EPIC EDUCATION POLICY INITIATIVE *at* CAROLINA

The North Carolina Principal Fellows Program: A Comprehensive Evaluation

In this policy brief, we report on our comprehensive evaluation of the North Carolina Principal Fellows program. We find that: (1) Principal Fellows have higher principal licensure exam scores and are much more likely to enter school leadership positions—assistant principals and principals—than other UNC MSA graduates; (2) nearly 90 percent of Principal Fellows fulfill their scholarship loan requirement; and (3) Principal Fellows are at least as effective as other UNC MSA graduates and all other principals, with more positive impacts on student absences, teacher retention, and school working conditions. Overall, the evidence suggests that:

1. *Principal Fellows are an academically-competitive, reliable, and stable source of school leaders for North Carolina.*
2. *North Carolina needs more evidence about the quality of principal recruitment and preparation programs and what recruitment and preparation practices are most effective.*

Introduction

Research evidence indicates that school principals have significant effects on educational outcomes of interest—student achievement, absences, and graduation rates; teacher retention and on-the-job learning; and school working conditions. Given these findings, states and school districts face strong incentives to improve the quality of their principal workforce through policies that recruit highly-competitive individuals into the principal pipeline and training practices that prepare principal candidates to be effective school leaders. Policymakers and practitioners need evidence about the effectiveness of principal recruitment and preparation programs, and yet, currently, only a few studies have rigorously analyzed the relationship between such programs and principal performance. Therefore, in this policy brief, we report findings from a comprehensive evaluation of the North Carolina Principal Fellows program. The evaluation examined the characteristics of Principal Fellows and the schools they lead, the impact of Principal Fellows on student, teacher, and school outcomes, and the persistence of Principal Fellows in school leadership positions.

Background

Created in 1993 by the North Carolina General Assembly, the goal of the North Carolina Principal Fellows program is to prepare outstanding candidates for school administrator positions—assistant principals and principals—in the state's schools. Principal Fellows receive a competitive, merit-based scholarship loan to attend one of eleven participating UNC system institutions and earn a Master's degree in School Administration (MSA). The

program offers one year of full-time academic study and a one-year internship in a public school in North Carolina. Throughout the program, Principal Fellows participate in additional enrichment activities designed to better prepare them for school leadership positions. After completion of the MSA, Principal Fellows promise to seek and obtain employment as an assistant principal or principal in a public school or a United States government school in North Carolina for four years (within a six year period) or repay their scholarship loan with interest.

In this evaluation we assess the characteristics of Principal Fellows and the schools that they lead, the impact of Principal Fellows on student, teacher, and school outcomes, the percentage of Principal Fellows fulfilling their four-year service requirement, and the persistence of Principal Fellows in school leadership positions. To address these topics we use data provided by the North Carolina Department of Public Instruction and the UNC General Administration to link students to teachers and schools, principals to their type of preparation, and principals to the schools that they lead. For our descriptive and empirical analyses the study sample consists of the most comprehensive set of available data—full-time principals[1] in the 2005-06 through 2011-12 school years—and we compare the outcomes for Principal Fellows with those of other UNC MSA (non-Principal Fellow) graduates and principals with *all other* types of preparation.[2] Please see the sections below for further details on our research methods and study sample.

What are the characteristics of Principal Fellows and the schools that they lead?

In Table 1 we compare the individual characteristics of Principal Fellow graduates from 1996 through 2012 to all other UNC MSA graduates from the same period. Overall, there are several noteworthy differences between the groups. First, a higher percentage of Principal Fellows are female, while conversely, a lower percentage are members of a minority racial or ethnic group. Second, Principal Fellows score substantially higher on their principal licensure exams—by more than one-quarter of a standard deviation—than other UNC MSA graduates. Third, Principal Fellows are on a slightly "faster track" than other UNC MSA graduates: Principal Fellows teach for fewer years in North Carolina public schools, complete their MSA at an earlier age, and become principals at an earlier age. Finally, a much higher percentage of Principal Fellows assume school leadership positions in the state's public schools—96 percent of Principal Fellows, versus 61 percent of other UNC MSA graduates, have been or currently are an assistant principal; likewise, 46 percent of Principal Fellows, versus 27 percent of other UNC MSA graduates, have been or currently are a principal.[3]

To complement these individual characteristics, Table 2 presents characteristics of the schools led by Principal Fellows, other UNC MSA graduates, and all other principals during the 2005-06 through 2011-12 school years. These results show that, on average, Principal Fellows lead schools with (1) fewer minority students and fewer students receiving subsidized meals (especially in comparison to other UNC MSA graduates); (2) more students passing their End-of-Grade or End-of-Course exams; and (3) lower per-pupil expenditures.[4] Additionally, Principal Fellows are more likely to lead an elementary school and less likely to lead a high school than other UNC MSA graduates and all other principals.

