

The Alternative?

Alternative School Calendars' Effects on
Nonacademic Data in Independent Districts

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THE EXECUTIVE SUMMARY

This study measures the effect of alternative school calendars, otherwise known as year-round calendars, on “nonacademic data”, which includes average daily attendance rates, retention rates (where retention rate is defined as percentage of students held back a grade level), and dropout rates. This measurement will be done on Kentucky’s Independent School districts, which have a unique advantage of never having a problem with overcrowding (which will be explained as an important consideration for measurements of effects of alternative school calendars) and in whose districts the majority of alternative school calendars in Kentucky have been implemented. The study will be performed with a dataset that spans four school years, from 2000-2001 to 2003-2004.

This study will give a brief history of the alternative school calendar movement, explain industry-specific terminology, take a broad stroke over subtleties in and the underlying philosophy of the alternative school calendar debates, and discuss relevant literature pertaining to alternative school calendars being utilized in secondary schools and their subsequent effects on academic achievement (read test scores), dropout rates, retention rates (as defined as the inverse of dropout rate: the percentage of students kept from dropping out), motivation, and burnout.

Using explanatory variables that fall under the umbrellas of teacher training, relative wealth of a district, parental involvement, demographic, and income measures, a Fixed Effects model and a Between-Effects model will be used to measure the dependent variables “average daily attendance,” “dropout rates,” and “retention rates (as defined as the percentage of students held back a grade level)”. The models will be run twice, once without demographic and income variables and once with these variables included.

The results will find that, in both scenarios, the majority of any effect on the dependent variables results from undefined fixed effects. Without income effects and with regards to dropout rates and retention rates, having an alternative school calendar does, on average, over time and across districts, have a positive effect on decreasing these rates. With income effects included the aforementioned results are made irrelevant. The income variable had a positive effect on dropout rates in both models, a negative effect on average daily attendance in both models, and, interestingly, a negative effect on percentage of students held back a grade in between years, but on average over time and across districts having a positive effect on this variable.

THE POINT

Here is the problem:

Public Education is a system. As such, throughout its formal history it has been perceived to need and actually has needed reform. One of the first system reforms to occur after the official federal commitment of funds to public education and consequent shaping of the system to its current conception (via Lyndon B. Johnson's Elementary and Secondary Education Act of 1965 of which the No Child Left Behind Act is but one of numerous revisions) concerned changing the traditional school calendar. This was done in Hayward, California in 1968 at Park Hills Elementary where students went to school for fifty days and then had a fifteen-day vacation [Ballinger and Kneese, 2006; p. 36].

The idea, in 1968, involved the perception that the traditional school calendar was anachronistic. The idea of a twelve-week summer vacation revolved around agrarian thinking. The United States was not an agrarian society then. Why then should it have an agrarian calendar?

Fundamentally, this argument has not changed: Why do American schoolchildren need a twelve-week summer break along with a seemingly illogical spattering of breaks whilst in school? The argument has, naturally, other more developed arguments and evidence supporting it now, but the implication is the same: there is a Time component to learning, especially among children and adolescents who are not only dealing with intellectual development but with physiological development, as well.

School calendar reform disappeared as a solution to Public Education system reform from the 1970s until the early 1980s. As will be discussed in more detail later in

this study, creating alternative calendars for schools and school districts occurred in between these years, but occurred with different, less system-reform oriented motives in mind. During this period, the idea developed that an alternative school calendar could be used to solve school or district logistical issues arising from overcrowding and unsustainable enrollment.

In 1983, The National Commission on Excellence in Education, a task force convened at the behest of then-President Ronald Reagan via his Secretary of Education T.H. Bell, released a report entitled *A Nation At Risk: The Imperative for Educational Reform*. This little thirty-six-page report became the catalyst and the Lazarus for every one of the educational reform ideas with which our present society has become so accustomed and with whose ideas and implementation strategies our society is still grappling. Everything from our current conception of the Charter School Movement to our current questioning of the role of teachers' unions derived from this report. And, with the broad-stroke statement "...time available for learning should be expanded through better classroom management and organization of the school day," [National Commission on Excellence in Education, 1983; p. 29], so changing the school calendar received new breath as a viable means of reforming " 'the widespread public perception that something is seriously remiss in our educational system'" [National Commission on Excellence in Education, 1983; p. 1].

