Who Should be Our Leader? Examining Female Representation in the Principalship Across Geographic Locales in Texas Public Schools

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Since the 1970s, there has been keen interest in examining gender representation in leadership positions across various areas of employment, including K-12 education. Indeed, there have been long-standing concerns about the percentage of women principals. Few studies, however, have examined the percentages of women principals at different schooling levels (elementary, middle, and high schools) and across different geographic locales. In this study, we rely on 23 years of employment data for Texas public schools to examine the percentage of employed principals and newly hired principals who were women by school level and geographic locale. We also employ logistic regression to identify the independent effect of a school being located in a rural area on the odds of a school hiring a woman to be principal. We find that schools in all locales evidence an increase in hiring women as principals—particularly during the 1990s. We also find schools located in rural areas—both inside and outside metropolitan statistical areas—were less likely than schools located in large cities and large suburbs to employ a woman principal and hire a woman to fill a vacancy in the principalship.

Since at least the 1970s, there has been a long-standing interest in examining gender equity in employment across all types of occupations, including K-12 education. In particular, there has been repeated questioning about the extent to which women are underrepresented in school and district leadership positions relative to men, especially given the vast majority of teachers are women. While evidence suggests the field of educational leadership has made great strides in terms of greater representation of women in school and district leadership positions, the percentage of women principals remains lower than the percentage of men principals at both the middle- and high-school levels despite the majority of middle- and high-school teachers being women (Goldring, Gray, & Bitterman, 2013).

This gender disparity in employment is important for at least three reasons, each of which will be reviewed in greater detail in subsequent sections. First, basic notions of equity and fairness require that educators support more proportional employment of women in principal positions. Indeed, as women are now the vast majority of educators obtaining principal certification/licensure (Fuller, Hollingworth, & An, 2016) and are equally as likely as men to aspire to and apply for school leadership positions (DeAngelis & O'Connor, 2012), we would expect the percentage of women principals to roughly approximate the percentage of women teachers. Second, women principals tend to lead in ways that are more effective in building community, fostering collaboration, and improving student outcomes (Eagly, Karau, & Johnson, 1992; Gipson, Pfaff, Mendelsohn, Catenacci, & Burke, 2017: Urick & Bowers, 2013). Thus, employing a greater percentage of women as principals can have positive effects on school and student outcomes. Third, there is some evidence that women in leadership positions can serve as role models for other women (Hoyt & Simon, 2011). Having greater gender equity in leadership positions, in fact, sends an important message to students about who can and should be in a position of leadership.

While the issue of women in principal positions is not a distinctly rural issue in the manner described by Arnold,

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Newman, Gaddy, and Dean (2005) in this journal, there is a small body of research that suggests the issue of gender representation is more acute for rural schools than for schools located in other locales. For example, in the *Journal of Research in Rural Education*, Chance and Lingren (1988) found that only 4% of principals in small, rural schools in South Dakota were women. Similarly, in a longitudinal study of all principals in Iowa, Hollingworth and Dude (2009) used descriptive statistics to determine that the ratio of men to women principals in rural schools was six to one. Finally, in a multi-state study, Beesley and Clark (2015) estimated the percentage of women principals in rural schools in North Dakota, South Dakota, Nebraska, Kansas, Wyoming, Colorado, and Missouri was 39.2%, compared to 54.5% of non-rural principals in the same states. Finally, using the only nationally representative data available, Goldring, Gray, and Bitterman (2013) found 44.0% of rural principals were women as compared to 48.5% of town principals, 54.9% of suburban principals, and 59.5% of urban principals. Thus, research suggests a lower percentage of rural principals are women relative to the percentage of principals who are women in other geographic locales. As shown above, this pattern has long been the case and has led to repeated calls for a greater focus on recruiting and employing women in principal positions in schools in all locales (Fuller, Reynolds, & O'Doherty, 2016; Hollingworth & Dude, 2009; Pounder & Merrill, 2001), including those in rural areas (Howley & Pendarvis, 2002).

The available research examining the percentage of women principals, however, is problematic in a number of ways. First, much of the research is based on descriptive statistics or simple inferential statistical approaches such as independent sample t-tests, which are incapable of identifying the independent effect of being a woman on becoming a secondary school principal. Second, most of the studies are based on a snapshot of employment data in a particular year. Thus, such research cannot identify trends over time. Third, research in this area rarely examines differences across school levels even though data available from state education agencies and national Schools and Staffing Surveys have shown differences in the percentages of women principals by school level—specifically, elementary-, middle-, high-, and combined-level schools. Indeed, even within secondary schools, there are differences in the percentages of women principals in middle schools and high schools. Studies that do not disaggregate the data by school level likely reach inaccurate conclusions. Finally, most studies do not examine differences across multiple geographic locales. For example, some studies compare the percentages of women principals between rural and urban schools or between rural and non-rural schools. This aggregation to larger groups of schools results in the loss of information about the distribution of women principals across multiple geographic locales such as urban, suburban, town, and rural. Moreover, most studies treat rural as a single monolithic identifier rather than examining the percentage of women principals in schools in different types of rural locales.

The purpose of this study, then, is to address these four problems with prior research on the percentages of women principals in secondary schools, particularly with respect to schools located in rural areas. More specifically, the purpose of this study is two-fold. The first purpose is to examine the percentage of newly hired women secondary school principals in Texas public middle and high schools by geographic locale. The second purpose is to examine the degree to which rural middle and high schools are more or less likely to hire a woman principal relative to schools located in other locales after controlling for the personal characteristics of principals and the school characteristics hiring the principals. We focus on the percentage of women principals in rural schools within a metropolitan statistical area (MSA) and rural schools outside a MSA.

Despite the focus on rural schools, this study is not "rural specific" (Arnold, Newman, Gaddy, & Dean, 2005) in that our study does not endeavor to understand an issue that is unique to rural schools. Rather, we employ a critical quantitative inquiry approach (Stage, 2007) to determine if the issue of the underrepresentation of women principals in secondary schools is more acute in schools located in rural areas of Texas, both inside and outside metropolitan statistical areas (MSAs). Such an approach aligns directly with the call by Coladarci (2007), in a previous issue of the *Journal of Research in Rural Education*, to employ analyses that compare rural schools to schools in other locales as well as schools in different types of rural settings. We undertake this research not to cast aspersions on schools in particular locales, but to identify positive trends for locales and shine light on trends that need to be addressed. We also support qualitative researchers conducting rural-specific studies focused on the hiring of principals that could be modelled after work on such topics as the retention of superintendents (Tallerico & Burstyn, 1996), how school boards talk about gender in relationship to the hiring of superintendents (Chase & Bell, 1990), gender perceptions of the desirability of the principalship (Howley, Andrianaivo, Perry, 2005; Pounder & Merrill, 2001), and the marginalization of female leadership in rural settings (Sherman, 2000).

In this study, we focus only on employment as a principal and do not include employment as an assistant principal in our analysis. Based on prior work using Texas data by Fuller, Hollingworth, and An (2016), we would expect different results if we grouped assistant principals and principals into one "school leader" group. Thus, the reader should take note that our analyses focus solely on the position of principal and that the inclusion of assistant principal in these analyses could reveal different outcomes.

We commence the remainder of this article by reviewing the literature in five areas: the importance of studying the employment of women in principal positions,

gender differences in the hiring of women as principals, barriers to entry for women into leadership positions, and barriers to entry into the principalship in rural communities.

Importance of Women Principals

There are three primary rationales for why the hiring of women principals is important: equity and fairness in making employment decisions about individuals, differences in effectiveness between male and female principals, and the importance of role modeling for K-12 students.

Equity and Fairness

There has been a long-standing concern about the degree of equity and fairness regarding the hiring of women relative to men in leadership positions (Hoyt & Simon, 2011; Gipson et al., 2017; Hill, Miller, Benson, Handley, 2016), including in the field of education (Howley & Pendarvis, 2002; Joy, 1998; Pounder & Merrill, 2001; Riehl & Byrd, 1997; Shakeshaft, 1989). As discussed below, women have experienced—and continue to experience—serious barriers to entry into leadership positions, including the position of principal.

Differences in Leadership Effectiveness by Gender

Research in the broader field of leadership finds only small differences in leadership *styles* between women and men such that there does not appear to be any clear, consistent advantage for either gender (Gipson et al., 2017). However, within the field of education, there is some evidence that women leaders adopt leadership styles that are not only different than those enacted by men leaders, but are also associated with facilitating greater collaboration and community within schools. More importantly, research within the field of education suggests there are differences in leadership *behaviors* between men and women and, moreover, that the leadership behaviors enacted by women are more effective than the leadership behaviors exhibited by men in improving school outcomes (Gipson et al., 2017).

With respect to leadership styles, Eagly, Karau, and Johnson (1992) conducted a meta-analysis of 50 studies and found women principals employed a more collaborative, participative, and democratic style than men principals—all behaviors associated with more effective principal leadership. More recently, Urick and Bowers (2013) conducted a multivariate analysis of principal leadership styles using nationally representative survey data and found women principals were less likely to employ a balkanizing and controlling leadership style than men principals and, instead, were more likely to enact an integrating and collaborative leadership style. Moreover, the authors concluded principals who employed an integrative and collaborative leadership style were associated with a greater likelihood of meeting state accountability goals.

Unfortunately, there is less research with respect to differences in actual leadership behaviors and effectiveness between women and men principals. This dearth is likely due to the great difficulty in collecting accurate data on actual leadership behaviors and in identifying principal effectiveness (Fuller & Hollingworth, 2016). One exception to this paucity of research is the meta-analysis by Hallinger, Dongyu, and Wang (2016) that examined the relationship between gender and the enactment of instructional leadership. The authors found women principals were more likely than men principals to enact instructional leadership behaviors. While research is mixed about the relationship between instructional leadership and student outcomes (Neumerski, 2013), there is stronger evidence of such a relationship when instructional leadership is construed more broadly to include activities such as "staff development, curriculum development and coherence, student assessment and analysis, and evaluation and individualized feedback" (Kraft & Gilmour, 2016, p. 716). Hence, although not conclusive, there is some evidence that instructional leadership can have a positive impact on student outcomes. Thus, the finding that women principals may be more likely than men principals to enact instructional leadership is a potentially important finding related to the gender composition of principals.