[1]To define a full-time principal at a school we specified the following rules: (1) an individual had to begin work as a principal at a school in one of the fiscal year's first three pay periods (July, August, or September) and (2) an individual had to remain as a full-time principal at that school for at least eight pay periods (months).

[2]This includes those earning a MSA at North Carolina private and independent colleges and universities, those earning principal preparation degrees at North Carolina institutions of higher education prior to the establishment of MSA programs, and those earning principal preparation degrees out-of-state.

[3]In their first year post-MSA graduation 11.18, 85.33, and 3.49 percent of Principals Fellows worked in teaching, assistant principal, and principal positions, respectively. By comparison, in their first year post-MSA graduation 35.04, 56.11, and 4.82 percent of all other UNC MSA graduates worked in teaching, assistant principal, and principal positions, respectively.

[4]These spending differences between groups are due to the fact that (1) in North Carolina, high-poverty and low-performing schools spend more, per-pupil and (2) Principal Fellows are less likely to work in high schools, where per-pupil expenditures are the highest.

Table 1: Individual Characteristics

Characteristics	Principal Fellows	Other UNC MSA
Total Number of Graduates (1996-2012)	1228	4530
Percentage Female	71.12	64.62
Percentage Minority	26.01	31.99
Age at Completion of MSA	36.07	38.17
Principal Licensure Exam Scores (Std.)	0.313	0.043
Taught in NC Public Schools	1182	4106
Years Teaching in NC Public Schools Pre-MSA	6.58	8.98
Assistant Principals in NC Public Schools	1182	2770
Principals in NC Public Schools	565	1215
Age at First Principalship	38.45	40.58
Years Between MSA Completion and First Principalship	3.24	2.77

NOTE: *This table displays descriptive characteristics for Principal Fellows and all other UNC MSA graduates from 1996 through 2012.*

Estimating Principal Effectiveness

Estimating the impact of principals on academic outcomes of interest is challenging for three main reasons. First, for some outcomes, such as student achievement, principals' effects are indirect. For example, instead of directly teaching students, principals impact student learning by hiring, assigning, and retaining teachers, overseeing instruction, and establishing the school's working environment. Second, principals' effects may not be immediate, but rather, may take time to develop as they shape their teaching staff, promote a school vision and culture, and build relationships. Finally, principal quality is not randomly distributed across schools; instead, certain types of schools may attract principals who are more effective or better-credentialed.

To help address these concerns, we estimate the impact of principals on academic outcomes of interest with two types of models. Model one generates an estimate of school effectiveness for each principal-school combination.

Table 2: School Characteristics

School Characteristics	Principal Fellows	Other UNC MSA	All Other
Subsidized School Lunch Percentage	54.54	59.37	55.88
Minority Student Percentage	46.17	49.31	46.42
Performance Composite	72.64	70.36	70.97
Total Per-Pupil Expenditures	$8779.72	$9623.94	$9433.55
Novice Teacher Percentage	21.76	20.96	21.36
NBC Teacher Percentage	12.14	11.41	11.63
Advanced Degree Percentage	28.51	26.95	29.08
School Level			
Elementary School	66.51	56.68	57.09
Middle School	19.00	19.42	17.10
High School	13.77	22.48	23.57
K-12 School	0.72	1.42	2.24
Unique Principal Count	520	1175	2565
Principal-by-Year Count	2368	4727	9903

NOTE: *This table displays principal-by-year characteristics for principals in North Carolina public schools during the 2005-06 through 2011-12 school years.*

Table 3: Principal Effects on Student Achievement

	Principal-School Effectiveness Models				
	Elementary Grades Math	**Elementary Grades Reading**	**Middle Grades Math**	**Middle Grades Reading**	**High School EOC**
Principal Fellows	0.002	-0.018	0.020	0.013	0.045
Other UNC MSA	**-0.025****	**-0.046****	**-0.012***	**-0.016****	0.039
All Other	0.012	**0.029****	0.002	0.006	**-0.026****
	Within School Effectiveness Models				
Principal Fellows	-0.008	-0.027	-0.009	0.001	-0.004
Other UNC MSA	-0.013	-0.037	-0.016	-0.006	**0.050****
All Other	**0.009****	**0.026****	**0.011***	0.003	-0.020