In 1991, the Education Council Act created an independent advisory body called the National Education Commission on Time and Learning. This body would release another highly influential report in 1994 called *Prisoners of Time*. The Commission was put together with the express purpose of reviewing the relationship between time and

learning in public schools. This report would say this: “Our schools and the people involved with them...students, teachers, administrators, parents, and staff...are prisoners of time, captives of the school clock and calendar. The six-hour, 180-day school year should be relegated to museums, an exhibit from our education past. Our usage of time virtually assures the failure of many students” [National Education Commission on Time and Learning, 1994; letter of transmission]. So, whereas *A Nation At Risk* was a clarion call for education reform in general, those in favor of and those studying the effects of implementing an alternative school calendar would and will frequently cite the *Prisoners of Time* report as the specific beginning of the organized, system-reform oriented school calendar reform movement.

Consequently, rather than alternative school calendars being implemented in schools for mainly logistical reasons and geographically being implemented in the western United States as they were throughout the 1970s and through most of the 1980s, alternative school calendars since 1983, and especially since 1994, have been implemented throughout the United States and have been implemented with the philosophical intention of improving academic outcomes.

So: The problems with implementing alternatives to the traditional school calendar currently revolve around where these alternatives have been implemented, how these alternatives have been measured, and on what outcomes these measures of effectiveness have traditionally focused. A significant majority of alternative school calendars have been implemented in elementary schools. For reasons elaborated upon later and alluded to in the aforementioned quote from *Prisoners of Time*, arguably, school calendar reform is most needed in secondary schools. Further, studies of the effectiveness

of alternative school calendars seem to have occurred with any frequency only within the confines of two inconsecutive decades, the 1970s and 1990s. The 1970s' results are hard to place in today's post-*Nation At Risk* context. Further, a significant number of studies were done within a year of implementation of an alternative calendar. Related to this, these studies, obviously, have an ideological bent as they were commissioned by schools and school districts with an express outcome desired by those doing the commissioning of the studies. Lastly, the vast majority of studies tend to focus on academic achievement in the form of test scores. The results from these studies are predictably dubious, having either marginal or no effect on test scores or if positively having an effect being accompanied by an antithetical study proving otherwise. But this fact will all be elaborated upon later. Stay tuned.

THE QUESTION

The question this study will attempt to answer, then, will be: What effect will alternatives to the traditional school calendar implemented in secondary schools have on nonacademic achievement outcomes, where nonacademic outcomes are defined as the National Education Association (NEA) defines them, namely and specific to this study as dropout rates, attendance rates, and retention rates¹?

THE JARGON (THE LITERATURE, PART I)

Thus far, this paper has thrown around the terms “traditional calendar” versus “alternative school calendar” or “school calendar reform” as if you, the audience, were

¹ There are two antithetical definitions for retention rates. This study will use the term as the Kentucky Department of Education (from whence the data will derive) uses it: Percentage of students held back a grade. Most literature uses another definition: Percentage of students that are kept from dropping out. (Dropout's antithesis)

clear on the meaning of such terms. As it was prudent to generalize these jargon specifics in order to begin this paper with a point in hand in the form of a problem statement and with a research question, now, before continuing into topic-specific literature or talking of research methodology, data description, and results, it is prudent to take a step back and familiarize yourselves with how the literature interprets the terms this paper will continue to use.

The Traditional Calendar

When school calendar reformers use the term “Traditional Calendar,” they can be specifically referring to the school calendar America uses currently or, more broadly, a school calendar that has federally standardized elements to it. Used specifically (the former), the Traditional Calendar refers to the 170 – 180 day, nine-month calendar that typically runs from September to June and is divided into two time periods (from September to January and from mid-January to June) with a two-week “holiday” break around Christmas and Hanukkah, a one-week “Spring Break” around the end of March or in April, and a twelve-plus week break in the summer. However, the “Traditional Calendar” has not always been a tradition.

Around 1847, the standardization of school calendars was beginning. Until then (and very much for a long time after 1847), “schools in America’s largest cities were open 11 or 12 months of the year,” [Ballinger and Kneese, 2006; p. 33]. In the rural areas, where some 85% of a state’s population was engaged in agriculture, the school year was significantly shorter. If you were an older student, you may have had only three months of schooling a year. Otherwise, and more commonly, you would have had about 6 or 7 months of schooling. In the smaller cities and towns of a state, the school year seemed

more identifiable to today's society, where the population of those cities and towns would have been in school for about 7 to 9 months of the year [Ballinger and Kneese, 2006; p. 34]. In 1847, however, curricular modifications and a newly-implemented standardization of grade-level organization being introduced into schools caused a gradual move towards uniformity of the school calendar. Urban schools began to cut back the number of days of schooling and rural schools began adding the number of days of schooling [Glines, 1988]. The great catalyst of the "Traditional Calendar" (as was the great catalyst for many things in America) was World War II. It was after World War II, and with the well-documented decrease in population geographical stratification (suburbanization), along with the effects of the G.I. Bill, a booming, relatively manufacturing sector-dominated economy, and the somewhat awkward necessity of rigid rules of social conduct that America considered school time should be from 170 to 180 days and should run roughly from Labor Day to Memorial Day [Ballinger and Kneese, 2006; p. 34]. (International education standards fact to consider: "Despite the movement toward greater uniformity of the length of the school year, there has never been a standard national calendar dictating the annual starting and ending times of America's schools, setting the United States apart in this regard from some other countries," [Ballinger and Kneese, 2006; p. 34].

