eligible for Free/Reduced Price Lunch	-1.098	0.050	-0.366	-21.970	0.000
	Average Class Size Kindergarten - 3rd Grade	-1.410	0.410	-0.028	-3.438	0.001
	Average Class Size 4th - 6th Grade	1.094	0.211	0.045	5.195	0.000
	% of Teachers with Full Credentials	0.161	0.073	0.019	2.199	0.028
	% of Parents with Some College	0.190	0.069	0.023	2.753	0.006
	% of Parents with a College Degree or Higher	1.146	0.054	0.288	21.378	0.000
	% of Students Who Are Asian	0.493	0.063	0.068	7.878	0.000
	% of Students Who Are Hispanic	-0.803	0.052	-0.257	-15.482	0.000
	% of Students Who Are Black	-1.176	0.073	-0.147	-16.127	0.000
	% of Students Who Are Pacific-Islander	-0.469	0.628	-0.006	-0.748	0.455
	% of Students Who Are Filipino	-0.054	0.168	-0.002	-0.321	0.748
	% of Students Who Are Native American/Alaska Native	-0.872	0.185	-0.038	-4.715	0.000
	% of Students Who Are Multi-Racial	-0.622	0.270	-0.017	-2.305	0.021
	Urban	16.077	2.663	0.085	6.038	0.000
	Suburban	10.674	2.523	0.057	4.230	0.000
	School Enrollment	0.003	0.003	0.010	1.007	0.314

Appendix J: Wake County Parameters and 2003 API

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
API03	0.912	0.831	0.830	38.756

ANOVA						
Model		Sum of Squares	df	Mean Square	F	Sig.
API03	Regression	20,428,846.0	17	1,201,696.800	800.036	0.000
	Residual	4,156,182.3	2,767	1,502.054		
	Total	2,458,028.0	2,784			

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
API03	(Constant)	778.141	15.925		48.862	0.000
	School Calendar Type	10.678	2.443	0.039	4.371	0.000
	% of Students Eligible for Free/Reduced Price Lunch	-1.171	0.059	-0.383	-19.945	0.000
	Average Class Size Kindergarten - 3rd Grade	-1.496	0.545	-0.023	-2.744	0.006
	Average Class Size 4th - 6th Grade	0.926	0.268	0.029	3.457	0.001
	% of Teachers with Full Credentials	0.078	0.089	0.008	0.879	0.380
	% of Parents with Some College	0.160	0.079	0.019	2.021	0.043
	% of Parents with a College Degree or Higher	1.138	0.060	-0.290	18.902	0.000
	% of Students Who Are Asian	0.493	0.068	0.070	7.264	0.000
	% of Students Who Are Hispanic	-0.778	0.061	-0.239	-12.690	0.000
	% of Students Who Are Black	-1.017	0.092	-0.114	-11.010	0.000
	% of Students Who Are Pacific-Islander	-0.382	0.717	-0.004	-0.533	0.594
	% of Students Who Are Filipino	-0.097	0.179	-0.005	-0.542	0.588
	% of Students Who Are Native American/Alaska Native	-1.855	0.454	-0.035	-4.085	0.000
	% of Students Who Are Multi-Racial	-0.715	0.359	-0.016	-1.990	0.047
	Urban	17.537	3.434	0.093	5.107	0.000
	Suburban	12.666	3.327	0.067	3.807	0.000
	School Enrollment	-0.009	0.006	-0.016	-1.700	0.089

Appendix K: California Data and Change from 2002-2003

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
Change from 2002 to 2003 API	0.434	0.189	0.185	21.169

ANOVA						
Model		Sum of Squares	df	Mean Square	F	Sig.
Change from 2002 to 2003 API	Regression	383,507.553	17	22,559.268	50.340	0.000
	Residual	1,650,925.497	3684	448.134		
	Total	2,034,433.049	3701			

