The Declining Academic Quality of School Principals and Why it May Matter: Evidence from Missouri and Wisconsin

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Abstract

In this article, we explore the changing distribution of academic backgrounds of school principals in the states of Wisconsin and Missouri, using data on all principals, matched to their employing schools, in the states of Wisconsin (1997 to 2007) and Missouri (1999 to 2006). In Wisconsin, we do not find an overall decline in the academic quality of principals, but we do see classic disparities in the distribution of principals (academically weaker principals in higher poverty, higher minority schools). In Wisconsin, we do not see a strong adverse effect on teaching quality as measured by the hiring of teachers by academically weak Wisconsin principals. In contrast, our Missouri data suggest sharp declines in the academic quality of principals and the teacher pool from which principals are drawn. We also see that principals tend to be academically weaker than the teacher pool from which they are drawn in Missouri. We also find a relatively strong association between the academic backgrounds of principals and the academic backgrounds of teachers hired into schools after the principal.

Introduction

In this article, we explore the changing distribution of academic backgrounds of school principals in the states of Wisconsin and Missouri over roughly a decade. Further, we examine the implications of the changing academic distribution of principals by investigating the qualifications of teachers hired by practicing principals in the two states.

School level leadership plays a role in the school culture, the teachers' perception of their work environment, the quality of the teaching staff, and student outcomes. With the significance of these roles, research on principals, who they are and where they come from has gained increased attention in recent years. While greater attention has been paid to teacher labor markets and teaching quality than to principal labor markets and principal quality, the two are highly interconnected in part because most principals rise from the ranks of teachers but also because principals may influence teacher sorting across schools, teacher hiring and retention. Because there are many fewer principals than teachers involved in public education systems and because principals may exert influence over teacher labor markets, principals are a potentially critical leverage point for influencing school improvement through state education policies.

A growing body of empirical evidence validates that principals may substantively influence schools, teachers, and student achievement (Hallinger & Heck, 1998; Heck & Hallinger, 1999; Leithwood, Louis, Anderson & Wahlstrom, 2004; Leithwood & Jantzi, 2005; Waters, 2003). Specifically, research has found that principals indirectly influence student achievement through several key "avenues of influence:" people, purposes and goals of the school, structure of the school and social networks, and organizational culture (Hallinger & Heck, 1998, p.171). Additionally, principals play a leading role in

designing and supporting school social contexts that support professional learning (Printy, 2008), which has been associated with increasing teacher retention (Ingersoll, 1999).

With respect to the influence that principals have on the people working in their schools, studies indicate that effective schools leaders hire and retain high quality teachers not only by influencing retention but also by influencing hiring (Bateille, Kalogrides, Loeb, 2009; Baker and Cooper, 2005: Brewer, 1993). Brewer (1993) measured the percentage of teachers hired by a particular principal with either high or low standards, finding that student outcomes were better in schools where larger shares of teachers were hired by principals with high standards. Bateille, Kalogrides and Loeb (2009) in a recent study using data on principals in Miami-Dade school district found that "evidence suggests high value-added principals are associated with higher turnover among less effective teachers and lower turnover among more effective teachers. Moreover, high value-added principals are not only able to retain effective teachers but are also able to recruit them from other schools." (p. iv)

Baker and Cooper (2005) used national data from the Schools and Staffing Survey to explore the link between principals' background education and that of the teachers they hired. Using the selectivity of one's undergraduate institution as a proxy both for ability and for principal and teacher quality, they found that principals who attended more selective colleges were more likely to attract and hire teachers with similar backgrounds--even in high poverty schools. Taken together, the findings of Baker and Cooper (2005) and Brewer (1993) suggest that not only is a principals' educational background and ability important in their selection of teachers but that the quality of a leader, as indicated

by his or her undergraduate institution, may be a key indicator of the quality of the team of teachers that she or he hires and develops.[1]

Applying the same logic, a leader's graduate education may play a role in signaling the quality of an educational leaders and his or her ability to build and retain a high quality teaching team. Although the literature focused on quality preparation is in its infancy, the growing number of studies are building a case that 1) certain program attributes are associated with quality preparation (Darling-Hammond, et.al., 2007; Young, 2008; Young & Grogan, 2008; Young, Fuller, Brewer, Carpenter, & Mansfield, 2007), 2) different types of graduate institutions have more or less institutional capacity to prepare leaders effectively (Baker, Orr & Young, 2007), and 3) different types of graduate institutions yield different rates of principal career advancement, suggesting differences in principal effectiveness (Fuller, Young & Orr, 2007; Orr & Pounder, in press). Although limited research exists on the relationship between preparation and effective leadership practices (Leithwood, Jantzi, Coffin, & Wilson, 1996), a principal's preparation institution could potentially serve as an indictor of principal quality.

We argue that recent trends in production signal a decline in the qualifications of principals that can potentially have negative consequences on the qualifications of teachers and ultimately on student achievement. Moreover, we argue that, as when teacher quality declines, the effects of decline in principal quality are not distributed

[1] Batielle, Kalogrides and Loeb (2009) find principal experience to be an important determinant of productive teacher recruitment and retention behaviors, but the authors do not include information on academic preparation other than degree level. Clark, Martorell and Rockoff (2009) provide confirmatory evidence regarding the importance of experience in a study of New York City principals, and cast some doubt on the importance of academic credentials such as college selectivity, but the authors measure selectivity narrowly by median SAT scores of enrolled undergraduates in the undergraduate and graduate institutions attended by the principals in their sample.

equally across schools. Rather, struggling schools are more likely to feel the effects of the decline.

Review of the Literature

This work builds on earlier work by Baker, Young and Orr (2007) that explored the academic production pipeline in terms of graduate degrees produced by higher education institutions in the field of educational administration and the work of Baker and Cooper (2005) in examining the match between principal qualifications and the qualifications of teachers hired by the principal.

Academic Pipeline of Principals by Type of Institution

Baker, Orr and Young (2007) focused on the overall growth in the production of masters' degrees in educational administration (a common minimum credential for building level leadership) and found some dramatic shifts in just a ten-year time period. Specifically, they found:

> "The largest number and greatest increase were among master's degrees. In 2003, there were 15,720 master's degrees conferred in educational leadership, a 90 percent increase since 1993.'

More pertinent to this article, Baker, Orr and Young (2007) also raised concerns regarding the distribution of that growth across higher education institutional types:

> "Even more striking are the increases in master's degree granting programs at Comprehensive II and Liberal Arts II institutions. Such program increases reflect

a dramatic growth in the availability of programs in local and regional institutions."

And further, that:

> "The percentage of all master's degrees produced by higher status institutions, the Research I through Doctoral II institutions dropped from 42 percent in 1993 to 36 percent in 2003."[2]

That is, master's degree production in particular has mushroomed over the past decade-and-a-half and many of the new masters degrees produced are from institutions that previously had minimal involvement in educational administration and are generally considered lower status institutions. At the very least, Baker, Young and Orr's findings suggest a diversification in the production of graduate degrees in educational administration. More cynically, Baker, Young and Orr's findings suggest a decline in the average academic quality of graduate degrees and degree recipients in educational administration. Baker, Young and Orr (2007), however did not evaluate the extent to which this expanded production of graduate degrees influenced the profession in terms of the qualifications of existing principals, the distribution of principals from more elite programs, or the effect on teacher qualifications of these shifts.

Relationship Between Principal Pipeline and Teacher Qualifications

[2] Note, however, that we are suspicious of what appears to be systematic underreporting of doctoral production in educational administration among Research I institutions in a particular. This pattern exists across all years, but increases somewhat in more recent years of IPEDS data (2000-2003). Appendix B provides a comparison of doctoral production as reported by doctoral recipients, by Carnegie classification, and doctoral production as reported by institutions in 1990 and 2000. From the IPEDS data, it would appear that the share of doctoral degrees granted in Research I institutions was cut nearly in half from 1993 to 2003. From 1990 to 2000, the Survey of Earned Doctorates (recipient reported values), also indicates a dramatic decline, from 46 percent to 31 percent of doctorates earned.

On the one hand, these production shifts may be inconsequential if a) the diversification of options for pursuing graduate study in educational administration does not necessarily mean a decline in average academic quality of degree recipients or b) if degrees and degree recipients are of lower quality, but the distribution of practicing school leaders with degrees from research and doctoral institutions remains unchanged. In other words, if the increase in the production of masters degree graduates from lower quality institutions does not impact the proportion and distribution of principals from research and doctoral institutions, then the increase in production has no impact on the field. Fuller, Orr and Young (2008) find with Texas data that principals prepared in weaker graduate programs were, in fact, less likely to achieve leadership roles. Regarding doctoral programs in educational administration, Baker, Wolf-Wendel and Twombly (2007) do find substantive differences in the academic quality of degree recipients by graduate program status and of faculty by graduate program status. Baker, Wolf-Wendel & Twombly show that undergraduate preparation of doctoral recipients from regional colleges tends, on average, to be significantly weaker, academically than undergraduate preparation of doctoral recipients at research universities.

These shifts in the academic preparation of school leaders might also be inconsequential if, in the end, they have no bearing on the quality of schooling delivered to children. But, these shifts in academic preparation may pose equity and/or adequacy concerns.