The Alternative/Year-Round Calendar

An "alternative school calendar" is more commonly referred to as a "year-round calendar" and implementing such a calendar is referred to as "Year-Round Education (YRE)".

A "year-round calendar", semantically, sounds like a very specific "alternative school calendar". In actuality, its definition is very broad (making "alternative school

calendar” a nomenclature substitute), making policies using this term is subject to much variability. As with any policy that has withstood the test of time, there is a policy advocacy group devoted to the concept of Year-Round Education. This group is the National Association for Year-Round Education (NAYRE). The NAYRE definition of “Year-Round Education” is the one most frequently used in discussion of the topic. Though NAYRE prefers to use the term “modified school calendar,” according to NAYRE, a “Year-Round Education” refers to a “year-round school” or a school that has a “modified calendar” which is, simply, any school that adheres to “a reorganization of the school year during which no vacation is longer than 8 weeks in length” [Ballinger and Kneese, 2006; p. 78].

The year-round calendar and any school adhering to one possesses many nomenclatural faces: Year-round calendars have been referred to as *four quarter plans*, *continuous all year plans*, *four vacation plans*, *alternative calendar plans*, *mountain calendar plans*, *personalized calendar plans*, *community calendars*, *custom calendars*, *balanced calendars*, and the aforementioned *modified school calendars* [Ballinger and Kneese, 2006; p. 78]. There is a reason for the jargon madness, however. As implied by NAYRE’s broad definition, a year-round calendar does not allude to one universal policy, unlike what is deemed the “Traditional Calendar.” By design, the year-round calendar was to form-fit state, local, and community needs, thus the emergence of the myriad variations of name. (In fact, according to the 2006 edition of *Directory of School Districts on Non-Traditional Calendars*—a directory published yearly by NAYRE—there are listed 22 calendar variations in use across American school districts [Ballinger and Kneese, 2006; p. 79].) That said, there exist three broad categories under which all of the

specific variations live and whose amalgamation comprises the total definition of “year-round calendar” that, for the purposes of this paper and my research, it is important to describe. These categories are: *single-track*, *multiple-track*, and *extended year*.

The *single-track* category encompasses the year-round calendars frequently perceived by society. These are the most common reform calendars. According to NAYRE executive director Charles Ballinger, “A single-track year-round calendar is one in which a school, or a school district, and all of its students, teachers, and ancillary school staff, follow a schedule that has no vacation exceeding 8 weeks,” [Ballinger and Kneese, 2006; p. 52]. The *single-track* calendar is the area of alternative calendar implementation alluded to in the problem statement that occurred in 1968 in California, but did not see mass implementation until post-*Prisoners of Time*.

The *multiple-track* category (a.k.a. *multi-track*) possesses calendars that look and superficially act as the calendars under the single-track, but the motive behind utilization is entirely (and significantly) different. One would use calendar variations under the multi-track mainly in order to relieve one school district ill: overcrowding. As previously said, calendars under the multi-track may resemble by design those under the single-track; however, there is no system-reform oriented assumption to their utilization. The use of multi-track calendars is almost solely a matter of pragmatism. If funding for more or larger schools within a district is too difficult, too expensive, too time-consuming, et al; then a quick fix is to literally create school “shifts” where vacations are alternated between contingents of would-be students in order to prevent overcrowding. “Multi-track year-round education is implemented to provide additional capacity within already-existing space to accommodate an overenrollment [sic] of students, maximize the

efficient use of current resources, solve one or more administrative or logistical problems, or a variation of these three,” [Ballinger and Kneese, 2006; p. 60]. *Multi-track* calendars were the ones referred to in the problem statement as being the type implemented until the more ideology-based *single-track calendar* became widespread after 1983 and 1991-1994.

The *extended year* category, currently, is only a hypothetical and ideology-sustained school reform idea. An underlying assumption of most school calendar reform initiatives is that the legislatively mandated and standardized number of days a child must attend school within a school year will remain for a very long time. This number sits currently at between 170 and 180 days. The extended-year category of school calendars assumes that this underlying assumption can be or will be changed. Policies not only redesign how the school calendar will look, but also for how many days a child will attend school within a school year. However, one finds that many schools and school districts implementing a *single-track calendar* inadvertently or extra-legally *extend* the school year by offering “optional” summer schooling that is rarely all that optional.

