School Characteristics: Impact on a Student's Post-Graduation Decision

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Executive Summary

Graduating high school seniors have several choices to make as they begin their transition to adulthood. Some of the most popular and studied choices are to attend college, enter the work force, or join the military. Past research is focused on the effects of demographic, socioeconomic status, or gender characteristics, but little is known about the effect that specific school characteristics have on a student's post-graduation choice.

The purpose of this analysis is to answer the question "do school characteristics affect a high school student's post-graduation choice?" In this analysis I use Kentucky school level data and a simple regression model in order to identify what affect school characteristics have on a student's post-graduation choice. Three separate regression are used; each one containing a different dependent variable of student choice (college, workforce, military). A dummy variable for counties that contain a military installation is also created in order to account for the propensity of students in these counties to choose military based on their exposure.

I found that school characteristics indeed have some effect on a student's post-graduation choice. The results showed that the higher the schools index score and the larger the population of teachers with master's degrees, then the higher the propensity for a student to choose college. Additionally, the closer a student is to a military base the more likely they will choose military or workforce instead of college. Race/ethnicity and a student's socioeconomic status also significantly impact post-graduation choices.

The implications for this study are the possible changes in the delivery of the education to public high school students. By identifying which specific school characteristics have the largest impact on student choice, we can focus our energies into those specific factors so our students are afforded experiences that inform their futures in the best, most equal way.

Introduction and Overview

Graduating high school seniors have several choices to make as they begin their transition to adulthood. Some of the most popular and studied choices are to attend college, enter the work force, or join the military. These choices have an influence that extends over the course of a lifetime (Owens, 1992). Research on the topic of student choice is generally focused on the effects of demographic, socioeconomic status, or gender characteristics (Lee, 2012). However, little is known about the effect that specific characteristics of a high school as an institution have on a student's post-graduation choice, although there has been some work looking at high school quality and probability of attending college**.** Like the students within them, no two schools are identical. The numerous characteristics that define a school just like the characteristics that define a student's home life or any other institution will combine to create an influential environment (Moscoso, 2000). The possible decision shaping characteristics that make up this environment, specifically for high schools in Kentucky, are of interest to this study.

Background

To better understand the significance of this topic, it is important to first highlight Kentucky's distribution of educational institutions, academic outcomes, and labor market. Within its 120 counties, Kentucky is home to 202 public high schools with an average graduation rate of approximately 88 percent, a 2 percent increase from recent previous years (Kentucky Department of Education, 2013; School Report Card, 2015). Kentucky also contains 53 four-year universities as well as a variety of smaller two-year and community colleges (Kentucky Colleges). There are about 1,900,000 employed persons in the Commonwealth. The average unemployment rate was 5.5 percent as of December of 2015. The most popular occupations in Kentucky are in the office and administrative fields, followed by the production industry and

retail and sales (KYLMI, 2015). Kentucky is also home to two major military installations, the U.S. Army's Fort Campbell and Fort Knox. Located in the western part of the state, Fort Campbell is home to the 101st Airborne Division and the 5th Special Operations Group, and houses the 5th largest population of active duty military personnel (Fort Campbell Guide, 2012). Fort Knox is located in the North Central part of the state, and is home to Recruiting Command, Human Resources Command, Cadet Command, and an Air Assault U.S. Army Reserve wing. Fort Knox is comparable to Fort Campbell in geographical size, but has significantly fewer assigned personnel (Fort Knox Guide, 2012).

These numbers speak to the many opportunities Kentucky students have and to the importance of understanding what factors lead them to their post-graduation pursuits. Understanding such factors have implications for improving the structure and delivery of our educational systems.

Literature Review

The educational system in America has possible contradictions with respect to serving its student populations. On one hand, the educational system is expected to prepare students to be active, participatory citizens of democracy as they are provided a fair chance to compete for the "good life" in our society and all that good life entails (Gutmann, 1987). This serves the democratic objectives of our sociopolitical system. On the other hand, the educational system is comprised of public schools with varying levels of school resources and characteristics. As a result of these differences, potential barriers to the opportunities that allow students to make objective choices at post-graduation are created. The educational system expects high school students to act in self-interest, regardless of the majority, and obtain achievement accordingly,

because we assume that our schools provide an even playing field (Gamoran, 2009). Modern day perceptions of education view it as a vital societal resource and a catalyzing means for achieving egalitarianism. But how can we provide such equality for our students unless we better understand the systemic factors that influence their post-educational life paths?

