PATTERNS AND PREDICTORS OF EMERGING SCHOOL LEADERS: AN EXAMINATION OF FACTORS IMPACTING INITIAL PRINCIPALSHIP JOB ATTAINMENT

by

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DEDICATION

Dedicated to my wife, Sarah, who is a source of motivation and support. She is an inspirational educator, researcher, wife, and mother.

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My dissertation experience has been challenging. During particularly difficult times, I would reflect on all of those individuals who have prepared me for the difficult work I was undertaking. Without those family and friends, this would not have been possible.

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LIST OF ABBREVIATIONS

Abbreviation **Description**

ACP .....Alternative Certification Programs

AEE .....Alliance for Excellent Education

CASA ..... Committee for the Advancement of School Administration

CR ..... Critical Realism

ERC .....Educational Research Center

ESL ..... English as Second Language

ESSA ..... Every Student Succeeds Act

KM ..... Kaplan-Meier

NCLB ..... No Child Left Behind

NEA ..... National Education Association

OOS ..... Out of State

OYC ..... One Year Certification

PH ..... Proportion Hazard

RTT ..... Race to the Top

SLDS ..... State Longitudinal Data System

SLPP ..... School Leader Preparation Program

SPSS ..... Statistical Package for the Social Sciences

TEA ..... Texas Education Agency

UCEA ..... University Council for Educational Administration

ABSTRACT

Schools in Texas continue to welcome an increasingly diverse student population. The composition of school leaders remains less diverse, shifting at a slower pace than student populations. This exploratory investigation examines a number of personal and situational factors that serve to influence the time it takes individuals to reach the position of school principal. Leveraging the Texas Education Research Center's (ERC) State Longitudinal Data System (SLDS), student and school level data (linked hierarchically) was used to examine the career trajectories of educators who received principal certification continuing until either (a) the attainment of principal status or (b) the end of the data collection period was reached. To answer the research questions, a discrete-time survival analysis was used to examine the association of personal and situational factors (predictor/explanatory variables) on the time spanning from certification to attainment of principal status (outcome variable). Predictor/explanatory variables in the survival analysis included gender, race, age, years of teaching experience, and type of School Leader Preparation Program (SLPP).

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I. INTRODUCTION

Background to the Study

The population of the United States continues to become more diverse and will continue to get incrementally more diverse for the foreseeable future (Colby & Ortman, 2015). A report by the U.S. Census Bureau (2015) showed that the estimated population of individuals living in the U.S was 319 million; among them, 62.2% were non-Hispanic Whites, 17.4% Hispanic or Latino, 13.2% Black, 5.4% Asian, and 1.4% American Indian or Pacific Islander. The demographic group projected to increase the most over the next 50 years is Hispanic (Colby & Ortman, 2015), with the increased growth to be most significant in the American south, particularly in border states including the state with largest shared border with Mexico, Texas. In the next 10 years, the population of Hispanics is expected to surpass Whites as the largest ethnic group in the state of Texas (Potter & Hoque, 2014). As of 2015, the estimated population of Texas was nearly 28 million people: 42.6% non-Hispanic White, 39.1% Hispanic, 12.6 % non-Hispanic Black, 4.8% Asian, and 1.1% American Indian or Pacific Islander (U.S. Census Bureau, 2016). These changes have led to a call for an examination of how these changes will affect all sectors of life, including education.

The terms Hispanic and Latino are used to broadly identify individuals "of Cuban, Mexican, Puerto Rican, South or Central American, or other Spanish culture or origin regardless of race" (United States Census Bureau, 2010). It is important to note that while all other categories are considered a race, the Hispanic or Latino designation is an ethnicity, and the population of individuals with that designation may be classified as any of the other race designations depending on their lineage (U.S. Census Bureau, 2012).

From this point forward, the term Hispanic will be used to refer to this category of individuals.

As the general population grows increasingly more diverse, schools also reflect these changing demographics in the students they serve (Bryant, Triplett, Watson & Lewis, 2017). With its increasing Hispanic population, Texas in particular is faced with a population of students that is ethnically and racially different than the population of teachers and administrators providing educational services. In the 2016-2017 school year, the PreK-12 student population was 5,359,127 students: 28.1% non-Hispanic White, 52.4% Hispanic, 12.6% non-Hispanic Black, 4.2% Asian, and 2.7% American Indian, Pacific Islander, or students who were considered two or more races (Texas Education Agency, 2017). In the same school year, there was a teacher population of 352,616 teachers: 60.1% non-Hispanic White, 25.9% Hispanic, 10.0% non-Hispanic Black, 1.5% Asian, and 2.8% American Indian, Pacific Islander, or students who were considered two or more races (Texas Education Reports, 2017).

There are some fairly obvious discrepancies between the teacher and the student populations in the state of Texas P-12 public schools, the most obvious being gender in which the student population trends slightly more male (51%) than female (49%) (Texas Education Agency, 2017); yet, the teaching population is nearly three female teachers (76.4%) to every male teacher (23.5%) (Texas Education Agency, 2017). There are also a number of differences in the ethnic/racial breakdown between teachers and students. Although this includes a very low number of teachers of Asian descent (1.5%) compared to a slightly larger student population of students identified as Asian (4.2%), the largest racial or ethnic difference between student and teacher populations can be seen in the

Hispanic and White populations. Of students who attend Texas public schools, 52.4% identify as Hispanic, but the population of Hispanic teachers is much smaller, making up just over a quarter of the total teacher population (25.9%). Students identified as White make up the second largest population of students in Texas schools (28.1%) but are taught by a teacher population that is majority White (60.9%). These population discrepancies are just some of the reasons there has been an increase in research examining the relationships between race/ethnicity and student achievement, particularly when student performance is disaggregated by racial and ethnic, gender, or geographic considerations (Hart, Schalloil & Stoelinga, 2008; Perilla, 2014; Zoda, Slate, & Combs, 2011).

Given the discrepancies in student and teacher populations, it is important to consider if similar differences in the campus leadership population exist and what those differences may mean for student achievement. For the purposes of this introduction, principal and assistant principal populations are combined and referred to as "school leaders," but later descriptions will separate the two populations into their Texas Education Agency (TEA) designated categories. In the 2015-2016 school year, the school leader population consisted of 19,359 individuals: 56.5% non-Hispanic White, 26.0% Hispanic, 15.0% non-Hispanic Black, 0.8% Asian, and 1.8% American Indian, Pacific Islander, or individuals who identified as two or more races (Texas Education Reports, 2017). The gender population of administrators was just under two-thirds women (63.5%) versus one-third men (36.5%). A quick examination of the descriptive statistics indicates that, while the student population is majority Hispanic, the teacher and school leader populations remain largely female and white.

Further examination reveals that although men only compose 23.6% of the teacher population, they comprise a larger portion (36.5%) of the school leader population (Texas Education Reports, 2017). Black individuals represent a greater percentage of school leaders (15%) than Black teachers (10.0%), more closely matching the population of Black students currently in Texas schools (12.6%). Conversely, the percentages of Hispanic teachers (25.9%) and school leaders (26.0%) are nearly identical, but in both cases are approximately half the size proportionally compared to Hispanic students (52.4%).

Statement of the Problem

Schools in the United States have traditionally employed teachers and administrators who have been White (Rousmaniere, 2013). In the eighteenth and nineteenth century, schoolhouses were staffed by a population of primarily White male teachers. Over time, in an effort to reduce the cost of schooling, male teachers were replaced by female teachers, most of whom were both single and White (Galman, 2012). Female teachers could be paid less and there was a growing population of women entering the workforce, which also helped keep salary costs low. The advent of the Common School movement in the mid-nineteenth century, along with school consolidation at the turn of the twentieth century, resulted in larger schools and newly formed "districts" that both required oversight and management. This need was filled by the creation of the role of school administrator. Principals served as the administrators in individual schools, while district-level administrators were called superintendents. These positions were almost exclusively filled by White men, many whom had previous experience as teachers, although that was not always the case (Rousmaniere, 2013).

Initially the population of students attending public schools was comprised of significantly more White students than the current population. As the United States became the cultural "melting pot," as it is often labeled today, more students from diverse cultural and racial backgrounds began to need schooling. In some places, students were integrated into existing schooling environments; in others, separate, racially specific schools were established to keep racially disparate students separate from one another.

Prior to Brown v. Board of Education (1954), many students, particularly in the southern United States, were taught in racially segregated schools. Texas was no exception, with students in many communities attending schools according to their racial designation: Mexican Schools for the students of Hispanic origin, and Black schools for African American students (Spring, 2016). Although these schools often fell under the supervision of local school districts and their typically White school boards and superintendents, they often had a teaching and campus leadership team that was representative of the student population (Ruiz, 2001). There is little doubt these schools were under-resourced when compared with the same district schools serving primarily White students, but there is conflicting evidence as to the academic success students in these schools achieved (Ruiz, 2001; Walker, 1996). Non-white children attending schools staffed by non-white teachers and administrators were educated by adults who were more connected to the community and were more likely to have an interest in seeing students succeed (Ullucci & Battey, 2011).

Desegregation did not instantly happen following the Brown v. Board decision, especially in southern states like Texas where it took more than 10 years to achieve near full integration of public schools (Schott & Marcus, 1982). Some have argued that,

although the financial resources dedicated to minority student populations increased, the loss of educators who were representative of the community of students being served negatively impacted student achievement (Walker, 1996) as most of these students were now being forced to "endure the hostility of not only White teachers, but students as well" (Tillman, 2004, p. 290). As school districts began desegregating, most teachers and administrators working in the Mexican and Black schools, a majority of whom were Black or Hispanic themselves, lost their jobs (Ruiz, 2001; Tillman, 2004; Walker, 1999).

As non-White students began receiving more of the same school-based educational opportunities as their White peers, they did not experience the same levels of academic achievement as measured by standardized tests. The 1983 *A Nation at Risk* report that was commissioned by the Department of Education during the Reagan administration, the *No Child Left Behind (NCLB)* act of 2001 of the Bush administration, and the Obama era *Every Student Succeeds Act* of 2015 have all identified persistent achievement gaps among racial/ethnic minority[1] students and students who come from homes with less financial means, and posed them as a dangerous problem. Although there have been frequent efforts on both national and state levels to address the achievement gap between minority students and their White peers, there remains a substantial statistical gap in achievement (Crawford & Fuller, 2017; Zoda et al., 2011).

Research suggests school leaders can positively impact student achievement as well as improve overall school effectiveness (Heck & Hallinger, 2009; Marzano, Waters & McNulty, 2005; Sun & Leithwood, 2017). What is less understood is the role a principal's race plays in student achievement, with achievement being narrowly defined

[1] Having used the terms "racial/ethnic minority" and "minority" students, it is important to note those terms will be used interchangeably throughout the rest of this dissertation.

as improved student outcomes on standardized tests scores. Scholars have indicated there are documented educational benefits for students who attend schools with non-White school leadership. In his seminal work, Lomotey (1989) writes how African American principals can demonstrate an understanding of diverse student and community needs. Prior to desegregation, African American principals represented a rare professional class for students who had few professional opportunities available (Walker, 1996). Finally, persons from racial/ethnic minority groups who become school leaders offer the opportunity to bring in new ways of educating students as they are likely to "recogniz[e] the importance of culturally relevant practices" (Murakami, Hernandez, Mendez-Morse, & Byrne-Jimenez, 2016, p. 282). With these strains on the education system, the need for an increasingly diverse educator population, including school leaders who are more representative of the student population, may be a critical factor in addressing the achievement gap (Egalite, Kisida & Winters, 2015).

Purpose

Historically, fewer women and individuals from racial/ethnic minorities have demonstrated an interest in becoming a principal when compared to the teacher population (Rousmaniere, 2006). It may be that institutional obstacles result in selection bias, as women and racially/ethnically diverse persons choose to not pursue the principalship. Recent research has examined how personal variables (i.e. race, gender, and age) and school variables (i.e. rural vs. urban, school size) impact an individual's likelihood of attaining the level of principal (Davis, Gooden & Bowers, 2017). This dissertation study extends that research and considers additional variables (e.g., School Leader Preparation Programs [SLPP], number of attempts at principal certification) to

determine if there are moderating factors that impact attainment of the position of principal.

As the student population in Texas continues to become increasingly diverse, the composition of principals reveals that certain groups may be overrepresented proportionally relative to the size of the teacher and student populations. For example, although Hispanic students now make up the majority of students in Texas schools, Hispanic teacher populations remain below 25% and Hispanic administrators make up an even smaller portion of school leaders. Sanchez, Thornton and Usinger (2008) contend that "effective minority school leaders can greatly impact and contribute to school improvement and successful learning for all students" (p. 1). Staffing shortages have led to an increase in less experienced and nontraditional teachers providing instruction, and many school buildings are stretched beyond intended capacity, not only in terms of actual building size, but also in educators' ability to adequately address unique student needs (Boyd, Grossman, Lankford & Loeb, 2006; Graves, 2010; Sass, 2015).

Epistemological Framework

This study is grounded in the epistemological framework of critical realism. Conceptualized by Roy Bhaskar in the late 1970's, critical realism (CR) accepts that there is an interaction between the empirical world and an individual's constructivist perception about that world (Danermark, Ekstrom & Jakobsen, 2002). CR arose as a critique of positivist approaches commonly used in the social sciences in the middle of the 20th century. Instead of an outright rejection of either realism or anti-realism, CR accepts that there is an "external world independent of human consciousness and at the same time a dimension which includes our socially determined knowledge about reality"

(p. 6). CR recognizes that there is a reality that exists separate from our ability to observe it, but there is also reality that is capable of being observed by our senses, yet it is differentiated based on the influencing mechanisms through which we view these structures. A simplified way of understanding this would be to consider the activity of spear fishing. The first and probably most important lesson of spear fishing is to *aim low* because the refractive properties of water make the location of the fish appear differently than the actual position of the fish. The mechanism through which the spearfishers view the fish (the water) influences how they see the fish. CR presupposes there are innumerable mechanisms which interact and influence how problems are considered, which is why it works so well for education research (Scott, 2005).

If CR is meant to be a bridge between the false dualism of empirical research commonly associated with positivism and the "radical relativism" (Scott, 2005, p. 633) of constructivism. It is important to understand how it addresses the basic suppositions of each, which appear to be diametrically opposed. Scott (2005) writes that

> any attempts at describing and explaining the world are bound to be fallible; also, because the ways of ordering the world, along with its categorizations and the relationships between them, cannot be justified in any absolute sense, they are always open to critique and replacement by a different set of categories and relationships (p. 635).

It is this constant critique or internal conversation that leads the researcher not to Truth, but instead to flawed theories of reality that are constantly improving via the constant critique (Cruickshank, 2003). Archer et al. (2016) write that critical realism is "concerned with the nature of causation, agency, structure and relations and the implicit

and explicit ontologies we operate with" (p. 6). The use of critical realism offers a chance to "advance individual and collective strategies of emancipation" (Modell, 2017, p. 23), which is of interest when studying oppressive social structures.

CR focuses on an intersection of three ontological ideas, "the real, the actual and the empirical" (Bhaskar, 2008, p. 2). The blending of the three ontological ideas is what makes critical realism so unique: the empirical acknowledges there is an observable world (Edgley, Stickley, Timmons & Meal, 2016), the real accepts that there are unknown forces, or "mechanisms" (Bhaskar, 2008, p.2), influencing the observable world, and the actual is situated between the two ontological perspectives, asserting that there is an observable world, but our observation of that world does not account for unseen forces that contribute to its formation and remains informed by our own bias (Bhaskar, 2008).

This study examines the attainment of school principal through the lens of CR. This study will examine the attainment of the principal position for those educators that attended a Texas based principal preparation program, received a principal certification in Texas, and continue to work in Texas schools, meaning that social context for this study is centered in the Texas public education system. School leadership as a profession has origins that predate the establishment of public schools in Texas, yet the political context of school leadership is the product of historical contexts that have been influenced by a local, national, and international understanding of school leadership. Becoming a principal in Texas public schools is the result of both social and political mechanisms, some of which may be observed. CR acknowledges there are also unknown mechanisms that influence the attainment of the position of principal. The

mechanisms that influence the attainment of principal are not and have never been fixed, but have been and will continue to be influenced by generative mechanisms (Cruickshank, 2003).

Looking at the issue of principalship attainment through the lens of CR is notable for a number of reasons. Firstly, the empirical data demonstrates there are discrepancies between the administrator population and teacher and student populations. The empirical data is less clear on the specific reasons that these discrepancies exist. The real lens in critical realism assumes there are unseen forces that are influencing this discrepancy, be they institutional racism, or candidates selectively avoiding administrative positions because of socially constructed factors. The actual view of the situation acknowledges that there are unknown socially constructed forces that exist when principals are chosen. An example of this could be the traits that a society or a community considers to be critical to effective school leadership. Historically, many of the first female school leaders were situated in the elementary or primary school setting because of a socially constructed belief that they were better able to nurture young students when compared to their male counterparts. Similarly, non-white principals were often only given opportunities to work in schools comprised of students from similar racial or cultural backgrounds. A critical realism epistemological framework would suggest that socially constructed perceptions of school leadership contribute to an empirical discrepancy, and to best address the problem is to use all three domains of critical realism simultaneously to create a new lens which to view a problem (Bhaskar, 2008)

By employing a critical realist approach, this study aims to provide an examination of a wide range of social structures, including race, gender, teaching

experience, and SLPP, and how these relate to principal job attainment. As Danermark, et.al (2002) note, these social structures "cannot be regarded as belonging to the natural sphere, since they are social products, and dependent upon human action for their existence" (p. 193). Once these social structures are understood, the emancipatory work of "replacing undesirable social structures with desirable ones" (p. 193) begins.

The factors for this study are constructs of an interaction between existing structures and active agents (Kempster & Parry, 2011). Take, for example, demographic factors such as race and gender; in both cases there are existing structures (or classifications) which have been assigned to individuals over time. Hispanic or Latino are ethnicity designations for individuals who share a cultural heritage originating from many Central and South American countries and Hispaniola. This designation, however, is often confused with racial designations, even though it is possible to be both Hispanic and Black, as well as just Hispanic. This existing designation is the structure Kempster and Parry (2011) describe, but the existing structure is reinforced by the agent's (individual's) use of this designation to broadly describe a group of people, which includes self-identification. Bhaskar (2008) highlights how it is the examination and exploration of a problem that an understanding of the structures can be understood. These existing structures can change as the actors change their interaction with the structure. Previous teaching experience is now a prerequisite to becoming a school leader, and in Texas, so is having a master's degree, but neither was the case in the early days of school leadership. It was only through the agent's (individual's) interactions with the structures of choosing school leaders (school boards) did this change occur, which will be described in greater detail in the coming chapters.

The orientation of schools either geographically or by age of student population is a factor that is able to be measured empirically through designations of urbanicity or school level defined by the Texas Education Agency. Although they appear fixed, they are actually the result of centuries of educational policy action and reaction, and they do not guarantee school similarity, but rather a loosely generalized group. Similarly, the Carnegie rankings of universities providing school leader preparation gives a grouping of institutions that share some similarities, but they are not fixed and are subject to reevaluation every five years. These rankings are also viewed through the lens of what is considered important university priorities, with a stronger emphasis on research the higher up on the designation pyramid. Whether perspectives on research quality and quantity is an important element in educational preparation is not clear; however, what is less in debate is the overall perception that a higher Carnegie designation tends to signal a higher-quality institution, even though effects on a specific program, in this case school leader preparation, are less understood.

In this study, the policies and practices of school leader preparation and principal job attainment will be examined in detail. These policies and practices have been created and refined over time, and although they seem static when considered over recent years, the arch of time shows that they have been developed and sustained by individuals, and will continue to change. Through this discursive process, the mechanism of the existing social structures will be highlighted, and as a result can be employed by those marginalized by the existing structure (Danermark et al., 2002).

Research Questions and Hypotheses

Four research questions will guide this study. Each research question is presented below, along with its hypotheses:

1. How do traditional school-leader preparation programs and personal attributes such as age, gender, and race/ethnicity of aspiring school leaders affect the time it takes for an individual to attain a principal position after receiving their principal certification?

   Directional hypothesis: There is a significantly different direct effect between the more prestigious a SLPP attended and the shorter the time between principal certification and attainment of the job of principal.

2. How do the types and quality of school-leader preparation programs affect the time taken for an individual to become a principal once they receive their principal certification?

   Directional hypothesis: There is a significantly different direct effect between the more prestigious a SLPP attended and the shorter the time between principal certification and attainment of the job of principal.

3. How does the interaction of school-leader preparation programs type and personal attributes such as age, gender, ethnicity of aspiring school leaders affect the time it takes for an individual to attain the position of principal after receiving their principal certification?

Directional hypothesis: The interaction of SLPP type and the aspiring administrators ethnicity/race and gender mitigate the positive effects of attending more prestigious SLPPs for racial/ethnic minorities, women and older students.

4. What factors (or interaction of factors) display the greatest likelihood of attainment of the position of principal?

Directional hypothesis: Emerging school leaders who attended Research level institutions and are male, White, and younger are the population most likely to attain the position of principal in the shortest duration of time.

Methods

This study used utilize discrete-time survival analysis, as it allows for the analysis of longitudinal data specifically targeting time to an event or outcome of interest (Willett & Singer, 1991). The time span beginning from principal certification and terminating in formal employment as a principal was the focal outcome of this study. Survival analysis (encompassing a collection of statistical techniques) is the analytical technique of choice for accurately modeling time to an event occurring for a discrete outcome (e.g., becoming a principal or not) in relation to a desired set of explanatory or predictor variables (Box, et al., 2008; Tabachnick & Fidell, 2013). In this case *failure* or *death* is considered the moment an individual becomes a principal. Those individuals who did not experience a *failure* can still be included in the analysis through a process called censoring (Willett & Singer, 1991). Censoring is important as it allows for "the possibility that the average duration is likely longer than the length of the data collected" (Willett & Singer, 1991, p.

312-313) but does not distort the distribution of the results by removing all data that did not suffer failure.

Much like linear regression, survival analysis can accommodate multiple variables and allows for the use of treatment variables (Box, et al., 2008; Tabachnick & Fidell, 2013). The use of predictors allows for examination of variations in duration within the designated groupings in what are called survivor plots. The significant number of possible survivor plots possible for direct comparison illustrate the flexibility of survival analysis (Willett & Singer, 1995).

Key Terms

In order to understand the central ideas of this study, the following definitions are provided:

Censoring - allows for the inclusion the time present contributing to the hazard measurement, even though data collection ended before failure was noted (Willett & Singer, 1995). Simply stated, in a discrete-time survival analysis, censoring allows for the inclusion of data even if the stated endpoint was not experienced. This is important because regardless of failure or no failure, the individual experienced the time until end point that other participants also experienced (Andersen & Keiding, 2014).

Discrete-time survival analysis - a statistical method measuring the time it takes for an event to occur. Frequently used in medical statistics, survival analysis measures to an event (e.g. death) to determine differences among groups. Discrete-time survival analysis is also known as failure analysis in business manufacturing analysis (Tabachnick & Fidell, 2013).

Explanatory Variable - a factor that is used in statistical analysis to explain the occurrence of a phenomenon (Liao, 2004).

Latinx - a designation within the Latina/o community that is gender neutral and considered more inclusive, serving as a designation for transgender, gender nonconforming individuals, women, and man (Guzmán & Navarro, 2017).

Predictor Variable - the designation assigned to independent variables that are linked with a specific outcome, attainment of principal position in this study (Allen, 2010).

Racial/ethnic minorities - Racial and ethnic identities have long been used interchangeably to signify affiliation with ethnic groups or as an indication of racial oppression when paired with the word minority (Gamst, Liang & Der-Karabetian, 2011).

Survival Function - a measurement that demonstrates the probability of survival on a scale between zero and one, with the closer-to-one demonstrating an increased probability of experiencing a terminating event (Zhang, 2007).

Survival Curve - a visual representation showing survival function over a period of time (Freels, 2009).

II. REVIEW OF THE RELEVANT LITERATURE

Starting with the first European settlements in the early 17th century, there have been organized efforts to educate students. Early schooling was considered an imperative for the development of a moral society. Over the next 400 years, there was a slow evolution in school leadership and an increase in the number of school leaders, but many of the initial structures remain in some form or fashion in today's public schools. This chapter begins with a brief outline of the development of school leadership as a concept and its growth as an essential element of public schooling over the last four centuries; then, subsequent sections of the literature review will examine how school leaders have been historically chosen and placed over time. This chapter will also closely examine the current preparation of school leaders, the quality of preparation programs, and the changing contexts of school leadership positions.

School Leadership: A Brief Historical Perspective

The evolution of school leadership can be divided into four thematic eras: the Colonial and Early Republican period, the Common School Movement, the Progressive Era, and the Modern Era. This section examines the structure of schools and selection of school leaders for each period. New or alternative forms of leadership developed during each era will be briefly discussed as well.

Colonial and Early Republican Period. Many early North American colonial settlers left Europe to escape religious persecution and pursue opportunities unavailable to them in Europe (Miller, 2008). Schooling for their children was one of these opportunities many colonists sought, and many of these early schools were set in religious communities. The influence of the New England colonists' religiosity was

foundational to the very creation of public schooling. The Old Deluder Satan Act of 1647, for example, mandated public schooling in the Massachusetts colony for communities larger than 100 people to thwart Satan's efforts to keep man from the holy scriptures (Delano, 1976). The decentralized nature of these early schools resulted in significant teacher turnover, and little in the way of designated leadership (Bogotch, 2005). Eventually the larger New England communities would offer a number of schooling options, including boarding, religious, and locally established academies or charity schools (Wallenfeldt, 2012). Although public schools were common throughout the northeastern portion of colonial America, there were far fewer educational options throughout the rest of the Americas. Private schools, often with a religious orientation, were available for the wealthy while "charity schools" (p. 51) were for children of the poor or, more often, middle class (Wallenfeldt, 2012). In either case, these schools were typically small, single room schoolhouses where students of all ages would be taught by a single teacher (Rousmaniere, 2013). A majority of children now considered "school age" went unschooled during the colonial era (Martin, 2006).

Usually local school boards or designated trustees appointed lone teachers to staff each one-room schoolhouse (Rousmaniere, 2013). These voluntary local groups of influential male community members also served in a supervisory role, relating the community's educational desires and directives to the school teacher (Cohen & Scheer, 2013). Not many examples of a designated school leader existed during this period, and the few that did exist served in towns and cities that had grown large enough to necessitate larger schools with multiple teachers (Rousmaniere, 2013). These leaders were designated as "preceptor, schoolmaster, head teacher, and principal" (Rousmaniere,

2012, p. 9). Each of these titles highlights the varied expectations of school leaders, dependent on the community or school they served.