Why Would One Implement an Alternative/Year-Round Calendar?

In terms of academic achievement, an implementation of an alternative school calendar is supposed to address one specific thing: something the literature calls “Summer Learning Loss”. According to an oft-cited “meta-analysis”, or quantitative review, of all then-previous research concerning Summer Learning Loss, Harris Cooper and his colleagues estimated that the typical child loses a bit more than one month’s amount of skill or knowledge in math, language arts, and reading combined during a typical, “traditional” summer break [Cooper et al., 1996]. This same review of studies

would point out that the degree of summer learning loss experienced by a child varies by grade level, socioeconomic status, and subject area [Cooper et al., 1996]. Other well-known studies say that summer breaks have especially deleterious effects on poor children, especially minorities, and that the long-term consequences of this fact is a primary cause of the ever-widening achievement gap between poor minorities and White middle-class students [Alexander & Entwisle, 1996; Phillips, Crouse, & Ralph, 1998]. This discouraging fact is compounded if one heeds the precedent findings of *Learning, Retention, and Forgetting*, a report done by the New York State Board of Regents in 1978 that says socio-economically advantaged students make, typically, 15 months worth of academic gains during the course of a school year, while socio-economically disadvantaged children typically only make 12 months worth of academic gains during the same school year. Further, the advantaged child is found to gain a month of academic gain during the summer break whilst the disadvantaged child loses three to four months of academic gain over the course of a summer [*Learning,....*, 1978].

The point from all of this is that, seemingly, a long summer break—which would be shortened by implementation of an alternative school calendar—leads to schoolchildren, especially socio-economically disadvantaged and minority children, to lose a significant amount of “academic gain” garnered over the course of a traditional school year.

THE FINE-TOOTHED COMB (THE LITERATURE, PART II)

Now that industry-specific terminology and underlying motives of the alternative school calendar movement have been discussed, it is relevant to display literature concerning whether such alternative calendars actually have any effect, or if there even is

an underlying motive—Summer Learning Loss—that implementation of a year-round calendar should address.

Is There Really Such a Thing as Summer Learning Loss?

There have been numerous studies done regarding the phenomenon of Summer Learning Loss. Two oft-cited ones are from Dr. Barbara Heyns and from Dr. Rose Allinder (with Lynn Fuchs, Douglas Fuchs, and Carol Hamlett). In 1987, Dr. Heyns wrote a famous literature review regarding the effectiveness of extracurricular summer learning programs. While citing various studies, she cited herself in 1978 and a number of other articles that claim that there is not a significant amount of summer learning loss taking place, especially with the advent of summer programs, especially with Title I schools, and especially in the areas of reading, spelling, and handwriting. However, Dr. Heyns went on to cite others that said if there did exist summer learning loss, it occurred most frequently in mathematics and occurred most frequently with those in lower socio-economic classes [Heyns, 1987]. Dr. Rose Allinder et al., on the other hand, studied the effects of a twelve-week summer vacation on 275 second- through fifth-grade students in two rural schools. She and her colleagues found that among the second- and third-graders there was significant loss during the summer of spelling skills, but not of math skills. The inverse was true of fourth- and fifth-graders [Allinder, et al., 1992].

There is another way to determine if Summer Learning Loss is an academically accepted phenomenon: Look at studies of school summer programs. By implication, if schools and school districts implement summer educational programs and if these programs are found to have positive effects, then there can be assumed a Summer Learning Loss phenomenon. One such study to consider in taking this view was

performed by Drs. Gilbert Austin, Bruce Rogers, and Henry Walbesser, Jr. In it, they review the research of the Summer Compensatory Education Program component of Title I of the Elementary and Secondary Education Act. In doing so, they detail an exhaustive list of the examples of research attention that up until that point (1972!) had surrounded the concept and need of summer learning programs for learning loss [Austin et al., 1972]. Austin et al.'s paper concludes that summer educational programs made available through schools were largely attended by socio-economically disadvantaged children. The implication is that Summer Learning Loss does occur and that summer programs meant either to help children meet minimum competency requirements, to allow high school students who had failed a course during the school year retake said course, to ensure children with disabilities receive a free and equitable education, or to recognize the special needs of children living in impoverished areas should consequently be implemented [Austin et al., 1972].

What Has the Literature Said About Alternative School Calendars in Secondary Schools?