The factors contributing to a high school graduate's choice to attend college, enter the work force, join the military, or pursue some other vocation have been studied for a long time. Such studies focus on the compounding effects that these choices have on the individual's quality of life, fluctuations in the job market and economy, college enrollment, and the strength of the military (Sewell & Shah, 1968; Owens, 1992; Woodruff, Kelty, & Segal, 2006; Nguyen &Taylor, 2003). Certain commonalties that exist among past literature focus on high school student demographics such as ethnicity, socioeconomic backgrounds, and even personal preferences as determinates of choice. Additional studies focus on importance of school characteristics as influencers, however these studies tend to focus namely on student achievement gaps, which have grown markedly in the US (Tavernise, 2012). There can be progress when equal educational opportunity produces unequal outcomes, but not when unequal opportunity produces unequal outcomes. In a country where quality of life is so directly tied to education, it is imperative that all students have an equal chance at that education, or equal access to significant influential school characteristics.

Choosing College or the Workforce

The literature demonstrates that student demographics such as race, ethnicity, and family background are relevant factors in a student's choice of post-secondary education or joining the workforce (Lee, Almonte & Youn, 2012; Nguyen & Taylor, 2003). More specifically, family backgrounds and family expectations prove to be one of the strongest predictors for student

choice after graduation (Dick & Rallis, 1991; Hossler & Stage, 1992). Parental employment status and income levels have been shown as determinates for the choices of attaining higher education or entering the workforce (Nguyen &Taylor, 2003). In fact, Nguyen & Taylor (2003) cite that minority students may choose college over entering the workforce in a pursuit to mitigate discrimination through attaining a higher education. What the literature does not indicated, however, is influence of primary and secondary school characteristics on a minority student's potential to pursue or even follow through with such choices.

Though school characteristics have been acknowledged as an influential factor in explaining achievement, we do not know enough about the significance of its impact on student choice after graduation (Dick & Rallis, 1991). Factors such as school and teacher quality, school resources, location, and social factors may be a few of the likely many that impact choice. If we could predict which students in the 9th grade would be planning different types of careers 4 years later, or if we could identify the student who would be likely to change their career plans over time, our educational training institutions would be better prepared to meet future student demands for different fields. School quality has shown some effect on high school retention and student retention has implications for which choices they are eligible for upon exiting high school (Ehrenberg & Brewer,1994; Card & Krueger, 1990). For example by dropping out of high school because of school quality characteristics the student has already made the choice to not attend college, at least not without earning their GED. In fact, when education levels are held constant, most literature supports the premise that the characteristic of "higher school quality" will result in higher wages earned (Ehrenberg & Brewer, 1994; Card & Krueger, 1990). So in considering the seemingly impactful, triangular relationship between student drop out, school

quality and projected wages earned after graduation, little attention has actually been given to the relationship between dropout rates and school organization (Bryk & Thum, 1989).

In the late 70s and early 80s there were some publications on the topic of the internal social structure of high school and its relationship to student outcomes. Examples of factors examined included teacher satisfaction, student programs, time devoted to instruction, and open versus closed door classrooms, student involvement and a student's attitude toward school and teacher (Brookover ,1979; Hawley, Rosenholtz, Goodstein, & Hasselbring, 1984). These studies indicate that student involvement as a characteristic within school structure has shown to positively affect student outcomes. Thus the lack of a normative and consistent environment within a school's structure can result in the prevalence of absences and subsequent dropouts. Therefore schools should adopt more standardized policies where students are pursuing similar course work in an orderly environment.