Preceptor is from a Latin word for instructor and highlights an expectation for teaching (Brown & Anfara, 2002), and employing Latin signals the leadership position as elevated over teacher or tutor. *Schoolmaster* was a term commonly used to describe a man who teaches children (schoolmaster, n.d.). The designation of schoolmaster was largely used to attribute authority in a school to a man at a time where administrative roles were universally gendered toward male authority (Bergen, 1982). Bergen highlights numerous examples of this male implied definition by highlighting how schoolmasters were described as like "clergymen" or a "solicitor," even as the number of female teachers was rapidly increasing. Schoolmaster and *headmaster* were often used interchangeably, but historically they represented two different types of school leaders. While schoolmasters were more commonly associated with elementary education, particularly in poor and working-class communities (Bergen, 1982), headmasters were associated with secondary education (Cookson & Persell,1985).

Head teacher, as the name implies, was a position of authority in the schoolhouse, but with continued teaching responsibilities (Rousmaniere, 2013). As one-room schoolhouse student populations began to grow, the head teacher would assume the role of supervisor over assistant teachers or even older students who provided instruction to younger students (Kavanaugh, 2005). The leadership responsibilities of these head teachers were limited largely to the schoolhouse, and in some cases to only rudimentary tasks, such as fire starting, bell ringing or materials management, along with their normal teaching duties (Weiss, 1992). The term head teacher is rarely used in the United States

anymore; it remains ubiquitous in educational systems in the United Kingdom where the position of head teacher is comparable to the position of principal in the United States (Bush & Glover, 2014).

Common School Movement. The Common School era began in the 1830's, its inception often attributed to Horace Mann, the father of the Common School movement (Danns & Span, 2008). Although there existed a loose but growing network of rural and urban schools in the 1800's, there was a financial and social instability within those schooling communities. Schools often operated or closed on the financial fortunes of the local community (Tolley, 2014). Seeking alternatives, Mann investigated different schooling approaches throughout Europe. Based on his observations in Europe, Mann advocated for public financing of education, which would be a more stable and predictable funding source, a means to ensure that communities throughout the rapidly expanding United States would have school options beyond the costly private and/or religious schools available to only the wealthy, most of whom were White.

Toward the end of the colonial/early republic era, the use of the designation *teaching principal*, later shortened to principal, began to be used (Kavanaugh, 2005). There does not appear to be much distinction between the use of head teacher and teaching principal initially, but over time, head teacher remained the designation of school leadership in remote or rural settings, while larger schools in urban settings with more teachers used the designation of teaching principal (Rousmaniere, 2013). Eventually teaching was dropped from the title, leaving just the designation of principal, which coincided with increased expectations for the role, including "providing professional development for teachers and promoting or retaining students" (Kavanaugh,

2005, p. 2). This broadening of role expectations increased the status of school leadership to something beyond basic rudimentary tasks and symbolized the coming changes in school leadership practice in the Common School Era of education.

The Common School Era aligned with a time of increased industrialization and manufacturing productivity in the United States (Campbell, Fleming, Newell, & Bennion, 1987). It has been argued that these industrial changes extended beyond industry and ultimately became part of school management structures (Persky, 2015). The Common School Era sought to establish institutional hierarchies meant to not only improve instructional practice, but also institutional efficiencies. Just as the lowest members of the factory hierarchy began organizing into unions, teachers, at the bottom of the schooling hierarchy, also began significant organizing efforts, with the founding of the National Education Association (NEA) in 1857 (Pullin & Melnick, 2008). As was the case in factories, much of the organizing of teachers began in large urban cities with higher concentrations of workers. Despite the many parallels, some argue that the rise of these two similar systems is not evidence of a causal relationship but does signify a relationship rather "more complex than many accounts allow" between labor unionization and teachers' organizing (Glenn, 1987, p. 12). Glenn (1987) points to England, a highly industrialized nation where the Common School Era and teachers' organizations took longer to develop when compared to the United States. The Common School Era created a hierarchical system that solidified and increased the significance of school leadership, while also bringing a level of organization to teachers that previously had been uncoordinated.

While the intent or inspiration for school change can be debated, school structures did evolve during the Common School Era, featuring significant refinement at the school leadership level. These innovations resulted in new designations for school leaders as well increased role responsibilities for those school leaders. The Common School Era saw the creation and evolution of the position of principal and superintendent, and to a lesser extent, assistant principal.

The evolution of the title teaching principal to principal coincided with a move away from teaching and toward a managerial or supervisory role (Glanz, 1994). This same evolution results in the creation of the position of superintendent as school communities or districts attempted to centralize power for the purposes of "efficiency and order" (Rousmaniere, 2013, p. 22). Superintendents were responsible for the oversight of teachers throughout their designated domain and were largely focused on educational programs and instructional coordination, rather than financial matters in their respective districts, as they were not given fiscal authority (Campbell et.al., 1987). This was particularly the case in communities with multiple schools, although there are examples of smaller communities employing a superintendent (Rousmaniere, 2013). Superintendents in these small locales often occupied positions quite similar in practice to that of a school principal, managing school activities, supervising teachers, and coordinated educational programs. As school districts grew, the possibility of a single superintendent supervising the teacher population became unrealistic, and superintendents passed the responsibility of teacher supervision down to principals (Campbell et.al., 1987). Principals, particularly in districts with multiple schools, became

the campus representatives of the district's or superintendent's authority (Rousmaniere, 2013).

This era also saw the first mention of an assistant principal, but in a much different pedagogical context than the position of assistant principal will see in later eras. There are examples of superintendents in larger districts naming a supervisor of teachers to serve in their place; these proxy superintendents were called assistant principals or sub-principals (Tyack, 1974). The ambiguous role responsibilities of these school leaders contributed to conflicts of positional responsibility and did little to stabilize the profession, which was already subject to the whims of local school boards (Candoli, 1995).

Progressive Era. Following the broad and systematic establishment of schools in the United States during the Common School Era, the U.S. education system entered a time of reform and refinement. The perspectives on school leadership during this era can best be illustrated by the work of two educational theorists, Ellwood P. Cubberley and John Dewey (English, 2006). Cubberley, drawing on Frederick Taylor's work on scientific management, applied Taylor's approaches in education as a superintendent of schools in San Diego before becoming Stanford's Dean of the College of Education. While working at Stanford, Cubberley further refined and popularized the school leadership model common in many modern schools today (Rousmaniere, 2006). The principalship, in Cubberley's (1923) view, was akin to the hierarchical management structures common in manufacturing or the military. The principal served as "the colonel of a regiment to the commanding general" (p. 342) of the superintendent. While Cubberley was advocating for a model of school leadership focused on efficiency and

measurement (both student and teacher), John Dewey (1946) deemphasized technical approaches to leadership and encouraged education focused on production of social equality. Dewey was less concerned with the mechanisms of efficiency in education and more concerned that a system modeled on efficiency failed to recognize that education is "a thoroughly socialized affair in contact at all points with the flow of community" (Dewey, 1902, p. 75). Simply stated, Dewey believed that schools were essential to the survival of a democratic society because they "imagine new ways of association and interaction that promote a respect for freedom, equality, and diverse ways of being in the world" (Gordon & English, 2016, p. 980). Unsurprisingly, the two disparate approaches to school leadership in the Progressive Era developed different forms of school leadership.

The scientific management style that Cubberley (1923) advocated required managers in support of managers to maintain the bureaucratic hierarchy. Keeping his military analogy, the colonel (principal) carried out the directives of the general (superintendent), but as student and teacher populations grew, the principal needed another layer to assist with management (Sexton, 1967). In many schools there were already "assistant principals" working at the behest of the superintendents' supervising teachers. As those supervisory responsibilities shifted to the principal, assistant principals transitioned supervising staff at the behest of the superintendent to supporting the principal, a lieutenant colonel to the principal's colonel. The work of assistant principals was, and remains, highly varied, but one core responsibility has remained largely the same in the last one-hundred years, and that is to "serve as intermediaries and as the main line of communication to (and from) the principal" (Marshall & Hooley,

2006, p. 8). The title of principal remained popular as the designation of a school leader, but the language about the role responsibilities hint at the two distinct educational leadership movements of the time. Those principals whose position was defined as a part of an efficient bureaucratic system were often talked about as school managers (Sharp & Walter, 2012). Leadership with a philosophical lean in the direction of Dewey were touted as democratic administration (Schultz, 2010) often highlighting the need for participation throughout the organizational structure. Toward the end of the Progressive Era until now, principals have blended the scientific with the humanistic/democratic approach in an attempt to manage the material expectations of educating students as well as the humanistic needs of adult educators and students alike (Kafka, 2009).

Modern Era. Our current Modern Era of school leadership began with the conclusion of the second World War. I f many of the seeds for the current system of schooling were laid in the previous era, the Modern Era solidified many approaches and structures because the post-war baby boom generation dramatically increased student populations. Schools became larger, particularly at the secondary level, and utilized a model of hierarchical control with the principal at the top (Glanz, 1994; Rousmaniere, 2013). Over the next sixty years, schooling and school leadership developed in response to societal changes, such as the Baby Boom generation (Easterlin, 1968), the civil rights movement (Rousmaniere, 2013), technological innovation, and increased standardized testing (Stuckart & Glanz, 2007). Larger schools led to an increase in the scope of school leadership responsibilities, and more school leaders yielded a growing variation in how school leadership was interpreted and practiced. Although educational administration became professionalized in the 20th century, the practice of leading a school vacillated

between the bureaucratic efficiency model proposed by Cubberley and the humanistic democratic model attributed to Dewey (Kavanaugh, 2005).

Currently, school leaders in this modern era are significantly impacted by an increased focus on accountability (Tucker & Codding, 2002). It has been argued the accountability movement is a new era in school leadership, as nearly all the decisions school leaders make in today's schools are viewed through the lens of accountability. School leaders who do not consider accountability and "their role in monitoring and improving school performance do so at their own risk" (Hallinger, 2005, p. 222).

In both approaches, school principals remained positioned at the top of the educational hierarchy, with assistant principals serving in support "do[ing] what the principals don't want to do" (Marshall, 1993, p.16). Other school positions became associated with leadership, such as school counselor, academic deans, and instructional coaches, but these positions remain on par or slightly below the position of assistant principal in the leadership hierarchy in schools (Armstrong, Macdonald, & Stillo, 2010; Dodson, 2009; Lieberman, 2004).

The role of principal continued to evolve during the Modern era. As the population of students rapidly increased and diversified in the 1950's, principals turned toward the scientific approaches to manage increasingly larger schools (Sexton, 1967). The last quarter of the century, however, saw a turn toward humanistic leadership coupled with an increased call for principals to become the instructional leaders at schools (Hallinger, 2005; Hallinger & Murphy, 1985; Mullican & Ainsworth, 1979). Although principals were increasingly labeled as the instructional leader of the school, the parameters of instructional leadership remained broadly and ambiguously defined.

The meaning of instructional leadership ranged from a balancing of the political, managerial, and instructional elements of a school (Cuban, 1988) to culture building (Hallinger, 2005). Not in dispute, at least initially, was that only principals were assigned the role of instructional leaders (Searby & Armstrong, 2016). Eventually, however, assistant principals were considered instructional leaders as well, but their position remained ambiguous and often subject to the whims of a supervising principal (Armstrong, 2015).

The role of assistant principal, sometimes called vice principal, became more prominent as the scope of principal responsibilities continued to grow with increased accountability. Although the duties of assistant principalship have increased in the last thirty years, assistant principals remain "middle space leader[s]" (Searby & Armstrong, 2016, p. 168), not teachers and not a principal. Assistant principals now, as they were at the start of the Modern Era of school leadership, often are responsible for tasks heavily tilted toward the managerial aspects of school leadership, such as behavioral management, cafeteria supervision, and materials management (i.e., textbooks) (Barnett, Shoho, & Oleszewski, 2012). Besides these typical managerial roles, assistant principals are increasingly responsible for instructional supervision of teachers, assuming the role of instructional leader while still subservient to the principal (Glanz, 1994).

As the duties for both principals and assistant principals have increased in number and variety, alternative leadership designations have developed, often with a more narrowly defined leadership expectation. Two common middle-leader positions are those of school counselor and instructional coach. Although rarely is either one given the same status as the principal or assistant principal, both can now be considered leadership

positions (Lieberman, 2004). School counselors are increasingly called upon to perform certain leadership responsibilities in schools (Wingfield, Reese & West-Alatunji, 2010), including student and teacher advocate and community liaison. In the past, these responsibilities fell to the principal, and then the assistant principal, but as time constraints related to school accountability efforts have increased, so too have counselor responsibilities (Armstrong, Macdonald, & Stillo, 2010). Counselors' positioning as leaders is not altogether surprising as they often have the same access to students, teachers, and the relevant data associated with these populations (Janson, Stone, & Clark, 2009), yet their educational preparation often has a "lack of specific leadership training" (p. 99).

Instructional coach is a term used to describe a leadership position, often performed by a trained or master teacher who works with fellow teachers to improve instructional quality (Fletcher, 2012). As Fletcher notes, instructional coaches' expertise is often based on extensive experience and/or specific training. The specific training associated with instructional coaching is an important distinction delineating coaching from mentoring, a role more commonly associated with the school counselor (Fletcher, 2012). However, there are those who link instructional coaching and mentoring (Walpole & Blamey, 2008). The leadership responsibilities of instructional coaches are similar to those of principal in they act as instructional leaders but are rarely considered actual instructional leaders due to the lack of evaluative responsibilities (Neumerski, 2012). Principals operate as instructional leaders who also have evaluative responsibilities, whereas the instructional coach is solely tasked with improving and supporting improvement of teaching and learning without evaluative responsibilities (Camburn,

Rowan & Taylor, 2003). Instructional coaches, much like school counselors, have been drawn into the sphere of school leadership through the designation of responsibilities commonly or historically attributed to the principal.

Much like the assistant principals before them, these middle leaders (i.e., instructional coaches and school counselors) "view their position as a necessary career step to a higher position" (Marshall & Hooley, 2006, p. 22). The successful completion of principal certification would seem to indicate a willingness or desire to ascend to the principalship, although growing evidence finds a number of certification seekers who do not aspire to principalship (Rhodes & Brundrett, 2005). The state of Texas does not offer a certification for these middle leader positions, so it is difficult to determine the aspirational career trajectory of school leaders, but it is safe to assume many who successfully complete certification are open to becoming school principals.

School leadership has constantly evolved over the last two hundred years. Principals have gone from being building caretakers to becoming managers of teachers and students, as well as instructional leaders accountable for student academic success. As the scope of principal responsibilities has grown, so too has who is performing leadership responsibilities in schools. Having looked at the evolution of leadership positions in schools, it is important to consider who chose school leaders historically, as well as what attributes or qualifications were used to make the selections.

School Leader Selection

Historically, school leaders have drawn much of their authority from the hiring bodies that appoint them. From community boards or designated trustees in the early days of schooling in colonial America, to superintendents in current times, principals

serve as bridges between teachers and greater governing authorities (Rousmaniere, 2013). Not surprisingly, at the time of early schooling efforts, school leaders were largely selected by and served groups comprised of influential men, most of whom were White (Parker, 1960; Rousmaniere, 2013). Even after over two hundred years of school evolution, oversight still resides with school board populations that remain overwhelmingly White (Diem, Frankenberg, & Cleary, 2015; Maeroff, 2011). Although there has been only marginal change in the composition of community groups charged with selecting school leaders, the qualifications or job expectations have changed substantially.

Colonial and Early Republic Period. During colonial times and the infancy of the republic, most communities had nothing more than a one- or two-room schoolhouse necessitating only one or two teachers hired by the governing board. However, larger towns, looking to increase status and attract manufacturing, would appoint a school leader (Teed, 2006). The requirements for being a school leader were few, if any, although most school leaders at the time had training or experience as a teacher. Some of these school leaders were self-made men from outside of the field of education (Parker, 1960), some were veteran teachers elevated to the position of school leader, and others were appointed leadership positions having previously received training as a teacher (Rousmaniere, 2013). Even with teacher training, many appointed school leaders had little experience as a teacher or a school leader.

The lack of specific training or education for school leaders during this era was not surprising as school leaders were merely viewed as proxy caretakers for the appointing community boards (Weiss, 1992). As schools grew to include multiple

classrooms separated by grade level, primarily in cities, the role of school leader evolved to include certain responsibilities, such as professional development of teachers, that would warrant specific training (Kavanaugh, 2005). A majority of school leadership positions were held by men, although there are instances where women were chosen as school leaders, usually to work with marginalized student populations (Castelow, 2009) or in remote communities (Tolley, 2015). Those female pioneers signaled a coming change in education that would offer increased opportunities for a variety of school leaders, but at the same time, White male dominance remained at the top of the school leadership hierarchy.

Common School Era. It was not until Horace Mann led the movement to provide more universal schooling opportunity that schools began to move away from classrooms containing a variety of ages and grade levels (Osgood, 1997). The Common School Era opened the door to many new students, thereby increasing student and teacher populations. As Osgood writes, with the growth of schools, ungraded classrooms created "a difficult teaching situation" (p. 390). While the Common School Era originated at the state level in Massachusetts, local community boards remained responsible for school decisions on a majority of issues (Rury, 2002). However, the increase in school population made oversight by local boards much more challenging. Direct oversight of schools waned, leading to a professional class of educational leaders tasked with school oversight, and this group of professional educators were headed by superintendents (Rousmaniere, 2013). The shift meant that, in many cases, principals were now appointed or hired not by community boards, but by the superintendents representing

these boards. As with the all-male community boards from the previous era, almost all superintendents were men, chosen from the ranks of school leaders (Rousmaniere, 2013).

As in the previous era, school leaders were considered disciplinarians and the keepers of order. As such, it was believed that men were better suited to the discipline responsibilities commonly associated with leadership positions, while women, who were perceived as more nurturing, were largely considered for teaching positions in schools (Tyack, 1974). Along with the perceived nurturing behaviors female teachers brought to the classroom, they were also viewed as having less intellectual abilities than their male counterparts, thereby necessitating oversight by male superiors (Blount, 2006). What little inroads female school leaders were able to make were, predictably, in the primary or elementary age schools, where women were more likely to be placed in school leadership positions, although with often with less pay and decision-making responsibility (Blount, 2006; Rousmaniere, 2013). Primary school leaders were more likely to be placed under the supervision of the grammar (secondary) school principal or school leader, without the direct access to superintendent or community boards (Glanz, 1991). Though the responsibility to hire school leaders moved from community boards to school superintendents, a defining feature of both was they were most often wealthy, White men. There were attempts, mostly at the town and city level of government, to legitimize the position of principal by establishing criteria for qualifications; however, those attempts had little connection to actual administrative responsibilities (Rousmaniere, 2013). Qualifications, often not explicitly stated, remained linked to personal attributes rather than leadership experience, skill, or knowledge. Non-White school leaders, mostly Black men, were considered to have the appropriate disposition to lead racially segregated

schools, which had become increasingly more common in the northern and southern United States (Walker, 1996). Much like many female leaders at the primary school level who were chosen for their perceived ability to nurture young students, Black men were tasked with school leadership of student populations from similar racial backgrounds because they were male and Black. Late nineteenth century efforts to establish criteria or certification requirements recognized the need to professionalize the field of educational leadership as a means for preparing school leaders and establishing criteria for professional preparation.

Progressive Era. Starting at the turn of the nineteenth century, the Progressive Era saw the largest percentage increase in student populations ever, fueled by immigration (Campbell et.al., 1987). Prior to the early twentieth century, educational leaders were most likely trained as teachers, as there was no formal educational process for school leaders. That changed as the Common School Era became the Progressive Era, and educational leadership became a subset of educational academia (Brown, 2006). Larger school populations resulted in more administrative staff, particularly at the district level, with specialized training to serve in these administrative roles at the district and school levels. As discussed previously, there were two main perspectives on educational administration at the time: the management faction of school administrators associated with Cubberley, and the democratic school leaders commonly associated with Dewey (Shen, Cooley, Ruhl-Smith, & Keiser, 2005). Both schools of thought highlighted the importance of school leaders trained specifically in the practice and philosophy of educational administration but disagreed about the role and traits of school leaders.

Cubberley (1923), influenced by a growing body of business and industrial management scholarship, believed school leaders training needed to prepare leaders to be "responsible for the management and control" (p. 342) of schools while passing down the educational directives of those leaders above them in the educational hierarchy. Dewey, on the other hand, was less concerned about the management skills required to pass down educational edicts from above, and instead emphasized the management of schools from the school community up (Campbell et.al., 1987; Dewey, 1916/2009). Dewey (1916/2009) believed effective school leadership prioritized establishment of a cooperative community rather than an efficient system.

Not surprisingly, the traits and qualifications advocated for by each of these school leadership reformers was unique to their view of school leadership. Cubberley (1923) believed schools leaders were the hand of the creative and informed superintendent; ultimately, they were not responsible to the school community they led, but rather they were expected to "execute plans and to follow and to support" (p. 343) the decisions of the superintendent. Traits that Cubberley promoted as critical to effective school leadership included "tact, intelligence, convictions, good common sense, deep personal loyalty, technical knowledge, and a type of professional skill not always found in who think they would make good school leaders" (p. 343). Ironically, many of the traits that Cubberley attributed to effective school leaders could be considered inherent traits, not those that could be developed through additional education. Where Cubberley focused on the inherent and technical capabilities required for school leaders in a model of educational leadership focused on hierarchy and efficiency, Dewey viewed schools and school leadership in relation to a democratic society.

Unlike the leadership approaches promoted by Cubberley that were informed by the systematic nature of schools, Dewey centered educational leadership development on the needs of the whole student (Stuckart & Glanz, 2007). Dewey believed in the idea of a "democratic administration" (Campbell et.al., 1987, p. 50). Dewey feared that efficiency and control associated with industrial management styles promoted by Cubberley gave little consideration to student needs and could "become an instrument of perpetuating unchanged and existing perpetual order of society" (Dewey, 1916/2009, p. 540). Effective school leaders, in Dewey's mind, flattened existing educational hierarchies to collaborate with teachers and the communities they served (Campbell et. al., 1987; Dewey, 1916/2009). Democratic school administrators (i.e., principals), needed to reflect the basic tenets of democracy if students were to learn how to live and function in a democratic society. Dewey therefore advocated for administrators who were intellectually curious about problems in education, able to develop cooperative relationships with their communities, and skilled at the tasks of administration (Rousmaniere, 2013).

The Progressive Era continued to see women and racial/ethnic minority principals afforded few opportunities for school leadership. Toward the end of this era, racial fault lines began to be drawn, ultimately having a significant impact on school leaders working in the separate system of schooling for students from diverse communities, especially Black and Hispanic school leaders (Morris & Morris, 2002; Walker, 1996). In the more progressive northern states, segregated schools began to close, and student populations were integrated (Dávid, 2009). Since many of the leaders at the racial/ethnic minority schools were chosen to lead because of matching racial backgrounds, once the schools

closed there were no acceptable leadership positions for many of these leaders, so they returned to the classroom or were given positions of less significance within the district hierarchy (Morris & Morris, 2002).

Modern Era. The Modern Era saw the continued growth of student populations leading to larger schools and districts. Throughout the previous era, which also spanned two world wars, women had finally begun occupying more principalship positions, although those advances came largely at the elementary level or in girls-only institutions (Blackmore, 2006; Goldin, 2006). As many men returned from World War II and attended college, due in large part to the GI Bill, the numbers of men in Educational Administration programs swelled (Rousmaniere, 2015). Men were attending graduate level educational administration programs at twice the rate, proportionally, to their female teaching peers, though 75 percent of the undergraduate educational degrees were earned by women. At the same time, state legislatures were increasingly requiring advanced (graduate) education in order to become a school principal, effectively narrowing the opportunities of women seeking school leadership opportunities. Consequently, school leadership remained the domain of men, particularly White men who were more likely to hold the requisite degrees required to be a school leader. During this era, the academic field of educational administration, seeking to further establish itself as an academic discipline, drew heavily on management science research, a majority of which was conducted by men, and about men in positions of management (Blackmore, 2006). This trend toward educational legitimacy framed management as gender and racially neutral, and it failed to account for the structural advantages that

contributed to the gender and racial disparity in the school leader population of today (Bell & Chase, 2014).

Texas Context for School Leader Preparatory Programs (SLPP)

After teachers, school principals represent the second most significant factor in impacting students' success (Leithwood, Harris, & Hopkins, 2008). The recent increase in the awareness of the role of school leaders is a result of an ever-increasing body of research examining leadership and student success (Pepper, 2010). A significant amount of this research focuses on the effect of principal leadership and explores other types of leadership styles utilized in the domain of education. Extensive scholarship exists detailing how educational leadership programs contribute to preparing and certifying principals and other school leaders. This section of literature review examines the history of SLPPs, and the types of institutions providing such programs. Further, it explores how effectively and thoroughly the practice of these programs been researched and defined, how students enter/choose this program, and the characteristics of high-quality or exemplary programs considered to be the bellwethers for SLPP.

History of School Leader Preparation

The conception of specific school leader preparation and certification is fairly recent in the domain of education development the United States; yet, in many other parts of the world it remains nonexistent, limited (Murphy, 1998), or relatively new (Bush, 2008). School leader preparation and certification has received increased attention over the last half century. This increased attention can be attributed to the changing role of school leadership, more specifically, the principalship. The early schools were largely

simple organizational systems comprised of one room school houses, where only limited building-level leadership was required (Gregg, 1969).

Chapters on School Supervision, written in 1875 by school superintendent William L. Payne, initiated the development of leadership preparation towards the end of the nineteenth century (Murphy, 1998). Payne was the first academician to have taught the first university level course on school leadership (Callahan & Button, 1964) and later went on to become a faculty member at the University of Michigan. As the percentage of women began to elevate in the educational workforce, primarily as teachers, men working in the education field began acquiring the positions of administrators or superintendents of collections of schools (Rousmaniere, 2013). The rampant shift in the workforce led to the creation as well as the rapid growth of educational management programs in the United States in the first half of the twentieth century. The number of specific university-based educational management programs in went from zero in 1900 to approximately 125 by the middle of the century (Brown, 2006).