There is much ambiguity in the literature concerning year-round calendar implementation in secondary schools. As mentioned in the problem statement, the concept of alternative school calendars has been around since 1967 [Ballinger, 1988]. As a consequence, many reviews look at calendars that were initially implemented in the 1970s, where, due to the infancy of the reform, there were bound to be implementation dilemmas unconsidered in the review. One famous study by Dr. Merino in 1983 is another meta-analysis of previous ambiguous studies on year-round education on secondary schools in which the consensus was that authors did not find positive gains for a year-round calendar [Merino, 1983].

Dr. Winters, in 1995, provides an oft-cited synopsis of past studies that ends up showing ambiguous results for year-round calendars being implemented in secondary schools. Dr. Winters summarized results of school and district tests reported for secondary schools in several states. At Sweetwater High School in California, for example, Dr. Winters found that some test scores were higher for alternative-calendar schools versus traditional ones. But he then also found the opposite results occurring in subsequent years. In National City, California, Dr. Winters found first year academic results declining in alternative-calendar secondary schools, then increasing, and then plateauing. In El Paso, Texas, he found that most alternative-calendar secondary schools achieved positive test results in reading, math, and writing. However, this finding was diluted with qualitative comments like: “The district perceives that the year-round program contributes to recent success, [but] school officials are quick to add that there are certainly many other variables to be considered,” [Winters, 1995]. Reviews such as Dr. Winters’ allow inference of another important matter to consider when thinking of alternative school calendars being implemented in secondary school settings: If the calendar is changed in hopes of reform, other reforms probably are being implemented as well.

What Are the Effects on Academic Achievement of an Alternative School Calendar?

Aforementioned is that there is ambiguity in the largely academic outcomes of schools and districts that have been studied that have implemented school calendar reform. But before simply reviewing literature that focuses primarily on academic achievement in alternative-calendar schools, it is important to note that said literature typically makes four mistakes: One, it does not separate multi-track alternative calendars

from single-track ones (Remember: Multi-track calendars are implemented for overcrowding, logistical reasons; single-track calendars are implemented for ideological motives about education reform); two, many studies have been done within the first year of alternative calendar implementation (because decision-makers want to know as soon as possible whether their reform idea is working); three, much literature has an agenda to promote; and, four, many studies do not indicate how failure and success are assessed.

Acknowledging these mistakes, however, studies have found academic improvement in alternative-calendar schools [Baker, 1990; Bradford, 1993; Grotjohn and Banks, 1993; Kneese, 1996; Los Angeles Unified School District, 1983; Mutchler, 1993; Peltier, 1991; Perry, 1991; Winters, 1995].

However, addressing literature ambiguity, studies have also shown only slight gains or no difference in academic achievement with alternative calendars [Goren and Carriedo, 1986; Hazelton et al., 1992; Merino, 1983; Zykowski et al., 1991]. (It is indeed Goren and Carriedo (1986) that made the aforementioned observation that many schools that change their calendars also “concomitantly change curricular materials.”) As a possible explanation for low or no academic gain, Dr. Rose Allinder et al. in 1992 and Drs. Capps and Cox in 1991 conclude that issues of retention and forgetting involve more than just time (the previously mentioned socio-economic and disadvantaged children argument).

What Are the Effects on “Nonacademic” Outcomes (School Attendance, Dropout, Retention, Motivation, and Burnout et al.) with Alternative School Calendars?

The literature concentrating in this area does indeed come to consensus that an alternative calendar reduces dropout rates, increases school attendance, and facilitates retention [Baker, 1990; Bradford, 1993; Brekke, 1983; Los Angeles Unified School

District, 1983; White, 1987; White, 1988]. These studies interpret the positive effects to higher and more sustained levels of motivation, which have been noticed to increase under alternative calendar regimes [Shields and Oberg, 2000; Hazelton et al., 1992; Zykowski et al., 1991]. Dr. Zykowski et al. says: “Students in year-round schools seemed more ready to learn and to maintain that motivation throughout the year than their peers in traditional schools.” Through surveys, Drs. Shields and Oberg found qualitative support for this case in that summer vacations were too long and too boring for students; students were ready to return to school earlier; and secondary school students found sustaining momentum for academics for a whole semester difficult. This last point seems an important point for this paper. Drs. Shields and Oberg seem to find that implementing an alternative school calendar will decrease dropout rates and increase retention rates and graduation rates because psychological burnout and subsequent scholastic discouragement occurs more easily and more readily under a traditional school calendar.