Choosing Military

There is a wide and complex range of possible influences for military enlistment, some of which include but are not limited to: patriotism, entry bonuses, best employment available, support of family, and the ability to receive money for college (Woodruff, Kelty, & Segal, 2006). One study concluded a high school senior's inclination to serve in the military expressed on senior surveys has shown to be a strong predictor of actual service (Woodruff, Kelty, & Segal, 2006). Kleykamp (2006) offers further insight into the relationship between school characteristics (location) and military enlistment during war time. Unlike previous studies he finds little association between racial or ethnic factor and military enlistment. In his analysis of a graduating cohort from a Texas high school in 2002 he finds that socioeconomic factors and the school-location characteristic are positively associated with enlistment propensity.

Rationale for Study

Though equal *access* to resources within the school cannot be guaranteed, we can guarantee equal *opportunity* to access those resources. By identifying which specific school characteristics have the largest impact on student choice, we can focus our energies into those specific factors so our students are afforded experiences that inform their futures in the best, most equal way.

Research Design

Data

In order to analyze the effect that specific school characteristics have on a senior's post-graduation choice, data containing multiple school level variables will be used. The school level data in this paper is a combination of the Common Core database (CCD), data from the Kentucky Department of Education (KDE) Report Card, Appalachian Math and Science Partnership (AMSP) professional development data, and data that have been collected over time by the University of Kentucky's Martin School of Public Policy and Administration. This data set includes data on all high schools in Kentucky, sorted by county and district for years 2001-2011. A student's post-graduation decision is based on the results of a survey requesting seniors to indicate if they plan to attend college, enter the civilian workforce, or join the military. Survey results indicate a student's stated plan, the data does not show the rate of student follow through with their survey answers. These variables are designated as "college", "workforce", and "military", and represent the percent of each graduating class. It is important to note that the data does not include Department of Defense (DoD) schools. Therefore, the students attending the school systems outside of the military installation (Fort Campbell and Fort Knox) are

unlikely to have a military parent (a factor shown to be a significant predictor of youth military enlistment propensity).

Model

For the purpose of this analysis a linear regression model is used to test the hypothesis that a school's characteristics affect students' planned choice. Three separate regressions are run, each one containing the dependent variable of "college", "workforce", or "military". In addition, a dummy variable will be created for the schools that are located in a county that has a military installation and for those schools that are in counties bordering the installation county in order to account for school location.

Table 1: Descriptive Statistics

variable	N	Mean	S.D.	Min	Max
College	2571	52.62	16.82	0	100
Workforce	2571	26.6	12.09	0	100
Military	2571	2.45	1.97	0	25
Military County	3003	0.11	0.31	0	1
School Index Score	2469	71.66	10.51	38.8	112.43
Total Enrollment per School	2969	741.93	455.37	0	2214
Attendance Level	2571	92.35	7.16	0	100
Spending per Student	2569	6003.92	1768.1	100	17340
Student/Teacher Ratio	2540	16.49	2.71	0	29
Student/Computer Ratio	2569	4.01	4.53	0.6	100
Total Number of Teachers With Masters Degre	2718	73.5	20.39	0	100
% Student Eligible for Free Lunch	2058	0.41	0.19	0	1.12
School Located in town	2970	0.27	0.44	0	1
School Located in Rural Area	2970	0.45	0.5	0	1
School Located in Suburban Area	2970	0.17	0.37	0	1
% Asian Students	2967	0.01	0.01	0	0.12
% Hispanic Students	2967	0.01	0.02	0	0.96
% Black Students	2967	0.09	0.15	0	0.83
% of Other Students	2967	0	0.01	0	0.2

--H0: Specific school characteristics have no effect on a high school senior's propensity to join the military, workforce, or college, controlling for all other variables.

--H1: Specific school characteristics affect a high school senior's propensity of joining the military, workforce, of college, controlling for all other variables.

The dependent variables are a graduating senior's propensity to enter college, the workforce, or join the military, as indicated by a survey given for the years 2001-2011.

The explanatory variables are:

School index score (idxai)

The school index score is used to understand overall student education quality and progress of a school (the higher the score, the greater the quality or progress). A school's index scores takes into account the student achievement for reading, mathematics, science, social studies and writing. Additionally, it focuses on student achievement gaps by measuring the distance of a school's *Student Gap Group* to the goal of 100 percent proficient. Student groups take into account ethnicity, special education, poverty, and English proficiency. The index also measures the growth of a school in terms of progress. This is done my comparing individual student test scores to their peers to gain a student growth percentile for each school. Additionally, it takes into account ACT completion (FAQs, 2012). Finally, this variable provides a measure for college readiness by dividing the number of high school seniors that have met standards for graduation by those that have not.