On the one hand, if overall academic quality of principals is declining and that decline leads to or is at least associated with declining quality of the teaching workforce, overall school quality may suffer. More likely, however, is the possibility that the highest

need schools will have an increased likelihood of employing academically weak principals who, in turn, weaken the teacher workforce in those schools. Using national data, Baker and Cooper (2005) showed the relationship between undergraduate backgrounds of principals and teachers hired into their schools, concluding:

> "Principals in high-poverty schools who attended highly or the most selective undergraduate institutions were 3.3 times more likely to hire teachers who attended similar institutions." p. 449

That is, academically strong principals, when placed in high poverty settings, can improve the academic quality of teachers in their schools. As such, it stands to reason that if increased numbers of academically weak principals flood the labor market and land positions in high need, high poverty schools, these principals may cause an overall decline in the academic quality of teachers in these schools, thus exacerbating existing inequities between high- and low-poverty schools.

Teacher Qualifications and Student Achievement

This too would be inconsequential were it not for strong and consistent evidence from a multitude of studies that the academic caliber of the teacher workforce is highly relevant to student success. While many sources highlight this issue (see for example, Baker & Cooper, 2005; Baker & Dickerson, 2006), Loeb and colleagues provide a particularly striking in the work in New York City. Indeed, they report that: :

> " . . . almost half of the teachers in the most effective quintile (based on student outcomes) graduated from a college ranked competitive or higher by Barron's, compared to only ten percent of the teachers in the least effective quintile."(p. 23)

The question at hand, then, is whether and to what extent do the shifts in degree production identified by Baker, Young and Orr (2007) translate to shifts in the academic preparation of building principals, the distribution of those principals, and changes in the academic make-up of the teacher workforce in relation to principals. This study explores longitudinal panels of principal and teacher level data for all teachers and principals in Missouri and Wisconsin from the late 1990s through 2006.

Purpose

The purpose of this article is three-fold:

1. Document the changing academic preparation of elementary and secondary school principals in practice in Missouri and Wisconsin;

2. Document the relationship between preparation pipelines for principals and the distribution of principals across schools; and,

3. Evaluate the connection between principals' academic preparation and the academic preparation of teachers hired into their schools after their arrival.

Data and Methods

For this study, we use data on all principals, matched to their employing schools, in the states of Wisconsin (1997 to 2007) and Missouri (1999 to 2006). Further, we link those principals to all teachers in their respective schools for each year. These data are from the respective state departments of education and both states maintain personnel data systems with unique identifiers for personnel, linked to schools, and with identification of institutions where undergraduate and graduate degrees were obtained.

Then, for each teacher and each principal, we linked undergraduate and graduate institutions to data on those institutions, including their 1994 Carnegie Classification[3] and, for undergraduate institutions, their Competitiveness rating from *Barron's Guide to the Most Competitive Colleges.* While the competitiveness rating is a crude measure, it

[3] The 1994 Carnegie Classification system categorizes institutions of higher education according to number and type of degrees awarded and externally funded research. The classification system's hierarchical method for categorizing the "comprehensiveness" and research emphasis of postsecondary institutions reflects differences in institutional program diversity and resources. Although comprehensiveness and research capacity is not a pure measure of quality, it is an indication of what an organization is potentially capable of achieving, particularly with regard to doctoral preparation. These include the following eight categories (Glassick, Huber, & Maeroff, 1997):

- Research I institutions offer a full range of baccalaureate programs, award 50 or more doctoral degrees each year, and receive $40 million or more in federal support annually. In 1994, there were 88 Research I institutions, which included major state flagship universities and large private universities such as Harvard or Stanford Universities.
- Research II Universities are like Research I institutions but receive between $15.5 million and $40 million in federal support annually. In 1994, there were about 40 Research II Universities, which included flagship universities in smaller states (Vermont, Wyoming, Idaho), other non-flagship state universities (Kansas State, South Florida), and some midsized to large private universities such as Lehigh or Syracuse.
- Doctoral I institutions offer a full range of baccalaureate programs and award at least 40 doctoral degrees annually in five or more disciplines (Glassick, Huber & Maeroff, 1997). In 1994, there were about 50 Doctoral I institutions, including some regional public universities (Univ. of Missouri at Kansas City, Georgia State University), as well as medium sized to large private colleges (Drexel, Fordham, Marquette).
- Doctoral II institutions award at least 10 doctoral degrees in three or more disciplines or 20 or more doctoral degrees in one or more disciplines. A typical example is Wright State University. In 1994, there were about 50 Doctoral II institutions, which represented an eclectic mix of regional public colleges and universities and private colleges with a handful of specialized graduate programs (Law, Medicine).
- Comprehensive I institutions offer a full range of baccalaureate programs and award 40 or more master's degrees annually in three or more disciplines. In 1994, there were over 400 Comprehensive I colleges which included large numbers of regional public universities, many of which had been founded as state teachers' colleges, or normal schools such as Montclair State in New Jersey or Emporia State in Kansas.
- Comprehensive II institutions award 20 or more master's degrees annually in one or more disciplines. In 1994, there were under 100 Comprehensive II institutions, which included small regional public colleges (such as Castleton State in Vermont), and small to midsized private colleges.
- Liberal Arts Colleges I tend to be highly selective, predominantly private institutions serving primarily undergraduate populations. They award more than half of their baccalaureate degrees in arts and science fields. In 1994, there were approximately 160 Liberal Arts I Colleges. Examples include Williams College (MA) and Swarthmore College (PA).
- Liberal Arts Colleges II tend to be less selective, predominantly private institutions also serving primarily undergraduate populations. They award more than half of their baccalaureate degrees in arts and science fields. In 1994, there were approximately 400 Liberal Arts II Colleges, including small private and some small regional public colleges.

has been used in numerous previous studies and been linked repeatedly to student outcomes.[4]

To address the first question above, we tracked the changes in the undergraduate and graduate backgrounds of practicing principals in each state. To address the second question, we linked school characteristics to each principal and used those characteristics to determine whether academically weaker principals were more or less likely to obtain positions in certain types of schools. To address the final question, we followed the approach of Baker and Cooper (2005) and estimated models of the relationship between principals' undergraduate and graduate backgrounds and the undergraduate backgrounds of teachers hired into their schools under their watch.

Previous work by Punswick, Baker and Belt (2009) has evaluated the career paths of principals using the same Missouri panel data, and Belt (2009) explored the principal labor markets in Missouri and Wisconsin major metropolitan areas. Among other findings, these earlier studies used the same data to reveal some disparities in the position stability of principals in higher poverty, higher minority schools and revealed relationships between principal salaries and their stability. But, these prior studies did not take the next steps of evaluating either the academic preparation of the principals or their potential influence on teacher hiring.

We begin with descriptive analysis of the graduate and undergraduate preparation of principals in Wisconsin and Missouri. We follow these descriptive analyses with

[4] Factors considered in determining the category for each college included: median entrance exam scores for the 2001-2002 freshman class (SAT or ACT), percentages of 2001-2002 freshman scoring in the top 15 percent of the SAT or ACT, percentage of 2001-2002 freshman that ranked in the upper fifth and upper two-fifths of their high school graduating classes, minimum class rank and grade point average required for admission (if any), and percentage of applicants to the 2001-2002 freshman class who were accepted. We assumed relative stability over time to the highest categories of selectivity.

logistic regression models of the distribution of principals by their academic preparation across different school types. That is, we use logistic regression to estimate the odds that an "academically weak" versus and " academically strong" principal works in a higher versus lower poverty school.

We conclude with a series of descriptive analyses of changes in the undergraduate preparation of teachers hired into the schools of academically strong and academically weak principals and a series of logistic regression models identifying the probabilities that teachers from stronger or weaker undergraduate institutions were hired into schools of academically strong versus academically weaker principals.

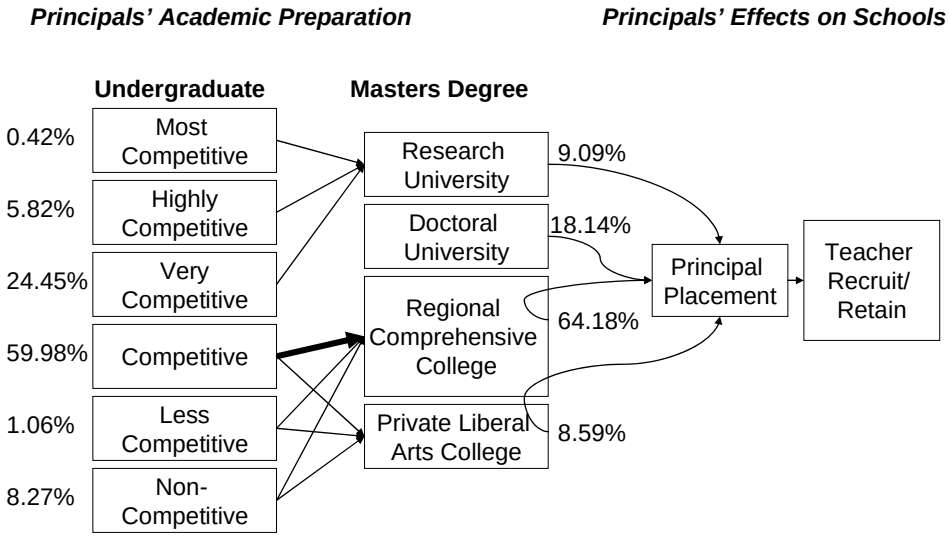
Structure and Distribution of the System

Figure 1 provides a model of the system being investigated in this article. Principals commonly come from the ranks of teachers. As such, their academic backgrounds, at least undergraduate preparation might be assumed similar to teacher's undergraduate preparation. We explore this point in greater detail for both states later in this article. On average, Missouri principals are most likely to have attended competitive or very competitive undergraduate colleges, but are also relatively likely to have attended the bottom category - non-competitive colleges, as measured by the Barron's ratings. Most of the large, regional teachers colleges in Missouri or Wisconsin tend to be competitive or less competitive colleges. And, principals who received their bachelors' degrees from one of these institutions seem generally more likely to receive their masters' degrees from similar if not the same institutions. This is the dominant pipeline – **Pipeline A (main)**. Nearly 2/3 of principals in Missouri in 2006 received their masters'

degrees from regional comprehensive colleges. Smaller shares received their masters' degrees from doctoral and research universities - where graduates were more likely to have undergraduate degrees from more competitive colleges – **Pipeline B (academically strong)**. A non-trivial share of practicing principals had masters' degrees from private liberal arts colleges and typically attended less competitive undergraduate colleges – **Pipeline C (academically weak)**.