THE DATA

My data is largely public data gleaned from the Kentucky Department of Education’s yearly-published School Report Cards. The actual School Report Cards, much like user interface on a computer, only shows the pretty and publicly understood facts for each school and district and Kentucky. Consequently, I am also using the spreadsheets that provide the data for the School Report Cards to fill in the statistic gaps. To these I was directed by Jay Roberts of the Kentucky Department of Education. The School Report Cards report from the 2002-2003 to 2006-2007 school years. The beefier backup spreadsheets, in turn, provide data from 2000-2001 to 2004-2005 and provide it only at the district level. Additionally, I received data from Dr. Eugenia Toma that

contains Free and Reduced Price Lunch figures for every high school in Kentucky for the school years 2000-01 to 2003-04. Consequently, the data I will run concerns the 2000-2001 to 2003-2004 school years.

Using the Kentucky Association of Year Round Education (KAYRE), a state subsidiary of the National Association of Year Round Education (NAYRE), and J.W. Mattingly's assistance, I received a list of those districts in Kentucky that have implemented an alternative calendar. Eleven districts (out of 177) have an alternative calendar. As a fun anomaly, all but three districts that have implemented this alternative calendar are "independent" districts. This is a fact that I will exploit for this research.

What is an Independent District?

A district being "independent" has a couple of different meanings. In Kentucky, an Independent District is only important in geographical matters (which are irrelevant to the research being conducted here). Normally, Kentucky school districts are county districts. If there is no Independent District within the county, then the school district ends at the boundary of the county. Independent Districts have the unique property of being able to cross county lines (as in the case of Caverna Independent Schools which reside in Horse Cave and Cave City), but are typically associated with a city and are used to adjoin clustered cities, which is why the Northern Kentucky and Eastern Coal Field area sees the highest concentration of Independent Districts. There are currently 54 independent school districts in Kentucky.

THE NICHE

So, here is what I have: 11/177 districts total have implemented an alternative calendar; 8/11 are Independent Districts; 54/177 districts total are Independent Districts;

51/54 are Independent Districts with only one high school (the other 3 have no high school and only elementary schools). As conveyed from the outset, this study wants to measure the effect of alternative school calendars on nonacademic data, which implies a study of only secondary schools. I also want to correct for the mistake of mixing in schools and districts that have implemented alternative school calendars for logistical reasons (the multi-track calendar). While Kentucky, generally, does not have an overcrowding problem that would result in the use of multi-track calendar, using Independent Districts that have high schools assures that overcrowding is not a problem (as Independent Districts are created because of *under*-crowding) and, as a bonus, implies a school-to-school analysis as every Independent District in Kentucky that has a high school only possesses one such high school (thus allowing the ability to substitute district data for individual school data and vice-versa).

What is Nonacademic Data?

Nonacademic data describes any variable other than test scores. For this study, due mainly to limitations of access on reliance only on public information, nonacademic data refers to dropout rates, attendance rates, and retention rates, where retention rates are defined as percentage of students being held back a grade level.

THE METHODOLOGY

From my dataset, I have an exhaustive set of district-wide variables for every school district in Kentucky. As eight out of eleven school districts having an alternative calendar were Independent Districts, and, as there are 51 Independent Districts (out of 54) that have a high school (and not just an elementary school), and, as aforementioned, Independent Districts in Kentucky adhere to no different set of rules or expectations as

other Kentucky school districts and are only distinguishable by their cross-county-boundary geography, I decided that I would compare only Independent Districts. Doing this contains another research advantage: If Independent Districts are only different from other Kentucky school districts because they cross county boundaries, then implied in the formation of Independent Districts is that within the county boundary in which most Kentucky school districts reside, there were *not enough* students to fill a set of schools. Consequently, the school district had to cross geographic barriers to obtain more students in the schools. In Independent Districts, then, there is zero chance of overcrowding to occur. If there is no overcrowding, there is no reason to implement an alternative calendar for logistic reasons. Hence, if an Independent District possesses an alternative calendar, it is for system-reform reasons. By using only Independent Districts, I have concocted a study that avoids the mistake of combining multi-track, logistical calendars to single-track, reform-oriented ones.

The Variables

Three dependent variables are analyzed: average daily attendance, the retention rate of students in a school (percentage held back a grade level), and dropout rate.

The explanatory variables used were “district percentage of classes taught by teachers certified for subject and grade level,” “district percentage of classes taught by teachers with a major, minor, or equivalent in the subject being taught,” “district percentage of classes taught by teachers who participated in content-focused professional development,” “district percentage of teachers with Master’s degrees or an equivalent,” “district average years of teaching experience,” “district spending per student,” “district student-teacher ratio,” “district student-computer ratio (as a proxy for relative wealth of

district),” “district percentage of classrooms with KETS workstations with Internet access,” “number of students whose parent/legal guardian had at least one teacher conference,” “number of parents/legal guardians voting in school council elections,” “number of parents/legal guardians serving on school board or committee,” and “number of volunteer hours spent by parents/legal guardians in school,” demographic variables (White, Black, Asian/Pacific Islander, American Indian, Other with Male and Female breakdowns), and “percentage of students within a school on Free/Reduced-Price Lunch” (an income variable). I also have included year variables. Summarizing, the explanatory variables attempted to encompass teacher training, relative wealth of district, parental/community involvement in education, demographic make-up of the community, and community income.