Total student enrollment per school (total_enrollment_CCD)

The total student enrollment must be controlled for to account for schools that have very few students, and thus offer a smaller, less accurate post-graduation survey result. Total enrollment also speaks to the size of the school which is a school characteristic that has been

shown to have effects on student achievement, perhaps because of the school's ability to control and influence its student population more efficiency, or because of more standardized socioeconomic backgrounds within its population. Regardless, it is seen as a characteristic that may influence student choice (Darling-Hammond et al., 2006).

Attendance (ada)

This variable shows the average percent of student attendance for each school per year. Schools that report low levels of attendance have less time to instruct and influence their student population. As a result, research supports that chronic absences are directly correlated with higher dropout rates so a school's attendance characteristics therefore could contribute to student choices (Research Brief, 2012).

Spending per student (spending)

The effect that spending has on each student is taken into account in order to control for the possible correlation of the amount of money spent on the achievement of a student and socioeconomic status of a county's school system (Wenglinsky, 1997).

Student-teacher ratio (stratio)

The student-teacher ratio is used here as a proxy to control for a student's quality of education. Studies show that a school's teacher-student ratio can have a significant effect on the quality of education ("Class size and student achievement." 2015).

Student-Computer ratio (st_comp_ratio)

This variable measures the ratio of students to the number of computers they have access to during school hours. A student's access to computers with internet during school hours has been shown to increase their digital competencies related to education activities (Technology in Schools: The Ongoing Challenge of Access, Adequacy and Equity).

Percent of teaches with masters degrees (totalmast)

Many studies have shown that a teacher's qualifications have little significance in relation to student achievement. However, few studies focus on this variable in relation to student choice. Because of their many college years, teachers who have master's degrees may be more likely to sway students towards college instead of focusing on other student options.

Percent of Student Eligible to Receive Free Lunch (per_lunch)

The free lunch variable is used as a proxy variable for a student's socio economic status. Pre-2011, students whose parents earned less than 14,000 dollars annually would qualify for free lunch (Department of Agriculture, 2009). The socioeconomic status of a student, as accounted for by their lunch status, is shown to be an important factor in a student's achievement levels. This variable is an obvious addition to this study for its likely ability to influence student choice (Darling-Hammond, 2000).

School is located: suburban area (loc_suburban); town (loc_town); rural area (loc_rural)

Results for the school location variables are compared to the omitted variable "city area". Student choice may likely be determined by the environment the school is located in and the varying types of exposure to decision influencers that each of these characteristics bring to its students. For example, a suburban school may have easier access to more college campuses as opposed to schools located in a rural area

Military counties (mil_county)

These are counties with a military installation and counties adjacent to military counties. A student choice of military may certainly be influenced by their school's exposure to military personnel or installation activities.

Percent of students: Asian (per_asian); Hispanic (per_hisp); Black (per_black); Other (per_other)

It is commonly known that various ethnic backgrounds contribute to student achievement, and therefore this study seeks to understand how these backgrounds (including their associated socioeconomic statuses and preferences) contribute to student choice.

Findings

When taking into account the chosen school characteristics for Kentucky, this model offers evidence in favor of the alternative hypothesis, indeed school characteristics do seem to have some effect on student choice, when controlling for all other variables. To begin with, the results indicate that a school's index score is significant; its positive coefficient for college suggests that as a school's score increases, so does the likelihood of students choosing college. Its negative coefficient for both workforce and military indicates that with one unit of increase in a school's index score there occurs a decrease in the propensity for a student to enlist in the military or workforce. Attendance is also strongly significant and positive for all choices, with the choice of college showing the most significance. A school's proximity to a military installation also yields a significant and positive result for both military and workforce. This suggests that exposure to the military does increase the propensity for a student to choose to join the military (or workforce) in lieu of attending college right after high school. At the 1% level, this model shows that schools with more teachers that hold a master degree have a higher prevalence of students that choose to attend college. In addition, the results indicate that the free lunch variable is significant for both college and workforce choices, however not for the military choice. Its negative coefficient in the college model indicates that with one unit of increase in a student's free lunch status there occurs a decrease in the propensity for a student to attend