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
Change from 2002 to 2003 API	(Constant)	38.019	6.096		6.237	0.000
	School Calendar Type	-0.269	1.186	-0.004	-0.226	0.821
	% of Students Eligible for Free/Reduced Price Lunch	0.206	0.026	0.273	7.785	0.000
	Average Class Size Kindergarten - 3rd Grade	-0.108	0.217	-0.009	-0.496	0.620
	Average Class Size 4th - 6th Grade	-0.189	0.112	-0.031	-1.690	0.091
	% of Teachers with Full Credentials	-0.114	0.039	-0.053	-2.943	0.003
	% of Parents with Some College	-0.067	0.037	-0.033	-1.831	0.067
	% of Parents with a College Degree or Higher	-0.036	0.028	-0.037	-1.290	0.197
	% of Students Who Are Asian	0.039	0.033	0.022	1.189	0.235
	% of Students Who Are Hispanic	0.092	0.027	0.117	3.356	0.001
	% of Students Who Are Black	-0.020	0.039	-0.010	-0.511	0.610
	% of Students Who Are Pacific-Islander	-0.140	0.330	-0.007	-0.425	0.671
	% of Students Who Are Filipino	0.043	0.089	0.008	0.483	0.629
	% of Students Who Are Native American/Alaska Native	0.037	0.097	0.007	0.385	0.701
	% of Students Who Are Multi-Racial	-0.006	0.142	-0.001	-0.041	0.967
	Urban	-0.265	1.407	-0.006	-0.188	0.851
	Suburban	-1.423	1.333	-0.030	-1.067	0.286
	School Enrollment	-0.001	0.002	-0.012	-0.530	0.596

Appendix L: Wake County Parameters and API Change from 2002-2003

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
Change from 2002 to 2003 API	0.459	0.211	0.206	19.480

ANOVA						
Model		Sum of Squares	df	Mean Square	F	Sig.
Change from 2002 to 2003 API	Regression	273,606.7	17	16,094.511	42.411	0.000
	Residual	1,026,139.8	2,704	379.490		
	Total	1,299,746.4	2,721			

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
Change from 2002 to 2003 API	(Constant)	30.170	8.098		3.726	0.000
	School Calendar Type	-0.133	1.252	-0.002	-0.106	0.916
	% of Students Eligible for Free/Reduced Price Lunch	0.222	0.030	0.312	7.447	0.000
	Average Class Size Kindergarten - 3rd Grade	-0.118	0.279	-0.008	-0.422	0.673
	Average Class Size 4th - 6th Grade	0.003	0.136	0.000	0.022	0.982
	% of Teachers with Full Credentials	-0.076	0.045	-0.035	-1.672	0.095
	% of Parents with Some College	-0.092	0.040	-0.047	-2.290	0.022
	% of Parents with a College Degree or Higher	-0.013	0.031	-0.014	-0.418	0.676
	% of Students Who Are Asian	0.011	0.034	0.007	0.315	0.753
	% of Students Who Are Hispanic	0.091	0.031	-0.120	2.920	0.004
	% of Students Who Are Black	-0.051	0.047	-0.025	-1.085	0.278
	% of Students Who Are Pacific-Islander	-0.255	0.364	-0.013	-0.700	0.484
	% of Students Who Are Filipino	0.028	0.091	0.006	0.311	0.756
	% of Students Who Are Native American/Alaska Native	-0.232	0.230	-0.019	-1.008	0.313
	% of Students Who Are Multi-Racial	0.019	0.181	0.002	0.103	0.918
	Urban	-1.550	1.742	-0.035	-0.893	0.372
	Suburban	-3.280	1.688	-0.075	-1.944	0.052
	School Enrollment	0.000	0.003	-0.001	-0.072	0.942

Appendix M: California Data and Attainment of Target

Step1	Chi-square	df	Sig
Step	125.692	17	0.000
Block	125.692	17	0.000
Model	125.692	17	0.000

Step	(-2) Log likelihood	Cox & Snell R Square	Nagelkerke R Square
	1,843.352	0.033	0.081

			Predicted		
			Target Attainment		% Correct
			Did not meet target	Met target	
Observed					
Step 0	Target attainment	Did not meet target	0	277	0.0
		Met target	0	3,425	100.0
Overall Percentage					92.5