Ideological Era. As stated by Murphy (1998), the eras of principal preparation start with the Ideological Era, which spanned from the end of Civil War to the 1900s. During this era, there was limited research and formal training for educational leaders. The scholarships that existed were found in different areas, which were more likely the supplement to broader educational preparation literature (Campbell et al., 1987). Schools in the Ideological Era were rooted in religiousness, and the educational leaders were viewed similar to clergymen and borrowed from this similar elevated status (Murphy, 1998).

Prescriptive Era. The subsequent era, the Prescriptive Era, starts with the growth of specific programs for educational leadership in universities and the increasing importance of the practical skills needed to be a successful educational administrator (Campbell, 1987). The focus on the practical aspects of educational leadership is not entirely surprising, as majority of the professors in the first wave of university-based educational leadership scholars had experience as school superintendents, similar to the experiences of William Payne (Murphy, 1998). The educational leadership programs of this particular era were "highly technical" (p. 363), partly due to their foundation in the practical experience or due to the educational policy trends of the time. The "theoretical underpinnings" (p. 363) of the school leaders' work were given limited attention.

Scientific Era. The Scientific Era began around the end of World War II. The focus during this era was on the consideration of the role and purposes of educational leadership, with a particular emphasis on social science research (Miklos, 1983). This era also saw the development of the organizations focused on improving school leadership preparation standards, with the stated purpose of proposing guideline standards for preparation programs (Murphy & Vriesenga, 2006). Consequently, the scientific era is defined by the development of a gap between the practitioner side of educational leadership and scholars working in the academy. As Murphy and Vriesenga (2006) stated, the increased focus on scholarship grew the body of research on educational leadership and administration, yet it also contributed to a developing gap between those doing educational administration and those researching educational administration, a gap that exists till today.

Types of Institutions Preparing School Leaders

As mentioned previously, a majority of the existing university based SLPPs were established in the last 100 years. As the number of colleges and universities increased, the need to differentiate among the functions and types of programs rose along with it. This need led to the development of the Carnegie Classification (The Carnegie Classification of Institutions of Higher Education, n.d.). Although there are many classifications that involve a broad spectrum of academic programs and disciplines, this current study will focus on the types of institutions offering a master's degree or a doctorate, as nearly all certified principals in the state of Texas hold one of these (Texas Education Agency, n.d.).

In the analysis of the placement of educational leaders graduating from a SLPP, Fuller, Hollingworth, and An (2016) focused on the eight Carnegie designations and the differences between the types of programs. It is critical to note that the quality of the received instruction are not examined. In the absence of it, another ranking system, such as the Carnegie Classification, may serve as a proxy for the institutional academic capacity and achievement and therefore to some degree of academic capacity. The six categories of programs are designated and are briefly described below:

Research/Doctoral:

- Research I (R1) institutions encompass the premier research universities in the United States and offer a broad range of undergraduate, masters, and doctoral degrees. Specifically, these universities award more than 50 doctoral degrees each year and receive federal support in excess of $50 million dollars per year.

- Research II (R2) institutions are similar to R1 in the number of degree programs offered, but traditionally offer less than 50 doctoral degrees and receive federal funding from $15 to $45 million in a year.
- Doctoral I (D1) institutions offer a wide variety of undergraduate and master's degree programs and limited number of doctoral degrees.
- Doctoral II (D2) institutions offer a wide variety of undergraduate and master's degree programs with only a few doctoral degree options.

Comprehensive/Masters

- Comprehensive I, also known as Master's (M1) granting institutions, typically offer a number of different master's degrees but no doctoral programs.
- Comprehensive II, known as Master's (M2) granting institutions, generally offer a very limited number of master's degrees.

Baccalaureate

- Baccalaureate institutions are considered those institutions where baccalaureate degrees constitute a majority of the degrees awarded, and the institution also awards less than 50 masters degrees or 20 doctoral degrees during a year.

Throughout the state of Texas, there are multiple institutions in each Carnegie Classification offering principal preparation opportunities. The list of SLPPs in the state of Texas also includes Alternative Certification Programs (ACP) that offer opportunities for individuals with a master's degree from an accredited institution to obtain principal certification. Along with the master's degree, the state of Texas requires individuals seeking certification to hold a valid teaching license, a minimum of two years of teaching experience, completion of a principal certification program, and successful completion of

the principal certification exam (Becoming a Principal or Superintendent in Texas, 2017). Created and encouraged by the state (Levine, 2005), these certification programs provide an alternate path to school leadership attainment. While the quality or purpose of these programs has often been called into question, with the perception that many have "low admissions requirements, weak academic standards, and students who were interested mainly in obtaining credentials rather than in learning new content or skills" (Levine, 2005, p. 53), they do provide alternatives. For those students looking for leadership training and certification outside of a traditional university setting (Jackson & Kelley, 2002), or in rural locations where access to university-based programs is limited (Versland, 2013), alternative certification programs are useful. It is worth noting the wide variety of alternative preparation programs for prospective principals in Texas, ranging from programs created by regional service centers tailored to the needs of specific regions of Texas, to statewide programs conducted online and run by for-profit institutions. Recently there has also be an increase in traditional principal preparation programs offering principal preparation in a majority online setting. The remaining educational administrator preparation programs can be grouped under a set of basic guidelines that have been traditionally established by the states; accreditation programs must adhere to these guidelines as well as some recommended guidelines laid out by the organizing bodies in the field of educational administration.

Standards and Collaboration of School Leader Preparation Programs

In the earlier days, the school leader preparation programs primarily focused on the preparation of school superintendents and eventually expanded to include principals in the early 1900's (Murphy, 1998). Drawing heavily from the management science

movement at the time, early training for school leaders focused mainly on the practical day-to-day skills school leaders needed to perform the job and spent limited time in preparing them to critically consider their role in educational change (Culbertson, 1988). The school leader preparation programs at the universities continued to increase as more individuals, schools, and policy makers at the state level recognized the need for specific school leader preparation (Brown, 2006). As Brown notes (2006), university-based SLPPs grew in size and prevalence, leading to the call for guidelines and coordination between preparation programs and the need to the establish a number of organizations. These included The Committee for the Advancement of School Administration (CASA) and University Council for Educational Administration (UCEA), which continue to influence school leader preparation practices today.

Committee for the Advancement of School Administration (CASA). Founded in 1955, CASA focused on the "development of professional standards of performance" for School Leader Preparation Programs (Murphy, 1998, p. 365). These standards were initially conceived and shared with educational leadership scholars, practitioners, and policymakers at the state and national levels (Hoyle, 2006). Once feedback from these stakeholders was received, the standards were codified and called *Guidelines for the Preparation of School Administrators.* The guidelines developed by Payne served as the foundation for subsequent iterations of similar guidelines, including the most recent set, *Professional Standards for Educational Leaders* (National Policy Board for Educational Administration, 2015).

University Council for Educational Administration (UCEA). Just one year after CASA's establishment, UCEA became an established organization that included

universities focused on improving the scholarship and preparation of school leaders (Davis, 2016). Whereas CASA focused on the general set of standards and guidelines for school leader preparation, UCEA concentrated on building the scholarship of educational leadership and defining effective instructional practices and guidelines for educational leader preparation programs (Hale & Moorman, 2003). The outcome of UCEA turning a critical eye on educational leadership programs resulted in a report titled *Leaders for America's Schools. The Report of the National Commission on Excellence in Educational Administration* (University Council for Educational Administration, 1987). This report has served as a foundation upon which the member universities still build and evaluate their preparation efforts.

The efforts of CASA and UCEA, along with other coordinating institutions, continue to serve as the basis for evaluation and improvement efforts focused on SLPPs, even for programs not officially affiliated with these organizations. The quality and types of leadership preparation programs vary extensively, thus there remains a need to critically evaluate the different types of preparation programs and their effects on students, teachers, and communities.

Quality of Programs and Quantity of Graduates

Although Levine (2005) uses the Carnegie rankings as a way of delineating the programs from each other in the report, it was also acknowledged that the ranking does not guarantee program quality. While Levine is careful to point out that the Carnegie classification does not serve as a guarantee of quality, when comparing doctoral granting institutions and master's granting institutions, Levine groups Masters 1 programs with other "weaker research-intensive doctoral degrees" (p. 24). Levine further establishes his

point when he states that the programs "have also been responsible for conferring master's degrees on students who demonstrate anything but mastery" (p. 24) and have "awarded doctorates that are doctoral in name only" (p. 24). This perspective leaves out the possibility that the doctoral granting institutions, even those at the top of the Carnegie classifications, face many challenges (Davis, 2016). Educational leadership stakeholders accorded that the training field suffers from a lack of consistent quality in its preparation of scholars as well as practitioners in the field (Jackson & Kelley, 2002). Even as the concerns of SLPP quality persist, there are examples of effective school leader preparation programs.

Traits of effective preparation programs. The near universal agreement that preparation programs need improvement is evidenced by the number of coordinating organizations making the call, including The Wallace Foundation, the Alliance for Excellent Education (AEE), UCEA, and New Leaders for New Schools (Perilla, 2014). In order to understand the required improvements, the changes in the role of the principal or school leader must be acknowledged. Over the last twenty years, principals have become increasingly responsible for student results, driven largely by the increased emphasis on the high-stakes testing (Hess & Kelly, 2007). Race to the Top (RTT) explicitly connected principal effectiveness to student achievement, leading to an elevated focus on the significance of leadership preparation programs (Davis & Darling-Hammond, 2012). The association of student performance with principal effectiveness has made it necessary to "assess principal preparation program quality and effectiveness" (Yoder, Freed & Fetters, 2014, p. 3)

A critical theme in effective leadership preparation is prioritizing that principal preparation programs work with local school districts. Recently, an increase in the number of reports calling for such collaborations has been reported (Davis, 2016). The findings from the Wallace Foundation reinforced the findings from an earlier report conducted by the Stanford Education Leadership Institute highlighting the advantages of university-district partnerships (Darling-Hammond, LaPointe, Meyerson, & Orr, 2007). The advantages of these include, among many, providing students with clinical experiences in a more structured learning environment (Hale & Moorman, 2003; Davis & Darling-Hammond, 2012). Despite advantages, there are limitations to university-district partnerships. Versland (2013) points out potential logistical difficulties (i.e., traveling distance, lack of appropriate mentors) posed for rural districts. Jackson and Kelley (2002) highlight the challenge faced by university-district partnerships, pointing out that the collaborations were an end result of "significant support for development and operations from foundations, the university, area districts, and the state" (p. 209). Without the supplemental funding, the universities risk a decrease in revenue. Certainly, the role of faculty members in a university-district partnership is different from the role of other college faculty; namely, it requires time for mentoring, teaching, and clinical feedback in a school setting, none of which is given as much relevance as written publications when individuals are considered for tenure (Tenuto & Gardiner, 2013).

The selection criteria for school-leader candidates has also come into question in the last couple of years. Many of the students in preparation programs are accepted without a rigorous examination of documentation, such as transcripts, written samples, letters of recommendations, or observed behavior prior to acceptance (Davis & Darling-

Hammond, 2012). Although there documented concern about candidates selection at many SLPPs, Davis and Darling-Hammond (2012) note that few SLPPs provide the accompanying supports to assist many traditionally overlooked candidates. As a way to mitigate these limitations, Davis and Darling-Hammond (2012) highlighted the attempts of several programs to partner with local districts that could identify a diverse cadre of potential students who would later undergo a rigorous screening process at the university level.

The establishments of efficient guidelines for effective leadership preparation are helpful; however, it is only effective when universities and certifying bodies implement the guidelines with fidelity. Members of different organizing bodies (i.e., UCEA) require frequent program evaluations and examinations on the implementation of research-based effective practices (Young, 2016). Although it is comprised of several relevant doctoral granting institutions, UCEA members do not represent all SLPPs in many regions. Although the Carnegie designation serves as a designation of the overall institutional capacity, it may not directly demonstrate the quality of the SLPP, nor take into account the number of students graduating and becoming certified. The following section looks at the effective programs and key factors that make the institutions and its actions effective.

Highlights of effective school leader preparation. Before highlighting characteristics of effective SLPPs, it is critical to note that differences in state policies dictate several key aspects of university preparation programs, including the required curriculum, previous teaching experience requirements for acceptance into the program, and number of hours required before certification (Murakami, Tornsen, & Pollock, 2007).

The guidelines for effective leadership preparation are broad enough as to allow programs to address guidelines while remaining in line with state policies. Davis and Darling-Hammond (2012) highlighted five highly effective principal preparation programs. The programs range from a Masters I to Research I and were spread throughout the United States, located in rural, suburban, and urban environments. The authors also identified program design features connected to overall effectiveness. Commonalities among these programs included an admission process that was "highly rigorous and highly selective" (Davis & Darling-Hammond, 2012, p. 30), partnerships with local districts, and project-based learning that connected theory and real-world application. Lastly, the programs used a cohort model, with the intended purpose of students starting, moving through, and finishing the program together.

Some programs from the Davis and Darling-Hammond (2012) study established effective practices as a result of a "mandated statewide overhaul" (p. 30) as in the case of Delta State University. While others, like the one at the University of San Diego, was the result of partnerships between local school districts with nearby universities. Regardless, the modifications mirror several key changes that were highlighted earlier by Jackson and Kelley (2002), detailing the qualities of effective leadership preparation programs.

Differing Contexts of School Leadership

The picture of school leadership has changed substantially over the last 50 years. Though young, white males retain an advantage when pursuing the principalship, new directions in school leadership are emerging, albeit more slowly than the constantly evolving student body (Crawford & Fuller, 2017). Despite an increasing number of leaders completing the schooling and certification requirements to obtain an educational

administration certification, there remains a shortage of qualified candidates applying to many principal positions, particularly in schools located in highly urban or isolated rural areas (Cruzeiro & Boone, 2009; Farley-Ripple, Raffel & Welch, 2012). The reasons for this lack of qualified principal candidates are numerous and speak to the inherent challenges experienced by school leaders. Reasons cited for principal turnover include increased scrutiny due to accountability (White & Agarwal, 2011), institutionalized hiring practices that favor certain types of candidates (Doyle & Locke, 2014), and the basic economics of pay and compensation (Baker, Punswick & Belt, 2010). As the position of school principal continues to experience regular turnover, it is important to understand the factors that contribute to school leaders' pursuit and acceptance of appointments to lead schools (Fuller and Young, 2009).

The pathway to school leadership is not the same for all those desiring a school leadership position. Internal motivations and outside factors influence the way and speed at which candidates move toward the principalship. White men continue to experience the least friction on the pathway to the principalship (Davis, Gooden & Bowers, 2017). It is important to understand the conditions in school leadership ascension that seemingly favor masculinity first, and whiteness second, resulting in a disproportionate representation of this particular group in school leadership ranks. In addition to the factors of race, gender, and age, preparation-program type should also be examined for their impact on attainment of principal leadership.

Race. Many demographic factors have contributed to the type of positions and attainment levels individuals have experienced in education throughout the U. S. history, with race being the most significant factor at certain times. Pre-*Brown v Board of*

Education, race was often a strong consideration when it came to staffing schools with non-White student populations, and at this time, a substantial pool of Black educators at all levels of educational employment, including school administration, grew (Walker, 2001). However, desegregation contributed to a substantial reduction of the Black educator population. Black students were integrated into majority White schools, leading to the closure or reassigning of teachers and principals from previously racially segregated schools (Tillman, 2004). Much like Black teachers, Black principals were the first administrators to lose their appointments and those that were offered positions in the newly integrated systems were almost always forced into lower status jobs such as assistant principal, teacher, or central office staff (Yeakey, Johnson & Adkison, 1986). At the time of desegregation, the prevailing assumption in many communities was that White teachers would not work under the supervision of a minority principal (Yeakey et al., 1986).

The *Brown* decision is historically associated with increased educational opportunity for Black students, but Hispanic children and educators experienced many of the same challenges, as student populations (Valencia, 2011). Hispanic students, largely in the Southwestern United States were often sent to *Mexican schools* prior to *Brown*. Although advocates for Latino student integration shared many of the same goals as those fighting for Black educational equality, they also endured a number of additional challenges. Hispanics in the south were in a legal grey area as they were not considered Black nor White (Nieto, 2004; Powers, 2014). While the segregating of students to different schools based on race was illegal, because of their legal ambiguity and because many of these schools were formed under the guise of English language deficiencies,

these Mexican schools persisted longer than their Black equivalents (Powers, 2014; Valencia, 2011). In many cases, Latino students were eventually integrated into schools, but were largely educated in an English-only setting, negating the need for many of the Spanish speaking teachers commonly associated with the Mexican schools (Nieto, 2004). The long-lasting effects of this disenfranchisement of an entire generation of minority educators can still be observed today.

The population of Hispanic principals has increased seven percent in the last fifteen years while the overall percentage of White principals has declined at approximately the same rate (Hill, Ottem & Deroche, 2012). Hispanic school administrators grew from 3% of overall administrator populations to 7% since 2001. Over the same time period, Black principals remained near 10% with little growth recorded. The shift in school leader populations demonstrates a turn toward a gradually diverse administrative community but remains substantially behind the rates of student diversity across the nation, where White students make up approximately 50%, Hispanic 25%, Black 17%, and all other racial designations (Asian American/Pacific, American Indian/Alaska Native, or Two or more races) making up the remaining 8% (McFarland, et al., 2017).

The disparities between school leader and student populations are likely the result of a combination of experiential factors that occur before a leader's ascension to the principalship, including one's educational background, teaching experience, and emerging leadership experience. Before becoming principals, most individuals spend time in emerging leadership positions, but for many minority school leader candidates, career opportunities open in schools with higher rates of poverty, lower rates of student

academic performance, or higher ESL student populations (Crawford & Fuller, 2017). Fuller and Young (2009) found that school leaders average tenure typically lasts about four years. When principals move, they typically move from lower achieving schools to higher achieving schools (Boyce & Bowers, 2016). For emerging school leaders, this means that, during a key leadership stage of development, many will experience transition of top leadership, upsetting an entire school environment. Principals leaving lower achieving schools for higher achieving schools also models to emerging leaders a career path away from marginalized student populations.

There are numerous reasons why the racial background of school leaders should be considered beyond the very basic call for educator populations that are more representative of the student populations in public schools. Tillman (2004) suggests that Black principals can serve as "role models and respected leaders in their communities" (p. 282), and Reed and Evans (2008) submit that African American administrators can offer leadership that avoids excessive discipline practices that reduce African American students' access to education. Lomotey (1993), in his book on African American school leaders, pointed to the importance of having *minority* principals, as they would be focused on ensuring *all* students received a quality education. Roch and Pitts (2012) in their study of differing effects of representative bureaucracy, found that administrators that share the same race as a majority of the student population have a positive impact on reading achievement. Furthermore, López (2003) speculates that the limited number of Latino educators could be contributing to the continued academic underperformance of Latino student populations, as the current population of teachers and leaders is not equipped to "envision different possibilities for schooling—particularly for our most

marginalized youth and communities" (p. 71). School administrator tenure varies, and minority school leaders are more likely to remain at schools with same race student populations (Loeb, Kalogrides & Horng, 2010), and they are more likely to empower same race teachers (Crawford & Fuller, 2017), while White school leaders are more likely to move frequently.

Race is but one component any individual brings with them into the principalship. The race of principal has not been proven to be a deciding factor in student success, but as the above section notes, there are potential positive outcomes that influence the practice of school leadership. As educational leadership has long, and possibly always, been defined from the perspective of white male leadership, it is important to look beyond that perspective to understand the differing contexts excluded populations bring to school leadership.

Gender. Though school leadership has historically been the domain of men, there has been a steady shift toward female administrators who are now the majority of school leaders (White & Agarwal, 2011). However, there remain many challenges worthy of consideration, study, and future advocacy. For the purposes of this study, I have chosen to use the false binary comparing male and female experiences and paths to the principalship, but I also want to acknowledge this does not define the experience or makeup of the entire school leader community in Texas, nor the nation as a whole. Folsom, Osborne-Lampkin and Herrington (2015), in their analysis of Florida administrators, found that principals who identified as male were younger than their female counterparts. Certified female administrators are less likely than their male counterparts to find employment as a school leader (Fuller & Hollingworth, 2014), and

although female administrators are the majority in Texas and across the nation, their representation in leadership positions is far below the proportion of women in teaching (Killingsworth, Cabezas, Kensler & Brooks, 2010). Digging deeper into the number of women in school leadership reveals that the discrepancies are even greater when considered with other demographic factors, such as race (Jean-Marie, 2013). Hernandez and Murakami (2016) write that many of the Latinx administrators are women, a majority of whom work in low achieving high poverty schools. Hernandez and Murakami (2016) posit that many of the female minority leaders choose these challenging school environments out of a sense of duty aimed at supporting communities that have typically been marginalized.

Female school leaders typically have more experience as teachers and spend more time in the emerging leader phase than their male counterparts (DeAngelis & O'Connor, 2012; Sanchez & Thornton, 2010; Young & McLeod, 2001). There is also a predictable trend of women occupying a majority of leadership roles at the elementary level, whereas men continue to be the majority of administrators at both the middle school and high school level. The larger proportion of women working in elementary school leadership may have to with long established gendered beliefs that women are better caregivers and nurturers (Horsford & Tillman, 2012; Reed & Evans, 2008). Men are typically associated with more directive and controlling leadership styles, while women are more often associated with relational and consensus-building styles (Krüger, 2008). As leaders, women are more likely to be transformational leaders, whereas men are more likely to utilize laissez-faire leadership (Krüger, 2008; Sanchez & Thornton, 2010). Elementary schools, with their smaller student and teacher populations, might be

perceived as more conducive to the leadership styles employed by women leaders, while the larger size of middle and high schools favor a more directive approach typically associated with male leadership. Whether school leader candidates are self-sorting themselves based on these expectations, or typical educational systems prioritize certain biases, or whether it is some combination of factors, remains up for debate (Farley-Ripple, Raffel & Welch, 2012).

Elementary school leadership is the only position where women hold a numerical advantage over their male counterparts, although it is still not proportional to the size of the teaching population, the place many administrators begin their education career (Parylo, Zepeda & Bengtson, 2013). Men experience a proportional advantage, even in elementary education, which may be in part due to the overwhelming number of women who are elementary teachers. Higham, Earley, Coldwell, Stevens, and Brown, (2015) highlighted that there are often instances where hiring boards were perceived "to be looking for a male headteacher" (p. 77) specifically, although the reasons for which were not explored in the report. Female administrators are more likely to stay in an elementary leadership position, whereas in all other school settings, there was no difference between male and female leaders (Fuller & Young, 2009). Finally, research indicates that secondary level teachers are more likely to pursue a degree in educational administration compared to elementary teachers (Baker, Punswick & Belt, 2010), and there may exist a bias against allowing elementary teachers to work up to secondary environments, thereby limiting elementary teachers and administrators to elementary schools.

Age and experience. The population of educators entering administration is becoming younger. White and Agarwal (2011) found that in Illinois the population of

principals under 40 years old increased significantly from 15% to 30% since 2001. Much of this change has been brought on by retirements from the Baby Boom generation of administrators, but some have also speculated that increased pressures for accountability has hastened the departure of many older administrators (DeAngelis & O'Connor, 2012; Farley-Ripple, Raffel & Welch, 2012). Not surprisingly, Folsom et al. (2015) found that the population of assistant principals was on average five years younger than that of principals. First time principals in Texas tend to be younger than the national average, with Texas principals averaging just over 41 years old (Davis, Gooden & Bowers, 2017). The overall impact of age is difficult to ascertain in large part because it is so often linked with experience as a teacher and/or administrator.

As with the other factors mentioned, age is informed by an interaction with other influences, including race and gender. Jean-Marie (2013) documents how women are often passed over for administrative appointments which they are qualified for based on their age and gender because of perceived maternal responsibilities, such as childcare. Bowers and White (2014) also showed that in Illinois, principals in Chicago tended to be older and whiter than those principals outside of Chicago.

As the school leader population gets younger, it is important to examine how this less mature population of administrators may be perceived on their campuses. The increased youth of the administrator populations has been accompanied by an increased likelihood that an administrator will have had emerging leadership experience as an assistant principal or similar position (White & Agarwal, 2011). However, less experienced principals are still more likely to work in higher poverty schools and are more likely to leave their leadership positions (Béteille, Kalogrides, & Loeb, 2012), and

it is on these same campuses where more emerging leaders are going to begin the experience of leading schools. Increased principal turnover has been shown to have a destabilizing effect on schools, where principal turnover increases the likelihood of teacher turnover. Increased turnover, in both the administrative and teaching ranks, has been shown to have detrimental effects on student achievement and tends to disproportionately affect schools with typically marginalized student populations (Ronfeldt, Loeb, & Wyckoff, 2013). Newly hired teachers in underserved schools are typically less experienced and are more likely to need additional professional development and mentoring supports in their first years (Darling-Hammond & Sykes, 2003), supports that many novice administrators are not prepared to adequately provide.

Age and experience has been shown to influence the likelihood that an individual becomes a principal, the likelihood increasing with age and experience up to the average of 5.12 years from initial principal certification (Bastion & Henry, 2015), at which point individuals seeking the principalship face a decreasing probability of becoming a principal (Davis, Gooden, & Bowers, 2017). This bell curve of likely attainment of a principalship varies depending on a number of factors. Tillman (2004) found that a larger portion of African American administrators were found in an emerging leader position such as assistant principal, with proportionally smaller number moving into the principalship. Women also tend to spend a longer time in other school positions before moving to the principalship, as the average age of female principals tends to be older (Young & McLeod, 2001). Additional teaching experience may have positive effects on leadership practice, but it is prior leadership experience that has been shown to increase attainment of principalship (DeAngelis & O'Connor, 2012).

Age and experience in teaching and leadership are best considered together as there is little research distinguishing between the two. In the over one-hundred years that school administration has been formally studied, the pathway to the principalship has grown increasingly more defined, which serves to narrow the influences of age and experience. The traditional pathway to the principalship now includes time as a teacher and as an emerging leader, either voluntary or through typical career advancement tracts. Though this increasingly well-defined path contributes to similar shared experiences among emerging leaders, age and experience still impact at least the achievement of the principalship, if not informing later practice as a principal.

Summary

The position of school leader has changed substantially over the last two centuries. Similarly, the processes for preparing and hiring potential administrators have continued to evolve either in response to or contributing to shifts in educational leadership over time. These shifts in the role and practice of school leadership have increased the educational significance of school leaders, indirectly contributing to student achievement (Marzano, Waters & McNulty, 2005) and directly influencing a school climate and culture (Hitt & Tucker, 2016). The role of school principal has grown to include a multitude of responsibilities, which in turn have resulted in an increased focus on school leader preparation and certification.