Role Modeling

Another reason for focusing on the percentage of women in leadership positions is the effect women leaders can have on younger women and girls (Hoyt & Simon, 2011). Indeed, research suggests one strategy to counteract the negative social messages sent to women and discrimination against women is exposure to positive role models such as women in leadership positions (Dasgupta & Asgari, 2004; Rios, Stewart, & Winter, 2010). The mechanism by which role modeling can have positive effects on aspirations and personal expectations is through the comparison of self to those with the desired skills or in the desired position (Hoyt & Simon, 2011). When self-comparisons focus on the similarities between the subordinate and leader they can have positive effects on aspirations and potentially translate into behavior such as seeking out leadership positions (Hoyt & Simon, 2011).

There have been far less research studies on the effects of women leaders on the aspirations, goals, and behavior of younger women, particularly those in K-12 settings in the United States. Regarding academic and college-going behavior, this may be less of a concern given that young women already exhibit greater academic outcomes in non-STEM subjects, greater college-going rates, and greater college-completion rates than young men (Whitmire &

Bailey, 2010; Voyer & Voyer, 2014).

Regardless of the academic or aspirational effects of a woman leader, we argue K-12 students at all school levels should be exposed to women and men principals as a mechanism to normalize the acceptance of women and men in a variety of leadership positions. Indeed, we contend that greater representation of women in secondary-school principal positions—especially in high school positions—will help K-12 students accept the employment of both women and men as leaders as the accepted norm.

Gender Differences in the Hiring of Principals

Few studies have examined actual differences in hiring rates between women and men for principal positions across multiple districts or for entire states. In a statewide study of Indiana, Black, Bathon, and Poindexter (2007) found 64% of men and 51% of women graduates from principal preparation programs secured employment in administrator positions. Similarly, Fuller and Hollingworth (2016) found almost 68% of men and about 52% of women graduates of Texas principal preparation programs gained employment as a school leader (both principal and assistant principal positions) within five years of obtaining certification.

To examine this issue nationally, we constructed tables based on data from the nationally representative Schools and Staffing Survey (SASS) from the National Center of Education Statistics—the only national source of data on the characteristics of principals. Using the SASS data, we constructed Table 1, which documents the percentage of school principals by gender for both elementary schools and secondary schools. From 1988 through 2012, there was a fairly substantial increase in the percentage of women principals—from 38.0% in 1988 to 60.9% in 2012. However, while the percentage of women principals at the secondary-school level nearly tripled from 1988 to 2012, only 33.1% of secondary-school principals were women in 2012. These data suggest school districts have increasingly hired women for open principal positions, but secondary-school principal positions remain disproportionally filled by men.

Barriers to Entry into Leadership Positions for Females

A substantial body of literature examines the barriers to employment as a leader experienced by women, and much of the literature base concludes that barriers continue to exist with respect to leadership positions in general (Hill et al., 2016) and educational leadership positions in particular (Fuller, Reynolds, & O'Doherty, 2016). The result of such barriers is a disproportionately low percentage of women in particular types of leadership positions (Hill et al., 2016), including those in the field of K-12 education (Fuller, Hollingworth, & An, 2016). In this section, we review some of the barriers encountered by women as they seek employment as a leader and divide our discussion into three broad and interrelated areas: recruitment, supply, and selection.

Recruitment

In their review of research, Fuller, Reynolds and O'Doherty (2016) found the recruitment of teachers into the leadership pipeline substantially affected the characteristics of those choosing to apply for acceptance to leadership preparation programs—the first step in the formal pipeline to school leadership. One important facet of recruitment is tapping—defined by Myung, Loeb, and Horng (2011) as an "informal recruitment mechanism of teachers to become principals" (p. 695). Tapping often involves a current principal or central office leader identifying and urging a teacher to enter a preparation program to become a school leader. In fact, the majority of respondents in the study by Myung and her colleagues (2011) indicated tapping was the initial reason for formally entering the leadership pipeline. This finding is consistent with the larger leadership literature that reports that access to existing leaders and influential networks of individuals is often more important to entering the leadership pipeline than job performance (Eagly & Carli, 2007; Hewlett, Peraino, Sherbin, & Sumberg, 2010).

Relying on tapping and informal networks, however, can disadvantage potential women leaders given that both men and women often hold stereotypes about leadership and effective leadership traits that are masculine in nature

Table 1

Percentage of United States Principals Who Are Female by School Level for Selected Years

School Level	Year						
	1988	1991	1994	2000	2004	2008	2012
Elementary Schools	38.0	42.4	46.4	55.1	58.7	59.9	60.9
Secondary Schools	11.9	12.9	16.0	23.1	26.9	29.4	33.1
All Schools	31.4	34.9	60.9	46.3	49.7	51.0	52.4

Note. Compiled from various National Center for Education Statistics reports. See Goldring, Gray, and Bitterman (2013).

and, hence, advantage males in this process—especially at the secondary-school level (Koenig, Eagly, Mitchell, & Ristikari, 2011). Indeed, stereotypical male characteristics such as independence, aggression, competitiveness, rationality, and objectivity are highly correlated with perceptions of effective leadership (Crites, Dickson, & Lorenz, 2015; Gipson et al., 2017; Koenig et al., 2011).

Supply

Research also finds that the individual choices made by individuals also have a substantial influence on the characteristics of those entering leadership positions (Gipson et al., 2017; Hill et al., 2016). Individual choices about entering the leadership pipeline, however, are not based solely on the calculus about an individual's personal life situation. Research, in fact, has consistently found that individual choices are greatly influenced by experiences of discrimination, stereotypes, and bias throughout the lives of individuals (Gipson et al., 2017; Koenig et al., 2011). Indeed, as Hill and her colleagues (2016) note, "Personal choices are never made in a vacuum. Organizational, cultural, economic, and policy barriers shape both men's and women's choices and opportunities" (p. 15). Moreover, the effects of these barriers—including stereotypes, biases, and overt discrimination—affect women at an early age in important ways. Perhaps most importantly, women tend to "diminish and undervalue their professional skills and achievements" by early adolescence (Hill et al., p. 22). Ultimately, these experiences can often lead women—even those who are extremely well qualified for leadership roles—to work to overcome their own preconceptions that they are unprepared and unqualified to lead (Hill et al., 2016). In contrast, men often overestimate their qualifications and competence about their leadership abilities and thus are far less hesitant than women to self-select into leadership pipelines (Pajares & Schunk, 2001; Wigfield, Eccles, & Pintrich, 1996).

The end result of these social dynamics is that women may be less likely to perceive themselves as sufficiently qualified to enter the formal leadership pipeline and hence be less likely to self-select into the pipeline as compared to similarly qualified men. Thus, not only do women encounter barriers in the recruitment process, they also encounter barriers in the self-selection process.

Selection

We broadly define selection as the process through which an organization chooses to hire an individual for a leadership position. In the realm of school leadership, selection refers to a school district's choice in hiring an individual to be a principal. The broader research on the selection of individuals to fill leadership positions generally concludes that hiring committees are often biased toward men at the expense of equally or even better qualified women candidates (Gipson et al., 2017; Koenig et al., 2011). In the business world, committees often choose applicants who fit the existing organizational culture, which tends to bias decisions against women applicants (Giberson, Resick, & Dickson, 2005; Jackson, Engstrom, & Emmers-Sommer, 2007). Most egregiously, hiring committees often conflate confidence with actual competence, which, given the rich research showing men exude confidence to a greater degree than women, leads to less qualified (but quite confident) men being selected for leadership positions instead of better qualified (but less confident) women applicants (Chamorro-Premuzic, 2013).

Importantly, this process is not always explicit and in fact is often based on implicit biases (Hill et al., 2016). According to Hill and her colleagues (2016), "Implicit, or unconscious, bias occurs when a person consciously rejects stereotypes but still unconsciously makes evaluations based on stereotypes" (p. 23). Such implicit biases can be difficult to detect by those holding such biases, such as individuals on hiring committees (Banaji & Greenwald, 2013). Indeed, research suggests that men—and to a lesser extent, women—continue to implicitly perceive positive leadership characteristics as being associated with stereotypically masculine behaviors, thus implicitly favoring men in the selection of leaders (Hill et al., 2016).

These implicit and explicit biases against women as leaders—particularly when held by men—have important ramifications because men continue to hold positions at the top of the organizational hierarchy and often make decisions about whom to employ (Koenig et al., 2011). This pattern is found both in corporate leadership (Koenig et al., 2011) and in the educational arena (Wallace, 2015). Results from research in the field of K-12 leadership suggest these processes occur in the hiring of school leaders as well (Fuller, Hollingworth, & An, 2016). Indeed, K-12 researchers suggest hiring committees employ discriminatory processes that result in reduced opportunities for women (e.g., Hudson, 1991; Joy, 1998; Ortiz & Marshall, 1988; Pounder, Galvin, & Shepherd, 2003; Riehl & Byrd, 1997; Shakeshaft, 1989, 1999). These processes appear to be particularly pernicious with respect to the hiring of females at the secondary-school level (e.g., Hudson, 1991; Joy, 1998; Ortiz & Marshall, 1988; Pounder et al., 2003; Riehl & Byrd, 1997). In other words, with men at the top of the organizational hierarchy, these biases will continue to serve as barriers to the advancement of women into leadership positions. One factor that affects this process is the lack of role models and mentors for female candidates at the high-school level and

in central office leadership positions (Grogan & Andrews, 2002; Ortiz, 1982; Young & McLeod, 2001).

Barriers to Entry into the Principalship in Rural Communities

There is a paucity of research about entry into the principalship in rural areas, and this paucity is even more acute with respect to research about the barriers to entry into the principalship by women in rural areas. There are, however, several possible barriers that are either unique to, or more acute in, rural areas. As noted above, one barrier to entry for women is that the position of principal—particular at the high-school level—is seen as the purview of men because "the [high school principal] must be a tough male, able to maintain control and exert authority" (Sherman, 2000, p. 135). Given school boards in rural areas have a greater proportion of men than school boards in other locales (Hess, 2002), and men are more likely to hold this androcentric view of leadership (Chase & Bell, 1990; Sherman, 2000), there may be less of a focus on recruiting women into the principal pipeline in rural districts than in districts located in other locales. For example, in her article on the marginalization of women leaders in rural schools, Sherman (2000) notes the women in her study felt the school boards "constrained women's leadership paths" (p. 140).