college. In a similar manner, the positive coefficient for workforce indicates that as free lunch status increases so does the propensity to join the workforce. Race/ethnicity also yielded strong, significant results. Asian students are much more likely to choose college over workforce or military. On the other hand, Hispanic students were shown to choose workforce and military over college. This model also provides statistically significant results for black students to choose college over workforce, but at a lower rate than Asian students. At the 5% confidence level there are results that suggest that schools located in more rural areas yield more students to choose workforce over college or military. Additionally, total enrollment was significant at the 5% level and concludes that bigger schools may produce more students that choose workforce or military over college enrollment. Refer to Table 2 in Appendix A.

Limitations/Conclusion

A limitation of this study is the limited amount of school characteristics contained in the data. There other possibly significant school characteristics that alter a student's choice based on their experience to these characteristics, for example the prevalence of "shop classes" that are not contained in this data. Additionally the data is based on a survey and therefore it is not known what rate these students followed through with their survey selection. Similarly there is the inability to see how such choices have actually affected the student years later. Therefore this may be used as a preliminary study that would provide a basis for future longitudinal studies. In contrast to the college and workforce models, the military model gains few significant results related to military enlistment and the R-squared value of .05 for the military portion suggests that there must be some other predictor for military service besides school characteristics. Another possible limitation of this study is the unknown number of military dependents (child with a military parent) that are enrolled in the traditional public school systems located close to Fort Knox and Fort Campbell. As stated, this number is likely to be very low according to the School

Liaison Officers that were contacted during this study. This is primarily because of the large Department of Defense school system in the area. Also the possibility of omitted variable bias may be present and would occur in the event that a certain key variable has been wrongly left out of the model. Therefore presence of such a bias has the potential for the model to over or under estimate the effect of other factors within the model. Finally, it must be noted that the best data was found to be from 2001 to 2011, and thus is somewhat outdated when considering the changing pace of the education system, economy, and military missions.

Appendix A

Table 2

Indepednent Variables	Dependent Variables: Student Choice Model 1 College	Model 2 Workforce	Model 3 Military
Military County	-6.63*** (-7.80)	2.80*** -4.27	0.44** -3.27
School Index Score	0.49*** -13.02	-0.37*** (-12.86)	-0.03*** (-5.14)
Total Enrollment per School	0.0008 (-0.97)	0.002* -2.51	0.0003* -2.57
Attendance Level	0.62*** -11.92	0.21*** -5.15	0.03*** -7.41
Spending per Student	0.0001 (-1.78)	-0.00003 -0.67	0.0001 (-0.90)
Student/Teacher Ratio	-0.004 (-0.03)	-0.009 (-0.18)	-0.02 (-0.41)
Student/Computer Ratio	-0.03 (-0.54)	0.11* -2.02	0.02 -1.27
Total Number of Teachers With Masters Degree	0.09** -2.7	-0.05 (-1.96)	-0.01 (-1.62)
% Student Eligible for Free Lunch	-11.89*** (-5.78)	10.41*** -6.14	-0.52 (-1.53)
School Located in town	1.98 -1.53	0.05 -0.05	0.04 -0.17
School Located in Rural Area	-2.33 (-1.73)	2.44* -2.48	-0.04 (-0.16)
School Located in Suburban Area	0.18 -0.09	1.04 -1.07	-0.22 (-0.88)
% Asian Students	327.0*** -7.56	-201.9*** (-7.77)	-16.39** (-3.03)
% Hispanic Students	-51.65** (-3.04)	35.47** -3.04	1.52 -0.59
% Black Students	11.27*** -3.43	-9.04*** (-3.71)	0.51 -1.03
% of Other Students	-28.57 (-1.08)	-14.8 (-0.72)	10.55* -2.11
Constant	-38.39*** (-6.04)	31.43*** -6	2.96*** -3.7

* p<0.05 ** p<0.01 *** p<0.001

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