Whether this pipeline differentiation matters, however, remains questionable. While we provide some preliminary insights in Figure 1 regarding the nature of the pipeline for academic preparation of principals, we provide no insights into where differently prepared principals end up working and/or whether they end up influencing the pool of teachers that subsequently work in their schools. But, these are the very reasons why the potentially declining academic quality of principals may be of great importance. What if, for example, increasing numbers of the least academically qualified principals are finding their way disproportionately into schools serving the highest need children? And what if these principals are then making poor decisions on teacher hiring - for example, as found by Baker and Cooper (2005), hiring larger shares of teachers with comparably weak academic backgrounds? If this is the case, then the declining academic quality of principals may contribute indirectly to declining quality of schools serving low income and minority children.

Figure 1
Structure of Preparation to Practice Pipeline with 2006 Missouri Distribution



See appendix A for complete distributions of undergraduate and graduate preparation of Missouri and Wisconsin principals, and undergraduate preparation of Missouri and Wisconsin teachers.

Evaluating the Pipeline in Missouri and Wisconsin

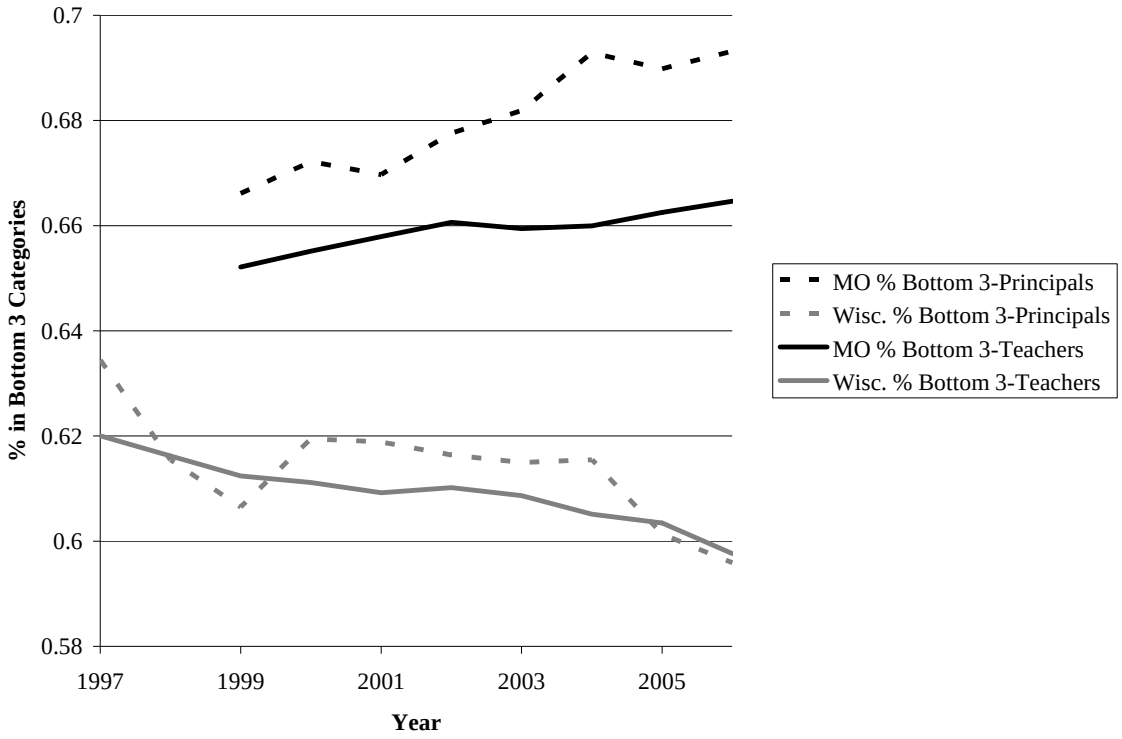
In this section, we describe the pipelines for school principals in Missouri and Wisconsin. We begin by comparing principals' undergraduate backgrounds to those of the teacher pool from which the principals generally arise. Next, we explore the changing distribution of graduate credentials obtained by principals during the relatively short window of time in our data panels.

Shifting Undergraduate Preparation among Principals

Figure 2 shows that, over time, trends in Missouri and Wisconsin differ. In Missouri, the shares of the general teacher and principal populations that attended less competitive undergraduate colleges has increased moderately over the time span. Interestingly, the share of principals who attended less competitive undergraduate colleges in Missouri was greater than the share of teachers who attended such institutions and the share of principals who attended less competitive undergraduate colleges appears to be growing faster than the share of teachers in Missouri who attended such colleges. In short, the selectivity of the institutions attended by principals was lower than that of teachers and the percentage of principals from less competitive institutions was growing faster than the percentage of teachers from less competitive institutions.

By contrast, in Wisconsin, the share of teachers and principals who attended less competitive undergraduate colleges was about the same in both the beginning and ending years. Thus, the percentage of both teachers and principals from less competitive institutions declined at about the same rate.

Figure 2
Competitiveness of Undergraduate Institutions attended by Practicing Principals in Missouri and Wisconsin (% Bottom 3 of 6 categories)



In sum, as the pool of teachers and principals in Missouri has become less competitive over time, the pool of teachers and principals in Wisconsin has become more competitive over time. While the changes do not appear to be dramatic, one must remember that there are 2,000 principals and 60,000 teachers in our Missouri data (matched records) and 700 principals and 38,000 teachers in our Wisconsin data (matched records with complete data), thus three or four percentage point changes over a relatively short time period suggest fairly dramatic swings in production and placement as we show in the next section.

Shifting Graduate Preparation

Table 1 documents the top ten most common graduate programs where practicing principals in Missouri received their Master's degrees in 1999 and 2006. In 1999, the list of institutions where Missouri's practicing principals received their Masters degrees was dominated by urban doctoral universities and regional colleges, with two smaller comprehensive colleges making the list. Only seven short years later, a small private liberal arts college in Fulton, Missouri (William Woods) with branches across the state had catapulted itself into the fourth place position among degrees held by practicing principals. Right behind William Woods was Lindenwood--another major newcomer and private comprehensive college.

Table 1
Top Producers of MA Degrees for Principals in Missouri (Practicing Principals)

	Institution	Research I	Doctoral I	Doctoral II	Comp. I	Comp. II	Liberal Arts II	Principals
1999								
	U of Mo St.L.	0	0	282	0	0	0	282
	Central Mo. State U.	0	0	0	266	0	0	266
	SW Missouri State U.	0	0	0	228	0	0	228
	SE Missouri State U.	0	0	0	210	0	0	210
	Truman State U.	0	0	0	174	0	0	174
	UMKC	0	168	0	0	0	0	168
	U. of Missouri Col.	163	0	0	0	0	0	163
	NW Missouri State U.	0	0	0	149	0	0	149
	Drury College	0	0	0	0	61	0	61
	Lincoln University	0	0	0	0	56	0	56
	Total (N)	163	168	282	1027	117	0	1757
	Total (%)	9.3%	9.6%	16.1%	58.5%	6.7%	0.0%	100.0%
2006								
	SW Missouri State U.	0	0	0	279	0	0	279
	Central Mo. State U.	0	0	0	254	0	0	254
	U of Mo St.L.	0	0	249	0	0	0	249
	William Woods College	0	0	0	0	0	205	205
	Lindenwood University	0	0	0	185	0	0	185
	UMKC	0	182	0	0	0	0	182
	SE Missouri State U.	0	0	0	181	0	0	181
	NW Missouri State U.	0	0	0	156	0	0	156
	U. of Missouri Col.	118	0	0	0	0	0	118
	Truman State U.	0	0	0	92	0	0	92
	Total (N)	118	182	249	1147	0	205	1901
	Total (%)	6.2%	9.6%	13.1%	60.3%	0.0%	10.8%	100.0%

Table 3 compares the undergraduate backgrounds of principals who attended a) Research Universities (primarily University of Missouri at Columbia), b) doctoral colleges (primarily the two urban public doctoral colleges), c) comprehensive colleges, and d) liberal arts II colleges (primarily William Woods). For those who received their MA from a research university, about 40% attended less competitive undergraduate colleges. That share rises to about 55% for masters' recipients from doctoral colleges. But, for regional comprehensive colleges, that share is about 75% in recent years and for those who received their masters from liberal arts colleges, about 80% attended undergraduate colleges in the bottom three categories of competitiveness. That is, there are substantial differences in the undergraduate backgrounds of principals who obtained their graduate degrees from research universities versus those who received their graduate degrees from liberal arts colleges. These findings are consistent with national findings for doctoral recipients by Baker, Wolf-Wendel and Twombly (2007).