A second barrier is the potential of the greater complexity of the principal position in rural communities (Arnold et al., 2004; Browne-Ferrigno & Allen, 2006; Duncan & Stock, 2010) to reduce the supply of women available to fill vacant principal positions (Sherman, 2000). Due to the greater complexity of leading rural schools and the expectation of rural principals to take on many more tasks than principals in other types of schools (Kruse & Krumm, 2016), leading a rural school—particularly a secondary school—can be more time consuming than leading other schools. Research on barriers to entry into leadership positions of women notes that many women—especially those with children—may be unwilling to take on roles that require additional time commitments (Gipson et al., 2017; Tallerico & Burstyn, 1996).

A third barrier is the remote nature of the rural school coupled with the greater proportion of men in both school and district leadership positions. While all rural principals may feel isolated, women feel particularly isolated because of the lack of other women with whom to engage or serve as mentors (Sherman, 2000). This realization could certainly prove a disincentive for women to enter the principal pipeline and certainly impacts their decisions to remain a principal (Sherman, 2000).

These barriers to entry into principal positions for women in rural areas suggests that rural schools may in fact be less likely to hire women as principals—particularly with respect to secondary schools. Thus, investigating this potential seems warranted given the importance of employing women in principal positions discussed above.

Data and Methodology

Data

We relied on multiple data sets to complete this study. We obtained educator employment data from the Texas Education Agency (TEA) for each school year from 1987-88 through 2011-12. From these data files, we created files that contained only employed principals for each of the 25 school years and then created a master file such that each principal was included in the file in each school year in which he or she was employed as a principal. Thus, individuals may appear multiple times in the data. Using this file, we identified when an individual principal was newly hired at a particular school. Based on this calculation, we then removed from each year all the principals who were not a newly hired principal in a particular school. The resulting file included only principals identified as a newly hired principal at a particular school in each of the years. We then included each principal's age, gender, and race/ethnicity.

We also downloaded the school characteristics from the TEA website for all schools for each of the 25 years. These files contained total student enrollment, student racial/ethnic demographics, student participation in special programs (special education, bilingual education, and gifted education) as well as identification as an English language learner. As there was substantial missing data at the individual and school levels for the 1987-88 and 1988-89 school years, we restricted our final sample to the 1989-90 through 2011-12 school years. Since our focus is on secondary schools, we included only individuals employed in middle or high schools.

Our final file of newly hired principals at the secondary-school level (both middle schools and high schools) included 7,347 unique newly hired principals and a total of 14,737 newly hired principal years in secondary schools (both middle schools and high schools). The much greater number of newly hired principal years reveals that a number of individual principals were identified as newly hired multiple times. Such principals move from one school to another and each move identifies them as newly hired.

We used geographic locale data from the National Center for Education Statistics (NCES) to determine the geographic locale for each school. As most of our years of data were prior to 2006 when NCES revised the geographic locales, we used the older version of geographic locales as designated by NCES. For the six academic years for which the NCES reports the new geographic locales, we recoded the new 12 geographic locales into the old eight geographic locales in the following manner. First, because of the small number of schools designated as being in a town locale both

prior to and after 2006, we collapsed all the different town locales into one overarching "town" locale. Second, for schools placed in one of the three rural locales after 2006, we recoded them into rural-inside an MSA if the school was located within an MSA and as rural-outside an MSA if the school was not located in an MSA. Third, schools designated as being in a large city or large suburb locale remained identified as a large city or large suburban school across all years of data. Fourth, for the years after 2006, we collapsed mid-size and small city locales into one locale (mid-size/small cities) and we collapsed mid-size suburban and small suburban into one locale (mid-size/small suburbs).

Methodology

We used descriptive statistics to examine the percentage of all principals in schools who were women and the percentage of newly hired principals who were women by geographic locale. Since we relied on the universe of all schools and all principals in Texas and there was an extremely small amount of missing data, we did not employ inferential statistics. The percentage of missing cases for each year of the employed principal analysis was less than 2.5% (see Appendix Table A-1) and less than 1% for any locale within a particular year (available upon request). There were no missing cases for the newly hired principal analysis. Thus, any differences apparent in our analyses reflect actual differences and do not require the use of inferential statistics to assess if the apparent differences are accurate or due to chance from sampling. This does not mean, however, that any identified differences are practically significant. Small differences between locales, in our view, are not particularly important. Rather, we encourage the reader to focus on the more substantial differences between locales.

Variable Selection

With respect to our logistic regression analysis, we selected variables based on our review of the literature on the hiring of principals. With respect to the personal characteristics of individual educators, we included an individual's age, race/ethnicity, and gender in the analysis given the ample research that concludes these factors influence the hiring of principals (Fuller, Hollingworth, & An, 2016).

In contrast to the substantial body of research that identifies the influence of personal characteristics on the odds of being hired, there is a paucity of research that examines the relationship between school characteristics and the odds that an individual with particular personal characteristics will be hired at a school. Despite the lack of research in this area, we believe some school characteristics would theoretically be associated with the types of schools employing women or men. Specifically, some research suggests that women are more concerned about the time commitments and stress of being a principal than are men (Sherman, 2000). Given that schools that enroll greater proportions of students living in poverty and schools with greater proportions of special education students may be more stressful and require more time and effort to be academically successful (Ingle, Rutledge, & Bishop, 2011), we argue these factors might be associated with decreased odds of women choosing to lead such schools. On the other hand, research from the business world has confirmed the existence of a "glass cliff"—the phenomenon of hiring women for leadership positions for which there are fewer resources and that place the individual at greater risk for failure (Ryan et al., 2016). If, in fact, women are offered principal positions in more difficult to lead schools, we would expect the odds that a woman was hired as a principal would increase as the percentage of economically disadvantaged students in a school increased.

An additional school characteristic included in our study is the percentage of women teachers in a school. We include this variable as a proxy for the potential supply of women principals given that principals—particularly in rural areas—are often selected internally from the same school or district. Ideally, we would include the number of women in a particular labor market who held principal certification. We did not, however, have access to such data. We do believe our variable serves as a reasonable proxy for the percentage of individuals eligible to be a principal who are women.

We also include a binary variable that indicates if the school was located in a district led by a female superintendent. This variable could be considered an assessment of representative bureaucracy. According to Grissom and Keiser (2011), representative bureaucracy accrues benefits for those in subordinate positions who possess the same characteristics as the individual in the position of leadership. In the realm of hiring, a district with a woman superintendent would be more likely to hire a woman principal than a district with a man superintendent, all other factors being equal (Grissom & Keiser, 2011).

We include all the above variables in an effort to control for factors that may influence the hiring of women in principal positions that may also be correlated with geographic locale, particularly with respect to schools in rural areas, but are outside the control of principal hiring committees. Efforts to control for these factors are necessary to identify the independent effect of rural locale on the decision to hire a woman or a man for the position of principal in secondary schools.

Finally, we include binary indicators of geographic locale. We use these variables to identify the relationship between being located in a particular geographic locale and the hiring of a woman principal. However, our inability to include all relevant variables related to supply and school

characteristics in our analyses means we must be cautious in interpreting our findings.

Methodology

Examining the gender of a principal each year regardless of whether a new principal was hired does not tell us much about a district's preferences for hiring a woman principal. In fact, given the negative consequences of turnover, we would argue that a district should never remove a principal simply to hire a new principal with different personal characteristics. Thus, we choose to focus on only newly hired principals because doing so allows us to examine the choices a district makes about whether to hire a woman for an open principal position. To identify any potential independent effects associated with a school being located in a rural area on the odds of hiring a woman principal, we employ logistic regression analysis (LRA). We express the general logistic regression model with the following equation:

$$\text{Odds of Being Female} = b_0 + b_1(\text{Personal Characteristics}) + b_2(\text{School Characteristics}) + b_3(\text{Superintendent Female}) + b_4(\text{Geographic Locale}) + b_5(\text{Year}) + \textit{error}$$

While the personal characteristics of the principal are time-invariant, we allow for school characteristics, the gender of the superintendent, and the geographic locale of the school to vary over time. We also include year-fixed effects to control for the effect of the passage of time and unobserved factors associated with particular years. The inclusion of the year-fixed effects is important given that acceptance of women as leaders has changed over time, and the percentage of women obtaining certification has increased dramatically since 1990 (Fuller, Reynolds, & O'Doherty, 2016), including in Texas (Fuller & Hollingworth, 2016).

To account for potential auto-correlation and the likelihood of similar principal trends within districts, cluster-adjusted standard errors were used to relax the independence assumption of the logistic regression models. This adjustment reduces the likelihood of type 1 errors by adjusting for correlated residuals within districts while still assuming independence between districts.

Limitations of the Study

There are several important limitations to this study. First, we did not have data on who applies for specific principal positions nor the underlying reasons why particular individuals applied for and accepted/declined specific job offers. We could only find two studies that examined actual application behaviors of individuals. First, in their study of graduates of principal preparation programs in Illinois, DeAngelis and O'Connor (2012) found that similar percentages of men and women apply for school leadership positions. They could not, however, disaggregate the information to specifically examine applications for principal positions. In contrast, Lankford, O'Connell, and Wyckoff (2003) found in New York state that a greater percentage of men than women applied for school leadership positions, including principal positions specifically. The differences between the two studies could potentially be explained by the nine-year difference between them. While some studies have examined the reasons why individuals choose to apply for and accept/decline job offers, we could not identify any large-scale research that disaggregated the reasons by gender. Lankford and colleagues (2003) did mention that the reasons for accepting an employment offer does not differ by gender, but they did not actually provide any evidence of such results.

In addition to not having any data on the reasons individuals choose to apply for and accept/decline an offer, we did not have information on the hiring processes or decision-making rationales adopted by school districts. Moreover, we could not identify any research that examined district hiring processes related to gender other than small cases studies. In short, we could not ascertain *why* the results occur; we could only identify *what* the results are. This limitation underscores the need for researchers to undertake large-scale projects that examine the reasons individuals provide regarding why they apply for a position and why they accept or decline offers of employment.

Second, as with almost all quantitative studies, there is always a concern with omitted variable bias. This occurs when an analysis does not include all variables that could potentially influence the outcome variable—in this case, the hiring of women principals. For example, our analysis did not include the percentage of women teachers with principal certification in the district or labor market in which the school is located. This supply-side measure could certainly help explain if a school in a particular setting hires a woman or a man for a principal position given schools may be limited in their hiring of women if the pool of potential hires has a low percentage of women. We also did not include information on the number of assistant principals at a school. Given that research suggests women applicants for the principalship often give greater weight to the issue of time needed to enact the job (Sherman, 2000), a lack of administrative assistance may discourage women from applying to particular positions. This trend is particularly relevant to this study given that rural schools often have no assistant principals and lack other types of support (Arnold et al., 2005).

