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Holding School Leaders Accountable: Estimating the Effects of Retrospective Evaluations of Kentucky School District Superintendents

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This research represents an attempt to apply the theory of retrospective voting to the issue of turnover among Kentucky school district superintendents. The analysis tests the hypothesis that poor school district performance should increase superintendent performance. The hypothesis is tested using accountability data compiled by the Kentucky Department of Education. The analysis reveals somewhat mixed support for the hypothesis. Different performance measures have different kinds of impact. Schools with students scoring high on the math and writing were more likely to experience superintendent turnover than other school districts were. The index scores for science and social studies had a negative, statistically significant effect upon turnover. The district spending measure had a negative, statistically significant coefficient, indicating that the bigger spending districts had somewhat lower turnover than did other districts. Surprisingly, the superintendent salary measure is positively and significantly associated with turnover.

Key Words: Kentucky, education policy, superintendent evaluation

In politics and in many organizations, leaders appear to be evaluated based upon the performance of the programs that they lead. If their programs appear to be successful (e.g., if a coach's team wins ball games), leaders are retained and even rewarded. In the political science literature, an argument about the way that voters make decisions about candidates (particularly presidential candidates) has been based upon this tendency. The political science scholarship describes this phenomenon as "retrospective voting" (Fiorina, 1981). According to this argument, voters evaluate the incumbent based upon the performance of the government that he/she leads. In most of

the research, the incumbent who is examined is the incumbent president, and the major focus of the voters' evaluation is the state of the economy. There is considerable evidence that these retrospective models do explain quite a bit of the variance in citizen evaluations of the president and the vote share obtained by incumbent presidents and the presidential candidates of the incumbent's party. Nonetheless, the near exclusive focus on the state of the economy offers a somewhat incomplete view of the concerns of all voters, since most voters care about a wide variety of other issues.

This problem in modeling citizen evaluations may be mitigated when the analysis is directed to a different kind of public office responsible for a limited set of policy responsibilities. Many governments, particularly at the local level, are primarily tasked with carrying out a single kind of public policy. Public school districts, for example, are responsible for delivering educational services. They do not need to be concerned with foreign policy, environmental regulation, or labor relations. They simply need to focus upon schooling. Of course, education policy, like all policies, may have multiple dimensions. Citizens and educators may have concerns about many different aspects of the educational experience. It should also be noted that public schools are involved to some extent in activities that are not education, in the narrowest sense of the word. School lunch programs contribute to the nutritional needs of children, school nurses promote public health, drug prevention classes may serve law enforcement ends, and after-school programs may act as low cost and convenient day care facilities. Nonetheless, one should think that schools and school personnel would be evaluated by citizens using much less complex criteria than would be applied to agencies and public officials involved in general purpose government (see Berry and Howell, 2007).

The task of citizen evaluation of schools and school leaders has been affected in recent years by the school accountability movement, which has required public schools to be assessed based upon quantifiable scores on a number of variables. These include student test scores, most obviously, but also include measures of dropout rate, graduation rate, assaults on campus, etc. Many schools or school districts also report to the public data on per pupil expenditures, teacher-student ratios, percentage of classrooms connected to the Internet, and other "input" measures. Access to these data makes it easier for citizens and elected officials to evaluate the work of public schools. Quite possibly, citizens will use such data to evaluate the leaders who run public schools. If citizen-voters make evaluations retrospectively, they should support elected school board members in districts that are doing well on the accountability criteria and oppose those doing badly. For the same reason, school board members should be expected to support (and vote to retain) school district superintendents whose districts are scoring well on various measures, while not retaining or outright firing superintendents whose districts are struggling.

The paper proceeds in the following fashion. The first section of the paper will describe the superintendent's position in Kentucky and some of the varied research addressing the causes of superintendent turnover nationwide. The second section describes an analysis of turnover in that position in Kentucky between 2000 and 2005. The third and final section discusses the results of that analysis and some future research directions that should be pursued.