Figure 3
Competitiveness of Undergraduate Colleges Attended by Missouri Principals by Graduate Institution Type

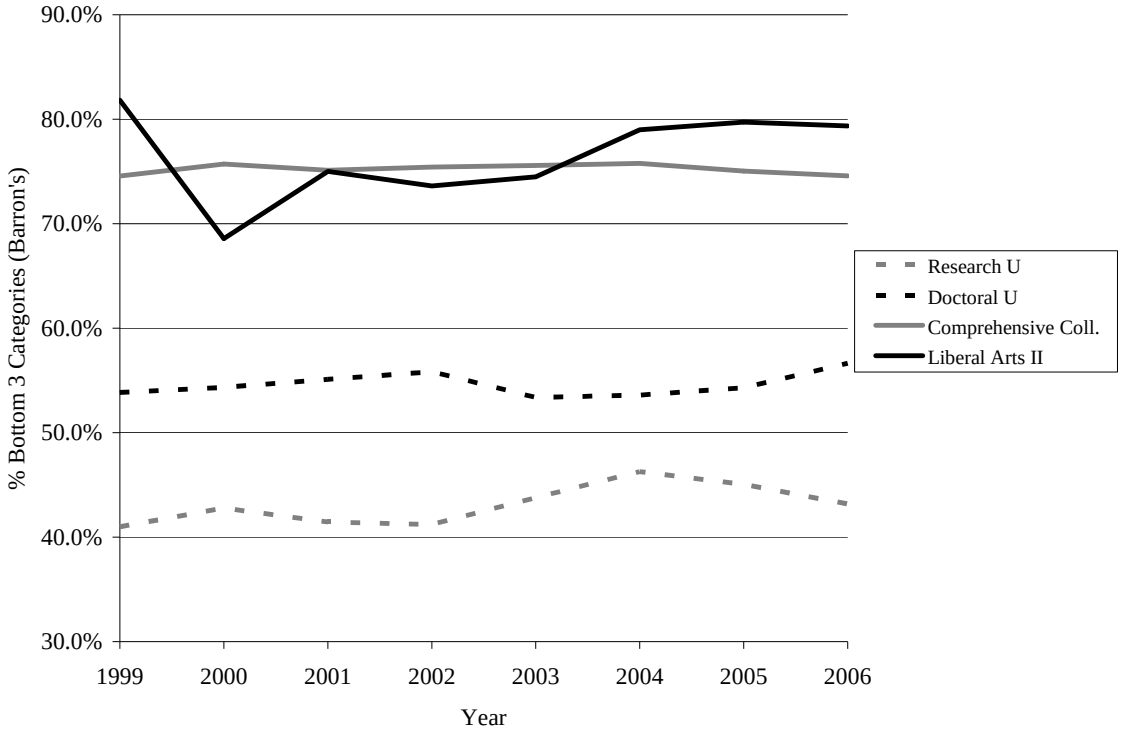


Table 2 shows the changes in major producers of graduate credentials for practicing principals in Wisconsin. The stratification of institutions by location is somewhat different for Wisconsin. Regional public colleges and universities play a similarly large role and are scattered around the corners of the state. A Research II University--University of Wisconsin at Milwaukee--plays a role similar to that of the urban doctoral colleges in Missouri (University of Missouri--St. Louis and University of Missouri—Kansas City). In 1999, a handful of practicing principals received their masters' degrees from Marian College of Fon-Du-Loc (now Marian University, but previously a 1994 Carnegie classified Liberal Arts II college). Also climbing in the ranks of masters producing institutions for Wisconsin principals is a northern Illinois institution – National Louis University.

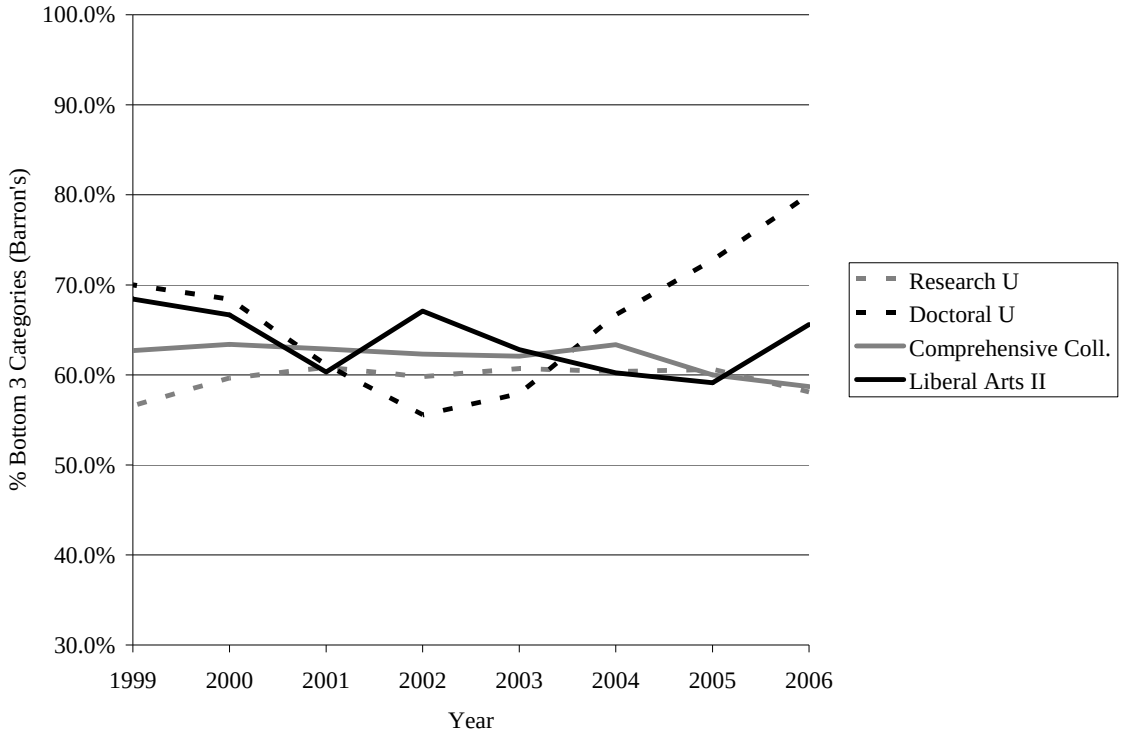
Table 2
Top producers of MA degrees for Principals in Wisconsin (Practicing Principals)

		Research			Liberal Arts		
	Institution	Research I	II	Doctoral I	Comp. I	II	Total
1999							
	University of Wiscons-Milw	0	276	0	0	0	276
	University of Wiscons-Mad	189	0	0	0	0	189
	University of Wiscons-Sup	0	0	0	108	0	108
	University of Wiscons-WW	0	0	0	66	0	66
	Winona State College	0	0	0	61	0	61
	Marian College	0	0	0	0	59	59
	University of Wiscons-OK	0	0	0	55	0	55
	Cardinal Stritch Univ	0	0	0	42	0	42
	Northern Illinois Uni	0	0	28	0	0	28
	University of Wiscons-Stout	0	0	0	24	0	24
	Total (N)	189	276	28	356	59	908
	Total (%)	20.8%	30.4%	3.1%	39.2%	6.5%	100.0%
2006							
	University of Wiscons-Milw	0	241	0	0	0	241
	University of Wiscons-Mad	166	0	0	0	0	166
	Marian College	0	0	0	0	143	143
	Cardinal Stritch Univ	0	0	0	81	0	81
	University of Wiscons-Sup	0	0	0	81	0	81
	Winona State College	0	0	0	60	0	60
	University of Wiscons-WW	0	0	0	54	0	54
	University of Wiscons-OK	0	0	0	40	0	40
	National-Louis Univer	0	0	0	34	0	34
	University of Wiscons-LaC	0	0	0	29	0	29
	Total (N)	166	241	0	379	143	929
	Total (%)	17.9%	25.9%	0.0%	40.8%	15.4%	100.0%

Figure 4 addresses the stratification of undergraduate backgrounds of principals who attended the various types of graduate programs. Figure 4 shows substantially less stratification among Wisconsin graduate programs than seen in Missouri. There exist a few explanations. First, Research Universities in Wisconsin include the state flagship in Madison and University of Wisconsin Milwaukee. Undergraduate competitiveness of masters' recipients in Madison is much greater than in Milwaukee, and when the two are averaged, they are comparable to regional comprehensive colleges. The most volatile pool of undergraduates appears to be those who received masters' degrees from doctoral colleges, a relatively small group in Wisconsin (who received MA degrees from Northern

Illinois). For all other institutional types, about 60% of masters' recipients received their undergraduate degrees from colleges in the bottom three categories of competitiveness.