The processes for selecting school leaders have also changed over the same timeframe, although it could be argued not nearly as much as the role of principals in schools. Early school leaders were hired by local groups of influential men (Rousmaniere, 2013). The hiring of school leaders now often falls to superintendent, the

majority of whom remain disproportionally male and White, acting at the behest of local school boards that are often not proportionally representative of the students or community they serve (Diem, Frankenberg, & Cleary, 2015).

The formal academic preparation of school leaders in the United States has evolved over the last century, and has focused on different elements of leadership, starting with the technical aspects of leadership at the beginning but growing to include broader philosophical considerations of school leaders and their role in schools and education (Shen, Cooley, Ruhl-Smith, & Keiser, 2005). The formalization of school leadership preparation also coincided with the emergence of various coordinating organizations that further legitimized professional preparation and the existing scholarship (Perilla, 2014).

Finally, the path to becoming a principal is uniquely informed by the contextual experiences each educator carries with them. Educational leadership is experiencing significant churn at the school level, with principals being younger and less experienced than at any time in the last 20 years. Even with the increase in available opportunities, certain populations of educators remain more likely to become principals. White males face the shortest timeline to becoming a principal, particularly in schools that are rural, suburban, or secondary (Blackmore, Thomson, & Barty, 2006). Conversely, females have seen a significant increase in the school leader ranks, but only as a result of significant representation at the primary or elementary level. In Texas, with its majority minority student population, prospective school leaders who are considered Hispanic or Black are underrepresented in school leadership roles, particularly so if they are female (McFarland et al., 2017; Parylo, Zepeda, & Bengtson, 2013).

There is little empirical research examining the experience or factors of emerging leadership that contribute to ascension to the principalship. This research study examined the factors that contribute to becoming a principal in Texas. This study contributes to the existing literature by establishing an empirical foundation describing the factors that have a positive or negative impact on the likelihood of becoming a principal, along with the factors that have no measurable effect. Once highlighted, these factors can be further explored to understand their significance.

III. RESEARCH METHODOLOGY

This chapter describes the study design as well as the composition of factors that led to the selection of discrete-time survival analysis as the analytic tool of choice. Discrete-time survival analysis allows for the analysis of longitudinal data specifically targeting time to an event or outcome of interest (Willett & Singer, 1991). The event or outcome being examined in this study is the time span between principal certification, typically achieved within a year of completing an Educational Administration preparation programs (EAPP) or a School Leader Preparation program (SLPP), and employment as a principal. This chapter section also describes the predictor variables used in the analysis, also known as covariates, and the reasoning for their inclusion in the study.

The design of this prospective study was non-experimental, as it draws on existing data. The data used to examine the career trajectories of principals for the study comes from the Texas Electronic Research Center (Texas ERC) and is comprised of hierarchically linked longitudinal student and school level data. The goals of this study were to discover factors or combinations of factors that contribute to the discrepancy between principal populations and teacher/student populations. This exploratory study revealed "patterns in the data" (Behrens, 1997, p. 131) to better understand why some populations of educators are more likely to become principals and others are not.

Survival Analysis

Historically speaking, survival analysis is quite old. Coming out of demographic and actuarial sciences, the mathematical foundation for current approaches in survival analysis can be traced back to the 1800's (Andersen & Væth, 2010). The choice of survival analysis as the intended methodological tool for this study is appropriate as

survival analysis is suitable for large data sets examining duration, while also allowing for use of procedures that examine the influence of specific variables on the duration being measured, also known as *survival time* (Tabachnick & Fidell, 2013). Survival analysis was initially used in medical research looking at the conditions that contributed to or negated the likelihood of death for a patient, hence the inclusion of the name "survival" as a descriptor of the type of analysis and the outcome variable. Later, similar statistical techniques were used in manufacturing analysis to examine the factors predicting failure of a non-living subject, in which the defining event was a failure; still, the underlying statistical processes remained the largely the same (Allison, 2010). Finally, when used in social science research, this type of analytic technique is often referred to as an event history analysis, although both previous designations are frequently found throughout the literature (Aalen, Borgan, & Gjessing, 2008).

The use of survival analysis in educational research is useful as many questions within education research revolve around duration, from a designated starting point to a stated objective (Willett & Singer, 1991). An example of this would be how long it takes to identify all 26 letters in the alphabet starting from the point when students enter pre-kindergarten, or the rate of recidivism for students sent to the office one time. Although the stated examples are simplifications, a benefit of survival analysis is that multiple variables can be added to the analysis to determine the influence specific variables have on the outcomes (Willett & Singer, 1991). Extending the previous examples, factors like gender or parent educational level can be included, provided that the information is known. Regarding this study, another key advantage of survival analysis is that it allows for testing of the effect of a specific predictor over time, instead of assuming the value

remains constant over the duration of the measurable time (Willett & Singer, 1991). For example, measuring the factors contributing to attainment of the position of principal and with a starting point of certification completion, the predictor with an effect that could vary over time is the duration of time spent in an emerging leadership position. Key benefits of survival analysis are its capacity to include variables that represent (1) an outcome at a specific time, (2) a specific starting point, and (3) sensitivity to detecting failure (or not) before the designated end of the data collection (a.k.a. "censoring").

Censoring

Censoring is an intriguing feature of survival analysis as it allows for longitudinal data structures that include participants experiencing failure or those not relative to the outcome inside or outside the duration of the study. For example, censoring allows data to be included in the analysis even if measurement outcomes occur outside the formally prescribed measurement timeframe (Tabachnick & Fidell, 2013; Willett & Singer, 1995). The time until event is still measured, even if the research is unable to determine if attainment of the event happened in the future. Once censoring is applied, data collection on the subject does not continue (Willett & Singer, 1995).

There are three types of censoring: right, left, and interval censoring. Left censoring is when the event being measured occurs before the measurement window begins, or if visualized as a horizontal timeline, to the left of the measurable time (Gates, Ringel, Santibañez, Guarino, Ghosh-Dastidar & Brown, 2006). An example of that from this study would be an individual who has already attained the position of principal, but for whatever purpose was initially certified during the measurement window of the study.

Interval censoring involves the censoring of data that occurs between two points of measurement that occur at regular intervals (Zhang, 2007). An example of interval censoring in this study would be a measurement of principalship attainment at regular six-month intervals in which an individual had not become a principal at 12 months, but by 18 months, had attained principalship. In this case, it is unknown at what point in the six-month period the individual became principal but rather that it occurred during that time.

Finally, the last type of censoring is right censoring. Right censoring occurs when data falls outside the end of measurement time and is the most common type of censoring in survival analysis (Tabachnick & Fidell, 2013). Individuals who attain principal certification but have not become principals by the end of the measurement period would be right censored.

Figure 1 shows a visualization of how data is organized and measured in survival analysis. Although individuals received their principal certification in different years, the start point on record for the analysis is prior to becoming a principal and is included as *the designated starting point*; in this case, this point is defined as when they received their principal certification in the state of Texas. The duration of time is then measured from that point until they experience *the event,* becoming a principal, or their data is censored because there is no data available (i.e. move to another state), the event occurs outside the data collection window, or it has not yet happened.

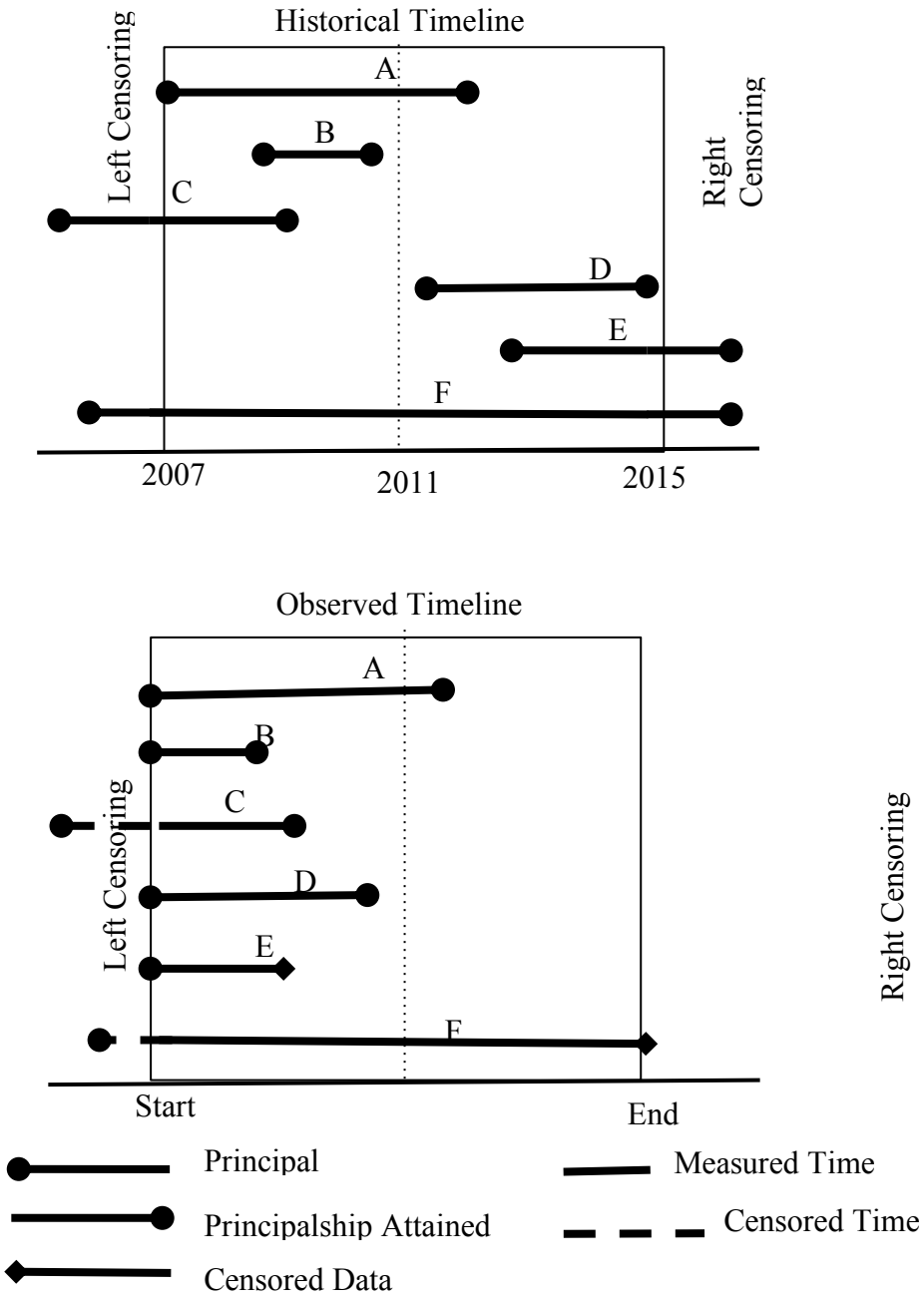

Figure 1: Sample data visualization, censoring.

Survivor Functions/Life Tables

Survival analysis also allows for the creation of survivor functions and life tables. These two techniques are useful as they are two different ways to demonstrate that an event is likely to occur (Bagiella, 2008). Survivor function is also defined as the Kaplan-Meier estimator, or when represented visually, the Kaplan-Meier curve (Rich, et al, 2010). The Kaplan-Meier curve is described as a stair step going up, or down, with each discrete step being a point in time (Bagiella, 2008). Kaplan-Meier accommodates the inclusion of censored data, especially right censored data. To determine the likelihood of an event, or a death occurring, data is collected at designated intervals with the possible outcomes being event occurrence or no event occurrence (Rich et al., 2010). At the end of data collection, all remaining data points that have not experienced the occurrence of an event are censored but their survival time is factored into the overall results. Life tables are similar to survival functions, in that they show the probability of an event occurring.

The example in Table 1 uses a fictional data set that examines the duration of time between when an individual completes her principal certification and becoming a principal. The first column shows each period of time that is measured, with the second column showing the time interval measured in years. A key element of the Life Table is the *Survival Function,* which is "the cumulative proportion of cases surviving" (Tabachnick & Fidell, 2013, p. 516); this shows the proportion of measured cases that have yet to experience the hazard event. The third column shows the total number of fictional people who completed their certification over the duration of time being measured. Column four indicates the number of individuals who become a principal (d_i)

during the interval being measured, while column five shows those individuals who were censored (c_i) because they left the data set or persisted beyond the measured time of the study. The sixth column displays the proportion of the remaining eligible individuals who became a principal, and the seventh column shows the proportion that survived that interval. The final column shows the cumulative proportion that experienced the hazard event after each interval.

Table 1

Life Table Example

Period	Interval (Years)	Certified	Became a Principal During Period	Censored	Proportion that achieve event	Proportion that remain (Survive)	Cumulative Proportion that achieved event
0	0-1	100	0	3	---	1.000	1.000
1	1-2	97	9	5	0.093	0.907	0.907
2	2-3	83	4	2	0.048	0.952	0.863
3	3-4	77	10	1	0.130	0.870	0.751
4	4-5	66	2	7	0.030	0.970	0.729
5	5-6	57	7	3	0.123	0.877	0.639
6	6-7	47	6	6	0.128	0.872	0.558
7	7-8	35	2	1	0.057	0.943	0.526
8	8-9	32	0	3	0.000	1.000	0.526

9	9-10	29	5	2	0.172	0.828	0.435

Key Terms

Survival analysis is a statistical method that is commonly used in medical research (survival analysis) or manufacturing research (failure analysis), but it has seen increased use in educational research over the past 25 years (Singer & Willett, 1993). The terms listed below emphasize key information presented in previous sections and aid in understanding the essential components of survival analysis.

- **The event -** Survival analysis reduced to its simplest form is the measuring of the time from a designated starting point to an occurrence of a specific event. This study is measuring the time starting with the achievement of principal certification and ending with the event; in this case, the event is the attainment of the position of principal. Once the event is experienced, data collection for the subject stops (Tabachnick & Fidell, 2013).
- **Censoring - not observed event -** Censoring, as described in greater detail above, is the inclusion of duration data that have not experienced an event (or death). This study's data includes emerging leaders that have not become principals at the completion of data collection, but have experienced the starting event, principal certification.
- **Covariates -** All the predictors in survival analysis are considered covariates, including dependent (DV) and independent variables (IV).
- **Life Tables -** Life tables estimate survival probability over the duration by determining the number of individuals who experience an event (death/failure) that occurred since the

last measurement, as well as the number of individuals who did not experience the event (survivors).

- **Survival Function -** Survival function is the probability that the time for experiencing the event is later than the measured time. Typically, the further from the starting time, the smaller the probability of survival.
- **Survival Curve (aka Kaplan-Meier curve)** - Survival functions represented as a visual curve are considered smooth, but in actual practice they are typically represented by a visual image that looks like stair steps trending in a downward direction. The steps down represent the decreased probability of survival with each time interval measurement.
- **Time -** The start of the study until one of three things occur: (1) experience of the event, (2) completion of the study before the event was experienced, and (3) loss of contact throughout the study with measurement unable to continue.

Population and Sample

The population for this study will be comprised of individuals who completed principal certification between 2007 and 2017. Similar studies have used populations of more than 10,000 candidates (Davis, Gooden & Bowers, 2017). However, criteria for this study have broader parameters for selection of the population, resulting in a larger population sample (n=25,910). It is likely the sample population in this study includes a portion of the same individuals in from the Davis, Gooden, and Bowers study, but the overall population of this study includes many cases not included in Davis, Gooden, and Bowers study of principal certification.

Data

This exploratory investigation examined several personal and situational covariates that affect the time it takes individuals to reach the position of school principal, as shown in Table 1. Leveraging the Texas Education Research Center's (ERC) State Longitudinal Data System (SLDS), student and school level data (linked hierarchically) were used to examine the career trajectories of educators that begin with principal certification completion and continue until either (a) the attainment of principal status was achieved, or (b) the end of the data collection period was reached.

Variables Used in the Study

The analysis employed in this study included eleven variables, or covariates, to explore which factors or combination of factors significantly influenced the speed at which designated groups attain the position of principal. The goal of this study was to determine if there were factors that increase or decrease the likelihood of principalship attainment. Also, attempts were made to determine which actors had the greatest influence on the attainment of a principal position and which factors enhanced or mitigated that attainment when combined with other factors from this study.

Race/Ethnicity. For the purposes of this study, the racial/ethnicity designations used by the state of Texas were used; however, the researcher acknowledged that racial and ethnic designations were not always constant. The designations used in the Texas data are as follows: White, Black, Hispanic, Asian, Pacific Islander / Native American, and Two or more races. Ethnic background was considered for this study and is defined by existing demographic data provided through the ERC database. Ethnicity is also considered an important factor because the initial impetus for this study arose from

existing discrepancies between the principal population and the current teacher and student populations in Texas schools. Ethnicity is a time-independent covariate.

Gender. The binary designations (Male/Female) used by the state of Texas were used. The researcher acknowledged there is disagreement in the literature as to whether biological sex or gender is the more appropriate designation. Gender is a time-independent factor.

Age. Age is a time-dependent covariate. Age was be determined by the age at time of principal certification.

School leader preparation program type. As of 2016 there were 75 principal preparation programs in the state of Texas. The type of institution attended may play a significant factor in the duration of time between certification and principalship. While the measuring of quality within each of these programs is beyond the scope of this study, the institutions will be grouped according to the Carnegie designation in lieu of another indicator of quality. It is important to note that the Carnegie designation will be grouped in their general categorical groups and not the rankings within those groups. The four general categories as defined by the Carnegie ranking system are as follows: Research/Doctoral, Masters/Comprehensive, Other[2], and Alternative Certification (Note: The University of Texas is a Research 1 institution and Texas State University is considered a Research 2 institution, but both will be considered "Research" institutions for the purposes of this study). SLPP type is considered a time-independent covariate, but there may be instances in which the university Carnegie designation changed over the course of the study. In such cases, the designation at the time of graduation will be applied to students.

[2] Consisting of a combination of Baccalaureate institutions and Religious institutions

Principal Certification Achieved. Following the successful completion of a Masters program in Educational Administration, individuals take a state assessment which they must receive a scale score of 240 out of a possible 300 in order to receive their principal certification. Principal certification achievement is the starting point of the duration measurement for this survival analysis. Failure to receive a passing score on the principal examination would preclude an individual's inclusion in the study.

Data Analysis

Data analysis proceeded using discrete-time survival analysis which includes a variety of methods including Cox proportional hazard regression model within IBM's Statistical Package for the Social Sciences (SPSS) 24 (IBM, 2016), as well as Stata (StataCorp. 2015). Survival analysis was appropriate for this study as it is considered both robust and predictable (Willett & Singer, 1993)in time to event analysis. The use of Cox Regression is also appropriate as this study involved a significant number of covariates and considered the potential hazard for any individuals as proportionally the same (Kleinbaum & Klein, 2005).

The use of discrete-time survival analysis allows for the incorporation of multiple variables. The discrete-time hazard method is flexible, which is particularly helpful when conducting quantitative research in the field of education, as the coefficients being studied can be stable (i.e. gender, race, certification achieved) as well as vary over the time of measurement (Singer & Willett, 1993). It is also important to remember that the findings using discrete-time survival analysis are represented as probabilities instead of actual rates at which an event occurs. Confusion on this fact makes clarification important and warrants mentioning. An example of the confusion between probabilities

and actual rates could be seen in the 2016 United States Presidential election. Forecasting markets stated that Hillary Clinton had anywhere between 96% to 66% chance of winning the 2016 United States presidential election. In many cases, these win probability numbers were interpreted to mean that she was a sure bet to win. Ultimately, the assertion that she was assured of winning was wrong. A 66% probability merely stated that she had a two in three chances of winning, and the other major candidate, Donald J. Trump, had a one in three chance of winning the election, which is ultimately what happened. Regarding the study at hand, hazard is considered the probable likelihood that an individual becomes a principal or not.

Research Questions

Four research questions will guided this study. Each research question is presented below, along with their associated hypotheses:

1. How do traditional school-leader preparation programs and personal attributes such as age, gender, and race/ethnicity of aspiring school leaders affect the time it takes for an individual to attain a principal position after receiving their principal certification?

   H1: There is a significant direct effect between a candidate being male and a shorter the time between principal certification and attainment of the job of principal.

   H2: White principals' candidates are most likely to experience the highest probability of becoming a principal.

   H3: The older a principal candidate becomes, the less likely they are to become a principal.

2. How do the types and quality of school-leader preparation programs affect the time taken for an individual to become a principal once they receive their principal certification?

   H1: Attending traditional principal preparation programs (university based) offers a statistically significant increased probability of becoming a principal.

   H2: Traditional university-based principal preparation programs with higher Carnegie rank categorization offer a statistically significant increase in principalship attainment.

   H3: Attending social justice principal preparation programs increases the probability of principalship attainment.

3. How does the interaction of school-leader preparation programs type and personal attributes such as age, gender, ethnicity of aspiring school leaders affect the time it takes for an individual to attain the position of principal after receiving their principal certification?

   H1: Emerging school leaders who attended Research/Doctoral level institutions and who are male, White, and under 40 years of age are the population most likely to attain the position of principal in the shortest duration of time.

   H2: Emerging school leaders who work in rural settings and are White and male are more likely to become a principal than any other population combination

   H3: The positive effects of attending a Research/Doctoral university principal preparation program are more pronounced in urban and suburban settings.

5. What factors (or interaction of factors) display the greatest likelihood of attainment of the position of principal?

H1: There are three factors that show a significant impact on the attainment of principal positions and several other factors that are statistically significant but have a smaller overall effect on the attainment of the position of principal. Gender, racial designation, and attendance in a principal preparation program at a prestigious university all have a significant impact on the time it takes to become a principal.

IV. FINDINGS AND RESULTS

The purpose of this study was to examine the factors that contribute to principalship attainment following principal certification, to better understand the demographic discrepancies between the principal population and the teacher and student populations in the state of Texas. This chapter begins with a detailed account of the population used in this investigation. Next, the descriptive data for the populations of individuals certified as principals and the population of individuals who experienced the failure event (i.e. earning a principalship for the first time) are described. Understanding factors that contribute to the demographic differences among principal, teacher, and student groups serves as a possible impetus for change in policy and practice in school leadership preparation. Also, understanding such discrepancies provides insight into principal selection and performance in Texas schools. This chapter details the results of the analysis, including descriptive statistics of the population of the study, and the results of a collection of statistical techniques used in a survival analysis, which includes Life Tables, Cox Proportional Hazard, Kaplan Meier Procedure, Survival and Hazard Functions and Adjusted Survival Functions. The results of this suite of statistical techniques demonstrates complex and sometime contradictory findings about the trajectory of prospective school principals in Texas public schools.

Descriptive Statistics of Variables

The ERC includes data on principal certification dating back to 1960. According to available data, TEA has provided a principal certification or the equivalent more than 140,000 times between 1960 and 2017. For the purposes of this study, only those individuals with the most current type of principal certification were included, thereby

eliminating older and additional types of certifications that allow an individual to serve as a principal in Texas. Next, since the focus of this study was School Leader Preparation Programs (SLPPs) and their potential effect on principalship attainment, all standard five-year certifications were selected, eliminating all Out of State (OOS) and One Year Certifications (OYC). The reasoning for this is twofold; first, the most complete data in the ERC is for individuals who attended institutions in Texas, whereas individuals (a) from out of state or (b) seeking a temporary OYC often had limited or incomplete data. Secondly, OYC can be obtained prior to completion of a principal preparation program, provided the candidates meet other requirements delineated by the Texas Education Agency (TEA). It is for these reasons, all OYC were eliminated from the dataset. As the focus of this study was on the time between principal certification and attainment of the principal position, the final sample was delineated to include unique individual data where first-time certification occurred on or after 2007. The final sample used in the analysis was comprised of 25,910 unique cases.

The data for this study was arranged in person-period format, meaning that for each period (year) of employment in a Texas public school, an individual had one line of data for observation, resulting in 146,186 total number of observations. The dataset includes individuals that have one line of data for two reasons. First, persons who become a principal in the same year they achieve their certification are included on a single line. Second, other individuals have up to eleven lines of data because they were certified in the first year measured in the study, 2007, and persisted through the duration of the study without ever becoming a principal (i.e. experiencing a censoring event). Table 2 details the descriptive statistics for the populations used in this study. Information

in Table 2 includes two subgroups - the initial group studied (n=25,910) and the population that attained the principalship (n=3538).

Inspection of the subgroups illustrates notable differences between the population of individuals with a principal certification and those attaining the principalship over the duration of this study. The descriptive differences identified in Table 2 illustrate differences in principalship attainment that are explained later in the chapter.

Table 2

Population Descriptive Statistics

	Initial Certification		Became Principal	
Biological Sex				
Male	7,088	27.36%	1,255	35.47%
Female	18,822	72.64%	2,283	64.53%
Ethnicity				
White	15,228	58.77%	2,232	63.09%
Black	4,149	16.01%	437	12.35%
Latinx	5,812	22.43%	787	22.24%
Other	721	2.78%	82	2.32%
Sex+Ethnicity				
Male+White	4,378	16.90%	844	23.86%
Female+White	10,850	41.88%	1,388	39.23%
Male+Latinx	1,627	6.28%	247	6.98%
Female+Latinx	4,185	16.15%	540	15.26%
Male+Black	885	3.42%	136	3.84%

Female+Black	3,264	12.60%	301	8.51%
Male+Other	198	0.76%	28	0.79%
Female+Other	523	2.02%	54	1.53%
SLPP Type				
Alt Cert	2,581	9.96%	292	8.25%
Traditional	23,329	90.04%	3,246	91.75%
SLPP Level				
Research	5,323	20.54%	845	23.88%
Doctoral	9,954	38.42%	1,222	34.54%
Masters	7,745	29.89%	1,136	32.11%
Other	307	1.18%	43	1.22%
SLPP Social Justice				
UCEA Member	5,835	22.52%	901	25.47%

Gender. The population of individuals with a principal certification throughout the duration of this study was nearly three times (72.6%) greater than the population of males (27.4%) with a principal certification. Even though females continue to comprise a large majority of principal certifications in the state of Texas as well as initial principal position attainment, their rate of attainment is less substantial (64.5%) than their proportion of the overall population of initially certified individuals. Persons identifying as male accounted for 27.36% of the individuals with an initial principal certification, while a much larger proportion, 35.47%, of those males ended up becoming a first-time principal during the study.