There are 197, 200 or 201 observations with four years of data and 51 districts. (Exceptions: Somerset did not exist as a district in 2000 and Harlan Independent is missing a lot of data in 2001. Paintsville is missing one variable of data in 2000, as well.) In the case of the Free/Reduced-Price Lunch variable, there was a significant amount of districts with unrecorded data for the 2003-2004 school year.

The Running of the Tests

Two statistical models are used: Fixed Effects and Between-Effects models of districts and these models are run for two different scenarios, one without district demographic and Free/Reduced-Price Lunch variables and one with them included.

The Fixed Effects model controls for fixed unobserved characteristics of districts and analyzes the changes in outcomes between years.

The Between-Effects model analyzes the average levels of the dependent variable over the dataset and could be described as a model to explain the Fixed Effects.

An alternative model, the Random Effects model, is rejected in the cases of retention rate and dropout rate because the correlation between the explanatory variables and fixed effects is large and statistically significant in all cases.

Consequently, all results will be presented as Fixed Effects or Between-Effects.

THE RESULTS

The First Scenario: No Demographics and No Income Variable

The fixed effects under the scenario sans demographics and the income variable are indeed important between districts. They explain anywhere from 56% to 81% of the variance of all residuals in the various models run. This, of course, and disappointingly, implies the existence of important fixed factors that, currently, are not in the dataset.

The effect of an alternative school calendar on the fixed effects estimation is never statistically significant. In other words, there is no effect on changes in any dependent variable. This would result from the lack of variation present, but it is also possible that there is simply no effect.

Table 1: Percentage of Variance of Residuals Explained by Unobserved, Intrinsic Fixed Effects, First Scenario

Dependent Variable	Percentage Explained by Fixed Effects
Dropout	.612
Retention	.629
Average Daily Attendance	.809

Note: This is a table displaying the percentage of variance of residuals explained by fixed effects in this first scenario.

Using the Between-Effects estimation, having an alternative school calendar does produce the desired effect: There is a statistically significant negative effect on dropout rates and retention rates. The Between-Effects are effects on the average levels of both explanatory variables and dependent variables. There are no Between-Effects on average daily attendance. To reiterate for emphasis that should serve as foreshadowing: *Over the years and over the districts an alternative calendar reduces the dropout rate and retention rate of students.*

Table 2: Alternative Calendar’s Effects on the Dependent Variables

Alternative Calendar Effect	Coefficient	p-value
Dropout	-.965	.073
Retention	-1.642	.021
Average Daily Attendance	NSS	.411

Note: NSS = Not Statistically Significant. Displays specific statistical significance of a district having an alternative school calendar.

The Second Scenario: Demographic and Income Data Included

An interesting aspect of including demographic variables is the effect on fixed effects they had. When included, anywhere from 84% to 97% of all variance of residuals is explained by fixed effects. Demographic variables had no statistically significant effect on any of the dependent variables in any test.

Table 3: Percentage of Variance of Residuals Explained by Unobserved, Intrinsic Fixed Effects, Second Scenario

Dependent Variable	Percentage Explained by Fixed Effects
Dropout	.966
Retention	.839
Average Daily Attendance	.981

Note: This is a table displaying the percentage of variance of residuals explained by fixed effects in this second scenario.

Including the income variable—percentage of students on Free/Reduced-Price Lunch—changed the results sought from this paper considerably. Again, with Fixed Effects, having an alternative school calendar was never statistically significant on any of the dependent variables. However, this time, using Between-Effects, on average over time and across districts, alternative calendars now also offered *no effect* on any dependent variable. What did have a highly significant effect on average daily attendance, dropout rate, and percentage of students held back a grade level was the income variable, where it had a positive effect on dropout rates in both models, a negative effect on average daily attendance in both models, and, interestingly, a negative effect on percentage of students held back a grade in between years, but on average over time and across districts, having a positive effect on this variable.