Third, this study focuses only on one state. While Texas is a large state with a large number of schools in all geographic locales and a diverse population of students and teachers that makes the state more generalizable to the

United States than many states, our study is situated in one particular state and, thus, our results cannot be generalized to other states or the United States.

Findings

This section is divided into two sub-sections. The first sub-section reviews the descriptive statistics on the percentage of women in all principal positions by geographic locale from 1990 through 2012. The second sub-section reviews our findings from our descriptive and LRA analyses focused on newly hired principals who were women.

Before reviewing our findings, it is important to note that the inclusion of two regression analyses with more than 30 variables in each analysis increases the odds that we will identify a false positive—otherwise known as a Type I error. A false positive occurs when our statistical analysis identifies that an independent variable is statistically significantly related to our dependent variable (a newly hired principal is a woman) when, in fact, the finding of a statistically significant relationship was not evidence of an actual relationship, but simply due to random chance that is inherent in conducting statistical analyses.

Since the odds of the occurrence of a Type I error increase with the number of independent variables included in the analyses, readers should interpret some of our findings with caution. Specifically, at the middle-school level, readers should use caution when interpreting the results for the following variables: percentage of economically disadvantaged students, superintendent being a woman, mid-size/small city, and for the individual year variables that are statistically significant at the $p < .05$ level. At the high-school level, readers should use caution when interpreting the results for the following variables: individual is Black, mid-size/small city, and for the year variables that are statistically significant at the $p < .05$ level rather than the $p < .01$ level.

Employed Principals

In this section, we present the percentage of all principals who were women by seven geographic locales: large city, mid-size city, large suburban, mid-size suburban, town, rural inside a MSA, and rural outside a MSA. As the characteristics of principals differ by school level (Fuller, Hollingworth, & An, 2016), we present separate results for middle and high schools.

With respect to middle schools (see Figure 1), there was in increase in the percentage of women principals from 1990 to 2012 for schools in all locales. Across all years, schools located in either rural areas or towns had the lowest percentages of women principals, while schools in large city and mid-size city areas had the greatest percentage of women principals. Starting in 2006, schools in large suburban locales joined schools in large city locales and mid-size city locales as having the greatest percentages of women principals. Interestingly, the percentage of women principals in schools in rural locales outside MSAs increased from about 8% in 1990 to around 30% in 1999, but then remained relatively constant at around 30% for the remaining years. The nearly 22 percentage-point increase for rural schools outside MSAs was the greatest percentage-point increase in women principals for any locale over any 10-year time span included in our study. Despite these improvements, schools in rural locales outside MSAs were the only group of schools to employ 30% or fewer women principals. Moreover, in 2012, the percentage of women principals in rural schools outside MSAs was 10 percentage points lower than schools in any other locale.

As shown in Figure 2, the percentages of women principals of high schools also increased over the 23-year period at roughly the same rates as at the middle-school level. Despite these increases, the percentage of women principals in 2012 was 50% or greater for only two locales—large city and large suburban. In contrast, the percentage of women principals was less than 32% for three locales—town, rural inside MSAs, and rural outside MSAs. Interestingly, for all schools except those in mid-size suburban and town locales, the increase from 1990 to 2001 was greater than the increase from 2001 to 2012. Thus, for five of the seven locals, the rate of increase in the percentage of women principals declined over the last 11 years relative to the first 11 years. Finally, with respect to rural schools in 2012, there was essentially no difference in the percentage of women principals for high schools in three locales—town, rural inside MSAs, and rural outside MSAs. More specifically, about 31% of high school principals in these three locales were women. In comparison, more than 45% of high school principals in large cities, large suburbs, and mid-size cities were women.

Newly Hired Principals

In this section, we first review the results from our descriptive analysis and then from our logistic regression analysis.

Descriptive statistics. In this section, we examine the percentage of newly hired principals who were women in secondary schools in the same seven geographic locales. As the number of newly hired principals was relatively small within each locale and year, there were fairly large year-to-year fluctuations. To reduce these fluctuations, we calculated rolling three-year averages by summing the percentages for each three-year span and dividing by three. Figures 3 and 4 present these three-year rolling averages of the percentage of women principals. Since the figures present the three-

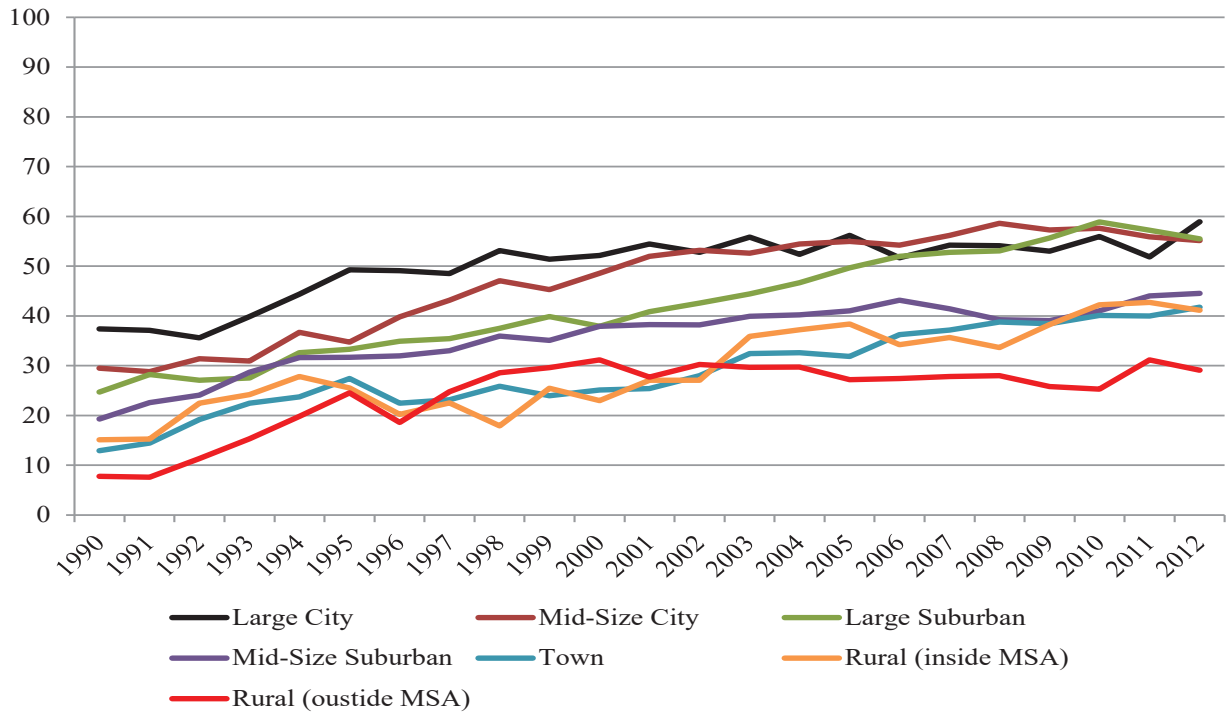


Figure 1. Percentage of female principals in middle schools by geographic locale (1990-2012).

year rolling averages, our time frame is constricted to the 21 years between 1991 and 2011.

Figure 3 shows increases in the percentage of newly hired women principals in middle schools for all seven geographic locales from 1991 to 2011. The increases were greater in the first 11 years than the second 11 years. For most of the 21 years, rural schools outside MSAs had the lowest percentages of newly hired female principals. Further, in 1991, only about 14% of newly hired principals in rural schools outside MSAs were women as compared to at least 34% for schools in large city, large suburban, mid-size city, and mid-size suburban locales. By 2011, the percentage of newly hired women principals in rural middle schools outside MSAs had increased to 32%. However, despite this increase, the percentage was nearly 30 percentage points lower than for schools in large city and large suburban locales.

In contrast, schools in rural areas *inside* MSAs had the greatest increase in the percentage of newly hired women principals from 1991 to 2011. By 2011, the percentage of newly hired principals who were women in rural locales inside MSAs was not substantially different than the percentages for schools in town and small suburban communities and only about 15 percentage points below schools in large city and suburban communities.

As shown in Figure 4, the overall percentage of newly hired women principals in high schools increased for all locales from 1991 through 2011. As at the middle school level, increases were greater for the first 11 years than in the second 11 years. There were double-digit increases for all but two locales—large city (2.4 percentage points) and rural areas inside MSAs (8.2 percentage points). The two locales with the greatest percentage point increases were large suburban locales (34.2 percentage points) and rural areas outside MSAs (19.7 percentage points). With respect to the two rural categories, rural schools inside MSAs had relatively large increases in the percentage of newly hired principals who were women at the middle-school level but had relatively small increases in the percentage of newly hired principals who were women at the high-school level. In contrast, rural schools outside MSAs had relatively large increases in the percentage of newly hired principals who were women at both the middle-school level and the high-school level.