Figure 4
Competitiveness of Undergraduate Colleges attended by Wisconsin Principals by Graduate Institution Type



Evaluating the Distribution of Principals by Academic Preparation

In this section, we evaluate the location of principals by school type, given their academic preparation. Specifically, we are interested in the types of schools that employ principals from Pipeline B – highly or most competitive undergraduate colleges and research university graduate training and Pipeline C – less or non-competitive undergraduate colleges and liberal arts college graduate training. Notably, these are relatively small groups of principals who fall at the extremes of the distributions (See appendix A). We use logistic regression models to estimate the likelihood that a schools' principal came through either of these pipelines. We include in our models binary

variables for each labor market across the state, such that we are comparing principals and school characteristics to others in their same labor market. We control for the local labor market because sorting operates on a local level.

Our model for both states is expressed:

$$\textbf{Principal (strong/weak)} = f(\textbf{Demographics}_s\textbf{, Level}_s\textbf{, Year, Labor Market})$$

Where the dependent variable, in separate models, is whether the principal is from pipeline B – academically strong, or from pipeline C – academically weak, compared to the sum of Pipeline A and the other omitted pipeline. School demographics include both the shares of children qualifying for free or reduced price lunch and the school racial composition. The model also includes a year indicator, which captures the extent to which the likelihood of having a strong or weak principal has changed over time. Finally, the models include the fixed effect for labor market, using the definition from the National Center for Education Statistics Education Comparable Wage Index.

Table 3 shows the logistic regression results for our Missouri models. The table shows that large schools are less likely to have principals from Pipeline C – academically weak principals but no more or less likely to have academically strong principals. In Missouri, higher poverty schools in any given labor market are actually more likely to have academically strong principals and less likely to have academically weak principals. Middle schools are less likely to have academically strong principals and high schools more likely to have academically strong principals.

The most disconcerting finding in Table 3 comes from the year fixed effect for each model. Base-lined against the first year in the panel, the year fixed effect indicates that , as compared to 1999, principals in 2006 were only 59% as likely to have come from

Pipeline B – the academically strong pipeline --and were 9.5 times more likely to come from Pipeline C—the academically weak pipeline-- than they had been seven years earlier. Thus, as compared to principals employed in 1999, principals employed in 2006 were less likely to have progressed through the academically strong pipeline and substantially more likely to have come from the academically weak pipeline.

Table 3
Logistic regression of the distribution of academically strong and academically weak principals in Missouri *(re-title)*

	Pipeline B Barron's Top 2 & RU 1 MA			**Pipeline C Barron's Bottom 3 & LA2 MA**		
	Odds Ratio	Std. Err.	P>z	Odds Ratio	Std. Err.	P>z
School Characteristics						
Enrollment	0.987	0.085		0.487	0.049	*
% Free or Reduced Lunch	1.375	0.119	*	0.730	0.094	*
% Black	1.061	0.035	**	0.957	0.031	
$% Hispanic	0.962	0.035		1.017	0.024	
Middle School	0.691	0.095	*	1.081	0.136	
High School	1.331	0.180	*	1.138	0.153	
Year						
Year = 2000	0.922	0.159		1.323	0.418	
Year = 2001	0.943	0.161		2.363	0.679	*
Year = 2002	0.902	0.156		2.978	0.827	*
Year = 2003	0.776	0.138		4.095	1.099	*
Year = 2004	0.726	0.132	**	5.656	1.486	*
Year = 2005	0.648	0.121	*	7.387	1.910	*
Year = 2006	0.590	0.113	*	9.530	2.429	*

Includes Labor Market fixed effect
**p<.05, **p<.10*

Table 4 shows the same logistic regression analysis, but applied to our Wisconsin principals. Notably, despite an apparent improvement to the overall academic quality of principals in our descriptive graph, Table 4 indicates a slight decline over time in the probability that a principal came through the academically strong pipeline and an increase in the likelihood that a principal came through the academically weak pipeline.

In Wisconsin, larger schools are more likely to have principals from the academically strong pipeline, but interestingly, high schools are more likely to have academically weak principals and less likely to have academically strong principals.

Middle schools on the other hand, were more likely to have academically strong principals. But, the Wisconsin data display the more classic inequities across high- and low-poverty schools. Specifically, higher poverty schools in particular are less likely to have academically strong principals although no more likely to have the academically weakest ones.

Table 4

Logistic regression of the distribution of academically strong and academically weak principals in Wisconsin

	Pipeline B Barron's Top 2 & RU 1 MA			**Pipeline C Barron's Bottom 3 & LA2 MA**		
	Odds Ratio	Std. Err.	P>z	Odds Ratio	Std. Err.	P>z
School Characteristics						
Enrollment	1.256	0.108	*	0.807	0.114	
% Free Lunch	0.771	0.051	*	0.999	0.099	
% Black	0.996	0.034		0.953	0.052	
% Hispanic	1.048	0.027	**	0.978	0.042	
Middle School	1.194	0.100	*	1.187	0.179	
High School	0.787	0.081	*	1.713	0.240	*
Year						
Year = 1998	1.070	0.153		1.108	0.342	
Year = 1999	1.140	0.160		1.152	0.348	
Year = 2000	1.103	0.156		1.295	0.382	
Year = 2001	1.042	0.148		1.701	0.476	**
Year = 2002	0.946	0.136		2.311	0.617	*
Year = 2003	0.939	0.136		2.290	0.616	*
Year = 2004	0.943	0.136		2.495	0.661	*
Year = 2005	0.934	0.135		2.628	0.695	*
Year = 2006	0.905	0.132		2.920	0.764	*

Includes Labor Market fixed effect
**p<.05, **p<.10*

Evaluating Potential Effects on Teacher Quality

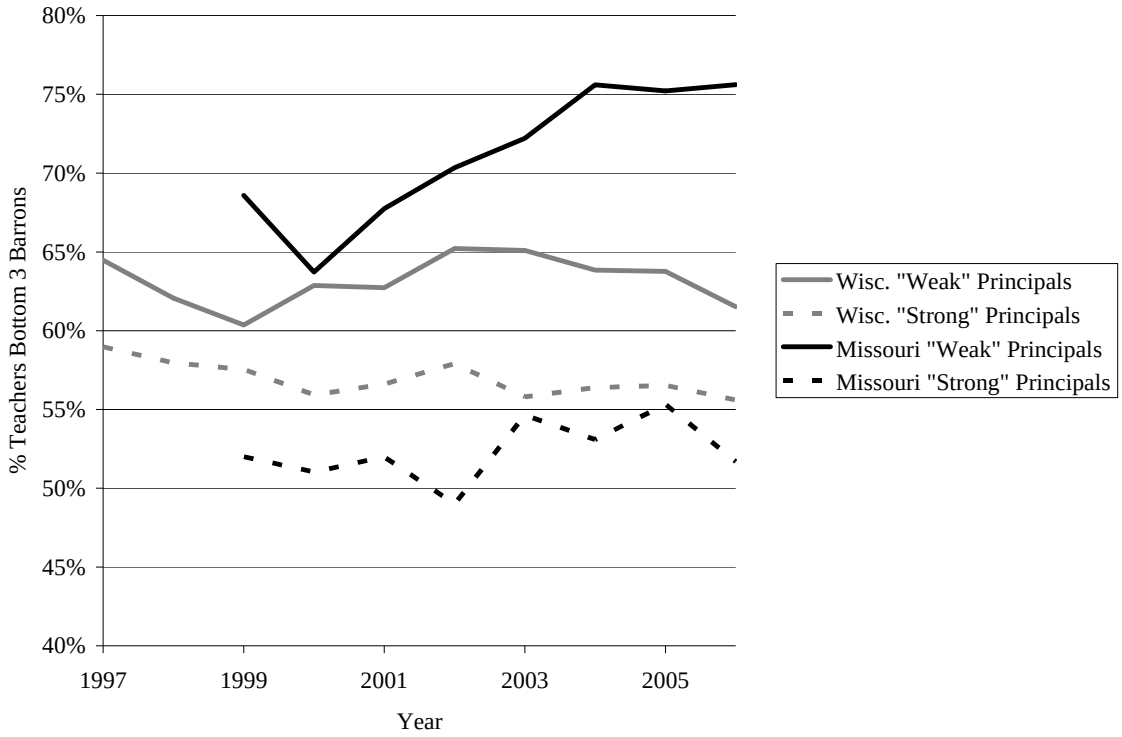
In this final section, we explore the connection between principal academic background and teacher academic background for teachers who arrived at a given school after the principal. In short, we are examining whether principals own academic backgrounds are associated with the academic quality of their own teacher workforce.

Figure 5 paints a particularly disconcerting picture for Missouri. Figure 5 displays the undergraduate competitiveness backgrounds of teachers hired under academically

strong versus academically weak principals in Missouri and in Wisconsin. In Missouri, about one-half of the teachers hired under academically strong principals attended colleges in the bottom three competitiveness categories. Recall that statewide in Missouri, about 66% (and climbing) of all teachers attended the bottom three categories of undergraduate colleges, so academically strong principals in Missouri schools are hiring a disproportionately lower percentage of teachers from academically weak institutions. By contrast, teachers in schools of academically weak principals in Missouri are increasingly academically weak themselves. In 2000, about 65% of teachers hired after the employment of an academically weak principal had attended undergraduate colleges in the bottom three categories of competitiveness. By 2004, that percentage had increased to 75%-- much greater than the statewide average and climbing.