NOTE: *The top panel of this table presents estimates for the average effect of principals on student achievement from principal-school effectiveness models; the bottom panel of this table presents estimates for the average effect of principals on student achievement from within school effectiveness models. +, *, and ** indicate a statistically significant mean difference between Principal Fellows and UNC MSA/All Other principals at the 0.10, 0.05, and 0.01 levels.*

A benefit of this principal-school effectiveness model is that effectiveness comparisons are made across all of the principals in the analysis. The key concern, however, is that the model attributes the entire school effectiveness estimate to the principal, which may incorrectly debit or credit the principal with results that are outside of her control (e.g. the performance of teachers hired prior to a principal's tenure). In response, model two generates a within-school estimate of effectiveness. This within school effectiveness model requires principal transitions—that two or more principals lead the school during the study period—and then compares the effectiveness of the school during the tenure of Principal 1 to the effectiveness of the school during the tenure of Principal 2. The main benefit of this approach is that it attempts to separate the effect of the principal from the effect of the school. The key concern with this model, however, is the generalizability of the results since effectiveness comparisons are limited to a small number of principals (those who have led the same schools) and schools without principal transitions do not contribute to effectiveness estimates. These limited comparisons may unfairly measure principal performance since a principal's effectiveness estimate is relative to the effectiveness of other principals who led the same school.

Below, we detail the impacts of Principal Fellows on student achievement, student absences, teacher retention, and school working conditions. The principal-school effectiveness estimates are centered—mean of zero—across all of the principals in the sample; the within-school effectiveness estimates are centered—mean of zero—within the principals who have led the same school.

Do Principal Fellows impact student academic outcomes?

To explore the impact of Principal Fellows on student academic outcomes, relative to other UNC MSA graduates and all other principals, we used the principal-school and within-school effectiveness models to estimate the effects of Principal Fellows on student standardized test scores and student absences.[5]

Table 3 shows the results of our effectiveness models for standardized test scores in elementary, middle, and high school. In the principal-school effectiveness models, Principal Fellows are associated with larger student achievement gains in elementary and middle grades mathematics and reading than other UNC MSA graduates and all other principals in high school; Principal Fellows are associated with smaller achievement gains in elementary grades reading than all other principals. The within-school effectiveness models show that Principal Fellows are associated with smaller achievement gains in elementary grades mathematics and reading and middle

[5]We estimated standardized test score models for End-of-Grade exams in elementary grades mathematics and reading and middle grades mathematics and reading and a combined model for five high school End-of-Course exams—algebra I, biology, English I, U.S. history, and civics.

grades mathematics than principals in the all other category and other UNC MSA graduates in high school. Overall, Principal Fellows tend to be positively associated with student test scores in comparison to other UNC MSA graduates and negatively associated with student test scores in comparison to all other principals. These results are not consistent across models, however, suggesting that the effects of Principal Fellows on student test scores may be highly dependent upon the estimation approach and sample.

Table 4 displays the effects of Principal Fellows on student absences from school. In the within school effectiveness model, Principal Fellows reduce the number of absences for elementary school students in comparison to principals in the all other category. Across models in middle schools, Principal Fellows are associated with fewer student absences than other UNC MSA graduates but more student absences than principals in the all other group. Finally, in the principal-school effectiveness model, Principal Fellows are associated with fewer student absences in high school than principals from both comparison groups.

Do Principal Fellows impact teacher and school outcomes?

To determine the extent to which Principal Fellows impact teacher retention and the school environment, relative to other UNC MSA graduates and all other principals, we measure the effect of principals on teachers returning to the same NC public school in the following year and two measures of school working conditions – vision and culture and instructional leadership—taken from the North Carolina Teacher Working Conditions survey.[6]

Table 5 shows the impact of Principal Fellows on teacher retention. The top panel of the table displays results from the principal-school effectiveness model and the bottom panel shows the results from a within-school effectiveness model. Results from the top panel suggest that Principal Fellows have more success at retaining teachers than principals in the all other category across all school levels but are less likely to retain teachers than other UNC MSA graduates in elementary schools. In the within school model, only the comparison between Principal Fellows and all other principals in elementary schools remains statistically significant.