Logistic Regression Analyses

In this section, we review the results of our logistic regression analyses of the odds that a newly hired principal was a woman. The dependent variable is a binary indicator of whether the principal is female (woman =1, man = 0). There are five groups of independent variables:

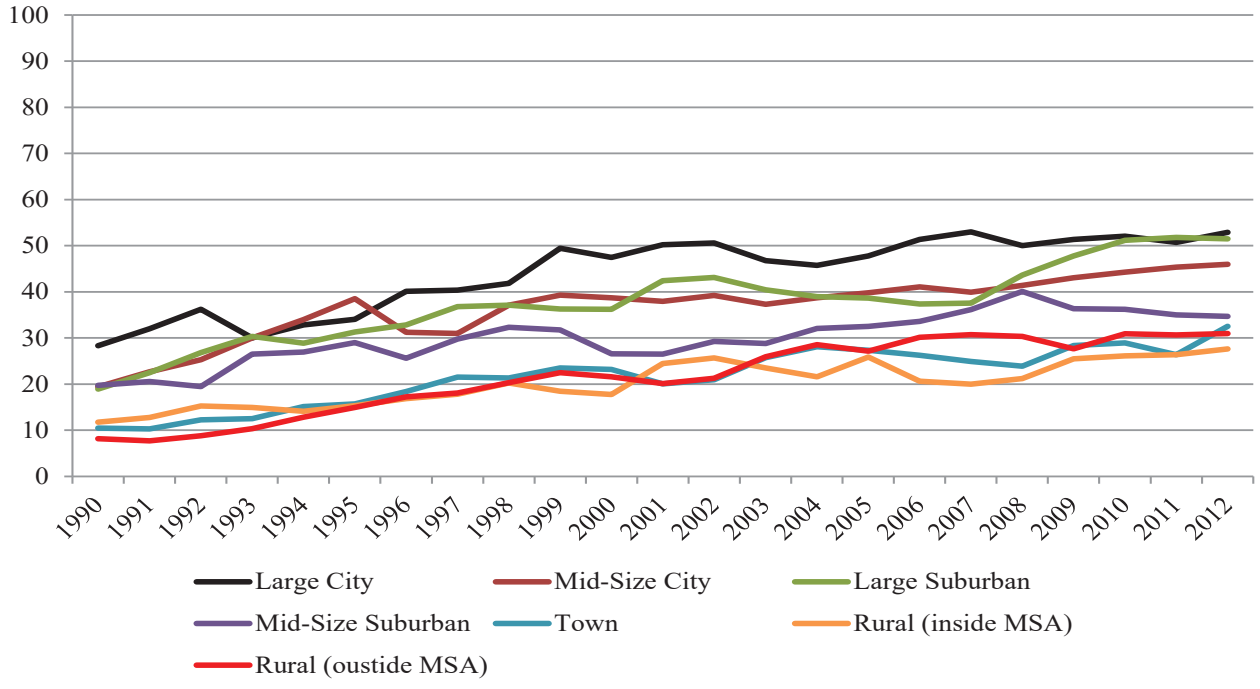


Figure 2. Percentage of female principals in high schools by geographic locale (1990-2012).

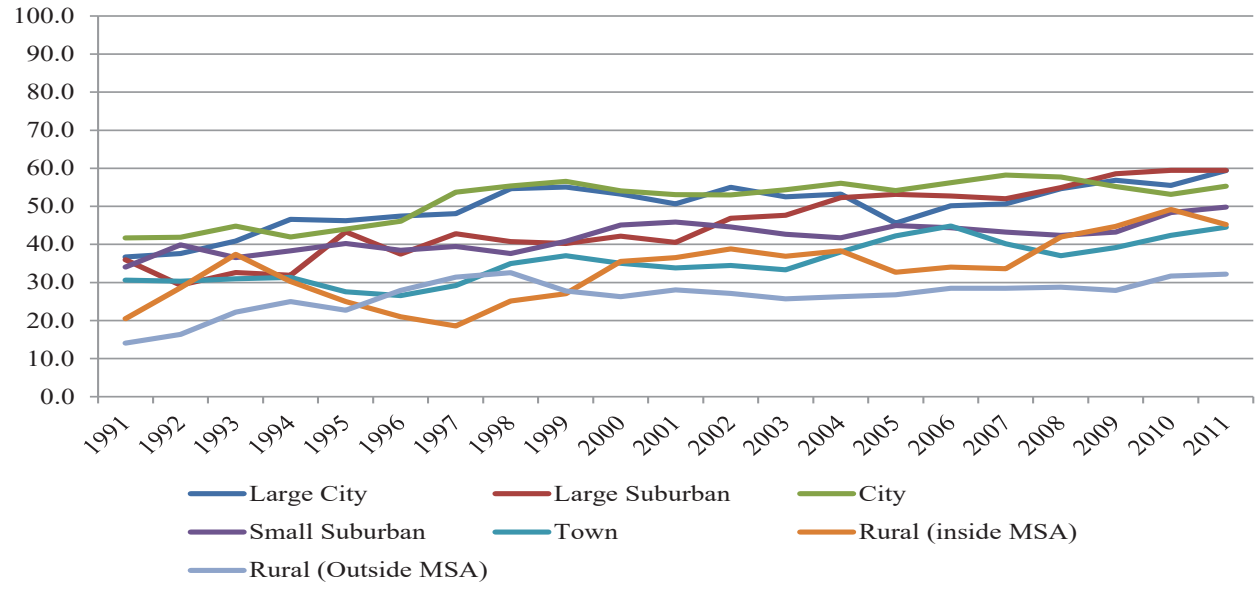


Figure 3. Three-year rolling average of the percentage of newly hired female principals in middle schools by geographic locale (1991-2011).

personal characteristics, student characteristics, female superintendent of the district in which the school is located, school geographic locale, and year-fixed effects (22 binary variables for the years 1991 through 2012). We report the results of two separate analyses—one for middle schools and one for high schools.

The results of our logistic regression analyses are presented in Table 2, and we include results for both middle

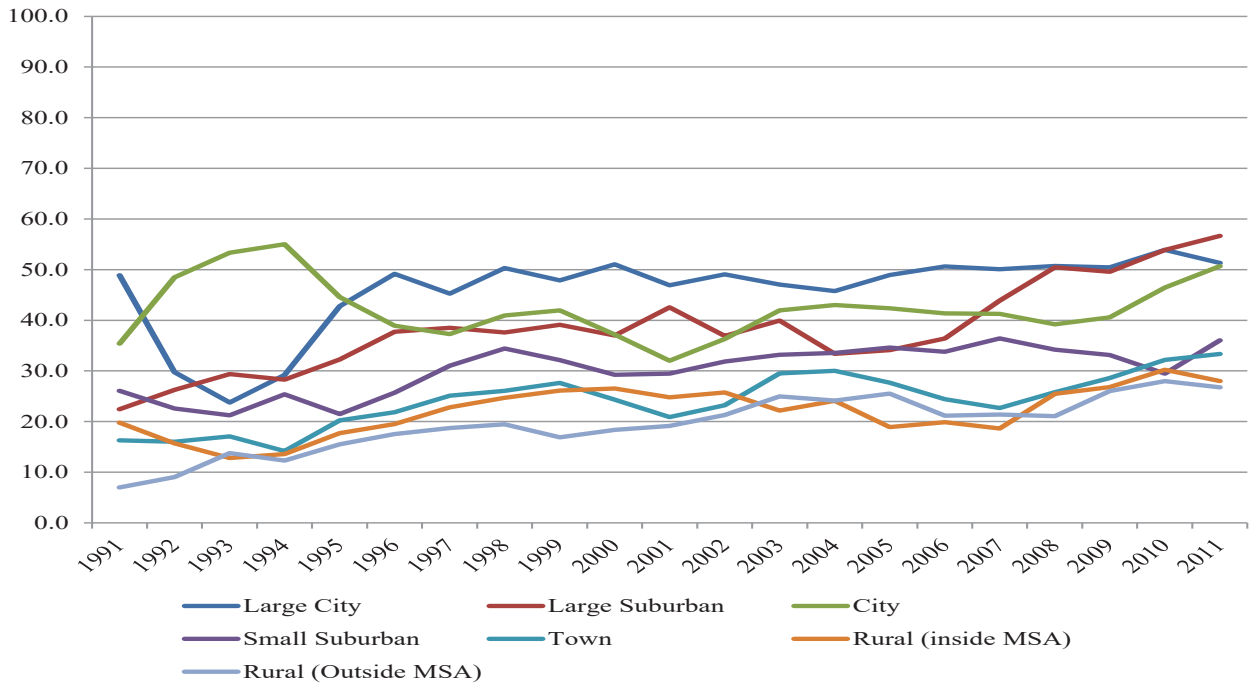


Figure 4. Three-year rolling average of the percentage of newly hired female principals in high schools by geographic locale (1991-2011).

and high schools. As the personal characteristics served as control variables, we do not discuss the results for this block of variables. Our school characteristic variables serve as imperfect proxies for factors that may impact the hiring of women principals, especially in rural schools. Thus, we discuss the results for this block of variables before reviewing the results for different locales.

With respect to charter schools, there was no statistically significant result for middle schools. For high schools, charter schools had greater odds of hiring a woman principal relative to non-charter schools. This finding contradicts the findings of Ni, Sun, and Rorrer (2015) in their study of principals in Utah, but it is consistent with other studies examining the percentages of women principals in charter and non-charter schools (Gates, Ringel, Santibanez, Ross, & Chung, 2004; Gross & Pochop, 2007). Our results may reflect the different hiring regulations in Texas for charters that do not require them to hire individuals with full state certification.

School size was not statistically significant for middle schools, but it was statistically significant at the high school level. Specifically, we found that the greater the student enrollment of the school, the lower the odds that the school hired a woman principal. This finding may reflect the influence of the long-standing belief that men are more capable than women of managing larger organizations on the decisions of hiring committees (Chase & Bell, 1990).

Only one of our two student demographic variables was statistically significant. Specifically, the percentage of economically disadvantaged students was statistically significantly associated with slightly greater odds of hiring a woman principal. Given that such schools tend to be more difficult to lead and are often at greater odds for being labelled as low-performing (Ingle et al., 2011), this finding supports the proposition of a glass cliff in which women are hired for positions that are at greater risk for failure (Ryan et al., 2016). However, given that we did not specifically set out to examine this issue and due to the possibility of a false negative because of the number of variables in our analyses, we cannot necessarily conclude that our findings substantiate the glass cliff findings from the business world.

As expected, the percentage of women teachers in a school was statistically significantly associated with greater odds of hiring a woman principal. As noted above, this variable may serve as an imperfect proxy for the supply of women available and willing to serve as a principal in a particular school. Unfortunately, we were unable to include the number of women educators with principal certification in the school, district, or labor market, which would have provided a much more accurate indicator of the supply of women principals.