Table 4: The Effect of Free/Reduced-Price Lunch Participation on Dependent Variables Using Fixed Effects and Between-Effects Models

<i>FRL</i>	Fixed Effects Model		Between-Effects Model	
	<i>Coefficient</i>	<i>p-value</i>	<i>Coefficient</i>	<i>p-value</i>
Dropout	.030	.078	.037	.034
Retention	-.005	.615 (NSS)	-.046	.002
ADA	-.054	.034	.058	.011

Note: ADA = Average Daily Attendance. NSS = Not Statistically Significant. FRL = Free/Reduced-Priced Lunch. Free/Reduced-Price Lunch had predictable effects on all dependent variables, at least on average over time and across districts. Inclusion of this variable made any result from having an alternative calendar statistically insignificant.

THE INTERPRETATION

Most results of this analysis do not defy commonsense: Decreases in dropout rates and retention rates and increases in school attendance rates seem largely determined by forces intrinsic to a community and to its population and schools. The extent of these intrinsic forces after including demographic variables was interesting. I assume this is

because being White, Black, Asian, male, female, etc. in and of itself matters little to whether or not one is going to attend school every day, drop out, or be held back a grade. However, there could be fixed, unobserved effects within each demographic participant that may affect the dependent variables, and, hence, increase the amount of unexplained variance of residuals.

The kicker to this analysis is that without including a variable for income distribution in a community, having an alternative calendar had the desired effects on the dependent variables over time and across districts. These effects were made irrelevant by the inclusion of an income variable. This seemed interesting. Consequently, a simple regression was run with the possession of an alternative calendar as the dependent variable and the district demographic data and the Free/Reduced-Price Lunch variable as the explanatory ones.

Table 5: Free/Reduced-Price Lunch Effects on Having an Alternative Calendar

Alternative Calendar	Coefficient	Standard Error	t-value	p-value
FRL	-.004	.0018	-2.56	.011

Note: FRL = Free/Reduced-Price Lunch. This is a simple regression seeing if the percentage of students on Free/Reduced-Price Lunch has an effect on having an alternative school calendar.

Lo and behold, while demographics had no statistically significant effect of possession of an alternative calendar, district income did. It seems alternative school calendars and the percentage of students on Free/Reduced-Price Lunch are negatively related. In other words, it may be interpreted that alternative calendars appear in wealthier districts. This could be administrative in nature and a consequence of school funding methods: Poorer districts have poorer schools and less money overall. Implementing any education reform is more costly both monetarily and in administrative

terms than in a wealthier district. Reform also offers less immediate benefit as monetarily struggling schools tend to stay struggling under current school funding methods that reward outcomes with no offsetting consideration for inputs, which is what Reform requires. It can also be claimed, though equivocally so, that poorer districts have historically valued education less and, hence, value reform (especially reform that has historically produced dubious results) less as well.

The point is this: For this analysis, percentage of students dropping out, coming to school each day, and being held back a grade is largely influenced by income distributions within a district. All explanatory variables that had any effect on these nonacademic variables had something to do with income: a wealthier district is more likely to have more average years of teaching experience, a higher percentage of teachers with college degrees in the subject areas in which they teach, lower student-teacher ratios, and less percentage of students on Free/Reduced-Price Lunch.

THE CAVEATS

This study could be improved. The best improvement would have been inclusion of other nonacademic data such as “discipline” measures as dependent variables as alternative school calendars are implicitly supposed to affect motivation and boredom of students. I would have also liked this study to have spanned a greater period of time.

As far as sheer data concerns, for the 2003-2004 school year there was a significant amount of data unrecorded regarding the Free/Reduced-Price Lunch variable.

THE RECOMMENDATION

So: I posed this question: What effect does possessing an alternative to the traditional school calendar have on nonacademic outcomes? And it seems the answer to this is “none”. Forces intrinsic to a district and its population and income distribution within a district matter the most to these outcomes. To a degree, this outcome is to be expected. As much as individuals are able to learn exogenously to resources, individuals are also incentivized by their environments. Public Education is a system and, hence, an environment that creates incentives for behavior. Learning is a behavior: There are costs subject to individual intelligence and there are benefits subject to individual perceptions. A school has always implicitly tried to tap into these individual perceptions of benefit. In other words, a school has always tried to incentivize the behavior of learning. For this analysis, I was not able to test any variable that would fall under the umbrella of “incentive to learn.” To give the concept of School Calendar Reform a break, implicit in the concern over Summer Learning Loss and the Time component to learning is the concept of incentives to learn: Having an unduly long summer break and having sporadic intra-school-year breaks affects incentives to learn. Acknowledging this, my recommendation is further study of the subject.

THE END

One final thought before concluding: I would like to acknowledge, give credit, and thank Dr. Toma and, especially, Dr. Butler, who helped me run my models and interpret my results. Any mistake made in interpretation of results is mine and mine alone.

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