Model		B	Std. Error	Wald	df	Sig	Exp(B)
Target	(Constant)	1.910	1.089	3.078	1	0.079	6.755
	School Calendar Type	0.238	0.246	0.939	1	0.333	1.269
	% of Students Eligible for Free/Reduced Price Lunch	0.009	0.004	3.921	1	0.048	1.009
	Average Class Size Kindergarten - 3rd Grade	0.027	0.036	0.588	1	0.443	1.028
	Average Class Size 4th - 6th Grade	-0.013	0.019	0.486	1	0.486	0.987
	% of Teachers with Full Credentials	-0.005	0.007	0.630	1	0.427	0.995
	% of Parents with Some College	-0.014	0.006	5.130	1	0.024	0.986
	% of Parents with a College Degree or Higher	0.028	0.006	23.786	1	0.000	1.028
	% of Students Who Are Asian	0.008	0.008	0.990	1	0.320	1.008
	% of Students Who Are Hispanic	-0.002	0.005	0.294	1	0.588	0.998
	% of Students Who Are Black	-0.016	0.006	8.276	1	0.004	0.984
	% of Students Who Are Pacific-Islander	0.009	0.012	0.509	1	0.475	1.009
	% of Students Who Are Filipino	-0.024	0.013	3.508	1	0.061	0.976
	% of Students Who Are Native American/Alaska Native	-0.027	0.011	5.753	1	0.016	0.973
	% of Students Who Are Multi-Racial	-0.024	0.022	1.189	1	0.276	0.976
	Urban	-0.378	0.237	2.538	1	0.111	0.685
	Suburban	-0.064	0.213	0.090	1	0.764	0.938
	School Enrollment	0.002	0.001	10.514	1	0.079	1.002

Appendix N: Wake County Parameters and Attainment of Target

Step1	Chi-square	df	Sig
Step	80.215	17	0.000
Block	80.215	17	0.000
Model	80.215	17	0.000

Step	(-2) Log likelihood	Cox & Snell R Square	Nagelkerke R Square
	1,240.129	0.029	0.076

Observed			Predicted		
			Target Attainment		% Correct
			Did not meet target	Met target	
Step 0	Target attainment	Did not meet target	0	179	0.0
		Met target	1	2,542	100.0
Overall Percentage					93.4

Model		B	Std. Error	Wald	df	Sig	Exp(B)
Target	(Constant)	1.092	1.725	1.216	1	0.270	6.697
	School Calendar Type	0.051	0.274	0.033	1	0.853	1.052
	% of Students Eligible for Free/Reduced Price Lunch	0.010	0.006	2.969	1	0.085	1.010
	Average Class Size Kindergarten - 3rd Grade	0.043	0.058	0.553	1	0.457	1.044
	Average Class Size 4th - 6th Grade	-0.040	0.030	1.794	1	0.182	0.961
	% of Teachers with Full Credentials	0.000	0.009	0.000	1	0.997	1.000
	% of Parents with Some College	-0.017	0.008	4.456	1	0.035	0.983
	% of Parents with a College Degree or Higher	0.029	0.007	15.349	1	0.000	1.029
	% of Students Who Are Asian	0.012	0.010	1.274	1	0.259	1.012
	% of Students Who Are Hispanic	-0.006	0.006	0.827	1	0.363	0.994
	% of Students Who Are Black	-0.021	0.008	7.054	1	0.008	0.979
	% of Students Who Are Pacific-Islander	0.036	0.077	0.223	1	0.637	1.037
	% of Students Who Are Filipino	-0.025	-0.015	2.859	1	0.091	0.975
	% of Students Who Are Native American/Alaska Native	-0.075	0.034	4.836	1	0.028	0.927
	% of Students Who Are Multi-Racial	-0.049	0.032	2.350	1	0.125	0.952
	Urban	-0.347	0.341	1.036	1	0.309	0.707
	Suburban	0.007	0.319	0.000	1	0.983	1.007
	School Enrollment	0.002	0.001	6.219	1	0.013	1.002