Our final school characteristic was an indicator of whether the school was located in a district with a woman superintendent. As shown in our results, schools in a district

Table 2

Logistic Regression Results

Variable Name	Middle Schools (N=7,117)				High Schools (N=7,620)			
	Coeff.	Std. Error	Odds Ratio	Stat Sig	Coeff.	Std. Error	Odds Ratio	Stat Sig
Personal Characteristics								
Age	0.190	0.032	1.209	***	0.208	0.033	1.231	***
Age Squared	-0.002	0.000	0.998	***	-0.002	0.000	0.998	***
Black	-0.049	0.083	0.952		0.178	0.091	1.195	*
Latinx	-0.091	0.076	0.913		-0.025	0.079	0.975	
Other	-0.247	0.206	0.781		-0.823	0.232	0.439	***
School Characteristics								
Charter	0.206	0.210	1.229		0.367	0.119	1.443	**
School Size (100s)	0.009	0.009	1.009		-0.012	0.004	0.989	**
% Eco Dis	0.003	0.001	1.003	*	0.005	0.001	1.005	***
% Special Educ	-0.004	0.005	0.996		-0.003	0.003	0.997	
% Tchrs: Female	0.017	0.003	1.017	***	0.012	0.002	1.012	***
Female Supt	0.146	0.070	1.157	*	0.197	0.071	1.218	**
Locale								
Large Suburban	0.017	0.090	1.017		-0.091	0.097	0.913	
Mid-Size/Small City	-0.162	0.096	0.850	^	-0.188	0.101	0.829	^
Mid-Size/Small Suburban	-0.307	0.095	0.735	**	-0.534	0.100	0.586	***
Town	-0.558	0.101	0.572	***	-0.891	0.101	0.410	***
Rural (Inside MSA)	-0.543	0.124	0.581	***	-0.908	0.120	0.403	***
Rural (Outside MSA)	-0.883	0.125	0.414	***	-1.126	0.108	0.324	***
Year								
1991	0.045	0.235	1.046		-0.345	0.284	0.708	
1992	0.149	0.230	1.160		0.056	0.272	1.058	
1993	0.106	0.228	1.112		-0.461	0.281	0.631	
1994	0.340	0.221	1.405		-0.093	0.269	0.911	
1995	0.179	0.226	1.196		-0.026	0.268	0.974	
1996	0.201	0.222	1.223		0.185	0.256	1.203	
1997	0.314	0.220	1.369		0.182	0.255	1.200	
1998	0.544	0.219	1.722	*	0.301	0.253	1.351	
1999	0.500	0.217	1.649	*	0.465	0.251	1.592	
2000	0.404	0.221	1.497		0.136	0.254	1.145	
2001	0.612	0.214	1.845	**	0.165	0.249	1.180	
2002	0.447	0.218	1.563	*	0.333	0.251	1.395	
2003	0.636	0.213	1.890	**	0.356	0.249	1.427	
2004	0.511	0.217	1.667	*	0.440	0.249	1.552	^
2005	0.675	0.214	1.964	**	0.231	0.251	1.260	
2006	0.491	0.215	1.634	*	0.387	0.249	1.472	
2007	0.767	0.212	2.153	***	0.313	0.248	1.367	
2008	0.592	0.213	1.808	**	0.263	0.247	1.300	
2009	0.629	0.212	1.876	**	0.484	0.245	1.623	*
2010	0.761	0.219	2.141	**	0.469	0.252	1.598	^
2011	0.719	0.215	2.053	**	0.572	0.249	1.772	*
2012	0.807	0.216	2.240	***	0.636	0.249	1.890	*
Constant	-6.671	0.798	0.001	***	-6.486	0.817	0.002	***

Note. $p < 0.10$; * $p < 0.05$; ** $p < 0.01$; $p < 0.001$

with a woman superintendent were statistically significantly associated with greater odds of hiring a woman principal. This finding may indicate that representative bureaucracy accurately predicts a woman superintendent will result in women applicants accruing a benefit—namely, being hired as a principal. On the other hand, the presence of a women superintendent may be a proxy for the overall community views on gender and leadership.

With respect to geographic locale, our omitted group of schools was schools located in large city communities. Thus, the results for the other six locales are in reference to this omitted group of schools. We chose to employ schools in this locale as the reference group because this set of schools often had the greatest percentage of newly hired principals who were women (see Figures 3 and 4) and had the most proportionate ratio of women principals to women teachers of the seven locales (see Appendix Figures A-1 and A-2).

There were no statistically significant results for large suburban schools at either school level. We expected this result given the similarities in the percentage of women hired as principals in large city and suburban locales in the above descriptive analyses. Schools located in mid-size or small cities had statistically significantly lower odds of hiring a woman as a principal. This result, however, was only statistically significant at the $p < 0.10$ level, thus the result is not particularly strong and should be interpreted with great caution.

The remaining four locales—mid-size/small suburbs, town, rural inside an MSA, and rural outside an MSA—all had statistically significant results at both the middle- and high-school levels. In all cases, these locales had lower odds of hiring a woman principal relative to schools in large city locales. With respect to the focus of this study, both sets of rural schools had substantially lower odds of hiring a woman principal than schools in large city locales. Moreover, rural schools located outside MSAs had the smallest point estimates of all locales. While we did not specifically test whether secondary schools located in rural areas outside MSAs had the lowest odds of hiring a woman principal, our findings do suggest this as a distinct possibility. Further research should be directed at determining the degree to which this possibility might be accurate.

Conclusion and Discussion

In this study, we have employed descriptive and multivariate statistical techniques to examine the employment and hiring of women principals in Texas public schools from 1990 through 2012 across geographic locales for both middle and high schools. Importantly, we found the percentage of women principals increased steadily over the 23 years for both middle and high schools across all geographic locales. Despite this progress toward more proportionate employment of women principals relative to the employment of women teachers, the majority of middle school principals were women in schools in only three locales (large cities, mid-size cities, and large suburbs), and at the high school level, women were not the majority of principals in any of the geographic locales.

On a more positive note, our data on newly hired principals reveal relatively substantial progress in the hiring of women principals in both middle and high schools across the 23 years for all locales. Indeed, at the middle school level, there were double-digit increases in the percentage of women principals across all seven locales. With respect to rural locales, schools in rural communities within MSAs had the greatest percentage point increase while schools in rural areas outside MSAs had the fourth-greatest percentage point increase.

At the high school level, all but the large city and rural-inside MSAs locales evidenced double-digit percentage point increases in the percentage of newly hired principals who were women. With respect to the two types of rural schools in our study, schools in rural communities outside MSAs had the second-greatest percentage point increase of all seven locales while schools in rural areas inside MSAs had the second-lowest percentage point increase.

Our statistical analysis of newly hired principals that controlled for the personal characteristics of principals, school characteristics, gender of the superintendent, and school year, revealed that middle and high schools in both rural locales had statistically significantly lower odds of hiring a woman principal relative to schools in large city communities. Indeed, relative to schools in large city locales, schools in rural locales outside MSAs had the lowest odds of hiring a woman principal.

These findings are important in three ways. First, from moral, ethical, and legal perspectives, women should have an equal opportunity to seek and obtain employment in particular positions, including school leadership. This is particularly true given that women are the majority of teachers in both middle and high schools for all seven locales in Texas. Indeed, we would expect the percentage of women principals to at least be equal to, if not greater than, the percentage of men principals, and we would hope that the percentage of women principals would be roughly equal to the percentage of women teachers employed in schools. Unfortunately, we have simply not yet arrived at that point in the field of educational leadership for any of the seven locales or for schools across the state.

Second, the actions of district leaders symbolically communicate to faculty, students, and members of the larger community about the acceptable norms and values of the district. When district leaders systematically select men rather than women for leadership positions, the district leaders are communicating that men are more qualified to fill leadership positions than women. This is certainly not the message of equality and acceptance we would hope school districts are communicating in the 21st century.

Third, extant research suggests women principals are more likely to employ leadership styles and enact leadership behaviors that are associated with more positive schooling outcomes. While we do not know the quality of individual applicants for rural principal positions, research would suggest that rural schools could potentially increase the quality of school leadership by hiring women applicants to a greater degree than is currently the case.

Within these broad findings was an additional important finding related to the gender of the superintendent and the odds that a woman was hired to fill an open principal position. After controlling for a host of other factors, schools in districts that employed a woman superintendent had statistically significantly greater odds of hiring a woman as a principal relative to schools in districts with a male superintendent.

Unfortunately, as noted above, we do not know why women are less likely to be employed as principals and less likely to be hired for vacant principal positions in rural schools. Our review of the literature suggests several different potential underlying barriers to entry that include issues related to recruitment and supply, both of which are impacted by discrimination and bias within the field of education and in society in general. Rather than speculate about the degree to which district leaders and school board members hold more traditional androcentric views of leadership and possess explicit and implicit biases against women educators as appropriate for leadership positions, we strongly encourage others to embark on qualitative studies that investigate this issue.

References

Arnold, M. L., Newman, J. H., Gaddy, B. B., & Dean, C. B. (2005). A look at the condition of rural education research: Setting a direction for future research. *Journal of research in Rural Education*, *20*(6), 1-25. Retrieved from http://jrre.vmhost.psu.edu/wp-content/uploads/2014/02/20-6.pdf

Banaji, M. R., & Greenwald, A. G. (2013). *Blindspot: Hidden biases in good people*. New York, NY: Delacorte Press.

Beesley, A. D., & Clark, T. F. (2015). How rural and nonrural principals differ in high plains U.S. states. *Peabody Journal of Education*, *90*, 242-249. doi:10.1080/0161956X.2015.1022114

Black, W., Bathon, J., & Poindexter, B. (2007). *Looking in the mirror to improve practice: A study of administrative licensure and master's degree programs in the state of Indiana.* Bloomington: Indiana Department of Education.

Browne-Ferrigno, T., & Allen, L. W. (2006). Preparing principals for high-need rural schools: A central office perspective about collaborative efforts to transform school leadership. *Journal of Research in Rural Education*, *21*(1), 1-16. Retrieved from http://jrre.vmhost.psu.edu/wp-content/uploads/2014/02/21-1.pdf

Chamorro-Premuzic, T. (2013). Why do so many incompetent men become leaders? *Harvard Business Review*. Retrieved from https://hbr.org/2013/08/why-do-so-many-incompetent-men

Chance, E. W., & Lingren, C. (1988). The South Dakota rural principal: Characteristics and leadership style. *Journal of Research in Rural Education*, *5*, 23-25. Retrieved from http://jrre.vmhost.psu.edu/wp-content/uploads/2014/02/5-1_4.pdf

Chase, S. E., & Bell, C. S. (1990). Ideology, discourse, and gender: How gatekeepers talk about women school superintendents. *Social Problems*, *37*, 163-177. doi:10.2307/800646

Coladarci, T. (2007). Improving the yield of rural education research: An editor's swan song. *Journal of Research in Rural Education*, *22*(3). Retrieved from http://jrre.vmhost.psu.edu/wp-content/uploads/2014/02/22-3.pdf

Crites, S. N., Dickson, K. E., & Lorenz, A. (2015). Nurturing gender stereotypes in the face of experience: A study of leader gender, leadership style, and satisfaction. *Journal of Organizational Culture, Communications, and Conflict*, *19*(1), 1-23.