Ethnicity. Individuals considered White make up the largest percentage of principal certifications at 58.77%, while Latinx comprise 22.43% of initial principal certifications. Individuals classified as Black make up 16.01%, with the combination of all other ethnicity designations comprising the remaining 2.78%. There are notable differences when compared to the population of individuals who actually became principals over the time studied. White candidates made up 63.09% of group to become principals, a 4% increase over the same population of candidates with certification, while Black principal candidates experienced a decrease of almost 4% when compared to the pool of individuals with a principal certification. Both Latinx and Other categories had similar percentages of the Became Principal group as they did of those with initial certification.

Sex and ethnicity. As both the biological sex and the ethnicity of prospective principals has been shown to impact attainment of the principal position, sex and ethnicity were grouped together to form another variable for consideration (Davis, Gooden, & Bowers, 2016). White males made up 16.9% of the initial certification group, but a larger percentage of the Became Principal group at 23.86%. White females were the largest percent to be certified as a principal (41.88%) and to became principals (39.23%), although there was a decline of those who became principal compared to those with an initial certification. Latinx men comprised only 6.28% of those certified as principals and approximately the same number became principal over the time studied (6.98%). Latinx females were the third largest proportion of individuals with a principal certification (16.15%) as well as the third largest proportion of individuals who became a principal, although their proportion of the group of first-time principals was slightly

lower at 15.26%. Black males made up a small percentage of the individuals that were certified principals (3.42%) and those who became principals for the first time (3.84%). Black females made up 12.6% of all individuals with a principal certification from study, while they made up a smaller percentage of those who actually became a principal (8.51%). Finally, the combined group (Asian, two or more races, Pacific Islander, and Native American) of all other individuals from the study comprised a very small group of individuals with principal certification or who became principal. Males in this category made up only 0.76% of initial certifications and 0.79% of individuals who became principal. Females from the same category made up 2.02% of the overall certification group but a reduced 1.53% of those who became principal.

School leader preparation program type. A majority of principals in this study attended a principal preparation program in a traditional university setting (90.04%), and 91.75% of those individuals who became a principal attended a traditional principal preparation program. The remaining individuals who received their principal certification (9.96%) in Texas attended what is considered an alternative certification program. Of those who became a principal over the duration of the study, 8.25% attended alternative certification programs.

The traditional preparation programs were further desegregated into groups based on their 2015 Carnegie designation. The subcategorization was broken into the four main categories of graduate rankings: Research, Doctorate, Masters, and Other (combination of Baccalaureate and Faith-Related Institutions). Research institutions were the attended programs for 20.54% of the overall principal certifications and 23.88% of first time principals. Doctoral granting institutions were responsible for 38.42% of the overall

principal certifications but only 34.54% of the first-time principals. Masters granting institutions were responsible for 29.89% of the overall principal certifications but 32.11% of the overall first-time principals. Finally, the small category of Baccalaureate and religious based institutions classified as Other accounted for a mere 1.18% of principal certifications and 1.22% of first time principals from the study.

Texas is experiencing significant change in the overall population demographics, but also a more substantial diversification of the student population attending Texas public schools. That being the case, it was also determined that principal preparation programs that claim to have a specific focus on issues of equity and social justice should be considered as a variable. UCEA is an organization that is focused on issues of educational administration and issues of equality and access for all students. In order to be a member institution of UCEA, a university must express a desire and documentation that indicates a commitment to educational administration focused on social justice (Young, 2016). The member institutions from Texas were combined to create a group labeled SLPP Social Justice. As shown, 22.52% of initial principal certifications attended a Social Justice program, and 25.47% of the first-time principals attended a social justice program.

Table 3 displays the means for Certification Year, Age at Certification, and number of Principal Certification test attempts by two groups: (1) individuals with an initial certification and (2) individuals that became a principal over the duration of the study. There were mean score differences between the entire group with an initial five-year principal certification and those that became principals in the course of the time studied.

The range of years for those who achieved their initial certification was 2007 through 2015. The mean year of certification for the entire population was 2011.2 (2.514 years) while the mean year of certification for the group that became principals was 2009.8 (2.244 years). The lower mean for the principal population would be expected, as the closer a candidate was to the minimum year of certification the increased number of chances that individual would have to become a principal. Those receiving their principal certification in 2007 would have eleven intervals to become a principal, whereas as an individual who completed certification in 2012 would only have six intervals of time to experience the event.

Those who completed initial certification ranged in age from 21 to 69. The age range at certification for those that became a principal was slightly narrower, at 22 to 63. The age at certification category showed some discrepancies with the population to become principal, whereas the group who became principals completed certification at a younger age (35.96) than the entire group with a principal certification (37.23).

Finally, principal certification in the state of Texas is granted upon successful completion of a principal preparation program as well as passing a Principal certification exam overseen by TEA. This test may seem like a small obstacle, but it does represent a requirement for principal certification and therefore should be examined. During the duration of the time studied, an individual could take the principal test until a passing score was achieved. Most pass the test on the first attempt, but as the mean score (1.30) of those with a certification demonstrates, a passing score on the first attempt is not a forgone conclusion.

Table 3

Descriptive Statistics: Certification Year, Age at Certification and Test Attempts

Variable	Obs	Mean	Std. Dev.	Min	Max
Certification Year	25910	2011.20	2.51	2007	2015
Age at Certification	25910	37.23	7.94	21	69
Test_Attempts	25910	1.30	0.81	1	≥5
Certification Year	3538	2009.80	2.24	2007	2015
Age at Certification	3538	35.96	7.20	22	63
Test Attempts	3538	1.26	0.76	1	≥5

Note: The number of attempts ranged from 1 to more than 30, although all attempts 5 or greater were grouped together. The group that became principals had a lower mean test attempts (1.26) although there was still a range of 1 to 5+.

Life Table

Life tables are a "fundamental tool for summarizing the sample distribution of event occurrence" (Singer & Willett, 2003, p. 326). As such, it is useful to start with the life table analysis before proceeding to more statistically rigorous methods to examine principalship attainment. Table 4 is a Life Table detailing the measurement period, the interval of time being measured (one year), the total number of individuals with a principal certification eligible to be a school principal, the number of individuals experiencing the event each period, and the number individuals censored each period. The next two columns show the proportion that survived (did not become principal) and

the proportion who experienced the failure event (becoming a principal) during each period. Finally, the remaining two columns show the confidence interval of each of the survival estimates, which is the survival estimate multiplied by the standard error at each interval of time.

Survival analysis allows for the use of censoring of events where the outcome is not known (Singer & Willett, 2003). The use of censored events eliminates the ability to use a sample mean as the estimate of central tendency, but because the outcome of censored events is unknown, "another estimate of central tendency is recommended: the median lifetime" (p. 337). Median lifetime is the point when 50% of the population has experienced the event being measured. As Table 4 illustrates, there is not a median lifetime measured over the course of the eleven years being studied, as the latest period still showed slightly more than 63% has not yet become a principal in Texas public schools. This finding mirrors Davis, Gooden, and Bowers (2016), who also examined the trajectories of prospective principals in Texas over a sixteen-year span and did not find a median lifetime.

Table 4

Life Table

Period	Interval	Not a Principal at Start of School year	Became Principal During Period	Censored	Survival Function	Hazard Function	[95% Conf. Int.]	
0	0, 1	25,910	-	-	1.000	-	-	-

1	1, 2	25,910	120	884	0.995	0.005	0.994	0.996
2	2, 3	24,906	385	957	0.980	0.015	0.978	0.981
3	3, 4	23,564	422	3,768	0.961	0.018	0.958	0.963
4	4, 5	19,374	500	3,060	0.934	0.026	0.930	0.937
5	5, 6	15,814	553	2,605	0.898	0.035	0.894	0.902
6	6, 7	12,656	528	2,620	0.856	0.042	0.851	0.862
7	7, 8	9,508	405	2,258	0.815	0.043	0.808	0.821
8	8, 9	6,845	299	2,334	0.772	0.044	0.764	0.780
9	9, 10	4,212	189	1,661	0.729	0.045	0.719	0.738
10	10, 11	2,362	93	1,234	0.690	0.039	0.678	0.702
11	11, 12	1,035	44	991	0.634	0.043	0.614	0.653

Two other key elements of Table 4 are the results of the survival function and the hazard function. These two elements are related, with the hazard function showing the probability an individual will experience an event during the period being measured and the survival function showing the cumulative proportion of those yet to experience the event (Singer & Willett, 2003). Where the hazard function is concerned with the risk of experiencing the event being measured, the survivor function takes a broader view to consider the cumulative proportion surviving at each period of measurement.

There are several key findings provided in the Life Table. First, the chance of becoming a principal is exceptionally small the first year after certification, as illustrated by a hazard function of 0.005 translating into a less than 1% chance of becoming a

principal. There are a number of factors why this might be the case and will be further discussed in chapter 5. The overall hazard function is greatest in period nine, at 0.045 or just over 4.5% probability of becoming a principal. The subsequent two years show a decreased likelihood of becoming a principal.

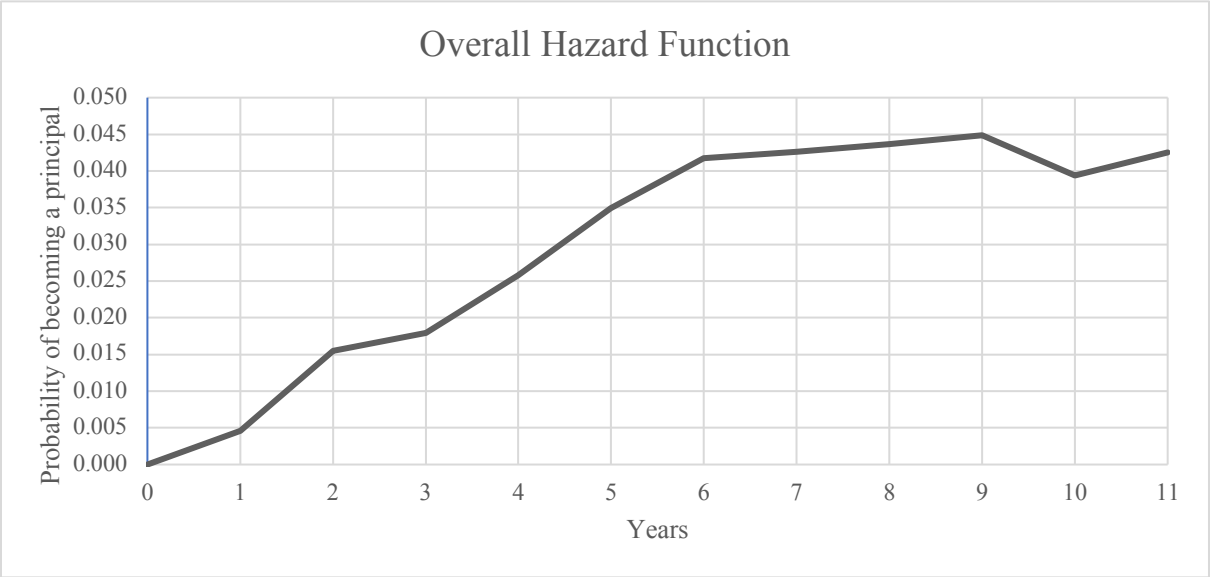

Figure 2. Plotted hazard function of entire population from study.

The likelihood of becoming a principal increases in the years directly following principal certification, leveling off during the middle years, and then beginning a gradual downward trend in the last couple of years of the study. Although the greatest likelihood of becoming a principal occurs in periods seven to nine, the overall likelihood of becoming a principal remains exceptionally low. Figure 2 highlights the estimated hazard, while Figure 3 shows the survival function from Table 4. The survival function after the eleven periods of measurement is 0.634, which translates into approximately 63% of those who had a principal certification not becoming a principal and 37% becoming a principal. The duration of time for this study was not long enough to determine the median lifetime, which is the point where 50% of the population has

experienced the event being studied (i.e., becoming a principal). It is worth noting that a majority of those 25,910 individual cases included in the study were censored before reaching 11 years of continuous service in public schools.

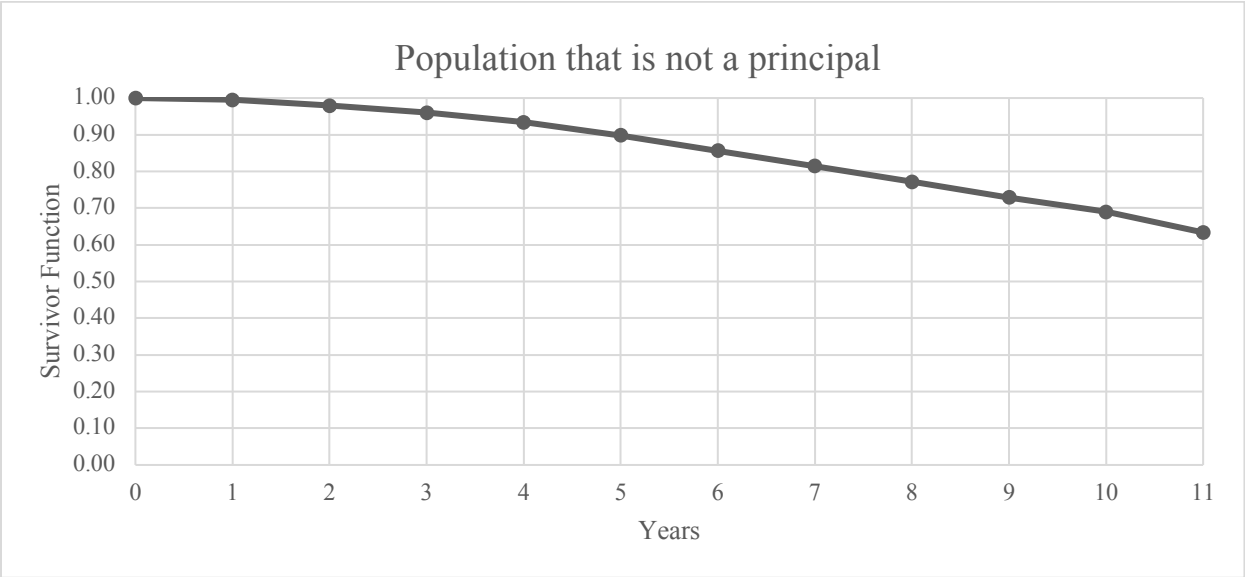

Figure 3. Plotted survivor function of entire population from study.

The Life Table for the overall population serves as a starting point for survival analysis, and in the coming pages a more detailed exploration of the life tables of various specific populations will be explored in greater detail. The overall life table information represents a broad understanding of the trajectory individuals in Texas experience from principal certification to becoming a principal. A more detailed examination considering demographic factors will shed additional light on the varied experiences of prospective principals. In order to gain additional insight into which factors may play a role in principalship attainment, it is appropriate to utilize other statistical tools associated with survivor analysis, including the Cox Proportional Hazard Model.

Cox Proportional Hazard Model

Another popular approach to analyzing survival data is the use of the Cox proportional hazard (PH) model, or as it is sometimes known Cox regression model. Developed by David Cox in 1972, the PH model is widely considered "the best all-around method for estimating regression models for event history data" (Alison, 2014, p. 35). The PH model "assumes a proportionality of hazard over time, and when this assumption fails, the estimated hazard ratio will be an average that does not consider the effect over time (Aalen, Borgan, & Gjessing, 2008, p. 12). The Cox PH model is also applicable to censored data (Theune, 2015). The hazard ratio displayed in Table 5 provides the hazard in relation to the baseline measure. All predictor variables, or covariates, are presented as dichotomous variables.

Table 5

Cox Proportional Hazard (PH) model

Cox regression --	Breslow method for ties		
No. of subjects =	25,910	Number of obs =	146,186
No. of failures =	3538	LR chi2(14) =	320.98
Time at risk =	146,186	Prob > chi2 =	0.000
Log likelihood =	-33430		

Explanatory Variables	Haz. Ratio	Std. Err.	z	P>z	[95% Conf.	Interval]
Sex	0.6407	0.0280	-10.17	0.000**	0.5881	0.6981
Latinx	0.7697	0.0561	-3.59	0.000**	0.6672	0.8880
Black	0.8010	0.0745	-2.39	0.0170*	0.6675	0.9612

Other	0.8109	0.1559	-1.09	0.2760	0.5564	1.1820
Traditional	1.1846	0.0852	2.35	0.0190*	1.0288	1.3640
SJPROGRAM	0.9745	0.0415	-0.61	0.5440	0.8966	1.0593
CarnRANK_D	0.8239	0.0379	-4.21	0.000**	0.7530	0.9016
CarnRANK_M	0.9433	0.0456	-1.21	0.2270	0.8580	1.0370
CarnRANK_Other	1.2762	0.2016	1.54	0.1230	0.9364	1.7392
Sex_Latinx	1.2640	0.1117	2.65	0.008**	1.0630	1.5030
Sex_Black	0.8802	0.0988	-1.14	0.2560	0.7064	1.0968
Sex_Other	1.0368	0.2457	0.15	0.8790	0.6516	1.6498
Cert_Age	0.9794	0.0022	-9.11	0.000**	0.9751	0.9838
Test_Attempts	0.9489	0.0222	-2.24	0.025**	0.9064	0.9934

* Significant at 0.05 level.

** Significant at 0.01 level.

Note. Hazard Ratio (HR) the relationship between variables in the study and survival time (T), after controlling for the other covariates. A HR ratio of 1 indicates there is no effect. If the HR was 2, that would indicate twice the effect, or twice as likely to experience the event being studied. Conversely, a HR of 0.1 would indicate only $1/10^{th}$ the effect of experiencing the event.

Biological sex is a single dichotomous variable (female), while ethnicity is represented by three dichotomous variables (Latinx, Black, Other). Principal preparation program type is a single dichotomous variable (Traditional) and finally the Carnegie ranking of traditional programs is a represented by three dichotomous variables (Doctoral, Masters, and Other) with the reference sample being Research institutions.

The covariate SJPROGRAM was a dichotomous variable for social justice leaning principal preparation programs where 1= Social Justice Program and 0=all other Traditional programs. There are also combined variables (Ethnicity + Sex), including the same dichotomous variables previously mentioned. Finally, Cert_Age and Test_Attempts are continuous variables, with age being considered time invariant for the purpose of this study.

Table 5 displays the covariates measured in the study. The reference groups are as follows: Sex (Male), Ethnicity (White), Principal Preparation program type (Alternative), University Ranking (Research). The clearest way to interpret these covariates is to consider the hazard ratio, or the likelihood each factor has on experiencing the hazard event (becoming a principal). The following variables were not considered to be statistically significant and therefore will not be discussed further: ethnicity (Other), SJPROGRAM, CarnRank_M (Masters), CarnRank_Other, and the combination categories of Sex_Black and Sex_Other. Only those factors which were statistically significant at a 0.05 level will be discussed.

Sex. The hazard ratio for females was 0.6407 or approximately 64.1% the hazard ratio of men, or more simply, the risk of becoming a principal was only 64.1% of the risk of men. Considering the inverse, males were about 1/0.64=1.56, or about 56% more likely than women to become a principal. The z score of -10.17 indicates that being female has a significant negative impact on likelihood of becoming a principal compared to being male. With a P>z value of 0.000 this covariate was considered highly significant.

Race/Ethnicity. The reference category for ethnicity was White, and all comparisons will be in relation to the population of cases categorized as White. Individuals modeled as Latinx displayed a hazard ratio of 0.7697 or a 77% risk of becoming a principal when compared to a White individual. The z score of -3.59 the Latinx category and a P>z value of 0.000 for Latinx is considered highly significant. The other statistically significant ethnicity category was Black, although a z score of -2.39 indicates a negative impact with a P>z of 0.017 it is slightly less significant than Latinx. An individual categorized as Black had a hazard ratio of 0.801 or 80.1% as likely as a White individual to become a principal. Persons considered White had a 1/0.7697=1.2992 or a 29.9% greater chance of becoming a principal than a person considered Latinx, and at 1/0.801=1.2484, had 24.8% more likely chance of becoming a principal than an individual considered to be Black.

Principal preparation program characteristics. There are two general certification tracks in Texas. Certification through a traditional university-based program and alternative certification. With approximately 10% of all certified principals being alternatively certified, it is important to consider the general effect these programs have on the trajectories of potential principals. The dichotomous variable for principal preparation program was Traditional=1 and Alternative=0. The results indicate attending a traditional university-based program has a hazard ratio of 1.1846, or approximately represents a 18% increased chance of becoming a principal as compared to Alternative principal preparation programs. Upon further inspection, one covariate in the Traditional program was statistically significant with a z score of -4.21 and a P>z value of 0.0000. This category was Carnegie-designated doctorate granting institutions. Individuals

attending a doctoral-level institution experienced a hazard ratio of 0.8239, or only an 82.3% probability of becoming a principal compared to those individuals who attended a Carnegie research institution. Individuals certified for the principalship at doctoral institutions comprise the largest number of individuals in this study (n=9,954 or 38%). Attending a Carnegie-designated research institution results in a 1/0.8239=1.2137 or a 21.4% increased chance of becoming a principal compared to those who attend a doctoral-designated principal preparation program.

Age and test attempts. Finally, age at certification and the number of attempts at the certification test displayed statistical significance. Age was highly significant with a z score of -9.11 and a P>z of 0.000, and number of certification test attempts was slightly less significant at with a z score of -2.24 and a P>z of 0.025. The age at certification had a hazard ratio of 0.9794 or a 2% decrease in probability of principalship attainment with each subsequent year. Although this percent decrease was small, over a five-year span this equates to approximately a 10% decreased likelihood of principalship attainment and, extended to ten years since certification, results in a 20% decrease in likelihood of principalship attainment. The hazard ratio for number of attempts at certification was 0.9489 and considered significant although slightly less than age at certification. Stated another way, with each additional certification attempt an individual could expect to experience a 5% decrease in likely principalship attainment. A failure at the first test attempt at principal certification results in a 5% decrease in principalship attainment, 10% if you fail to achieve certification on the second attempt, and 15% if there was a failure on the third attempt.

Finally, combinations of Sex and Ethnicity categories were examined in the model. Although ethnicity was determined to be statistically significant for both Latinx and Black on their own, only the combination of Sex+Latinx was determined to be statistically significant. Certified Latinx female prospective principals were 26.4% more likely than the combination of all other categories to become a principal, with a z score of 2.65 and a P>z of 0.008. That is not to say that being Latinx and female indicated the highest probability of becoming a principal, but rather that when you compared the Latinx female categories to all other groups combined, they were more likely to become a principal. This will be discussed further in below, but the basic explanation lies in the fact that Latinx females are more likely to become principal than all but one of the four largest combination categories (White males). Most importantly, they are statistically more likely to become a principal than the largest combination category of White females. The sheer number of White females certified to be principals (n=10,850) make up more than 40% of the overall population from the study. The Cox PH model accounts for this size difference, allowing it to highlight differences that are not as clear using less sophisticated survival analysis methods, such as the Kaplan-Meier technique.

Kaplan-Meier Curve

As previously stated, it is possible to get a more detailed understanding of the Life Table by examining specific population traits using Kaplan-Meier (KM) modeling. A KM curve can account for the censored cases that occur in survival analysis. Instead of a smooth curve showing the survival times, the KM estimates survival using step functions that shows the proportion surviving at each measurement period (Kleinbaum & Klein, 2005). The KM model also allows one to compare the median life time, or when 50% of

the population has experienced the failure event (Singer & Willett, 2003). In the event median lifetime is not reached, as is the case in this study, it is still useful to compare the populations being compared at the end of the study period. The KM model provides a straightforward and simple descriptive summary of the survival information, which is further understood with interpretation of the median lifetime. In the case of this study, an exploration the KM models for various comparison variables never yielded a median lifetime. For example, no subcategories used in this study reached a point where half of the population became a principal over the duration of the study. In several, cases the hazard function provides additional detailed description of the likelihood of experiencing the hazard event, namely becoming a principal, and is specific to each time interval, but since the hazard model considers the hazard at each time interval, it is more sensitive to small population sizes, and therefore not as useful in all categories presented in as KM curves.

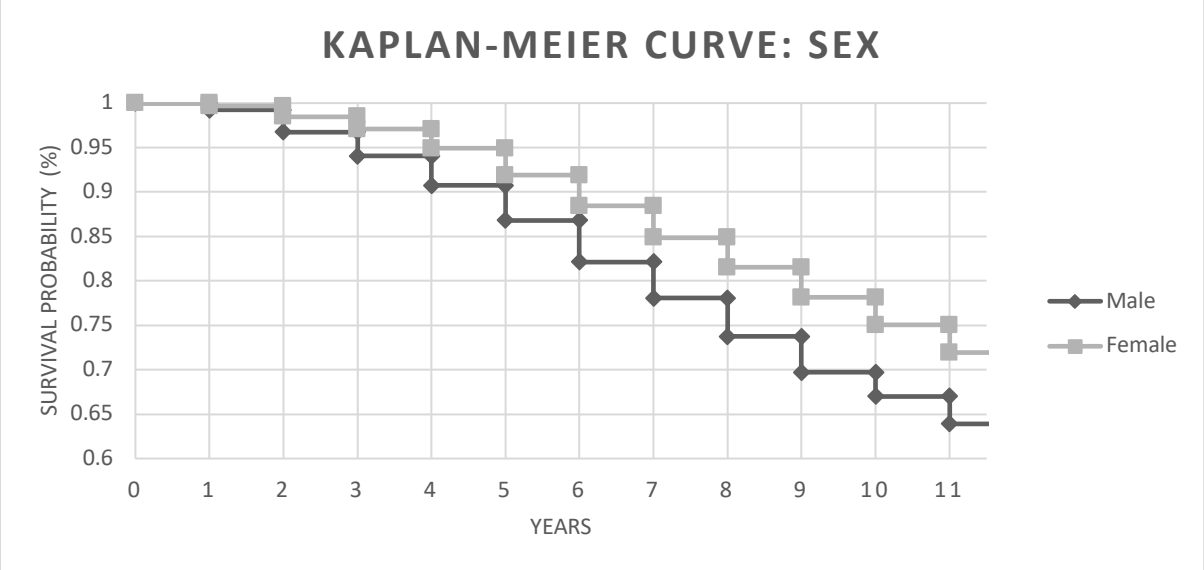

Figure 4: Kaplan-Meier Curve for principalship attainment graphed by sex.

Kaplan-Meier Curves are represented as a step function rather than a smooth curve, as this more accurately demonstrates actual data. The step down provides a graphical representation of the proportion experiencing the event being measured.