THE OFFICE OF SUPERINTENDENT

Throughout most of America, public school districts are managed by a professional, appointed executive, who is hired (and sometimes fired) by an elected school board. With the exception of a very few elected positions, superintendents are viewed as non-political, presumably expert managers of school systems. They are accountable to school boards, which are almost always elected bodies, but they are also tasked with the implementation of education policy that is crafted at the state and somewhat at the federal levels. By most accounts, one of the most important duties of the school boards is the selection, evaluation, monitoring, and occasional termination of the superintendent (see Glass, 2000). Exactly how such decisions are made by boards regarding superintendents is not always clear. Certain legal constraints apply in most states. For example, in Kentucky superintendent candidates must be certified by the Education Professional Standards Board as superintendents before their appointment. Superintendents can be appointed for contractual terms no longer than four years. A superintendent can be removed for cause up upon a vote of four-fifths of the school board membership with the approval of the commissioner of education (KRS 160.350). Also, superintendents can be dismissed upon the recommendation of a highly skilled certified educator and the approval of the commissioner of education (KRS 158.6455).

Research on turnover among school district superintendents has largely relied upon descriptive rather than inferential statistical analysis. Some studies have indicated that superintendents in large districts have more turnover than those in smaller districts, but other studies find no impact. Some research has indicated that turnover among superintendents has increased in recent decades, but other research indicates that there has been no particular change (see Natkin, *et al.* 2002). Much of the research indicates that turnover is often related to personal attributes of the incumbent administrator, and is related to political factors or perceptions of poor performance in only a minority of cases (Alsbury, 2004). Some reports indicate that the evaluations by school boards of superintendents are not very probing, with favorable evaluations given even to superintendents of districts which by every measure are doing badly (Morford, 2012). The research does indicate that conflict with the school board and internal dissension within the school board is one of the reasons that

superintendents leave their positions. In some instances, superintendents who appear to be doing well will leave their positions to take new jobs in larger, presumably better financed school districts.

Research by Christopher Berry and William Howell (2005; 2007) has indicated that measures of student performance at the district level leads to an increased likelihood of re-election for incumbent school board members, at least in elections with relatively high turnout. In low turnout, presumably low salience and low information elections, there is no identifiable effect. Kogan, Lavertu, and Peskowitz (2016a) found that school performance information may affect school tax levy referenda outcomes, with voters less likely to approve levies when districts appear to be performing poorly. On the other hand, Kogan, Lavertu, and Peskowitz (2016b) also found that in Ohio districts, school report card information seemed to have no statistically significant impact on council turnover, vote shares received by sitting school board members, and superintendent turnover. The next section represents an attempt to determine if measurable school accountability is related to superintendent turnover in Kentucky districts.

ANALYSIS

To analyze the impact of student outcomes upon superintendent turnover, the Kentucky Department of Education school report card data set was downloaded. The school report card data set contains data on a number of different measures of student learning, as well as measures that relate to the learning environment or school district resources. The data set also contains the names of the school district superintendent for each district for each recent year. Data are missing for several variables and several districts over various years, so the analysis was limited to turnover between 2000 and 2005. The unit of analysis was the district by year. If the listed name of the superintendent for a particular district in one year was different from the name listed in the previous year, the district was determined to have experienced turnover in the office of superintendent and the observation was assigned a value of "1" for the turnover variable. Otherwise, the observation was assigned a value of "0".

To estimate the likelihood of turnover, we built a model which included the average of all district Kentucky Core Content Test (KCCT) index scores in the following academic subjects: arts and humanities, mathematics, reading, science, social studies, and writing. Usually in each year three grade levels of KCCT scores were reported in a given subject. The mean values of each district for a given year were used. The data set includes measures for the number of assaults and drug incidents within the school district for a given year. We adjusted these scores by dividing the reported values by each districts' enrollment. We also included a measure for the number of volunteer hours reported by the district, to control for levels of parental involvement.