**Appendix O: Description of North Carolina Formula to determine
Annual Yearly Progress (AYP)**⁵⁵

Each student subgroup including the school as a whole must meet the following objectives:

- 1). 95% Participation Rate in Reading assessment;
- 2) 95% Participation Rate in Mathematics assessment;
- 3) Annual Measurable Objective in Reading
(68.9% Proficiency for elementary school through 2003-04)
AND
- 4) Annual Measurable Objective in Mathematics
(74.6% Proficiency for elementary school through 2003-04)
- 5) The school as a whole must also show progress on the:
Other Academic Indicator: Attendance
OR
Graduation Rate (at least 0.1% increase each year until 90% is reached)

If a subgroup meets the 95% participation rate, but does not meet the proficiency goals in a subject area, a subgroup may still meet the Annual Measurable Objective if:

- 1) The subgroup has reduced the percent of students not proficient by 10% from the preceding year for the subject area
- 2) the subgroup shows progress on the Other Academic Indicator

The subgroups include

- 1) School as a whole
- 2) American Indian
- 3) Asian
- 4) Black
- 5) Hispanic
- 6) Multi-racial
- 7) White
- 8) Economically disadvantaged
- 9) Limited-English Proficient
- 10) Students with Disabilities

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- ¹⁸ Rossell, Christine H. & Charles L. Glenn. "The Cambridge Controlled Choice Plan". 1988. *Urban Review* 20(2), p.75-94.
- ¹⁹ California Department of Education. Year-Round Education Fact Book 2004. <http://www.cde.ca.gov/re/pn/fb/yr04yearround.asp> Accessed 30 September 2004.
- ²⁰ California Department of Education. Year-Round Education Fact Book 2004. <http://www.cde.ca.gov/re/pn/fb/yr04yearround.asp> Accessed 30 September 2004
- ²¹ California Department of Education. Year-Round Education Fact Book 2004. <http://www.cde.ca.gov/re/pn/fb/yr04yearround.asp> Accessed 30 September 2004
- ²² California is one of 28 states nationwide that has a state-wide open-enrollment policy in public schools: Education Commission of the States Vol. 1 (1) May 1999. Furthermore, under No Child Left Behind, any school may become open to transferring students. In 2003-2004, 2.4% of California students utilized interdistrict transfers, but there is no data on within-district transfers according to Wayne Dughi at the California Department of Education (Phone interview: 14 February 2005). Roger Wolfertz at the California Department of Education does not believe that there are distinctive patterns of student enrollment at either traditional or year-round based on this school choice. He believes that most students utilize transfer options to choose neighborhood schools. (Phone Interview: 16 February 2004)

²³ All statistical analyses were conducted in Microsoft Excel and SPSS. T-tests and regressions were performed solely in SPSS. Multi-track year-round schools and traditional calendar schools comprised the main independent variables in this study. The t-tests for independent means are used to show the basic differences between multi-track and traditional schools. These linear regressions controlled for other demographic factors See Appendix A for list of demographic factors.

²⁴ These demographic factors included average school size; average k-3 class size; average 4-6 class size; urban school status; suburban school status; percent of teachers with full credentials; percent of parents with only some college; percent of parents with a college degree or higher; percent of students receiving free or reduced price lunch; percent of Asian students; percent of Hispanic students; percent of Black students; percent of Filipino students; percent of Pacific Islander students; percent of Native American/ Alaska Native students; and percent of students who are multiracial. Also see Appendix A for this list of demographic factors.

²⁵ North Carolina Department of Public Instruction. North Carolina School Report Cards. www.ncreportcards.org/src/search.jsp?pYear=2003-2004&pList=2&pListVal=Wake&GO2=GO. Accessed 15 October 2004. The demographic information available for Wake County was not as extensive as the California demographic information. Thus, the restricted characteristics are limited to the available Wake County data only. See Appendix B for a list of these Wake County variables and their parameters. For example, I ran the original regression model (with California data) but restricted the data to schools with at least 369 students and no more than 988 students.