As previously noted in the findings of the Cox PH model, the biological sex of a candidate is shown to have a significant impact on principalship attainment once certification is achieved. As Figure 4 indicates, there are fewer males that survive (do not become a principal) over the course of the eleven years from this study. The survival function at period 11 for males is 0.639 and for females is 0.7193. This means that by period 11 nearly 64% of males and 72% of females had not yet become a principal. The hazard function for Sex highlights another perspective on principalship attainment. Only those covariates that were considered statistically significant in the Cox PH model will be discussed in greater detail in the next section.

Sex. Figure 4 shows the hazard function by sex. The hazard of becoming a principal is greater for men than women at nearly every period of measurement, with the lone exception being in period 10 in which the male hazard function (0.0386 or 3.86%) drops below the female hazard function (0.0396 or 3.96% hazard of becoming a principal). For males, the year with the greatest hazard function or the greatest likelihood of becoming principal occurred in period 8 in which they had a 0.0551 or 5.5% likelihood of becoming a principal. The peak hazard function for females occurred a year later in period 9, but only had a hazard function of 0.414 or 4.1% hazard of becoming a principal during that period. Both males and females experienced increased hazard function over the first six periods measured, at which point the growth slowed or even regressed from period to period. Males experienced increases in hazard function much sooner than

females, especially in period 2 in which males had a hazard function of 2.5% and females had a hazard function of 1.1%, less than half that of males. In period 2, males were more than twice as likely to become a principal compared to females. Conversely, males also

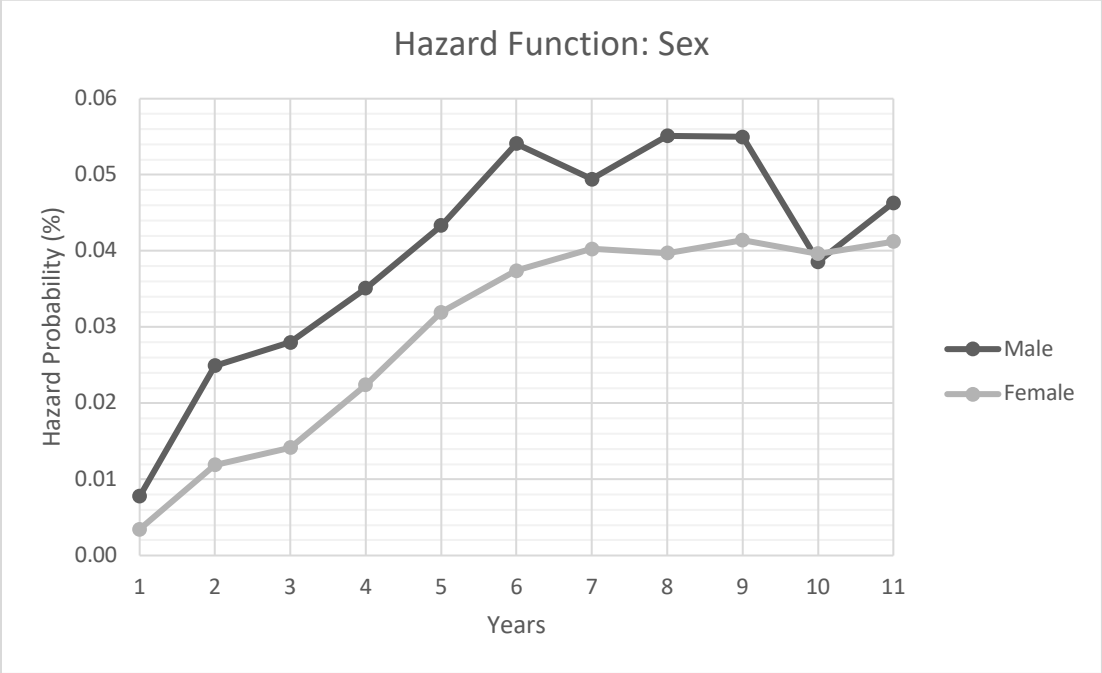

Figure 5. Survival Function by Sex

experienced the largest decline in hazard function, which occurred between periods 9 and 10 when males experienced a decrease of .055-.0386=0.0164, or more than 1.5% in the overall hazard function, dropping below the female hazard (0.0396 or 3.96%) for the first time. Over the course of this study, the female category never experienced a decrease in hazard function greater than 0.002 or 0.2%.

Ethnicity. Figure 6 shows the Kaplan-Meier (KM) Curve by ethnicity. Although the combination category of Other, consisting of the ethnicity classifications of Asian, Pacific Islander, Native American, and Two or more races, was not considered to be statistically significant in the Cox PH model, it was included in KM curve to merely highlight the probabilities based on discrete data. The survival function shows little

discrepancy between the groups measured but does illustrate that those with the designation of Black or the combination of all other ethnicity categories have a slightly higher survival function throughout the measured time when compared to the other designations (i.e. more people in these groups did not become principal). The only other item to note is that none of the covariates reached the median lifetime, indicating that after 11-year intervals no population reached the point where more than 50% of the population became a principal. Latinx (0.6998) and White (0.6966) displayed nearly identical survival function after 11 years. According to the KM model, after 11 years the number of individuals estimated to have become principal remains low, with roughly 70% of those included in the study failing to become principal after 11 years, regardless of ethnicity.

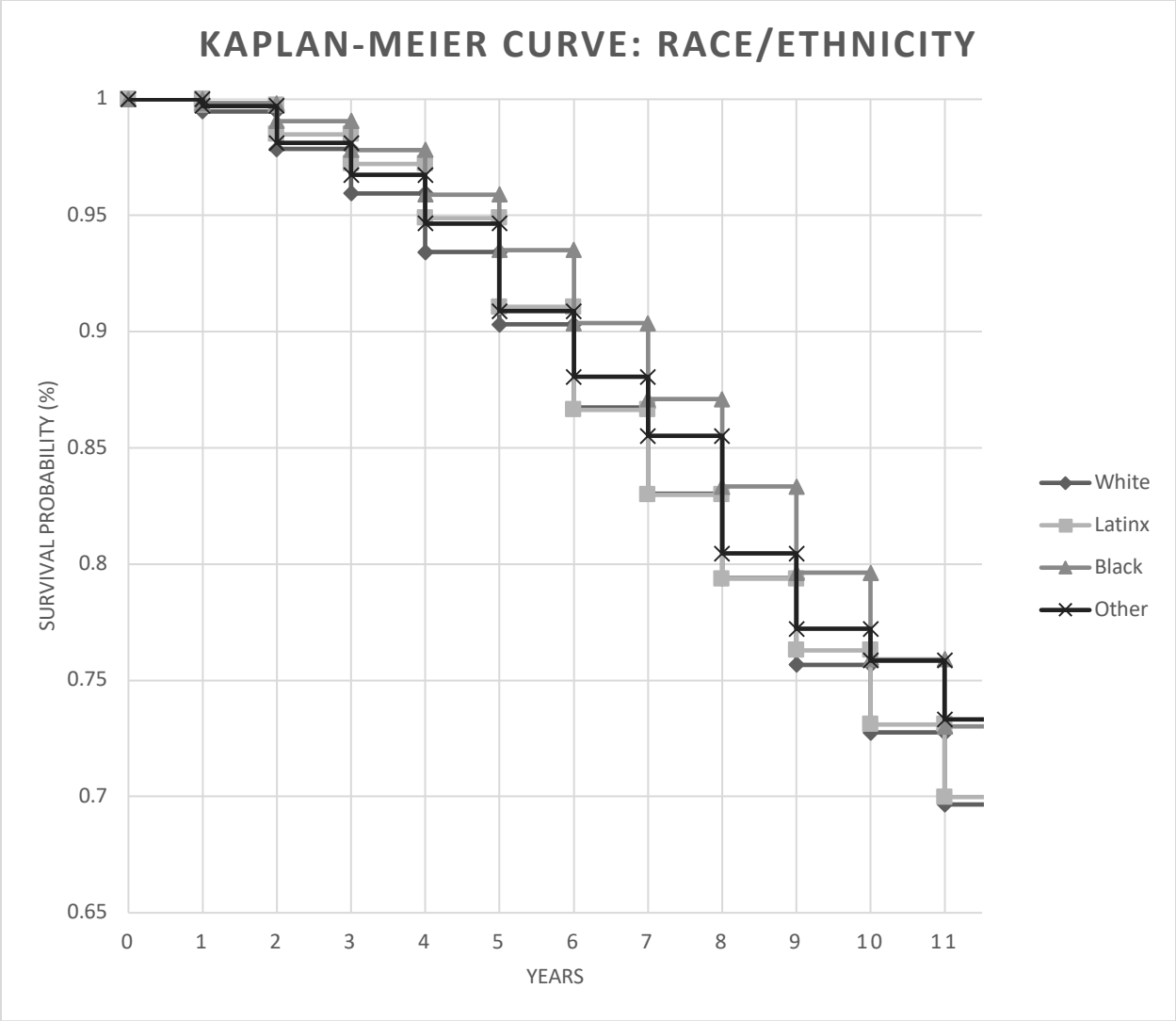

Figure 6. Kaplan-Meier Curve by Ethnicity.

The hazard function shown in Figure 7, delineated by ethnicity, reveals a more nuanced perspective on the hazard of becoming a principal classified by ethnicity. In the first year after certification all candidates have a small likelihood of becoming a principal (<1%) but White candidates are twice as likely to become principal compared to all other ethnicity designations. The group with the highest hazard function continues remains White until years 5 and 6 in which Latinx candidates have the highest hazard functions, 0.04 in year 5 and 0.049 in year 6. Latinx principal candidates peak hazard occurring in

period 6 is the earliest peak hazard function. For Whites the peak hazard occurs in year 9 when the hazard is 4.7%, and for Black principal candidates the peak hazard occurs a year later in year 10 at 4.7%. The hazard function for all Other designations not statistically significant and was not large enough to accurately report while maintaining individual anonymity, therefore it is not shown in Figure 7.

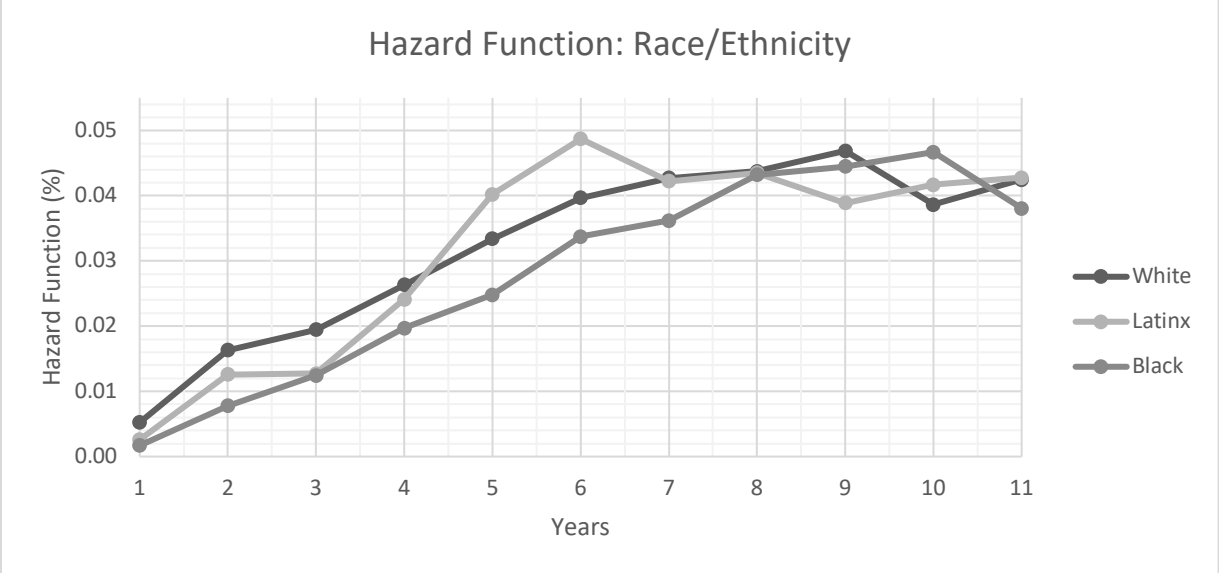

Figure 7: Hazard Function by Ethnicity

Ethnicity. Another way of considering how race/ethnicity impacts principalship attainment is to consider how the combination of ethnicity and sex impacts attainment. Figures 8 and 9 show the KM curves by ethnicity and sex. While the survival functions show little overall different between ethnicity, even after it is grouped based on sex, they do show that males of any ethnicity have a lower survival function than females, meaning they are more likely to become principal. The male ethnicity category with the highest survival function (Latinx = 0.6669) is still higher than the female category with the lowest survival function (Latinx = 0.7118). This is consistent with the findings from Figure 4 (SEX) that showed male principal candidates had a survival function higher that

was lower than female candidates. There are differences in the ethnicity survival functions rankings when further disaggregated by sex, as shown in Figures 8 and 9. For females, the ethnicity with the highest survival function is Black females (0.7562), followed by White females (0.7215) and then by Latinx females (0.7118). For males, Latinx are the group with the highest survival rate (0.6669), followed by Black males (0.6325), and finally White males who have the lowest survival rate of any of the subpopulations at 0.6302.

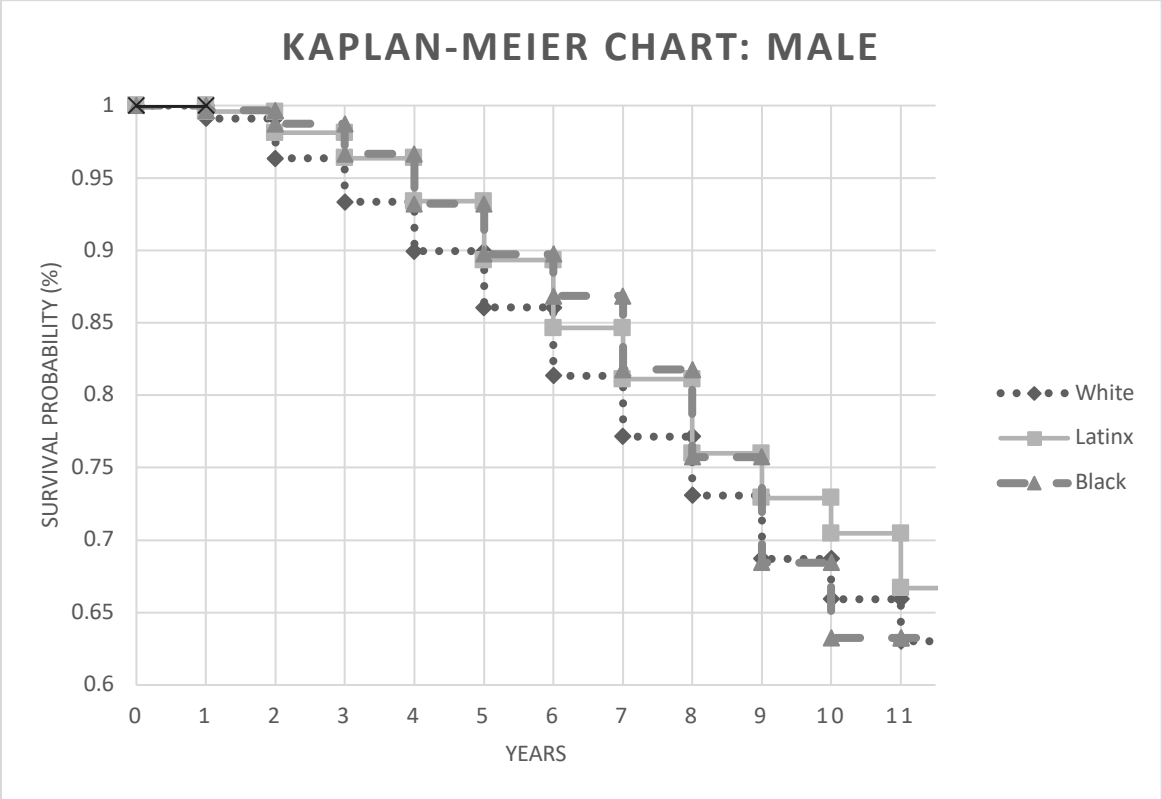

Figure 8. Kaplan-Meier Curve by Sex and Ethnicity (Male)

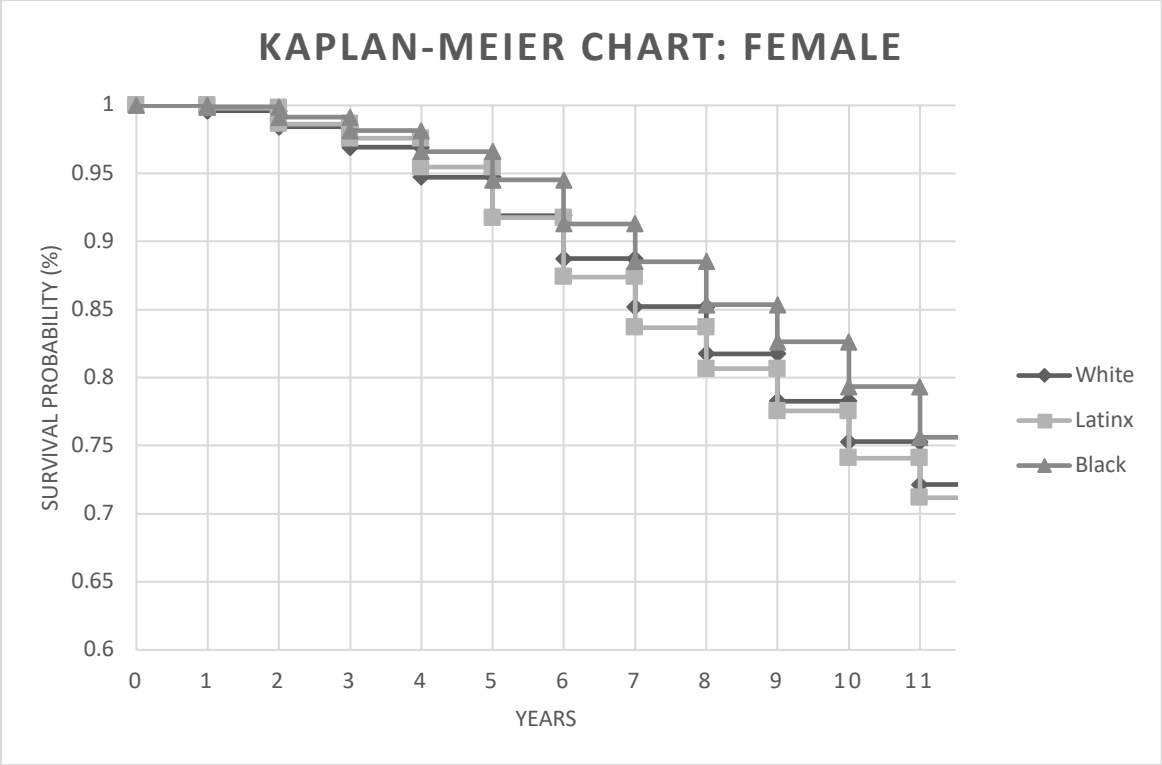

Figure 9. Kaplan-Meier Curve by Sex and Ethnicity (Female)

The type of principal preparation program is another important factor examined in this study. First, Figure 10 provides a look at the two main types of principal certification programs in the state of Texas, traditional university-based preparation programs and alternative preparation programs. Over the course of the eleven years studied, there is a clear trend showing a greater chance of being coming a principal for those that attended a traditional university preparation program. However, this trend was not evident during the first few years after certification (i.e., the likelihood of becoming a principal was nearly identical). However, by year 4 a gap appears there starts to be a gap in the survival function between the two groups that gradually increases until year 11. By year 11, those who attended an alternative principal preparation program have a survival function of 0.7561, meaning that after 11 years approximately 25% achieved the

principalship. For those from a traditional preparation program, the survival function is 0.6918, meaning that slightly more than 30% were likely to become principal on or after year 11. It appears that the gap between the two groups widens with each additional year, indicating that the beneficial effects of attending a traditional program increase with time. As 90% of the sample population attended a traditional preparation program, it is important to further parse the differences between program types. For this purpose, traditional programs were also grouped according to their Carnegie designated ranking (Research, Doctoral, Masters, All Others).

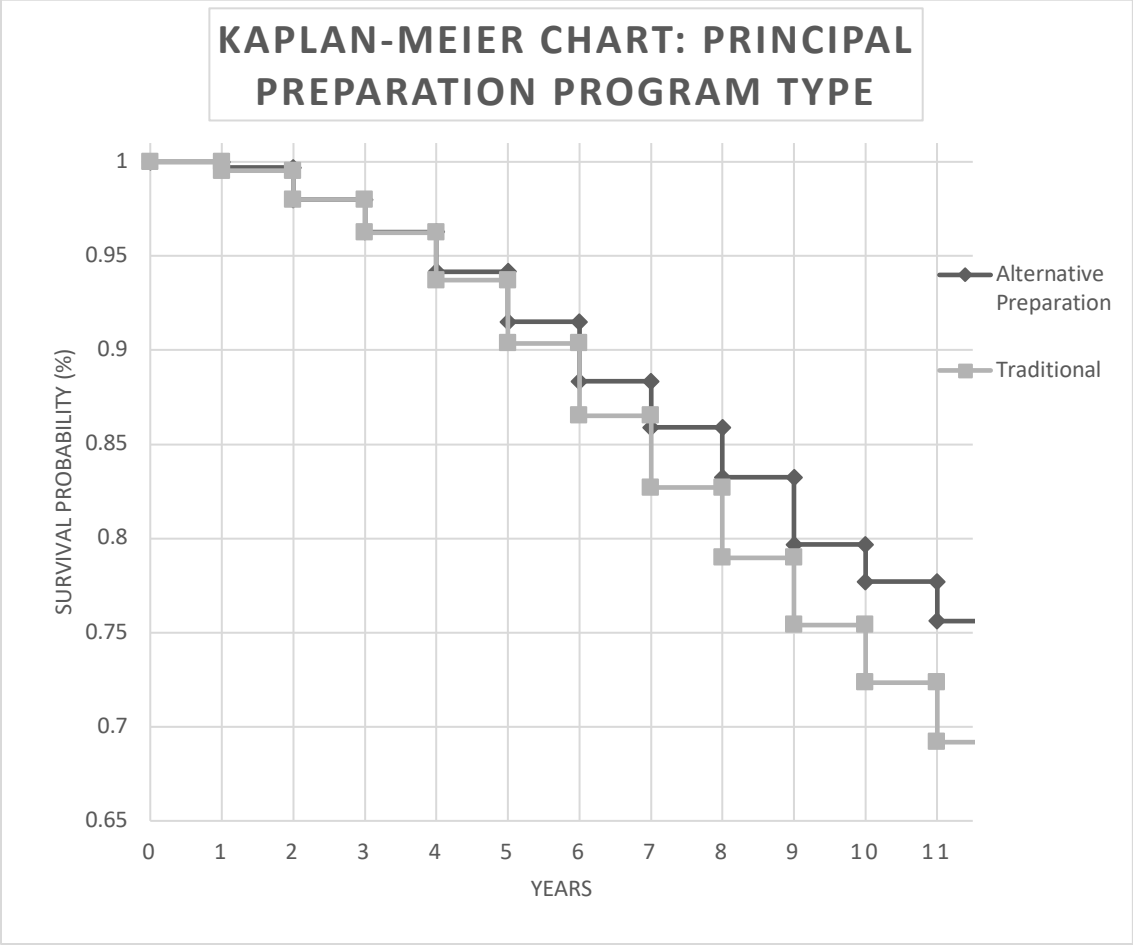

Figure 10. Kaplan-Meier Curves: Preparation Program Type

Figure 11 shows the KM curves of the traditional principal preparation types broken down by Carnegie designation. The largest percentage of students in Texas attended a graduate program at a university with a Carnegie designation of doctoral granting institution. Much like the gap between alternative and traditional preparation programs that grew larger with each subsequent year, there is a gap between doctoral programs and research institutions**.** This gap is small for the first couple of years after certification, but it gradually increases over time. In practical terms, this means that attending a doctoral-level principal certification represents an increasingly diminished likelihood of becoming principal compared to those who attended a research program. Although there was no statistically significant difference between research institutions and masters or all other types, it is less clear if a students attending doctoral-ranked programs are at a disadvantage when compared to either masters or baccalaureate ranked graduates. The KM model yielded a survival function for doctoral programs of 0.722 after 11 years, meaning 72% had not become a principal after 11 years. For research programs, the survival function was 0.685, meaning 68.5% of those who attend a research institution had not become a principal after 11 years. The other two categories, although not statistically significant, did have KM curves that were drastically different thank research-ranked institutions.

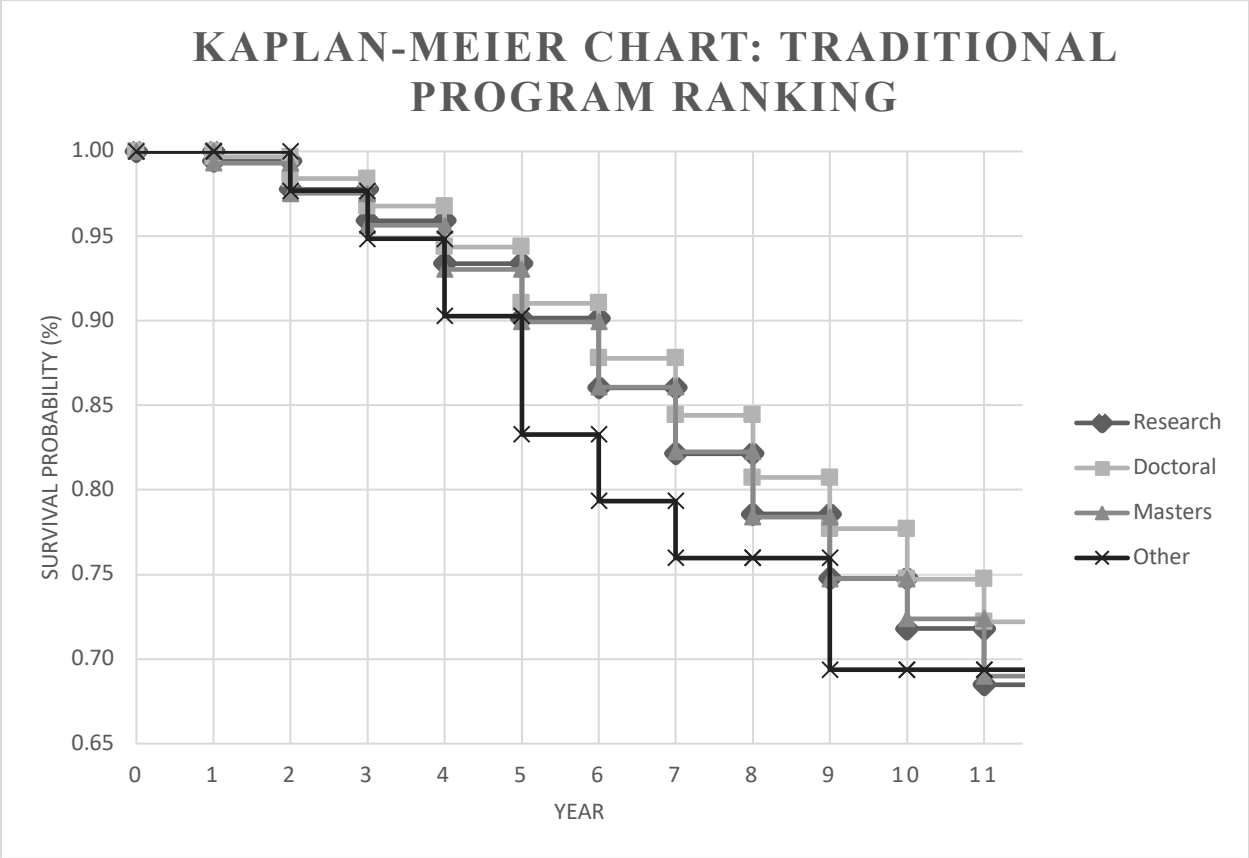

Figure 11. Kaplan-Meier Curve of Traditional University Preparation Program

The KM method is helpful for looking at data from the risk set at each interval of time, including information on censored individuals who did not experience the event but were dropped from the dataset either because the measurement time had ended, or no information was available for that individual in the next interval of time (Kleinbaum & Klein, 2005). The KM method describes the proportion of the population that has probability of survival at each point of measurement; however, it is somewhat limited as it does not adjust for other covariates in the study. Still, it is an approach that can account for various covariates providing an adjusted survival function.