This measure was also adjusted by dividing by the district's enrollment. To control for school district size, we included a variable representing the district's average daily attendance (ADA). A variable was also included to represent the district superintendent's salary, with the expectation that higher paid administrators may be less likely to leave. To control for the effect of school district finances, we included a measure of per pupil spending.

For the model reported in Tables 2, we included dichotomous measures for several performance indicators that represented whether a district ranked in the top third or the bottom third on a performance indicator. These variables are included to test whether school district performance may have a non-linear impact on turnover, with very high- and very low-performing districts having different impacts than average performing districts would. For the model reported in Table 3, we included a summary measure defined as the number of times that a district scored in the top third of the sample, minus the number of times that the district scored in the bottom third. This is included as a summary measure of overall academic performance. For the model reported in Table 4, we include an interaction term equal to the number of upper-third scores minus lower-third scores, multiplied by per pupil expenditures. This is included to examine the possibility that high spending might mitigate the effect of school performance on superintendent turnover. A dichotomous dummy variable representing whether or not the district was an independent school district, as opposed to a county district, was also included. This variable to some extent represents institutional differences, since independent district school boards are normally elected at-large while county school boards are elected from divisions within the districts. The county school districts also generally serve students in unincorporated areas, so the variable may also embody urban-rural differences. A logistical regression model was estimated using STATA. The results are reported below.

FINDINGS

The results reported in Table 1 indicate that some of the student outcome measures appear to increase turnover while others seem to decrease it. Ironically, schools with students scoring high on the KCCT math and writing exams were more likely to experience superintendent turnover than other school districts were. The index scores for science and social studies had a negative, statistically significant effect upon turnover. The district spending measure had a negative, statistically coefficient, indicating that the bigger spending districts had somewhat lower turnover than did other districts. Surprisingly, the superintendent salary measure is positively and significantly associated with turnover. The assaults incidents measure is also positively related to turnover, but only at a fairly generous level of statistical significance. The other variables did not have a statistically significant effect.

Table 1: Superintendent Turnover Explained by Subject Index Scores

Variable	Coefficient (Standard Error)
Per Pupil Spending (thousands of dollars)	-.229** (.099)
Arts and Humanities Index	.039 (.029)
Math Index	.07** (.031)
Reading Index	.047 (.037)
Science Index	-.095** (.034)
Social Studies Index	-.095** (.034)
Writing Index	.062** (.021)
Independent School District	.033 (.287)
Number of Drug Incidents	-.014 (.01)
Number of Assault Incidents	.026* (.015)
Volunteer Hours	.000 (.000)
Absolute Difference from State-Wide Average Enrollment	.000 (.000)
Average Daily Attendance	-.06 (.116)
Superintendent Wages (thousands of dollars)	.02** (.009)
Constant	3.493 (10.685)
Pseudo R ²	.069
Number of Observations	515

* = $p < .1$ ** = $p < .05$

Examining results reported in Table 2 reveals some non-linear impacts that are worthy of note. Districts performing in the lower third of the sample in mathematics were less likely to experience turnover in their superintendent. Ironically, districts performing near the top in science and in social studies were also not likely to lose their superintendents. The number of assaults in the district seems to have a modest impact encouraging turnover, but the number of drug incidents has a modest impact discouraging it. The superintendent salary variable is still significantly and positively related to turnover, while school expenditures are still negatively associated with it.