The Wisconsin data reveal greater stability over time, but still show a differential between teachers hired after principals under academically strong versus academically weak principals. Teachers hired under academically strong principals were somewhat less likely to have attended undergraduate colleges in the bottom three categories of competitiveness.

Figure 5
Changes in Distribution of Teacher Backgrounds in Schools under Academically "Strong" and Academically "Weak" Principals



Strong = Barrons top 2 & MA from Research I (Pipeline B)
Weak = Barrons bottom 3 and MA from LA II (Pipeline C)

Next we estimate logistic regression models of the association between principals' academic backgrounds and the backgrounds of teachers hired into the principals' school after the principal. This is no guarantee, however, that the principal in question had substantial latitude over the hiring. Our models place a dichotomous indicator that a teacher attended a highly or most competitive college on the left hand side of the equation:

$$\textbf{Highly/Most Competitive}_t = f(\textbf{Pipeline}_p, \textbf{Demographics}_s, \textbf{Level}_s, \textbf{Year, Labor Market})$$

Where our dichotomous dependent variable is modeled as a function of alternative specifications of principals' academic preparation including a) undergraduate preparation

alone (as tested by Baker and Cooper, 2005), b) graduate preparation alone, or c) "strong" versus "weak" combinations of undergraduate and graduate preparation. Our model conditions the principal to teacher match on the year of the data, the labor market location of the school and level of the school (Wisconsin data) and the demographics of the student population.

Table 5 provides a logistic regression analysis linking the undergraduate backgrounds of principals and teachers (hired after the principal) for both Missouri and Wisconsin. The model includes a fixed effect indicator for each labor market in each state, although we do not include the results for these fixed effects in our table. Further, the model controls for school characteristics, so as to evaluate the relationship between principal's academic background and that of teachers, after controlling for the effect of school characteristics on the academic background of teachers new to schools. The dependent variable is whether the teacher attended a highly competitive or most competitive undergraduate college. In this case, our Wisconsin models include schools of all grade levels, but our Missouri models include only elementary schools and/or K-8 schools, but not secondary schools or separate middle schools.[5]

Table 5 shows that in both states, teachers who attended highly or most competitive colleges are less likely to work in higher poverty schools, with the differential in Wisconsin being much greater than in Missouri. Importantly, this effect is after controlling for the race/ethnicity of students in the school. In both states, schools with greater Black or Hispanic populations were more likely to have teachers with strong

[5] These data were constructed for earlier work by Belt (2009) which focused specifically on elementary principal labor markets in Kansas City, St. Louis and Milwaukee.

academic backgrounds after controlling for poverty and larger schools were more likely to have teachers with strong academic backgrounds.

When it comes to the connection between the academic backgrounds of principals and teachers, principals who attended non-competitive undergraduate colleges were statistically much less likely to have academically strong teachers hired into their schools and principals who attended highly competitive undergraduate colleges were statistically much more likely to have academically strong teachers hired into their schools, even after controlling for student poverty and race/ethnicity. In Wisconsin, the handful of principals who attended the most competitive undergraduate colleges did have fewer academically strong teachers, but this was a very limited pool of principals.

In addition, note that the year fixed effect results suggest that in some years, teachers with stronger academic backgrounds were less likely to be hired overall.

Table 5
Relationship between Principal's undergraduate college competitiveness and teachers' undergraduate competitiveness for teachers hired after principal

DV = Teacher from Highly/Most Competitive	Wisconsin			Missouri		
	Odds Ratio	*Std. Err.*	*P>z*	*Odds Ratio*	*Std. Err.*	*P>z*
Principal's Undergrad. Barrons' Rating						
Non-Competitive	0.588	0.040	*	0.831	0.042	*
Less Competitive	1.027	0.035		0.830	0.105	
Competitive	1.035	0.035		0.818	0.020	*
Very Competitive						
Highly Competitive	1.104	0.043	*	1.704	0.054	*
Most Competitive	0.386	0.121	*	1.175	0.146	
Year						
Year = 1998	0.956	0.051				
Year = 1999	0.976	0.051				
Year = 2000	0.937	0.049		0.932	0.038	**
Year = 2001	0.933	0.048		0.915	0.037	*
Year = 2002	0.904	0.046	*	0.891	0.036	*
Year = 2003	0.908	0.046	**	0.892	0.036	*
Year = 2004	0.892	0.045	*	0.910	0.037	*
Year = 2005	0.898	0.046	*	0.943	0.038	
Year = 2006	0.948	0.049		0.941	0.038	
School Characteristics						
% Subsidized Lunch	0.465	0.060	*	0.983	0.001	*
% Black	1.955	0.178	*	1.014	0.001	*
% Hispanic	2.216	0.252	*	1.022	0.003	*
Enrollment (ln)	1.126	0.034	*	1.089	0.020	*
School Level						
Primary						
Middle	0.977	0.030				
High	1.354	0.051	*			
Other	1.034	0.077				

For all teachers newer to district than principal, includes CBSA fixed effect
**p<.05, **p<.10*

Table 6 explores the link between principals' graduate preparation and teachers' undergraduate preparation – for teachers hired into the school after the principal. Table 6 shows that in both states (though only marginally significant in Wisconsin), principals who attended research universities for their Master's degrees were more likely than those from the dominant pipeline (comprehensive colleges) to have academically strong teachers hired under their watch, even after controlling for student poverty and race/ethnicity. In Wisconsin, the Liberal Arts II (primarily Marian College) effect is counterintuitive – showing a greater likelihood of having academically strong teachers being hired. In Missouri, teachers hired in schools led by principals with masters' degrees

from Liberal Arts II institutions were no more or less likely to have academically strong backgrounds than teachers in schools led by principals from comprehensive colleges. But, teachers in schools of principals who attended second tier regional comprehensive colleges (Comp II – Drury & Lincoln U.) were much less likely to have attended highly or most competitive colleges.

Table 6
Relationship between Principal's graduate institution type and teachers' undergraduate competitiveness for teachers hired after principal

DV = Teacher from Highly/Most Competitive	**Wisconsin**			**Missouri**		
	Odds Ratio	*Std. Err.*	*P>z*	*Odds Ratio*	*Std. Err.*	*P>z*
Principal's MA Carnegie Classification						
Research I	1.049	0.028	**	1.141	0.037	*
Research II	0.962	0.028		1.070	0.064	
Doctoral I	1.210	0.054	*	1.025	0.049	
Doctoral II	0.871	0.103		1.007	0.029	
Comprehensive I						
Comprehensive II	0.906	0.127		0.683	0.035	*
Liberal Arts I	1.346	0.307				
Liberal Arts II	1.207	0.051	*	0.953	0.048	
Year						
Year = 1998	0.979	0.046				
Year = 1999	0.974	0.045				
Year = 2000	0.942	0.043		0.968	0.036	
Year = 2001	0.915	0.041	*	0.901	0.034	*
Year = 2002	0.917	0.041	*	0.868	0.033	*
Year = 2003	0.908	0.040	*	0.888	0.033	*
Year = 2004	0.901	0.040	*	0.911	0.034	*
Year = 2005	0.896	0.040	*	0.935	0.035	**
Year = 2006	0.879	0.039	*	0.924	0.035	*
School Characteristics						
% Subsidized Lunch	0.524	0.054	*	0.983	0.001	*
% Black	1.823	0.138	*	1.012	0.001	*
% Hispanic	2.464	0.224	*	1.024	0.002	*
Enrollment (ln)	1.093	0.027	*	1.102	0.019	*
School Level						
Primary						
Middle	1.013	0.026				
High	1.252	0.040	*			
Other	1.023	0.061				

For all teachers newer to district than principal, includes Labor Market fixed effect
**p<.05, **p<.10*

Finally, Table 7 collapses together principals' academic backgrounds into either Pipeline B – academically strong, or Pipeline C – academically weak, compared as a baseline against the dominant pipeline (A). Interestingly, in Wisconsin, academically

weak principals appear more likely than dominant pipeline principals to have teachers who attended highly or most competitive colleges. Academically strong principals were also marginally more likely than principals from the dominant pipeline to have teachers from highly or most competitive colleges. But, the effect was quite weak in that teachers from more competitive programs were only five percent more likely to be hired than teachers from moderately competitive programs. Table 7 suggests that the academically weakest principals in Wisconsin schools may not be producing a decline in the academic quality of teachers under their watch.

The case is different in Missouri where the expected, though more problematic, probabilities emerge. In Missouri, teachers in schools of academically strong principals are nearly 40% more likely to have attended highly or most competitive colleges than teachers in schools of principals from the dominant pipeline. By contrast, teachers in schools of academically weak principals are 16% less likely to have attended highly or most competitive colleges than teachers in schools of principals from the dominant pipeline. In short, the Missouri relationships between principal and teacher backgrounds, given the previous trends discussed, are suggestive of a problematic divergence and decline in both leadership and teaching quality across Missouri schools.