Adjusted Survival Curves

Adjusted survival curves are created by adjusting the model for all other covariates using a fitted Cox model as previously shown in Figure 12 (Kleinbaum & Klein, 2005). As with Kaplan-Meier curves, adjusted survival curves are plotted using the step function. The adjusted survival curve, much like a Kaplan-Meier curve, shows the survival function, albeit estimated for adjusted survival curves at each interval of time measured. The results of the adjusted survival curve highlight a more nuanced understanding of who is likely to become a principal and the length of the process.

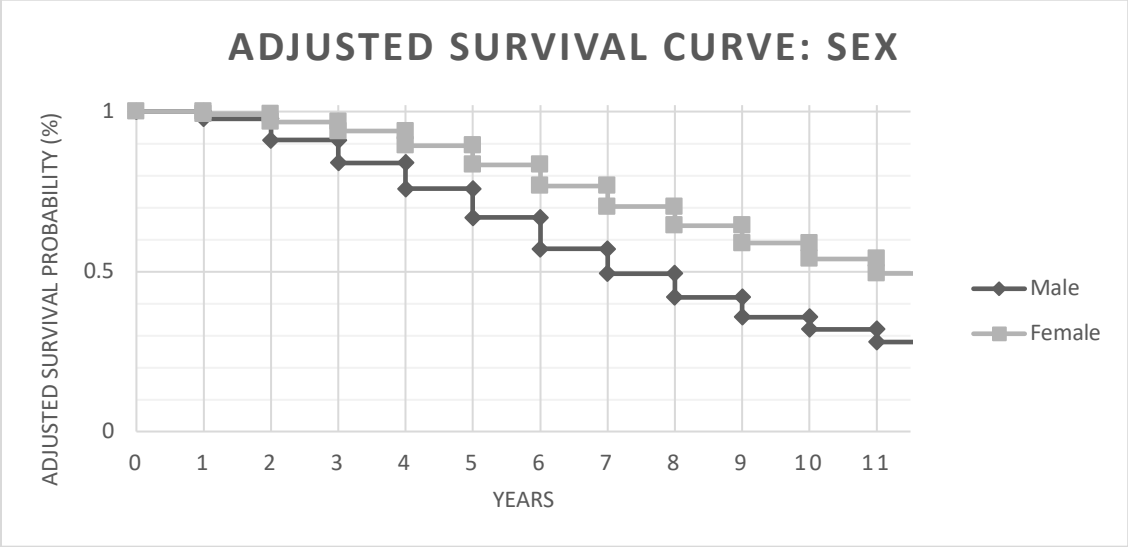

Figure 12, Adjusted Survival Curve: Sex

Sex. The adjusted survival curve shown in Figure 12 has similarities but also additional information regarding the likelihood of becoming a first-time principal in Texas. Much like the KM curves in Figure 4 show, males are more likely to become a principal compared to females. Whereas the KM curve had the difference between the two populations being approximately 8% different after period 11, the adjusted survival curve highlights an even stronger difference once all other covariates are accounted for.

The adjusted survival curves between females (0.494) and males (0.280) has a difference of 0.214, or 21.4%, in period 11. Although the median life time (0.50) was not reached using the KM model, the adjusted survival curve shows that over 50% of the male population would be expected to become principal for the first time by period 7. Females reached estimated median life time four years later by period 11.

Race/Ethnicity. When considering the impact of race/ethnicity on principalship attainment the adjusted survival curve and the Kaplan-Meier curves yield similar results. However, the adjusted survival curves highlight the impact of race/ethnicity to a greater degree than the Kaplan-Meier curve. The KM curve showed survival functions indicating that Whites were most likely to become principal, followed by Latinx, and then Blacks, which is the group with the highest survival function, or least likely to become principal over an eleven-year period. Once all the covariates were included (producing an adjusted survival curve), the inverse of the KM was produced. The ethnicity group with the largest adjusted survival function were Black individuals, with a median life time occurring in period 6 and an overall survival function of 0.0924 in period 11. Over 50% of those identified as Black had become principals by period 6, and by period 11 a mere 9% were estimated to not have become a principal if all other factors are held constant. Latinx individuals were still positioned in the middle, but they experienced an estimated median life time by period 8 and had a survival function of 28% in period 11. Finally, White individuals were the least likely to become principal of those charted in the adjusted survival curves. The median life time for White individuals occurred in period 9, and by period 11 approximately 35% had yet to become a principal for the first time. These findings highlight there are additional factors that contribute to the discrepancy in

overall principal population, which remains predominately White. This finding will be discussed further in Chapter 5.

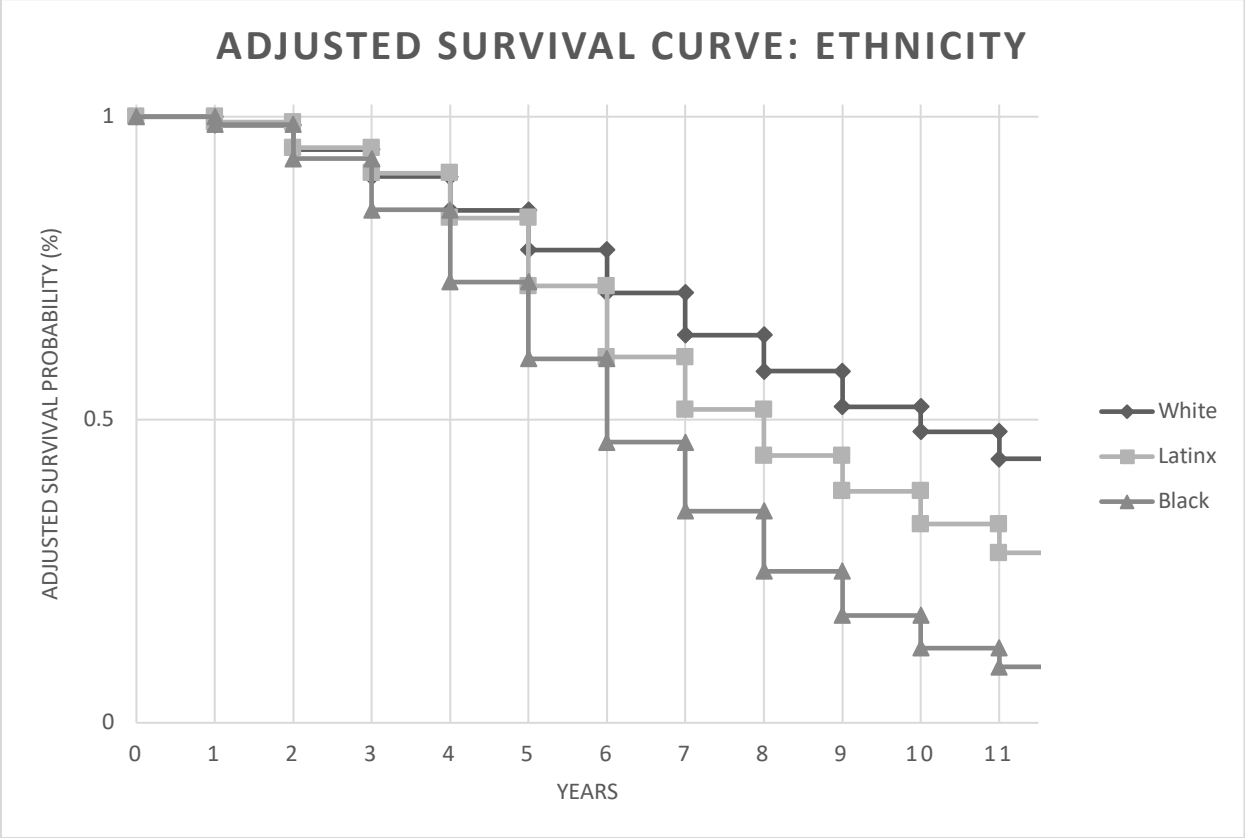

Figure 13. Adjusted Survival Function: Ethnicity

In order to gain a more detailed perspective on the impact of the Sex and Ethnicity combination, adjusted survival curves were plotted, matching the KM curves with the same covariates. Not surprisingly, the adjusted survival curves show that male survival functions were all lower than the female of same ethnicity. Black males displayed a very low adjusted survival curve by period 11 and that population passed over the median lifetime at period 5. Stated another way, by year 5 most Black male principal candidates had become a principal for the first time, and by period 11 a scant 3.8% had yet to become a principal if all other covariates were equal. Black females

were the female group with the lowest adjusted survival curve (0.3118), and the median lifetime for Black females was period 9.

Latinx males displayed a median lifetime that occurred at period 7, and had an adjusted survival function of 0.1929, or 19.2%, at period 11. Latinx females had a median lifetime that occurred two years after their male counterparts and ended up having an adjusted survival curve of 0.3855 at period 11, once all other factors were considered equal. Finally, White males had the highest adjusted survival function of the comparison male's groups at 0.3113 and experienced a median lifetime at period 8. White females did not experience a median lifetime in the adjusted survival curves ending up with a survivor function of 0.5097 in period 11.

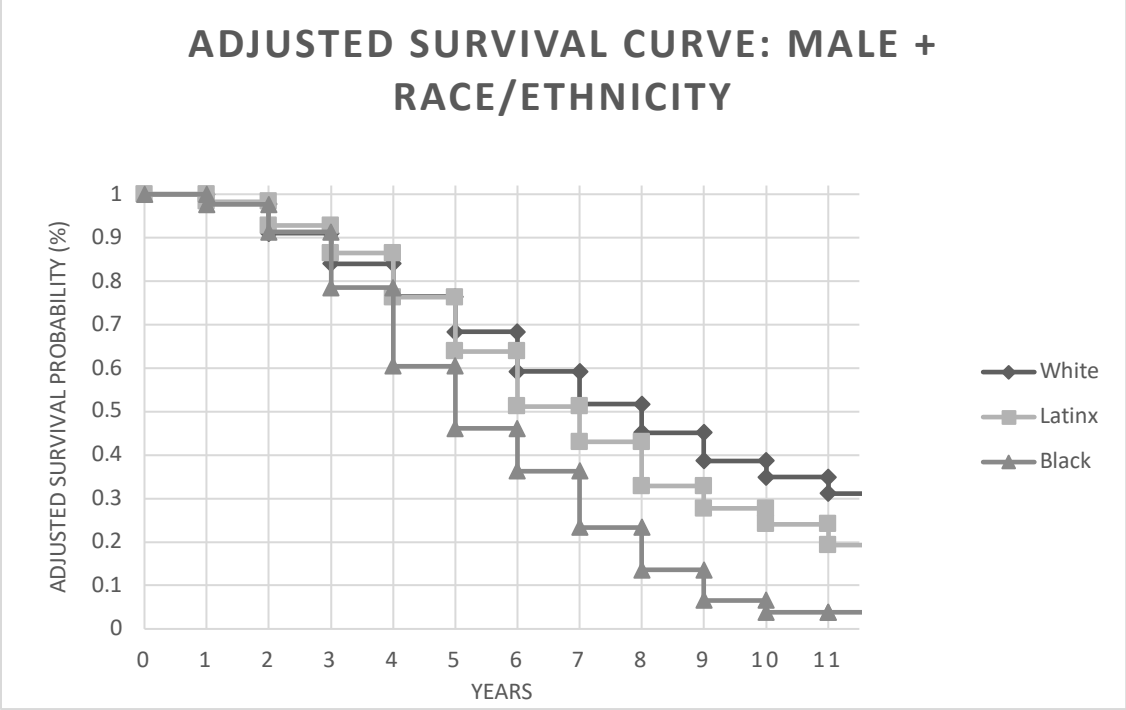

Figure 14. Adjusted Survival Function: Sex + Race/Ethnicity (Male)

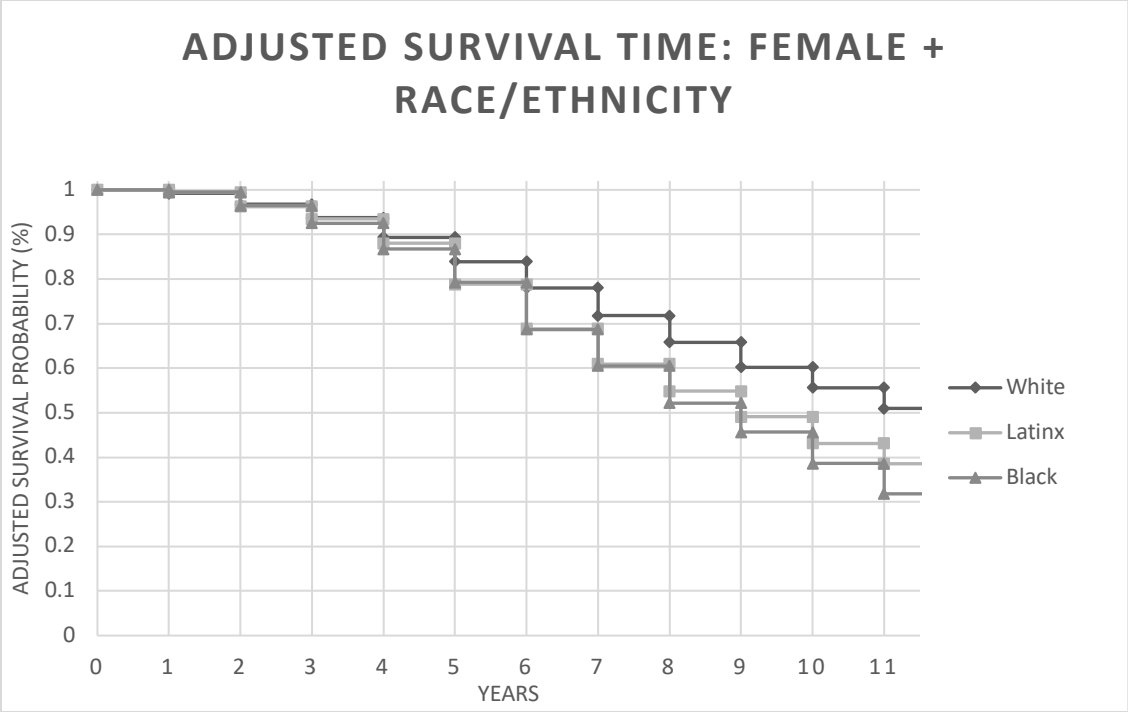

Figure 15. Adjusted Survival Function: Sex + Race/Ethnicity (Female)

Finally, Figures 16 and 17 show the adjusted survival curves for principal preparation program types, comparing traditional and alternative certification programs, as well as the difference between traditional doctoral-designated programs and research-designated programs. In comparison to the KM curve, the adjusted survival curve highlights that attending a traditional preparation program increases the chance of becoming a principal at all but the first time period. By period 3, those having attended a traditional program are more likely to have become a principal, and that trend persists through the remainder of the time studied. By period 11, the adjusted survival curve for traditional university programs was 0.1335 and, for alternative preparation programs, it was 0.2774. The adjusted survival curve shows that, after 11 years, 13.4% of those who attended a traditional preparation program would not become principal, and 27.7% of those who attended an alternative preparation program have yet to become a principal.

Looking at the median lifetime of the adjusted survival curves in Figure 16 show a difference comparing the two types of preparation programs, with traditional reaching median lifetime by period 6 and alternative requiring two additional years, reaching median lifetime by period 8.

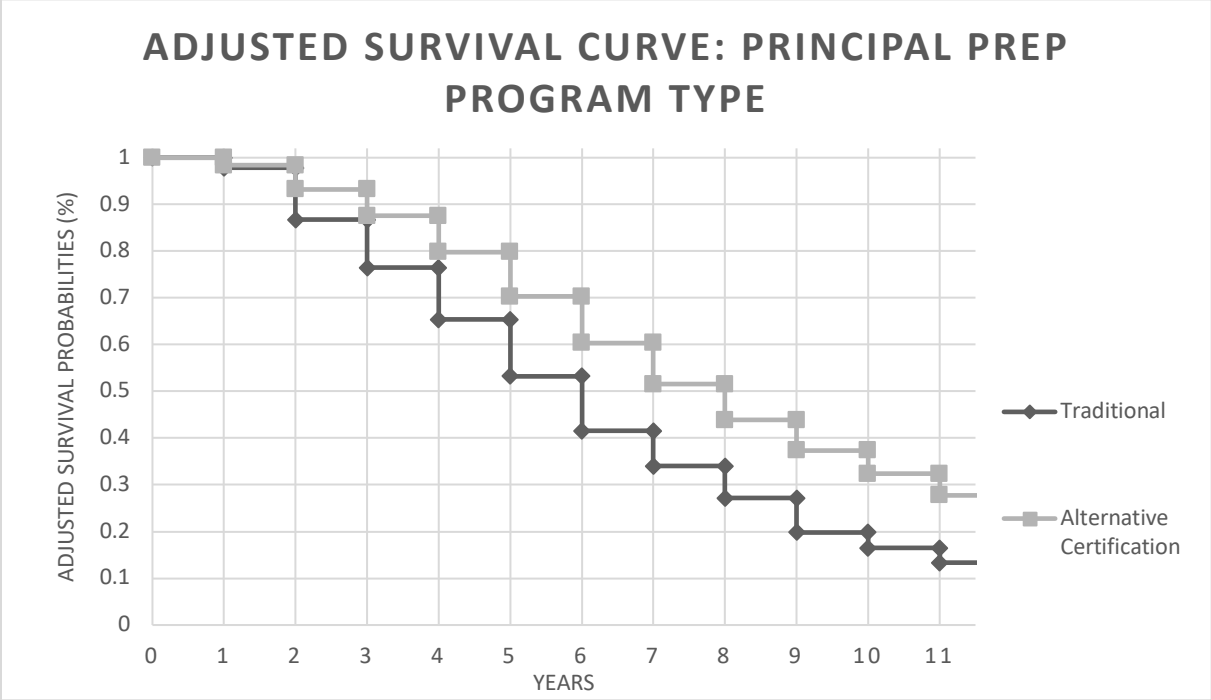

Figure 16. Adjusted Survival Function: Preparation Program Type

Figure 17 examines the two types of traditional university principal preparation programs that were considered statistically significant. These two Carnegie designations are research institutions and doctoral granting institutions. The adjusted survival curves comparing research intuitions and doctoral institutions show a growing gap in which doctoral institutions show a lower survival function (0.4185) by period 11 of the study as compared to 0.2834 for research institutions. The estimated median lifetimes also favor those who attended a research institution for their principal preparation, in which the

median was in period 8 as opposed to doctoral institutions in which the median occurred in period 10.

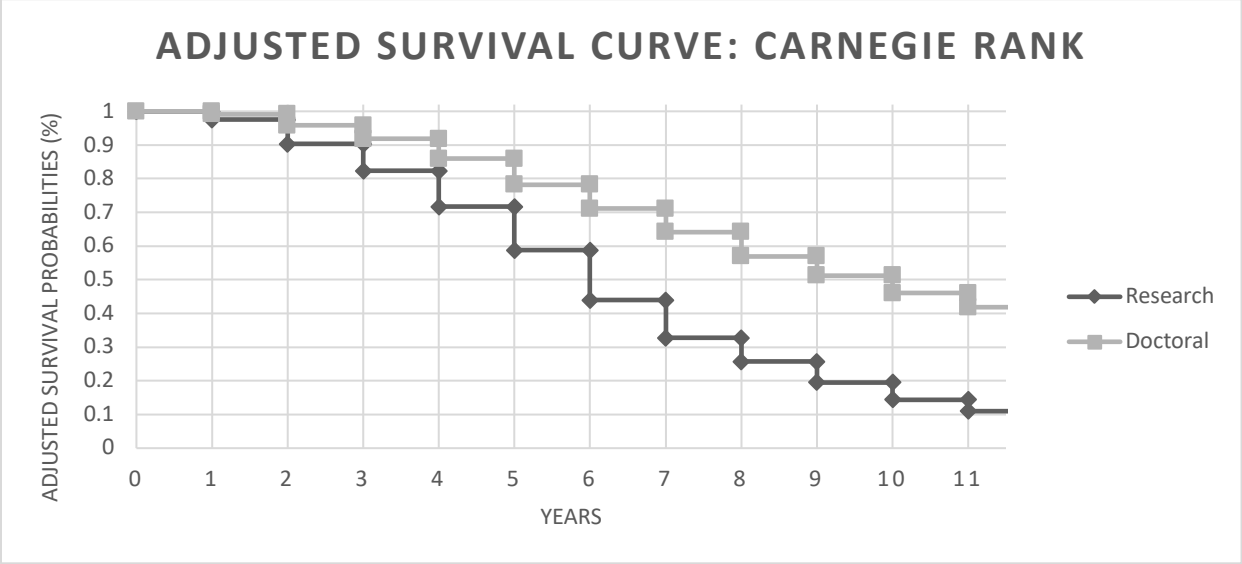

Figure 17. Adjusted Survival Function: Carnegie Rank

Findings for Research Questions and Hypotheses

The research questions and hypotheses form the basis for the study purpose and design. The results detailed in this chapter address the initial research questions and hypotheses.

Research question 1: How do traditional school-leader preparation programs and personal attributes such as age, gender, and race/ethnicity of aspiring school leaders affect the time it takes for an individual to attain a principal position after receiving their principal certification?

There is a statistically significant total effect of attending specific school-leader preparation programs. Attending an alternative principal preparation program is shown to have a statistically significant negative effect on becoming a principal compared to attending a traditional university-based preparation program. Comparing traditional

university preparation programs also showed a statistically significant negative effect on becoming a principal when attending a doctoral-designated university compared to a research-designated university. No other type of designation was shown to have a statistically significant impact on principalship attainment.

Age at certification was considered statistically significant to becoming a principal, with each additional year after certification decreasing the likelihood of becoming a principal by approximately 2%. The mean age of the entire population of individuals with a principal certification was just over 37 years old (37.23). The population of individuals with a principal certification that also became principals had a mean age at certification that was more than a year younger than the overall population (35.96).

Gender was also identified as being statistically significant, with males more likely than females to become principal. Females only have 64% probability of becoming a principal over the time studied compared to males with a principal certification. Plainly stated, when comparing equal size groups of 100 certified male and female candidates where all the males would likely find jobs as principals each year, an identical group of females would only result in approximately 64 of them becoming principal. When combined with ethnicity, these differences are even more profound.

The variable for Race/Ethnicity was statistically significant in the analyses. White individuals with a principal certification were most likely to become a principal while Black individuals were the second most statistically significant group to become a principal, followed by Latinx. The category comprising the remaining ethnicity designations was not statistically significant.

Research question 2: How do the types and quality of school-leader preparation programs affect the time taken for an individual to become a principal once they receive their principal certification?

Measuring the impact and quality of a principal preparation programs is difficult. The results of this study support the difficulties associated in assessing program impact with key differences identified. For example, similar levels of principalship attainment were noted for many types of traditional SLPPs, yet no statistically significant differences were observed Research level institutions, Masters institutions, all Other institutions. Similarly, SLPPs focused on social justice leadership development did not show a statistically significant difference from any other type of preparation program previously mentioned. However, several key findings emerged that a high level of statistical significance.

Candidates that attended Doctoral level programs in the state of Texas take longer to reach the principalship on average. Likewise, a comparison of principal candidates who attended traditional SLPP programs and those that attended an alternative SLPP showed a persistently longer time to principalship for those having attended alternative SLPPs.

Research question 3: How does the interaction of school-leader preparation programs type and personal attributes such as age, gender, ethnicity of aspiring school leaders affect the time taken for an individual to attain the position of principal after receiving their principal certification?

The effects of the PH model are assumed to be multiplicative in relation to the hazard (Kleinbaum & Klein, 2005). For example, consider a male principal candidate

who is considered Latinx. According to the Cox PH model this candidate would be approximately 23% (1 x .7697) less likely than a White male principal candidate to become a principal. The type of principal preparation program could also be a significant factor in becoming a principal. Using the same example as above, the Latinx male who attended a Carnegie research-level institution (1 x 0.7697 x 1=0.7697) had a 13% greater chance of becoming a principal in a specific year compared to Latinx males who attended Carnegie doctoral level institutions (1 x 0.7697 x 0.8239 = 0.6342). The difference experienced by White male candidates demonstrated a greater divide between those principal candidates that attended Research (1 x 1 x 1=1) versus doctoral ranked programs (1 x 1 x 0.8239=0.8239), with those attending a doctoral ranked program nearly 18% less likely to become a principal. Although the difference was greater for the White male candidates, even White males educated in doctoral programs were more likely to become a principal compared to the Black and Latinx males educated in Carnegie research-designated institutions, although the difference between those two groups attending research institutions was less than 5% in both cases.