Dasgupta, N., & Asgari, S. (2004). Seeing is believing: Exposure to counterstereotypic women leaders and its effect on the malleability of automatic gender stereotyping. *Journal of Experimental Social Psychology*, *40*, 642-658. doi:10.1016/j.jesp.2004.02.003

DeAngelis, K. J., & O'Connor, N. K. (2012). Examining the pipeline into educational administration an analysis of applications and job offers. *Educational Administration Quarterly*, *48*, 468-505. doi:10.1177/0013161X11436269

Duncan, H. E., & Stock, M. J. (2010). Mentoring and coaching rural school leaders: What do they need? *Mentoring & Tutoring: Partnership in Learning*, *18*, 293-311. doi:10.1080/13611267.2010.492947

Eagly, A. H., & Carli, L. L. (2003). The female leadership advantage: An evaluation of the evidence. *Leadership Quarterly*, *14*, 807-834. doi:10.1016/j.leaqua.2003.09.004

Eagly, A. H., Karau, S. J., & Johnson, B. T. (1992). Gender and leadership style among school principals: A meta-analysis. *Educational Administration Quarterly*, *28*, 76-102. doi:10.1177/0013161X92028001004

Fuller, E. J., & Hollingworth, L. (2016). Evaluating principal-preparation programs based on placement rates: Problems and prospects for policymakers. *Journal of Research on Leadership Education*, *11*, 237-271. doi:10.1177/1942775114559029

Fuller, E. J., Hollingworth, L., & An, B. P. (2016). The impact of personal and program characteristics on the placement of school leadership preparation program graduates in school leader positions. *Educational Administration Quarterly*, *52*, 643-674. doi:10.1177/0013161X16656039

Fuller, E. J., Reynolds, A., O'Doherty, A. (2016). Recruitment, selection, and placement of educational leadership students. In M. D. Young & G. Crow (Eds.), *Handbook of research on the education of school leaders* (2nd ed., pp. 77-117). New York, NY: Routledge.

Gates, S., Ringel, J., Santibanez, L., Ross, K., & Chung, C. (2003). *Who is leading our schools? An overview of school administrators and their careers.* Santa Monica, CA: Rand Education.

Giberson, T. R., Resick, C. J., & Dickson, M. W. (2005). Embedding leader characteristics: An examination of homogeneity of personality and values in organizations. *Journal of Applied Psychology*, *90*, 1002-1010. doi:10.1037/0021-9010.90.5.1002

Gipson, A. N., Pfaff, D. L., Mendelsohn, D. B., Catenacci, L. T., & Burke, W. W. (2017). Women and leadership: Selection, development, leadership style, and performance. *Journal of Applied Behavioral Science*, *53*, 32-65. doi:10.1177/0021886316687247

Goldring, R., Gray, L., & Bitterman, A. (2013). *Characteristics of public and private elementary and secondary school teachers in the United States: Results from the 2011-12 schools and staffing survey: First look*. Retrieved from National Center for Education Statistics, U.S. Department of Education website:

https://nces.ed.gov/pubs2013/2013314.pdf

Grissom, J. A., & Keiser, L. R. (2011). A supervisor like me: Race, representation, and the satisfaction and turnover decisions of public sector employees. *Journal of Policy Analysis and Management*, *30*, 557-580. doi:10.1002/pam.20579

Grogan, M., & Andrews, R. (2002). Defining preparation and professional development for the future. *Educational Administration Quarterly*, *38*, 233-256. doi:10.1177/0013161X02382007

Gross, B., & Pochop, K. (2007). *Leadership to date, leadership tomorrow: A review of data on charter school directors* (NCSRP Working Paper No. 2007-2). Retrieved from Center on Reinventing Public Education website: https://www.crpe.org/publications/leadership-date-leadership-tomorrow-review-data-charter-school-directors

Hallinger, P., Dongyu, L., & Wang, W. C. (2016). Gender differences in instructional leadership: A meta-analytic review of studies using the principal instructional management rating scale. *Educational Administration Quarterly*, *52*, 567-601. doi:10.1177/0013161X16638430

Hess, F. M. (2002). *School boards at the dawn of the 21st century: Conditions and challenges of district governance*. Washington, DC: American Enterprise Institute.

Hewlett, S. A., Peraino, K., Sherbin, L., & Sumberg, K. (2010). *The sponsor effect: Breaking through the last glass ceiling*. Boston, MA: Harvard Business Review.

Hill, C., Miller, K., Benson, K., & Handley, G. (2016). *Barriers and bias: The status of women in leadership*. Washington, DC: American Association of University Women.

Hollingworth, L., & Dude, D. (2009). Race, gender, and school leadership in a state with shifting student demographics. *Journal of Women in Educational Leadership*, *7*, 175-194.

Howley, A., Andrianaivo, S., & Perry, J. (2005). The pain outweighs the gain: Why teachers don't want to become principals. *Teachers College Record*, *107*, 757-782.

Howley, A., & Pendarvis, E. (2002). *Recruiting and retaining rural school administrators: ERIC digest*. Retrieved from http://files.eric.ed.gov/fulltext/ED470950.pdf

Hoyt, C. L., & Simon, S. (2011). Female leaders: Injurious or inspiring role models for women? *Psychology of Women Quarterly*, *35*, 143-157. doi:10.1177/0361684310385216

Hudson, M. J. (1991). *How educators get top jobs: Understanding race and sex differences in the old boy network*. Lanham, MD: University Press of America.

Ingle, K., Rutledge, S., & Bishop, J. (2011). Context matters: Principals' sensemaking of teacher hiring and on-the-job performance. *Journal of Educational Administration*, *49*, 579-610. doi:10.1108/09578231111159557

Jackson, D., Engstrom, E., & Emmers-Sommer, T. (2007). Think leader, think male and female: Sex vs. seating arrangement as leadership cues. *Sex Roles*, *57*, 713-723. doi:10.1007/s11199-007-9289-y

Joy, L. (1998). Why are women underrepresented in public school administration? An empirical test of promotion discrimination. *Economics of Education Review*, *17*, 193-204. doi:10.1016/S0272-7757(97)00021-6

Koenig, A. M., Eagly, A. H., Mitchell, A. A., & Ristikari, T. (2011). Are leader stereotypes masculine? A meta-analysis of three research paradigms. *Psychological Bulletin*, *137*, 616-642. doi:10.1037/a0023557

Kraft, M. A., & Gilmour, A. F. (2016). Can principals promote teacher development as evaluators? A case study of principals' views and experiences. *Educational Administration Quarterly*, *52*, 711-753. doi:10.1177/0013161X16653445

Kruse, R. A., & Krumm, B. L. (2016). Becoming a principal: Access factors for females. *Rural Educator*, *37*(2).

Lankford, R. H., O'Connell, R. W., & Wyckoff, J. H. (2003). *Our next generation: School leadership in New York state*. Albany: New York State Education Department.

Myung, J., Loeb, S., & Horng, E. (2011). Tapping the principal pipeline identifying talent for future school leadership in the absence of formal succession management programs. *Educational Administration Quarterly*, *47*, 695-727. doi:10.1177/0013161X11406112

Neumerski, C. M. (2013). Rethinking instructional leadership, a review what do we know about principal, teacher, and coach instructional leadership, and where should we go from here? *Educational Administration Quarterly*, *49*, 310-347. doi:10.1177/0013161X12456700

Ni, Y., Sun, M., & Rorrer, A. (2015). Principal turnover: Upheaval and uncertainty in charter schools? *Educational Administration Quarterly*, *51*, 409-437. doi:10.1177/0013161X14539808

Ortiz, F. I. (1982). *Career patterns in education: Women, men, and minorities in public school administration.* New York, NY: Praeger.

Ortiz, F. I., & Marshall, C. (1988). Women in educational administration. In N. J. Boyan (Ed.), *Handbook of research on educational administration* (pp. 123–141). White Plains, NY: Longman.

Pajares, F., & Schunk, D. H. (2001). Self-beliefs and school success: Self-efficacy, self-concept, and school achievement. In R. Riding & S. Rayner (Eds.), *Self-perception* (pp. 239-266). Westport, CT: Ablex.

Pounder, D. G., Galvin, P., & Shepherd, P. (2003). An analysis of the United States educational administrator shortage. *Australian Journal of Education*, *47*, 133-145. doi:10.1177/000494410304700203

Pounder, D. G., & Merrill, R. J. (2001). Job desirability of the high school principalship: A job choice theory perspective. *Educational Administration Quarterly, 37*, 27-57. doi:10.1177/0013161X01371003

Riehl, C., & Byrd, M. A. (1997). Gender differences among new recruits to school administration: Cautionary footnotes to an optimistic tale. *Educational Evaluation and Policy Analysis*, *19*, 45-64. doi:10.3102/01623737019001045

Rios, D., Stewart, A. J., & Winter, D. G. (2010). "Thinking she could be the next president": Why identifying with the curriculum matters. *Psychology of Women Quarterly*, *34*, 328-338. doi:10.1111/j.1471-6402.2010.01578.x

Ryan, M. K., Haslam, S. A., Morgenroth, T., Rink, F., Stoker, J., & Peters, K. (2016). Getting on top of the glass cliff: Reviewing a decade of evidence, explanations, and impact. *Leadership Quarterly*, *27*, 446-455. doi:10.1016/j.leaqua.2015.10.008

Shakeshaft, C. (1989). *Women in educational administration*. Newbury Park, CA: Sage.

Shakeshaft, C. (1999). A decade half full or a decade half empty: Thoughts from a tired reformer. In J. Murphy & P. Forsyth (Eds.), *Educational administration: A decade of reform* (pp. 237-250). Thousand Oaks, CA: Corwin.