Table 7
Relationship between Principal's undergraduate-graduate combination and teachers' undergraduate competitiveness for teachers hired after principal

DV = Teacher from Highly/Most Competitive	Wisconsin			Missouri		
	Odds Ratio	*Std. Err.*	*P>z*	*Odds Ratio*	*Std. Err.*	*P>z*
Principal's Pipeline						
Bottom 3 Barrons' & LA 2 MA	1.279	0.071	*	0.841	0.059	*
Top 2 Barrons' & RU 1 MA	1.056	0.030	**	1.377	0.062	*
Year						
Year = 1998	0.959	0.041				
Year = 1999	0.950	0.040				
Year = 2000	0.925	0.039	**	0.947	0.033	
Year = 2001	0.907	0.038	*	0.882	0.031	*
Year = 2002	0.894	0.037	*	0.850	0.030	*
Year = 2003	0.884	0.036	*	0.879	0.031	*
Year = 2004	0.882	0.036	*	0.907	0.032	*
Year = 2005	0.875	0.036	*	0.936	0.033	**
Year = 2006	0.864	0.036	*	0.915	0.032	*
School Characteristics						
% Subsidized Lunch	0.485	0.048	*	0.982	0.001	*
% Black	1.892	0.136	*	1.013	0.001	*
% Hispanic	2.343	0.203	*	1.024	0.002	*
Enrollment (ln)	1.092	0.025	*	1.109	0.018	*
School Level						
Primary						
Middle	1.019	0.025				
High	1.292	0.038	*			
Other	1.017	0.057				

For all teachers newer to district than principal, includes Labor Market fixed effect
**p<.05, **p<.10*

Conclusions and Policy Implications

Our data on Missouri and Wisconsin tell different stories regarding the production and distribution pipelines for school principals and the potential implications for school quality. In Wisconsin, we do not see an overall decline in the academic quality of principals, but we do see more classic disparities in the distribution of principals (academically weaker principals in higher poverty, higher minority schools). But, in the end, we do not see a strong adverse effect on teaching quality as measured by the hiring of teachers by academically weak Wisconsin principals. Interestingly, academically weak Wisconsin principals appear more likely to hire academically strong teachers.

In contrast, our Missouri data suggest sharp declines in the academic quality of principals and the teacher pool from which principals are drawn. We also see that

principals tend to be academically weaker than the teacher pool from which they are drawn in Missouri. We also find a relatively strong association between the academic backgrounds of principals and the academic backgrounds of teachers hired into schools after the principal. Over a relatively short period of time, the academic quality of teachers in the schools of academically weak principals has declined dramatically. The most important positive finding in the Missouri data is that we do not see the academically weaker principals disproportionately employed in higher poverty schools, either in the poor rural southern regions of the state or in the state's two major metropolitan areas. Rather, academically weak principals tend to be scattered through the middle portions of the state.

In both states, we have largely ignored and treated as a given the most common pipeline for principals - those prepared as both undergraduates and as graduate students in regional public colleges and other "comprehensive" colleges. But, in many respects, this group is difficult to differentiate from our Pipeline C - academically weak principals who attended the bottom three categories of undergraduate institutions and received their masters' degrees from start-up Liberal Arts II college programs. Future studies must take a more fine-grained look at this pipeline. Our interest in burgeoning Liberal Arts II programs was sparked somewhat by findings of Baker, Orr and Young (2007) regarding national trends, and dissertation findings of Belt (2009) which showed dramatic masters degree production increases by institutions such as William Woods in Missouri which would appear to have minimal faculty capacity to provide credible graduate programs (see Baker, Wolf-Wendel & Twombly, 2007).

The policy implications of the findings herein are vast. Ultimately, the goal of public policy - state and/or federal - is to improve the quality of public school leadership and to ensure greater equity in the distribution of quality leaders. Leadership quality is partly self-regulated by national accreditation organizations and also state regulated by state policies approving, or not, higher education institutions which grant school leadership credentials.

In recent years, it would appear that the state policy as well as professional self-regulation has endorsed diversification of preparation pipelines, perhaps built on the assumption that a "free-market" approach that includes a more competitive, more diverse landscape of pipelines will improve overall quality. Sadly, as indicated by the Missouri data, and by Baker, Orr and Young (2007), the fastest growing pipelines may be the academically weakest pipelines, and market pressures appear to play little moderating role. The Missouri analyses herein suggest that this trend may have dire consequences for school quality (as measured by teacher and leader academic preparation). These findings raise serious questions regarding the appropriateness of current regulatory practices.

Recent and renewed public rhetoric around public school leadership has focused on the need for *Ed Schools* - as a seemingly static entity - to clean up their act and provide more rigorous and more practical training to aspiring school leaders. These arguments are not new, but a rehashed version of arguments made previously by former Teachers College President Arthur Levine. Noticeably absent from this conversation is any discussion of the growing role of academically weak, but "accredited" institutions in producing newly "credentialed" school leaders. Rather, pundits, including Education Secretary Arne Duncan choose to invoke, quite shallowly, the usual comparisons to graduate medical education as a model - arguing that entrenched *Ed Schools*, must adopt

more practice-oriented training models – namely clinical training - thus making *Ed Schools* more like *Med Schools*.

But, those same pundits fail to acknowledge that the medical model relies on two critical prerequisites to clinical training – 1) highly selective entrance criteria and 2) successful completion of rigorous undergraduate education as well as another two years of rigorous content upload of basic sciences and other relevant curriculum. Without academically strong candidates to begin with, the medical model fails. Without rigorous up-front information uploading, and students who can handle it, the medical model fails. The medical model is equally reliant on all of its parts, not just the clinical training provided by *Med Schools*. And not just any institution which chooses to open up a medical school can provide credible basic sciences or clinical training.

Finally, while the conclusions herein might easily be construed as academic elitism, it is important to acknowledge that these analyses relate to the preparation of leaders for academic institutions --namely public schools. It is difficult to conceive of a rational argument for ignoring the relevance of academic credentials for individuals wishing to lead academic institutions. The research on teacher effectiveness and the link between principal attributes and teacher attributes discussed in the introduction to this article bear this out - academic preparation matters. The mixed findings herein suggest the need for subsequent, more fine-grained study across multiple states, to evaluate the influence on school quality of the changing landscape of principal preparation.

References

Baker, B., & Cooper, B. (2005). Do principals with stronger academic backgrounds hire better teachers? Policy implications for improving high-poverty schools. *Educational Administration Quarterly, 41*(3), 413-448.

Baker, B.D, Orr, M.T., Young, M.D. (2007) Academic Drift, Institutional Production and Professional Distribution of Graduate Degrees in Educational Administration. *Educational Administration Quarterly* 43 (3) 279-318

Baker, B.D., Wolf-Wendel, L.E., Twombly, S.B. (2007) Exploring the Faculty Pipeline in Educational Administration: Evidence from the Survey of Earned Doctorates 1990 to 2000. *Educational Administration Quarterly* 43 (2) 189-220

Batielle, T., Kalogrides, D., Loeb, S. (2009) What makes and effective principal? The characteristics and skills of quality school leaders. Working Paper 37. Center for the Analysis of Longitudinal Data in Education Research.

Boyd, D., Grossman, P, Lankford, H., Loeb, S., Wyckoff, J. (2008) Measuring Effect Sizes. The Effect of Measurement Error. National Conference on Value Added Modeling. University of Wisconsin, Madison, WI. http://www.teacherpolicyresearch.org/portals/1/pdfs/Measuring%20Effect%20Sizes%20%20the%20Effect%20of%20Measurement%20Error%20Boyd%20et%20al%20%2026Jun2008.pdf

Brewer, D.J. (1993). Principals and Student Outcomes: Evidence from U.S. High Schools. *Economics of Education Review 12*(4), 281-292

Clark, D., Martorell, P., Rockoff, J. (2009) School Principals and School Performance. Working Paper 38. Center for the Analysis of Longitudinal Data in Education Research.

Clotfelter, C., Ladd, H., Vigdor, J., and Wheeler, J. (2006). High Poverty Schools and Distribution of Teachers and Principals. A Paper Presented at the UNC Conference on High Poverty Schooling in America. Chapel Hill, NC.

Finn, C.E., Broad, E., Meyer, L. & Feistritzer, E. (2003) *Better Leaders for America's Schools. A Manifesto*. New York. Thomas B. Fordham Institute.

Fuller, E., Young, M.D., Baker, B.D. Career Paths and the Influence of School Principals on Teachers. *Educational Administration Quarterly*

Glassick, C., Huber, M. T., & Maeroff, G. (1997). *Scholarship assessed: Evaluation of the professoriate.* San Francisco: Jossey-Bass.

Gates, Guarino, Santibanez, Brown, Ghosh-Dastidar, and Chung (2004). *The Careers of Public School Administrators.* Rand Research Brief: Rand Education. Santa Monica, CA.

Goldhaber, D. Gross, B., Player, D. (2007). *Are Public Schools Really Losing Their Best? Assessing the Career Transition of Teachers and Their Implications for the Quality of the Teacher Workforce.* A Paper Presented at the Annual Conference of the American Education Finance Association. Baltimore, MD.

Hallinger, P., & Heck, R. H. (1998). Exploring the principals' contribution to school effectiveness: 1980-1995. *School Effectiveness and School Improvement,* 9(2), 157-191.

Hanushek, E. A., Rivkin, S.. 2007. Pay, working conditions, and teacher quality. *The Future of Children* 17(1): 69-86.