Table 2: Superintendent Turnover Explained by District Ranking

Variable	Coefficient (Standard Error)
Per Pupil Spending (thousands of dollars)	-.219** (.093)
Top Third Arts and Humanities Index	.313 (.356)
Bottom Third Arts and Humanities Index	.495 (.382)
Top Third Math Index	.236 (.384)
Bottom Third Math Index	-1.01** (.349)
Top Third Reading Index	.376 (.321)
Bottom Third Reading Index	..97 (.358)
Top Third Science Index	-.687* (.356)
Bottom Third Science Index	.139 (.335)
Top Third Social Studies Index	-.645* (.362)
Bottom Third Social Studies Index	.391 (.359)
Top Third Writing Index	.449 (.285)
Bottom Third Writing Index	-.832** (.309)
Independent School District	.116 (.272)
Number of Drug Incidents	-.019* (.01)
Number of Assault Incidents	.028* (.016)
Volunteer Hours	.000 (.000)
Absolute Difference from State-Wide Average Enrollment	.000* (.000)
Average Daily Attendance	-.078 (.112)
Superintendent Wages (thousands of dollars)	.021** (.009)
Constant	6.257 (10.694)
Pseudo R ²	.077
Number of Observations	515

* = $p < .1$ ** = $P < .05$

The results reported in Table 3 indicate that a summary measure of relative school performance is positively but modestly related to superintendent turnover. The per pupil spending measure continues to be negatively related to turnover, just as the assaults measure and the superintendent salary measures remain positively associated.

Table 3: Superintendent Turnover Explained by Number of Top Rankings in District *minus* Number of Bottom Rankings in the District

Variable	Coefficient (Standard Error)
Per Pupil Spending (thousands of dollars)	-.173* (.090)
Number of Top Third Rankings Minus Number of Bottom Third Rankings	.04 (.029)
Independent School District	.072 (.272)
Number of Drug Incidents	-.017 (.01)
Number of Assault Incidents	.03** (.015)
Volunteer Hours	.000 (.000)
Absolute Difference from State-Wide Average Enrollment	.000 * (.000)
Average Daily Attendance	-.063 (.105)
Superintendent Wages (thousands of dollars)	.021** (.009)
Constant	4.372 (10.075)
Pseudo R ²	.032
Number of Observations	515

* = $p < .1$

** = $P < .05$

Table 4 reports the effects of the interactive effect of spending and district performance. In this model, district academic performance (i.e., the number of top third rankings minus the number of bottom third rankings) is strongly and positively related to turnover, but the interaction between district spending and academic performance is negatively and significantly associated with related to turnover (because of the difficulties in interpreting interaction effects in logits, the 'inteff' command was used in STATA to graph the statistical significance of the interaction (see Norton, Wang, and Ai 2004 for a discussion), see Figure 1). This suggests that all things being equal, superintendents in high performing districts are likely to leave. But superintendents in high performing districts that spend a lot of money are actually likely to stay. Superintendent salary once again is associated with turnover.

Table 4: Superintendent Turnover Explained by Number of Top Rankings in District *minus* Number of Bottom Rankings in the District Interacted by District Spending

Variable	Coefficient (Standard Error)
Per Pupil Spending (thousands of dollars)	-.158* (.089)
Number of Top Third Rankings Minus Number of Bottom Third Rankings	.349** (.139)
Per Pupil Spending Multiplied by the Number of Top Third Rankings-Number of Bottom Third Rankings	-.044** (see Figure 1)
Independent School District	..57 (.276)
Number of Drug Incidents	-.015 (.011)
Number of Assault Incidents	.027* (.015)
Volunteer Hours	.000 (.000)
Absolute Difference from State-Wide Average Enrollment	.000 (.000)
Average Daily Attendance	.03 (.104)
Superintendent Wages (thousands of dollars)	.021** (.008)
Constant	.748 (10.154)
Pseudo R ²	.04
Number of Observations	515