Table 4: Principal Effects on Student Absences

	Principal-School Effectiveness Models		
	Elementary Schools	**Middle Schools**	**High Schools**
Principal Fellows	-0.075	0.405	-0.977
Other UNC MSA	-0.005	**0.780***	**-0.217***
All Other	0.010	**-0.548****	**0.190****
	Within School Effectiveness Models		
Principal Fellows	-0.039	0.077	0.009
Other UNC MSA	-0.061	**0.348***	-0.031
All Other	**0.041****	**-0.236****	0.044

NOTE: *The top panel of this table presents estimates for the average effect of principals on student absences from principal-school effectiveness models; the bottom panel of this table presents estimates for the average effect of principals on student absences from within school effectiveness models. +, *, and ** indicate a statistically significant mean difference between Principal Fellows and UNC MSA/All Other principals at the 0.10, 0.05, and 0.01 levels.*

Table 5: Principal Effects on Teacher Retention

	Principal-School Effectiveness Models		
	Elementary Schools	**Middle Schools**	**High Schools**
Principal Fellows	0.014	0.013	0.052
Other UNC MSA	**0.032***	0.024	0.045
All Other	**-0.021****	**-0.016****	**-0.031****
	Within School Effectiveness Models		
Principal Fellows	0.021	0.005	0.004
Other UNC MSA	0.029	0.003	0.021
All Other	**-0.021****	-0.003	-0.010

NOTE: *The top panel of this table presents estimates for the average effect of principals on teacher retention from principal-school effectiveness models; the bottom panel of this table presents estimates for the average effect of principals on teacher retention from within school effectiveness models. +, *, and ** indicate a statistically significant mean difference between Principal Fellows and UNC MSA/ All Other principals at the 0.10, 0.05, and 0.01 levels.*

[6]We used items from the 2005-06, 2007-08, 2009-10, and 2011-12 North Carolina Teacher Working Conditions surveys to create measures for vision and culture and instructional leadership.

Table 6 displays the effects of Principal Fellows on a measure of school vision and culture. Across both models, Principal Fellows lead schools with higher values for a vision and culture measure than principals in the all other group but lower values than other UNC MSA graduates in middle schools. Results in high school suggest that Principal Fellows may be more effective than the all other group and less effective than other UNC MSA graduates, but these results are not consistent across the two models. Finally, Table 7 displays the effects of Principal Fellows on the instructional leadership measure. In both sets of models, Principal Fellows serving in elementary and middle schools are more effective in instructional leadership than principals in the all other group. Across all school levels Principal Fellows and other UNC MSA graduates lead schools with comparable instructional leadership values.

Do Principal Fellows fulfill their service requirements and persist in school leadership?

As a condition of their scholarship loan, in the six year period post MSA graduation, Principal Fellows must work as a full-time school administrator—assistant principal or principal—for at least four years or repay the loan with interest. To determine the percentage of Principal Fellows fulfilling this service requirement, we tracked the employment status of the 1996 through 2006 Principal Fellows graduating cohorts over the six year period after their MSA graduation. In total, 87 percent of the 867 Principal Fellows in these graduating cohorts fulfilled their service requirement. When we expanded our analysis to include the 2007 and 2008 graduating cohorts and limited the post-graduation period to five or four years, 86 and 85 percent of eligible Principal Fellows, respectively, completed their service requirement in North Carolina.

Using data from the 2005-06 through 2011-12 school years, the top panel of Table 8 displays the percentage of principals who return to the principalship in North Carolina public schools in the following year, for all school levels combined and for elementary, middle, and high schools, separately. Overall, 88 percent of Principal Fellows, 89 percent of other UNC MSA graduates, and 82 percent of all other principals return to a principal position. These percentages are unadjusted values that do not account for any individual or school characteristics that may influence principal persistence. Therefore, we estimated models, controlling for individual and school characteristics, that predict the probability that principals return in the

Table 6: Principal Effects on School Working Conditions—Vision and Culture

	Principal-School Effectiveness Models		
	Elementary Schools	**Middle Schools**	**High Schools**
Principal Fellows	0.097	0.117	0.404
Other UNC MSA	0.175	**0.325+**	0.372
All Other	**-0.112****	**-0.208****	**-0.247****
	Within School Effectiveness Models		
Principal Fellows	0.239	0.069	0.008
Other UNC MSA	0.360	**0.313+**	**0.182+**
All Other	**-0.248****	**-0.192***	-0.083

NOTE: *The top panel of this table presents estimates for the average effect of principals on a measure of school vision and culture from principal-school effectiveness models; the bottom panel of this table presents estimates for the average effect of principals on a measure of school vision and culture from within school effectiveness models. +, *, and ** indicate a statistically significant mean difference between Principal Fellows and UNC MSA/All Other principals at the 0.10, 0.05, and 0.01 levels.*