²⁶ Four different data sets were used for this analysis. They include the following: California Department of Education. Academic Performance Index Data Files. 2002-2003 API Growth Data File. Accessed 28 September 2004; California Department of Education. Enrollment by Ethnic Group and School File 2002-2003. Accessed 28 September 2004; California Department of Education. *List of California Public Schools and Districts File*. 2003-2004. Accessed 28 September 2004; California Department of Education. School Information File. 2002-2003. Accessed 28 September 2004.

²⁷ Kindergarten and first grade students do not receive API scores and are thus were not relevant to the analyses.

²⁸ Alternative schools consisted of charter schools, magnet schools, independent study schools, community day schools, all other types of alternative schools. Some schools had student populations with some alternative students, ranging from 1 student to the majority of the student body. Schools with any alternative students were excluded.

²⁹ Schools with fewer than 10 valid API scores do not count towards California Department of Education totals

³⁰ California Department of Education. API description. Overview of Academic Performance Index. <http://www.cde.ca.gov/ta/ac/ap/apidescription.asp>. Accessed 1 October 2004. See Appendix E for explanation of target growth in the state of California

³¹ California Department of Education. API description. Overview of Academic Performance Index. <http://www.cde.ca.gov/ta/ac/ap/apidescription.asp>. Accessed 1 October 2004.

³² For elementary school students, these tests are the California Standards Tests (CSTs): English-Language Arts, Mathematics, and the California Alternate Performance Assessment (CAPA) in English-language arts and mathematics, as well as the Norm-referenced Test (NRT): California Achievement Test, Sixth Edition Survey (CAT/6 Survey) in all content areas.

³³ These analyses include t-tests for independent means. All of the listed differences were significant at the $p < .05$ alpha level. See Appendix F for full statistical output.

³⁴ These analyses include t-tests for independent means. All of the listed differences were significant at the $p < .05$ alpha level. See Appendix F for full statistical output.

³⁵ These secondary analyses include linear regressions for the following dependent variables: 2002 API, 2003 API, and Growth from 2002 to 2003. They also include a binary logistic regression for the Attainment of school target variable. The following variables were included in the model: percent of parents whose highest education was some college; percent of parents whose highest education was a college degree or higher; percent of school that is Asian; percent of school that is Hispanic; percent of school that is Black; percent of school that is Filipino; percent of school that is Native American or Alaska native; percent of school that is multiracial; urban status of the school; suburban status of the school; total enrollment of the school; average class size between kindergarten and 3rd grade; and average class size from 4th grade to 6th grade. Similar variable have been used in many other studies on academic achievement. After careful consideration, I excluded the variable for percent of English learners within each school from the regression model. This variable correlated highly with the percent of students who are Hispanic and thus was excluded from the analyses to simplify the model.

³⁶ North Carolina Department of Public Instruction. North Carolina School Report Cards. www.ncreportcards.org/src/search.jsp?pYear=2003-2004&pList=2&pListVal=Wake&GO2=GO. Accessed 15 October 2004. The demographic information available for Wake County was not as extensive as the California demographic information. Thus, the restricted characteristics are limited to the available Wake County data only. See Appendix B for a list of these Wake County variables and their parameters. For example, I ran the original regression model (with California data) but restricted the data to schools with at least 369 students and no more than 988 students.

³⁷ Nine other variables had a larger influence on 2002 API than the type of school calendar. These variables include (in order of influence): the percent of students receiving free or reduced price lunch, the percent of parents with a college degree or higher, the percent of Hispanic students, the percent of Black students, urban status, suburban status, percent of Asian students, average 4th-6th grade class size, and the percent of Native American/Alaska Native students. See Appendix G for statistical output.

³⁸ For Wake County parameters, seven other variables had a larger influence on 2002 API than the type of school calendar. These variables include (in order of influence): the percent of students receiving free or reduced price lunch, the percent of parents with a college degree or higher, the percent of Hispanic students, the percent of Black students, urban status, suburban status, and percent of Asian students. See Appendix H for statistical output.