* = $p < .1$

** = $P < .05$

Figure 1: Z-statistics of Interaction Effects after Logit

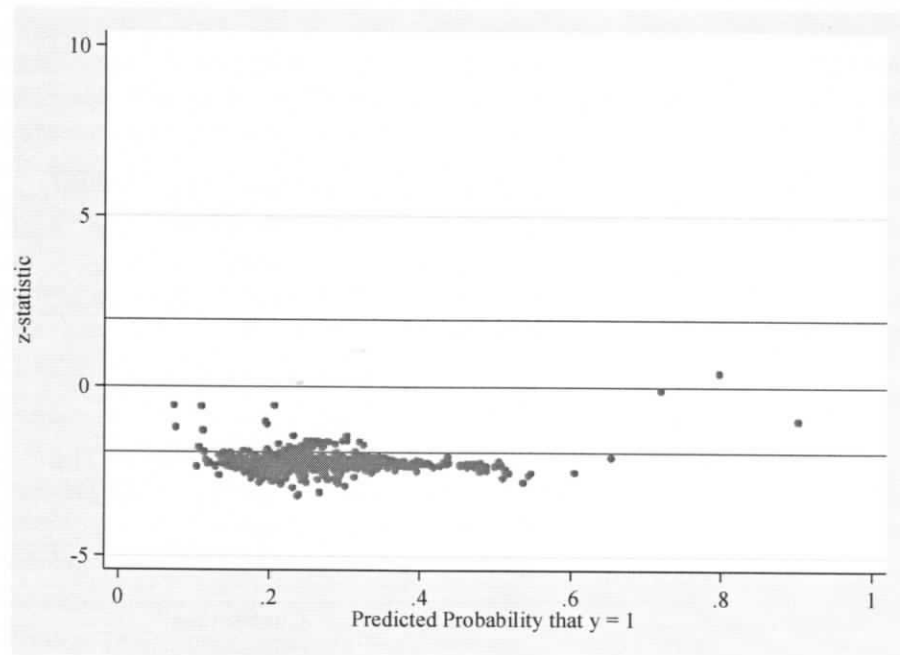


Table 5: Correlation of Academic Indices

	Math	Reading	Science	Social Science	Writing	Arts & Humanities
Math	1					
Reading	.841	1				
Science	.879	.899	1			
Social Studies	.915	.857	.855	1		
Writing	.656	.654	.701	.665	1	
Arts & Humanities	.889	.848	.844	.912	.691	1

Some of the puzzling findings may be due to multicollinearity. Table 5 reports a correlation matrix containing many of the index scores. Ironically, social studies index scores are highly correlated with math index scores at the district level, but these variables have diametrically opposed effects upon superintendent turnover. The social studies index scores are also highly correlated with the arts and humanities and the reading index scores, neither of which are related to turnover in a statistically significant way. Somewhat surprisingly, the correlation between the reading and writing index scores is not particularly strong.

DISCUSSION

These findings are quite interesting. Rather than finding that schools that were performing well on the accountability measures had lower turnover than other districts, we find that different performance measures had different kinds of impact. Whether this is due to the greater or different salience of some measures remains to be determined. It is possible that the math scores and to a lesser extent the reading scores, both of which are important for No Child Left Behind assessments, may be more important than some of the other scores. Perhaps superintendents with high math scores are lured away to other positions at other, higher paying districts. On the other hand, districts with high scoring students in science and social studies seemed to be retaining their superintendents.

Probably the most significant findings dealt with money. The effects of district expenditures were intertwined with district academic performance. Generally speaking, district expenditures per pupil discouraged turnover, as did overall district academic performance, but high expenditures and high academic performance particularly discouraged turnover. Another extremely robust finding was the impact that superintendent salaries had on turnover. Paying administrators fairly well does not keep them in the district. Perhaps high salary is an indicator of high quality, and the highest quality superintendents can be lured to other districts elsewhere, possibly out of state. In any case, these results do not offer much hope that Kentucky districts can retain their superintendents simply by paying them a bit more.

Further research on these questions is definitely needed, beginning with some examination of the effect that these index scores have on school board turnover. Change in the school board may also be related to change in superintendents. While superintendents are directly overseen by the school board members, it is the voters who would be making retrospective evaluations of the board members. Whether the voters assign responsibility to the school board based on the performance of the students remains to be seen. Also worth examining would be the impact of changes in the academic performance scores. These measures of "value-added" might be more useful for assessing

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whether superintendents were being held accountable for the performance of their districts.

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