Table 7: Principal Effects on School Working Conditions—Instructional Leadership

	Principal-School Effectiveness Models		
	Elementary Schools	**Middle Schools**	**High Schools**
Principal Fellows	0.075	0.188	0.111
Other UNC MSA	0.177	0.320	0.022
All Other	**-0.113****	**-0.223****	-0.028
	Within School Effectiveness Models		
Principal Fellows	0.305	0.138	-0.095
Other UNC MSA	0.468	0.197	-0.185
All Other	**-0.321****	**-0.140****	0.096

NOTE: *The top panel of this table presents estimates for the average effect of principals on a measure of school instructional leadership from principal-school effectiveness models; the bottom panel of this table presents estimates for the average effect of principals on a measure of school instructional leadership from within school effectiveness models. +, *, and ** indicate a statistically significant mean difference between Principal Fellows and UNC MSA/All Other principals at the 0.10, 0.05, and 0.01 levels.*

Table 8: Principal Persistence

	Percent of Principals Returning to NC Public Schools			
	All School Levels	Elementary Schools	Middle Schools	High Schools
Principal Fellows	88.00	87.66	90.45	80.50
Other UNC MSA	89.03	89.03	89.32	85.76
All Other	82.12	83.74	82.07	78.41
	Predicted Principal Persistence in Reference to Principal Fellows			
	All School Levels	**Elementary Schools**	**Middle Schools**	**High Schools**
Other UNC MSA	1.56	1.44	-1.03	**5.32+**
All Other	-0.01	0.65	**-4.44***	3.36

NOTE: *The top panel of this table presents the percentage of principals who return to a principal position in North Carolina public schools in the following school year. The bottom panel of this table presents predicted probabilities for returning to a principal position, in reference to Principal Fellows. + and * indicate a statistically significant difference between Principal Fellows and UNC MSA/All Other principals at the 0.10 and 0.05 levels.*

following year. The bottom panel of Table 8 shows that Principal Fellows in middle schools are significantly more likely to return, by 4.44 percentage points, than middle school principals in the all other category. Conversely, Principal Fellows in high school are significantly less likely to return, by 5.32 percentage points, than high school principals in the other UNC MSA graduates category.

Discussion

In this policy brief we examined the individual and workplace characteristics of Principal Fellows, the impact of Principal Fellows on student, teacher, and school outcomes, and the persistence of Principal Fellows in school leadership positions. We found that Principal Fellows have higher principal licensure exam scores than other UNC MSA graduates and are much more likely to serve in school leadership positions—assistant principal and principal—than other UNC MSA graduates. Furthermore, nearly 90 percent of Principal Fellows fulfill their scholarship loan requirement with four years of service as a school administrator in North Carolina public schools. Taken together, this indicates that Principal Fellows are an academically-competitive, reliable, and stable source of school leaders for North Carolina.

Estimating principal effectiveness is methodologically challenging because principal effects are often indirect, take time to develop, and are difficult to separate from the effect of the school. We used two models to address these challenges and acknowledge that each approach has concerns—the principal-school effectiveness estimates may incorrectly debit or credit the principal with results outside of her control and the within-school effectiveness estimates may unfairly measure principal performance due to the limited comparison sample. However, by combining the two methods, we are able to take advantage of complementary strengths and weaknesses. Overall, results suggest that Principal Fellows are at least as effective as other UNC MSA graduates and all other principals. Specifically, evidence returns mixed impacts on student achievement but more positive effects when comparing (1) Principal Fellows and other UNC MSA graduates on student absences and (2) Principal Fellows and all other principals on teacher retention and two measures of school working conditions—vision and culture and instructional leadership.

Moving forward, North Carolina needs more evidence about the effectiveness of principal recruitment and preparation programs. Such research should examine the characteristics and performance of New Leaders for New Schools, Regional Leadership Academies, MSA graduates from NC private colleges and universities, and add-on principal licensures. More broadly, North Carolina needs further evidence about what principal recruitment and training practices work so that school leadership programs can be strengthened through evidence-based reform and produce higher quality school leaders for North Carolina.

For more research on this topic

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Corcoran, S., Schwartz, A.E., & Weinstein, M. (2012). Training Your Own: The Impact of New York City's Aspiring Principals Program on Student Achievement. *Educational Evaluation and Policy Analysis,* 34, 232-253.

Grissom, J., Kalogrides, D., & Loeb, S. (2015). Using Student Test Scores to Measure Principal Performance. *Educational Evaluation and Policy Analysis,* 37, 3-28.

Study Authors: Kevin C. Bastian | Sarah C. Fuller

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