³⁹ Eight other variables had a larger influence on 2003 API than the type of school calendar. These variables include (in order of influence): the percent of students receiving free or reduced price lunch, the percent of parents with a college degree or higher, the percent of Hispanic students, the percent of Black students, urban status, percent of Asian students, suburban status, and average 4th-6th grade class size. See Appendix I for statistical output.

⁴⁰ For Wake County parameters, seven other variables had a larger influence on 2003 API than the type of school calendar. These variables include (in order of influence): the percent of students receiving free or reduced price lunch, the percent of parents with a college degree or higher, the percent of Hispanic students, the percent of Black students, urban status, percent of Asian students, and suburban status. See Appendix J for statistical output.

⁴¹ Within this regression model, the only three variables which successfully predicted API change were (in order of influence): the percent of students eligible for free or reduced price lunch, the percent of Hispanic students, and the percent of teachers with full credentials. See Appendix K for statistical output.

⁴² For Wake County parameters, the only three variables which successfully predicted API change were (in order of influence): the percent of students eligible for free or reduced price lunch, the percent Hispanic students, and the percent of parents with some college. See Appendix L for statistical output.

⁴³ Within this regression model, the only variables which successfully predicted school target attainment were (in no particular order): the percent of parents with some college, the percent of parents with a college degree or higher, the percentage of Black students, the percent of Native American/Alaska Native students and the total school enrollment. See Appendix M for statistical output.

⁴⁴ For Wake County parameters the only variables which successfully predicted school target attainment were (in no particular order): the percent of parents with a college degree or higher, the percentage of Black students, the percent of Native American/Alaska Native students and the total school enrollment. See Appendix N for statistical output.

⁴⁵ Smiley, Candy. "Literature Review on Single Track Calendar Year-Round Education". 2002. Report by the San Diego Unified School District.

⁴⁶ Ohio State Department of Education. "Student Mobility and Academic Achievement: A Report by the Urban Schools Initiative Mobility/Work Study Group". 1998.

⁴⁷ Ohio State Department of Education. "Student Mobility and Academic Achievement: A Report by the Urban Schools Initiative Mobility/Work Study Group". 1998.

⁴⁸ "Is Year-Round Schooling the Answer?" *Education World*. http://www.education-world.com/a_admin/admin137.shtml. Accessed 23 September 2004.

⁴⁹ "Palmer, Elizabeth A. & Amy E. Bemis. "Year-Round Education". <http://www.extension.umn.edu/distribution/familydevelopment/components/7286-09.html>. Accessed 23 September 2004.

⁵⁰ McChesney, Jim. "Year-Round Schools". *Research Roundup* 12(3) Spring 1996.

⁵¹ Mitchell, Ross E. & Douglas E. Mitchell. "Year-Round Education: Student Segregation and Achievement Tracking in Year-Round Schools". December 2000. Based on a paper presented at a 94th Annual Meeting of the American Sociological Association.

⁵² Another limit to this study is the high correlation of some of the factors in the model. The percent of students eligible for free or reduced price lunch correlated highly with several of the race and parent education variables. The high correlation level may have artificially inflated the overall predictive ability of the model. I chose to include the variable despite the high correlations because it is the only available measure of socio-economic status and thus important to the conclusions. Furthermore, the variable did not correlate highly with school calendar type. I am confident in my conclusions regarding multi-track and traditional schools.

⁵³ Wake County Public School System. "2004-2005 Student Assignment Plan Parent Information."

<http://www.wcpss.net/growth-management/parent-info>. Accessed 20 January 2005.

⁵⁴ Hui, T. Keung. "Wake may convert 36 to year-rounds". 22 September 2004. *The News & Observer*.

⁵⁵ North Carolina Department of Public Instruction. <http://64.233.161.104/u/ncpublicschools?q=cache:r-goQixNngJ:www.ncpublicschools.org/accountability/reporting/2004memo/aypstatus04.pdf+AYP&hl=en&ie=UTF-8>. Accessed 10 December 2004.

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