Sherman, A. (2000). Women managing/managing women: The marginalization of female leadership in rural school settings. *Educational Management & Administration*, *28*, 133-143. doi:10.1177/0263211X000282003

Stage, F. K. (2007). Answering critical questions using quantitative data. *New Directions for Institutional Research*, *2007*(133), 5-16. doi:10.1002/ir.200

Tallerico, M., & Burstyn, J. N. (1996). Retaining women in the superintendency: The location matters. *Educational Administration Quarterly*, *32*, 642-664. doi:10.1177/0013161X960321004

Urick, A., & Bowers, A. J. (2014). What are the different types of principals across the United States? A latent class analysis of principal perception of leadership. *Educational Administration Quarterly*, *50*, 96-134. doi:10.1177/0013161X13489019

Voyer, D., & Voyer, S. D. (2014). Gender differences in scholastic achievement: A meta-analysis. *Psychological Bulletin*, *140*, 1174-1204. doi:10.1037/a0036620

Wallace, T. (2015). Increasing the Proportion of Female Superintendents in the 21st Century. *Advancing Women in Leadership*, *35*, 42-47.

Whitmire, R., & Bailey, S. M. (2010). Gender gap. *Education Next*, *10*(2).

Wigfield, A., Eccles, J. S., & Pintrich, P. R. (1996). Development between the ages of 11 and 25. In D. C. Berliner & R. C. Calfee (Eds.), *Handbook of educational psychology* (pp. 148-85). New York, NY: Macmillan.

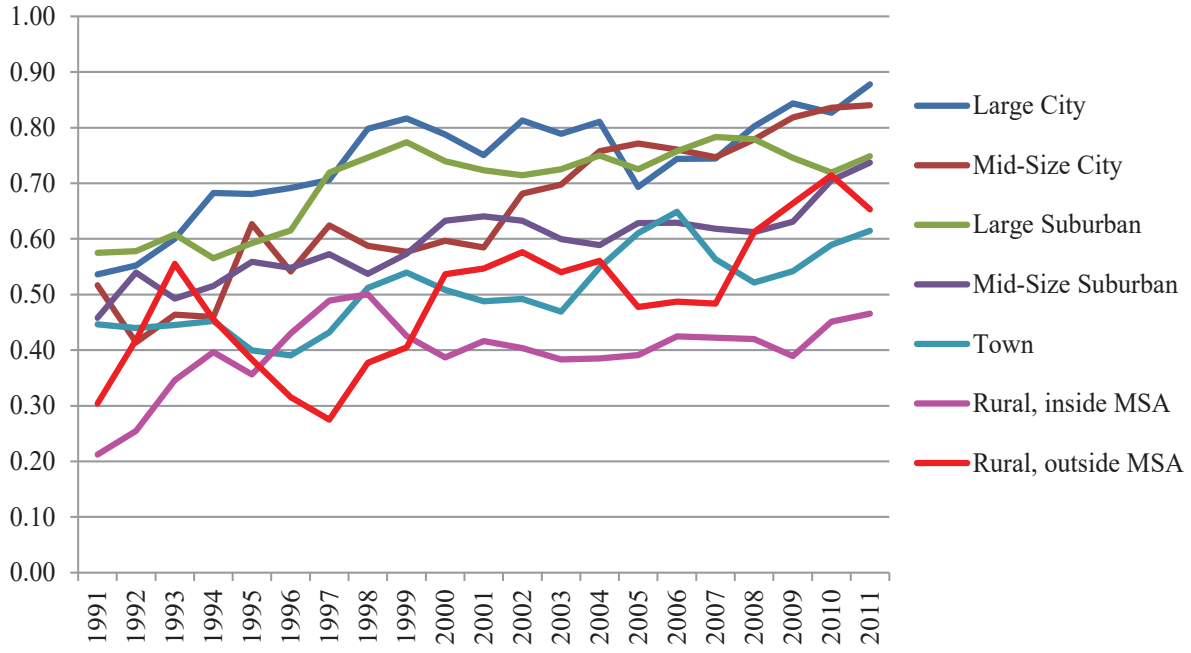
Young, M. D., & McLeod, S. (2001). Flukes, opportunities, and planned interventions: Factors affecting women's decisions to become school administrators. *Educational Administration Quarterly*, *37*, 462-502. doi:10.1177/0013161X01374003

Appendix Table A-1
Percentage of Cases with Missing Data

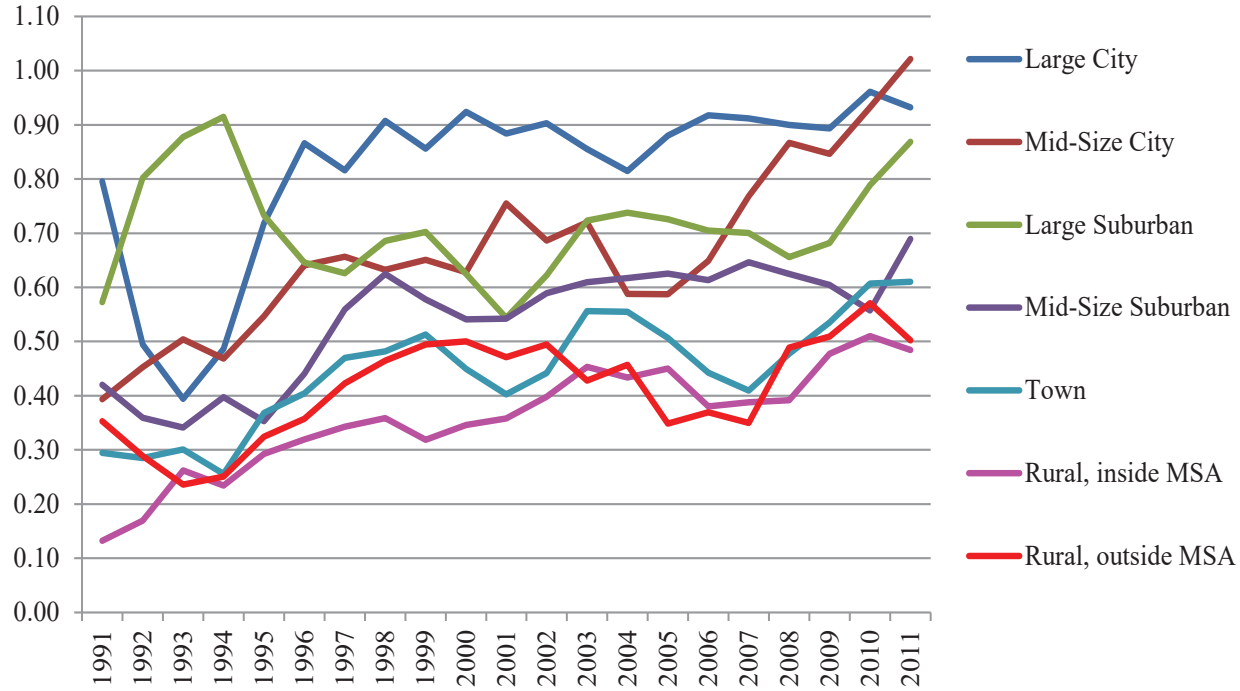
Year	All Principals			Newly Hired Principals		
	Characteristics		Total	Characteristics		Total
	Personal	School	Cases	Personal	School	Cases
1990	1.5	0.6	1.3	0.0	0.0	0.0
1991	1.1	0.8	1.4	0.0	0.0	0.0
1992	1.0	0.9	1.3	0.0	0.0	0.0
1993	0.7	0.7	1.1	0.0	0.0	0.0
1994	0.5	0.7	1.0	0.0	0.0	0.0
1995	0.4	0.7	1.0	0.0	0.0	0.0
1996	0.3	0.8	1.0	0.0	0.0	0.0
1997	0.3	0.8	1.0	0.0	0.0	0.0
1998	0.5	0.9	1.2	0.0	0.0	0.0
1999	0.8	1.1	1.7	0.0	0.0	0.0
2000	1.4	1.0	2.0	0.0	0.0	0.0
2001	1.7	1.1	2.4	0.0	0.0	0.0
2002	1.3	1.0	2.0	0.0	0.0	0.0
2003	1.0	1.0	1.8	0.0	0.0	0.0
2004	0.8	1.2	1.9	0.0	0.0	0.0
2005	0.8	1.2	2.0	0.0	0.0	0.0
2006	0.8	1.1	1.7	0.0	0.0	0.0
2007	0.8	1.0	1.8	0.0	0.0	0.0
2008	1.1	1.1	2.0	0.0	0.0	0.0
2009	1.1	1.0	2.0	0.0	0.0	0.0
2010	1.1	1.3	2.4	0.0	0.0	0.0
2011	1.5	1.3	2.4	0.0	0.0	0.0
2012	1.0	1.1	1.8	0.0	0.0	0.0

Appendix Table A-2
Means and Standard Deviations

Variable Name	Middle Schools		High Schools	
	Mean	Std. Dev.	Mean	Std. Dev.
Dependent Variable				
Principal is female	0.432		0.317	
Personal Characteristics				
Principal Age	45.1	7.7	46.4	8.0
Principal is Black	0.121		0.093	
Principal is Latinx	0.192		0.166	
Principal is Other Race/Ethnicity	0.016		0.017	
School Characteristics				
Charter School	0.018		0.059	
School Size (in 100s of students)	6.16	3.59	7.79	8.48
% students: eco disadvantaged	52.4	25.8	44.5	25.3
% students: Special education	13.0	6.1	13.0	9.4
% teachers: women	70.0	11.0	55.6	13.2
Superintendent Gender				
Woman Superintendent	0.149		0.152	
Geographic Locale				
Large City	0.148		0.147	
Large Suburban	0.211		0.138	
Mid-Size/Small City	0.124		0.098	
Mid-Size/Small Suburb	0.160		0.136	
Town	0.163		0.172	
Rural (Inside MSA)	0.091		0.108	
Rural (Outside MSA)	0.104		0.200	
Year				
1990	0.022		0.017	
1991	0.030		0.030	
1992	0.033		0.030	
1993	0.035		0.034	
1994	0.039		0.034	
1995	0.037		0.035	
1996	0.040		0.040	
1997	0.042		0.042	
1998	0.043		0.044	
1999	0.045		0.043	
2000	0.040		0.044	
2001	0.050		0.052	
2002	0.044		0.047	
2003	0.050		0.049	
2004	0.045		0.048	
2005	0.051		0.049	
2006	0.049		0.049	
2007	0.055		0.052	
2008	0.052		0.056	
2009	0.054		0.058	
2010	0.047		0.048	
2011	0.050		0.049	
2012	0.049		0.049	



Appendix Figure A-1. Ratio of the percentage of women teachers to the percentage of newly hired women principals for middle schools by geographic locale (1991-2011).



Appendix Figure A-2. Ratio of the percentage of women teachers to the percentage of newly hired women principals for high schools by geographic locale (1991-2011).