Hanushek, E.A., Kain, J., Rivkin, S. (2004) Why Public Schools Lose Teachers. *Journal of Human Resources* 34 (2) 326-354

Heck, R. H., Hallinger, P. (1999). Next generation methods for the study of leadership and school improvement. In J. Murphy & L. Seashore (Eds.), *Handbook ofResearch on Educational Administration. 2 nd ed*. (pp 463-487). San Francisco: Jossey-Bass.

Hess, R. and Kelly, A. (2005a) *Learning to Lead.* American Enterprise Institute. http://www.aei.org/docLib/20050517_Learning_to_Lead.pdf

Hess, R. (2005b) *Textbook: An Analysis of Leading Books used in Principal Preparation*. American Enterprise Institute. http://www.aei.org/docLib/20050517_Textbook_Leadership.pdf

Ingersoll, R.M. (1999). The problem of underqualified teachers in American secondary schools. *Educational Research*er, 28, 26-37.

Leithwood, K., & Jantzi, D. (2005, April 11, 2005). *A review of transformational school leadership research.* Paper presented at the American Educational Research Association, Montreal.

Leithwood, K., Jantzi, D., Coffin, G., & Wilson, P. (1996). Preparing school leaders: What works? *Journal of School Leadership, 6*(3), 316-342.

Leithwood, K., Louis, K. S., Anderson, S., & Wahlstrom, K. (2004). *How leadership influences student learning*. Toronto, Canada: Center for Applied Research and Educational Improvement & Ontario Institute for Studies in Education.

Levine, A. (2005) *Educating School Leaders. The Education Schools Project*. New York. Teachers College of Columbia University

Mitgang, L. (2003). *Beyond the Pipeline: Getting the Principals We Need, Where They are Needed*. New York, NY. The Wallace Foundation.

Ondrich, J., E. Pas, and J. Yinger. (2008). "The Determinants of Teacher Attrition in Upstate New York," *Public Finance Review* 36:112-44.

Orr, M. T., & Pounder D. (in press). Comparing leadership education from pipeline to preparation to advancement: A study of multiple institutions' leadership preparation programs. *Educational Administration Quarterly*.

Papa, Frank C. Jr., Lankford, H., Wyckoff, J. (2002). *The attributes and Career Paths of Principals: Implications for Improving Policy.* University of Albany, SUNY.

Papa, F. (2004). *The Career Paths and Retention of Principals in New York State*. Submitted to the University of Albany, State University of New York in partial fulfillment of the requirements for the Degree of Doctor of Philosophy. Albany, NY.

Punswick, E., Baker, B.D., Belt, C. Principal backgrounds and school leadership stability: Evidence from Missouri. *Educational Administration Quarterly*

Pounder, D., Merrill, R.J. (2001) Job Desirability of the High School Principalship: A Job Choice Theory Perspective. *Educational Administration Quarterly* 37 (1) 27-57

Printy, S. M. (2008). Leadership for Teacher Learning: A Community of Practice Perspective. *Educational Administration Quarterly, 44* (2), 187-226.

Rand. (2004). *The Careers of Public School Administrators.* Research Brief: Rand Education. Santa Monica, CA.

Young, M.D. (2008). Programs are making important progress in providing research-based preparation that supports student learning. *UCEA Review, 50* (2), 9-10.

Young, M.D., Fuller, E., Brewer, C., Carpenter, B., & Mansfield, K. (2007). Quality Leadership Matters. *UCEA Policy Brief Series, 1* (1) 1-8.

Young, M. D., & Grogan, M. (2008). Leadership preparation and development in North America. In J. Lumby, G. Crow, & P. Pashiardis (Eds.), *The international handbook of leadership development, pp. 303-324*. Lawrence Erlbaum.

Appendix A

A1 Distribution of Principals by Undergraduate Barrons' rating and Graduate Carnegie Classification

1999 Wisconsin

Carnegie 1994 Classification	Non-Competitive	Less Competitive	Competitive	Very Competitive	Highly Competitive	Most Competitive	Total
Research I	4	15	24	43	45	0	131
Research II	3	86	53	29	24	1	196
Doctoral I	1	7	5	3	3	0	19
Doctoral II	0	0	1	0	0	0	1
Comprehensive I	16	77	108	106	16	0	323
Comprehensive II	0	3	1	0	0	0	4
Liberal Arts I	0	0	1	0	0	0	1
Liberal Arts II	0	15	11	11	1	0	38
Total	24	204	204	192	89	1	714

2006 Wisconsin

Carnegie 1994 Classification	Non-Competitive	Less Competitive	Competitive	Very Competitive	Highly Competitive	Most Competitive	Total
Research I	2	16	28	35	30	0	111
Research II	2	74	36	27	20	2	161
Doctoral I	0	4	4	1	1	0	10
Doctoral II							
Comprehensive I	18	68	99	109	20	1	315
Comprehensive II	1	2	1	2	1	0	7
Liberal Arts I							
Liberal Arts II	4	31	26	24	8	0	93
Total	27	196	195	198	80	3	699

1999 Missouri

Carnegie 1994 Classification	Non-Competitive	Less Competitive	Competitive	Very Competitive	Highly Competitive	Most Competitive	Total
Research I	8	2	64	88	16	3	181
Research II	1	3	13	22	2	0	41
Doctoral I	11	5	70	36	4	0	126
Doctoral II	7	5	77	94	13	3	199
Comprehensive I	100	11	720	157	126	1	1,115
Comprehensive II	21	0	57	24	2	0	104
Liberal Arts I							
Liberal Arts II	2	0	16	3	1	0	22
Total	150	26	1,017	424	164	7	1,788

2006 Missouri

Carnegie 1994 Classification	Non-Competitive	Less Competitive	Competitive	Very Competitive	Highly Competitive	Most Competitive	Total
Research I	5	2	51	69	8	3	138
Research II	3	2	16	21	3	0	45
Doctoral I	13	2	78	33	4	0	130
Doctoral II	6	2	87	97	8	2	202
Comprehensive I	101	10	809	236	83	2	1,241
Comprehensive II	21	3	92	27	5	0	148
Liberal Arts I							
Liberal Arts II	22	1	127	31	8	0	189
Total	171	22	1,260	514	119	7	2,093

A2

Distribution of undergraduate backgrounds of teachers by both Barrons' and Carnegie classifications

Wisc Teachers 1999

Carnegie 1994 Classification	Non-Competitive	Less Competitive	Competitive	Very Competitive	Highly Competitive	Most Competitive	Total
Research I	0	0	50	390	2,798	49	3,287
Research II	4	2,584	80	56	38	8	2,770
Doctoral I	6	6	436	30	271	1	750
Doctoral II	2	10	69	66	8	1	156
Comprehensive I	1,268	5,087	7,075	7,667	13	5	21,115
Comprehensive II	14	435	544	706	1	0	1,700
Liberal Arts I	63	0	97	349	287	28	824
Liberal Arts II	38	401	2,302	200	8	0	2,949
Total	1,395	8,527	10,653	9,466	3,424	92	33,557

Wisc Teachers 2006

Carnegie 1994 Classification	Non-Competitive	Less Competitive	Competitive	Very Competitive	Highly Competitive	Most Competitive	Total
Research I	0	0	78	426	3,316	55	3,875
Research II	4	2,968	101	64	44	3	3,184
Doctoral I	12	6	449	31	375	5	878
Doctoral II	2	14	72	69	13	1	171
Comprehensive I	1,252	4,959	8,009	8,794	18	2	23,034
Comprehensive II	15	631	699	1,113	0	0	2,458
Liberal Arts I	57	0	144	331	335	27	894
Liberal Arts II	26	381	2,888	256	12	0	3,563
Total	1,368	8,962	12,441	11,087	4,113	93	38,064

Mo Teachers 1999

Carnegie 1994 Classification	Non-Competitive	Less Competitive	Competitive	Very Competitive	Highly Competitive	Most Competitive	Total
Research I	0	0	205	6,115	270	392	6,982
Research II	2	7	409	1,190	10	19	1,637
Doctoral I	14	4	459	1,434	151	4	2,066
Doctoral II	2	11	228	4,282	78	3	4,604
Comprehensive I	287	403	25,260	1,976	2,542	6	30,474
Comprehensive II	1,055	71	1,611	845	3	0	3,585
Liberal Arts I	19	6	718	179	98	26	1,046
Liberal Arts II	2,803	455	4,880	1,139	21	0	9,298
Total	4,184	981	33,782	17,161	3,173	453	59,734

Mo Teachers 2006

Carnegie 1994 Classification	Non-Competitive	Less Competitive	Competitive	Very Competitive	Highly Competitive	Most Competitive	Total
Research I	0	0	205	6,143	376	318	7,042
Research II	15	10	498	1,280	18	21	1,842
Doctoral I	12	25	590	1,575	194	9	2,405
Doctoral II	10	15	256	4,766	99	6	5,152
Comprehensive I	374	464	27,628	2,859	2,279	14	33,618
Comprehensive II	1,043	108	2,096	1,404	3	0	4,654
Liberal Arts I	26	29	892	219	126	37	1,329
Liberal Arts II	3,072	696	7,649	1,325	32	0	12,774
Total	4,562	1,369	39,847	19,572	3,129	408	68,887