The most significant differences occurred among female on among the female principal candidates. As noted previously, female candidates were significantly less likely than their male counterparts to become a principal, with ethnicity and principal preparation program type all mediating the likelihood of becoming a principal even more. A Latinx female who attended a research designated institution is 50% less likely to become a principal compared to a White male, and 15% less likely than a White female attending a similar institution. The older a candidate is at point of certification, the lower

the likelihood of principalship attainment each subsequent year, although the effect is small (< 3% per year).

Overall the group most likely to become principal utilizing the Cox PH model remains White males, although those attending research-designated institutions experience the greatest likelihood of principalship attainment. Latinx females who attended a principal preparation program at a doctoral-designated institution were the least statistically likely group to become a principal.

Research question 4: What factors (or interaction of factors) display the greatest likelihood of attainment of the position of principal?

The single most significant factor impacting the attainment of a principal position is the gender of the candidate, showing the greatest discrepancy between the two categorical groups being compared, male and female. The results of the KM analysis demonstrated that males are more were more likely to become principals than females throughout the duration of the study. Also, the percentage of males who achieved the principalship increased at a greater rate than females over the same duration. Finally, the adjusted survival curves displayed similar results to those previously mentioned (i.e., males were more likely to become principal at a greater rate than females with a principal certification over the same time span).

When considering ethnicity as a factor impacting principalship attainment, White candidates were the most likely to become principal. Two ethnic classifications displayed statistical significance. Black and Hispanic principal candidates were 20% less likely of becoming a principal compared to their White counterparts. The KM model yielded similar results, although not as pronounced as the Cox PH model. In the Cox PH

analysis, White and Hispanic candidates experienced similar rates of attainment. These rates were greater than all other ethnicity categorizations, the largest group being Black candidates who had lower rates of principal achievement over the course of the study. However, the adjusted survival curves (those adjusted for all other covariates in the study) highlighted an interesting difference from the Cox PH and the KM model. Controlling for all other factors, the adjusted survival model revealed that Black candidates were the most likely to become principals over the duration of the study, followed by Latinx candidates, and finally White principal candidates. Importantly, this finding highlights the interaction of a broad number of factors that contribute to principalship attainment.

The type of principal preparation program a candidate attended makes a difference in principal attainment as well. For this study, the two basic comparison groups as designated by the Texas Education Agency were traditional university-based principal preparation programs and alternative principal preparation programs, which span a range of organizational types including regional service centers, for-profit institutions, and county educational organizations. This study considered the two types of organizations as a general grouping first, meaning that all university programs were grouped together, as were all alternative certification programs. Using this approach, those students attending a traditional university-based principal program were more likely to become a principal compared to those attending an alternative principal preparation program. Results from the Cox PH model verified showed that attending a traditional preparation program resulted in 18% more likelihood of becoming a principal than an alternatively certified principal. Similarly, the KM model showed that over time those

who attended traditional programs saw an increasing advantage over those who were alternatively certified. Additionally, the rate of change over time for those attending traditional programs was higher than in other programs. The adjusted survival curves supported the findings of the KM model but did not reflect the growing probability shown in KM model. The adjusted survival curves clearly depict that those certified in a traditional program maintained an advantage over alternatively certified principal candidates.

The wide variety of traditional preparation programs in Texas allowed for additional analysis of traditional programs based on Carnegie rankings (Research, Doctoral, Masters, Other). This analysis highlighted one statistically significant discrepancy between the programs based on Carnegie rankings. The largest number of individuals with a principal certification, more than a third of all principal certifications, are conferred by doctoral institutions (n = 9954), yet that group of certified principals was much less likely to become a principal over the course of the study. Those individuals who completed their principal certification at a doctoral program were 18% less likely to become a principal compared to all other groups combined. This was further illustrated in the KM model in which those with a doctoral-program principal certification became principals less often than all other groups. Where the difference was most significant was when comparing doctoral programs to research institutions, as shown in the adjusted survival curves comparing the two student groups. Individuals completing their principal certifications at a research institution were much more likely to be a principal and saw their advantage over those certified at a doctoral institution increase as they got further away from their date of first certification.

Overall, males have the highest overall likelihood of becoming a principal, but using the adjusted survival curves, it is Black males followed by Latinx males that are most likely to become principals. Attending a university-based preparation program at a Carnegie-designated research institution has the highest likelihood of principalship attainment. Age is also a factor in the analysis, as with each additional year in age a candidate sees a slight decrease in likelihood of experiencing the event. Finally, the State of Texas has a certification test before certifying an individual as a principal. Up until recently, individuals could take that test as many times as needed to achieve a passing score, but that has recently changed to allow for only five attempts at certification. Most past the certification examines on the first attempt, but for those that do not, each subsequent attempt results in a 5% decreased likelihood of becoming a principal.

Conclusion

The results gleaned from this study reinforce much of what is known anecdotally about the path to the principalship, most notably that the path to the principalship is experienced much differently based on the sex of the candidate. Men are more likely to become principals than women. However, additional contributors to attainment were revealed by the advanced statistical tools utilized in this study. For example, the ethnicity of a principal candidate influences the likelihood of becoming a principal, with White individuals being the most likely to become principal. However, the results here suggest that all other factors being held constant, Black and Latinx principal candidates fair better than their White peers. A synthesis of the influence of ethnicity on principal attainment along with tangential findings of this study will be discussed further in the next chapter. Implications for practice, policy, and future research are provided as well.

V. DISCUSSION

This chapter presents a summary and synthesis of the results discussed in chapter four. Along with the implications and assumptions presented in the analysis, significance for both research and practice in educational administration are discussed. Based on these conclusions, recommendations are made addressing areas of opportunity in research, practice, and educational policy.

Educational leaders occupy a position of prominence in schools. However, there is little quantitative research specifically focused on the period of time from principal certification through the pre-principal years. This study aimed to address some of those deficiencies. The goal of this study was to examine factors impacting the career trajectories of individuals who are eligible to become a campus principal. Specifically, the time between achieving principal certification and principalship attainment was central to the goal and research questions that guided this research. Consideration of a variety of demographic and educational factors were considered based on the review of literature. Previous studies examined factors that influence attainment of the principalship, including race/ethnicity, gender, age, or previous experiences in education (Bastian & Henry, 2015; Kwan, 2009; Baker, Punswick, & Belt, 2010). This research considered many of these factors, and examined principal preparation type, including university versus alternative preparation programs. A more detailed analysis of the types of university programs grouped according to the 2015 Carnegie ranking was also addressed in this study.

Historically, school principals have largely been White and male a trend that has shifted during the last 50 years. Most principals in Texas identify as women (63.7%).

Women, along with Black and Hispanic individuals, continue to see incremental increases in their overall population percentages (Ramsay, 2018), but males, particularly those that are White, appear to experience ongoing advantages when it comes to principalship attainment. The population in Texas public schools has also shifted as more than half of the students in Texas are non-White. As the population of students attending public schools continues to grow increasingly diverse, the teacher and administrator populations have diversified as well, albeit at a significantly slower rate (Ramsay, 2018). There is relatively small amount of quantitative research on educational leadership attainment, and it is difficult to determine why educational leader populations are not shifting at a similar rate towards diversity. It is even more difficult to determine if these disparities impact student achievement.

Texas, as a border state, has historically been comprised of a population more diverse than other parts of the country. The student population in public schools is even more diverse than the population at large in Texas. However, the population of school administrators does not reflect this increasing diversity. Using survival analysis this research examined those individuals that are one step removed from the principalship, specifically those with a principal certification but not yet a position as principal. As individuals included in this study met all of the baseline requirements to become a principal, the inclusion of additional factors served to aid understanding the unequal trajectories to the principalship. A variety of analytical approaches were utilized to understand factors impacting principalship attainment. The following survival analysis-based approaches examined the likelihood of principalship attainment utilizing the same covariates:

- Life Table

- Kaplan-Meier Tables
- Cox Proportional Hazard Model (also known as the Cox Regression Model)
- Adjusted Survival Curves

The set of covariates in this study are discrete variables of individuals who successfully obtained a principal certification between 2007 and 2015 school years:

- Sex
- Race/Ethnicity
- Age
- Type of principal preparation program (Traditional or Alternative)
- Carnegie ranking of Traditional programs
- Number of attempts at Certification Test

Review of the Literature Findings

Historically, the position of school principal has been associated with men, particularly White men. In the early days of schools in the United States, women were rarely employed in schools. Early teachers were almost always men. In the 19th century women began entering the education workforce as teachers (Apple, 2013). Teaching, particularly the teaching of younger students, was a job strongly associated with the perceived caring and nurturing demeanor associated with women (Blount, 2006). As schools grew in size to accommodate more students, the number of teachers increased, and district superintendents and education boards began placing administrators in the school buildings. Men, many who had training and experience as teachers, were deemed well suited for this supervisory position. There are historical accounts of non-white or female administrators, but these are scant or from the recent past (last 40 years).

The route to the principalship has also been the result of policy or educational practices that limited the opportunities of persons of color and women. Initially, the development of the field of educational leadership and foundational research developed were heavily influenced by the work of former superintendents, most of whom were White men. As educational leadership gained legitimacy in academic and policy circles, certification requirements were developed. At the same time, large numbers of men attended colleges for little or no money as a result of the GI Bill, which in turn produced a large pool of potential principals that met the increasing academic and certification requirements. Women and persons of color did not benefit from many of these same financial advantages, resulting in fewer principals from those underrepresented groups. All these historical factors establish the conditions of school leadership selection, but do little to explain the unbalanced population of principals currently.

Texas, with its increasingly diverse population, continues to have principal populations that are not similarly representative of the ever increasing diverse student populations. During the time period before desegregation, many Texas school districts hired and employed a diverse principal population, with nearly all of these principals serving in the racially segregated schools common throughout the south (Morris & Morris, 2002, Walker, 1996). Even in racially segregated schools, the principals were most often men. Brown v Board of Education marked a turning point for many of these schools, as over the next 15 years students were integrated into the previously all White schools, but few of the principals or teachers of color made the same transition (Dávid, 2009). Student populations at public schools are increasingly diverse. Educators focused on social justice issues in education have suggested that there is a need to examine the

impact of schooling approaches that are more culturally responsive (Ladson-Billings, 2014; Paris, 2012, McCarty & Lee, 2014). One component of that has been to examine the racial and ethnic make up of teacher and school leader populations and their impact on student achievement and success (Bastian & Henry, 2015). This study goes a step further to examine the rate of school leadership attainment, considering a number of common factors all prospective principals in Texas encounter on their route to the principalship.

This study utilized an epistemological framework anchored in Bhaskar's conceptualization of Critical Realism (Bhaskar, 2008). The three lenses used in Critical Realism are the *empirical,* the *real* and the *actual.* The empirical evidence establishes that the population of principals is disproportionately incongruent with the populations of students and teachers. My previous experiences as an administrator working in Texas informs my use of the *actual lens,* having witnessed the varied experiences of prospective principals. The application of the *real* lens requires that the researcher not only rely on the empirical evidence and my own experiences, but also accept there are unknown forces influencing principalship attainment in Texas. It is through acceptance of *the real* that the researcher incorporates constant questioning or "critique" (Scott, 2005, p. 635), another key tenet of critical realism. The constant critique or internal conversation does not lead to an ultimate Truth; instead, these are processes of constantly revising an imperfect theory of reality (Cruickshank, 2003). As those perceptions of reality evolve, we are able to reconstruct the existing social structures toward more emancipatory and humane outcomes.

Discussion of Results

The principal population in Texas is proportionally different than the populations of either students or teachers. Persons identifying as male are more likely to become principals than individuals identifying as female. This phenomenon is consistent regardless of any other demographic factor. There are many more white males becoming principals than any other racial or ethnic designation; however, both Hispanic and Black males are more likely to become a principal than any type of female designation. The results of this study confirm previous studies of principalship attainment, reinforcing the empirical evidence suggesting that being male improves the likelihood of becoming a principal (Davis, Gooden, & Bowers, 2017; Ringel, Gates, Chung, Brown & Ghosh-Dastidar, 2004). The possible reasons for increased likelihood of males becoming a principal are varied and sometimes contradictory.

As discussed in the review of literature there is a long history of gendered roles within schools. School leadership and masculine traits were and continue to be linked; whereas teaching, especially at the elementary level (which constitutes the majority of schools in the state of Texas), has been linked with more feminine traits. This historical precedent contributes to males seeking out leadership opportunities or being encouraged to pursue leadership opportunities, while females tend to spend a greater amount of pre-leadership time engaged in instructional leadership activities (Hallinger, Bickman, & Davis, 1996). Killingsworth, Cabezas, Kensler, and Brooks (2010) found that men in educational leadership graduate school cohorts were less likely to seek confirmation they were "on the right track" (p. 545) as they progressed through a leadership preparation program. It is likely therefore to assume that many men are equally unlikely to seek

additional confirmation they are prepared to become a principal throughout the leadership development process. Conversely, women are less likely to apply for a job without meeting all of the stated and perceived requirements, whereas men tend to pursue jobs even when they are missing requirements (Mohr, 2014). There may also be some reasons that are less centered on potential principal candidates and more a result of organizational structures in education.

Elementary school buildings constitute the majority of schools in Texas (Morath, 2018). The population of teachers in these buildings is overwhelming female, although the student population remains relatively evenly split between male and female students. In the elementary and middle school settings, the lack of male teachers may actually improve the chances of those males who are seeking a principalship at those levels (Burton & Weiner, 2016). The majority of the males working as educators at any level (teacher aides, teachers, administrators, superintendents) are White. There are few educators of color, and even fewer male educators of color. Just as the lack of males in education benefits prospective male principal candidates, principal candidates that share a cultural congruence with the student population also benefit as they seek jobs as a principal (Hart, Schalloil, & Stoelinga, 2008). Communities are more likely to choose principals with a same-race connection when they are more involved in the principal selection process.

The female population of principals has gradually increased over the last century. Today, a majority of school principals are female (White & Agarwal, 2011). Teaching experience is now a requirement of principal certification, and since a majority of the teacher population in Texas are identified as White females, it is not surprising to

discover that a majority of female principals are White. In this study, White females comprise approximately 42% of those individuals who received a principal certification over the duration of time studied, and approximately 39% of individuals experiencing the terminating event of becoming a principal. Black and Latinx female principal candidates both make up a smaller proportion of those receiving a principal certification as well as those that became a principal. In short, certified principal candidates that identified as female are majority White (57%), with Latinx at 22%, Black at 17%, and all other racial/ethnic categorizations combined comprise the remaining 4%.

Although White females make up the largest proportion of administrators certified and who became principals, their success rate moving from principal certification to actual principalship was lower than other designations. As stated earlier, all male categorizations were more likely to move from certification to principalship than any female designation, with White females demonstrating the largest discrepancy in principalship achievement. Two survival analysis methods used highlight this discrepancy in female principal attainment. First, the Cox Proportional Hazard model showed that a principal candidate who was female and Latinx had hazard ratio (1.264) that was statistically significant (0.008), meaning that a Latinx female demonstrated a 26% increased likelihood of becoming a principal when compared to all other female categories combined. The Cox PH model controls for all of the covariates in the model, taking into account the varied population sizes. The data shows a large number of cases that identified as female and White with a principal certification. The large number of White females that did not become a principal did not conceal Latinx females who were converting at a higher rate, albeit with a much smaller starting population. Stated simply,

White females are the largest group of individuals certified as principal in Texas, but when viewed proportionally they are least likely to become principals. Black females had a Cox PH model hazard function of 0.8802, meaning compared to all other female groupings, they were 12% less likely to become principal. To further understand the impact of race, ethnicity, and gender on principalship attainment, adjusted survival curves were calculated.

The results of the adjusted survival curves aligned with the results of the Cox PH model, indicating that White females had the lowest likelihood of becoming a principal over the time measured. The adjusted survival curves consider the covariate being measured while holding all other factors equal. The adjusted survival rate for White females did not reach the median lifetime after eleven years. The adjusted survival function for White females can be interpreted to mean that, after eleven years, over half of the eligible individuals certified as principals would not be expected to have become a principal. For Latinx and Black females, that median lifetime (more than half of the designated population experienced the event) occurred at interval nine. The adjusted survival curves are more statistically robust when compared to Kaplan-Meier models, which are a common tool of survival analysis and presented in a similar manner (Kleinbaum & Klein, 2005).

There are a number of potential factors contributing to lower rates of principalship conversion once certification has been achieved. As discussed earlier, it has been shown that women are more likely to solicit feedback from peers before proceeding toward various leadership roles commonly associated with the principalship pipeline, such as moving from teacher to assistant principal or assistant principal to principal (Mohr,

2014). This feedback may provide internal validation of principalship readiness, but requires additional time and actual demonstration of skills necessary for the principalship. However, previous research has shown that pre-principal roles do little to actually prepare individuals for the actual requirements of the principalship (Barnett, Shoho, & Oleszewski, (2012). Women tend to move into administrative roles at an older age. The Cox PH model showed that every additional year of age accounted for an approximately 2% decline in the likelihood of becoming a principal. Although increased age has shown a small decrease in event occurrence outcomes, it was statistically highly significant (0.000) with the cumulative effects becoming more noticeable. Five additional years of age results in a 10% decline in likely principalship attainment. Although females are the majority of principals in Texas, their path to the principalship is experienced differently based on their racial and ethnic background.

Texas is home to the largest number of individuals in the nation who became teachers through an alternative certification program (Bailey, 2017). Therefore, it stands to reason that alternative certification for the principalship is also common in Texas. Approximately 10% of those achieving a principal certification in Texas over the course of this study did so in an alternative certification program. These programs are run by a variety of private or public entities, including regional service centers, for-profit, and non-profit organizations, or school and county districts. Every measure employed for this study indicated that individuals with an alternative principal certification had higher survival rates, meaning they were less likely to become a principal than those having attended a traditional principal preparation program. The Kaplan-Meier model showed that individuals from Alternative and Traditional programs had similar likelihood of

experiencing the event early in the measured time, but from Interval/Year four a noticeable gap developed and continued to grow throughout the remainder of the measured time. Supporting the Kaplan-Meier findings, the Cox PH model showed that those attending a Traditional principal preparation program had an increased likelihood (1.1846) of becoming a principal when compared to those with an alternative certification. This finding was considered significant (0.019), although not as much as other factors. The adjusted survival curve, which just compares Traditional and Alternative certification programs, shows a noticeable separation between the two types of programs earlier, with the advantage persisting through the time measured.

Individuals with a principal certification from an alternative certification organization were less likely to become a principal than those educated in a traditional university-based principal preparation program. Even more troubling for those with an alternative certification looking to become a principal was the finding that, as time from certification increased, the gap between alternative certified individuals becoming principal versus those from a traditional program widened. This finding is surprising as some alternative certification programs have a required administrative placement/internship as part of acceptance into the specific program (Alliance for Educational Leadership, 2018). Lower level administrative positions, such as assistant principal, are eligible, but these pre-principal positions move participants one step further down the route to the principalship. Although principal SLPPs in Texas have an internship component, in most Traditional programs the internship comes toward the end of the program. Many alternative preparation programs include the administrative placement/internship at the start of the SLPP experience. The alternative preparation

programs were grouped together and compared to the entire group of traditional university-based programs. The analysis does not take into account differences with these two general groups, of which there are likely many. An example of potential differences may include the types of instruction delivery from seated courses, to entirely online courses, or some variation of both. Within both the alternative and traditional SLPP the level of coordination or partnerships with school districts may vary as well.

In an attempt to gain a more nuanced understanding of the potential impact a program type might have on principalship attainment, the traditional programs were broken down by Carnegie ranking (The Carnegie Classification of Institutions of Higher Education, n.d.). Carnegie rankings were sorted into four broad groups: Research institutions, Doctoral institutions, Masters institutions, and Other (encompassing Baccalaureate and Faith-based institutions). As a point of clarification, a number of sample institutions are listed in Table 6 along with their corresponding Carnegie ranking and group for this study. The examples provided in Table 6 are commonly known examples of a traditional university-based program that has a principal certification program. A complete list of all of the programs and their assigned designation can be found in the appendix. Carnegie rankings can change every five years, so for the purposes of this study, the 2015 Carnegie rankings were used, but the researcher recognizes the subjective nature of these rankings and acknowledges that a specific designation does not equate to a guaranteed level of excellence in the principal certification program.

Table 6

Carnegie Ranking Example Schools

Institutions	**Official Carnegie Designation**	**Group**
University of Texas	Research 1	Research
Texas State University	Research 2	Research
Lamar University	Doctoral	Doctoral
University of Texas - Rio Grande Valley	Doctoral	Doctoral
Stephen F Austin State University	Masters 1	Masters
University of Mary Hardin-Baylor	Masters 2	Masters
Schreiner University	Baccalaureate / Faith-Based	Other
Huston-Tillotson University	Baccalaureate / Faith-Based	Other

Note: The institutions listed are examples at each level of the Carnegie ranking and not intended to be the complete list of Texas principal preparation programs.

The Carnegie rankings have been used in this and other studies (Baker, Punswick & Belt, 2010) as a signal of institutional capital and overall quality. The reference category for Traditional university programs was Research institutions. There was one statistically significant designation in the Traditional university-based programs, and that was Carnegie-ranked Doctoral programs. Carnegie-designated Doctoral programs are institutions offering numerous undergraduate and master's degree programs as well as

limited number of doctoral degrees (The Carnegie Classification of Institutions of Higher Education, n.d.). These doctoral programs were shown to have a fairly significant negative impact on principalship attainment. This finding was considered highly significant, at a 0.0000 level. This is another case in which each of the survival analysis tools used in this study demonstrated agreement. The Kaplan-Meier curves showed Doctoral level programs lagging behind all other program types, which demonstrated similar levels of principalship attainment success. The Cox PH model showed that students graduating from a doctoral-level institution experienced a hazard ratio of 0.8239, meaning they were 18% less likely to become a principal compared to individuals who attended Research institutions. Finally, the adjusted survival curves expose a profound difference in principalship attainment between those having attended a research-level institution and those having graduated from a doctoral-level institution.

It is worth noting that Doctoral-level programs contribute the largest share of certified principals (38.42%) to the Texas employment pool, so results revealing these prospective principals have a more difficult track to becoming a principal are important. Since the single largest producer of certified principal graduates is a doctoral-level university, it is possible the results of this single institution have a disproportionate effect on the overall results of all doctoral-ranked programs, in this case that effect would likely be negative. Further research on this particular outcome is justified and will be discussed further below.

As the population in Texas schools continues to become more diverse, there may be opportunities for school leaders who are specifically prepared to address issues of social justice to become principals in great numbers. University Council for Educational

Administration (UCEA) is a collection of universities focused on preparing leaders prepared to embrace the opportunities of working with student populations that have historically been marginalized or experienced academic inequality. There are a number of UCEA member institutions in the state of Texas and they were grouped together as an additional covariate. The results indicated that Social Justice Programs showed a slight decrease in the hazard ratio (0.9745), which could indicate a slight decrease in principalship attainment, but the SJProgram covariate was not considered statistically significant.

An inspection of attempts required to successfully pass the principal certification exam was included for two reasons. First, the principal certification test in Texas has recently changed and no longer allows an unlimited number of attempts before successful completion. Second, it was examined to see if successful completion of the principalship certification exam impacted future principalship attainment. In response to the first question, the majority of prospective principals passed on their first attempt, but there was a small number of individuals who took more than one attempt in order to pass the principal certification exam. The Cox PH model found that each additional test attempt before successful completion resulted in a 0.9489 hazard function. This means if a candidate required two attempts to administrations before achieving a passing score, that individual now had an approximately 5% decreased chance of becoming a principal compared to those who passed the exam on their first attempt. This result is also cumulative, meaning that if it took three attempts before successful completion, the likelihood of experiencing the hazard decreased an additional 5%, meaning a principal candidate now was approximately 10% less likely to become principal any given year.

Assumptions and Limitations

As with any study, there are limitations to the findings as a result of assumptions made throughout the development and implementation of the study. Chief among these is the assumption that those seeking and completing a principal certification will pursue or intend to pursue becoming a principal in Texas. In fact, the level to which individuals certified as principals sought out jobs as principals is unknown. Additionally, the scope of this study was limited to the covariates measured, and while other covariates were considered, it was determined that they were either beyond the scope of this research project or that sufficiently appropriate data was not readily available.

This study utilized data specific to educator preparation in Texas. Although there are many first time principals across the state of Texas that attended an out-of-state principal preparation program, they were not included in this study. The contexts of educational preparation programs in Texas are unique and their generalizability to a broad context of principal preparation approaches may be limited.

The use of survival analysis approaches also carries a number of limitations specific to the statistical approaches utilized. Although the Cox PH model is considered a "robust" (Kleinbaum & Klein, 2005, p. 96) model that can accommodate a variety of data scenarios, it is not without limitations. The Cox PH model predicts relative hazards instead of absolute hazard (Alison, 2014). Risks are relative to the larger population designation (i.e. gender) and does not accurately predict the hazard of a single case. More precisely, this indicates that applying the relative risk factors to a unique individual based on their specific circumstances does not accurately predict an outcome. Kaplan-Meier curves also have their own limitations, namely they present information that is known,

such as who became a principal, but provide little additional information especially considering the effects of other covariates.

This study employs quantitative approaches when attempting to understand factors impacting the attainment of a principal position for the first time. When viewed through the lens of critical realism, this new data point provides an additional piece of information to what is known about principalship attainment but in no way completes the picture. The data for this study is limited to the what the social structures (TEA, schools districts, governments, and communities) consider appropriate for collection, such as gender, race, ethnicity, and preparation program rankings. Additional research, particularly qualitative research, may allow for the gaps in quantitative data to become known. Additional data on the types of instruction experienced in principal preparation programs or curricular areas of focus in these programs may capture factors contributing to educational quality not examined in this study.

Implications

The purpose of this study is to enrich the body of literature focused on principal preparation, specifically the time from preparation completion until initial principalship attainment. Along with an examination of factors contributing to principalship attainment, this paper intends to provide suggestions for changes in practice and policy, as well as lay the foundation for future research possibilities.

Practice. The path to becoming a school principal has become more defined over time. In the early days of school leadership, being White and male appeared to be the key factors in principalship selection. Formal university education, even as a teacher, was important, but the lack thereof was not seen as a disqualifier for becoming the head

of a school. Over time, principal preparation programs and certification requirements became a requirement in order to become a school principal. In Texas, along with the educational and certification requirements, prospective principals are required to hold a valid teaching certificate and at least two years of classroom teaching experience (Texas Education Agency, 2017). The teaching population in Texas, is predominantly female and White. Not surprisingly, the results of this study show that first-time principals in Texas over the period studied were most likely female and White, but White female prospective principals were the least likely to become principals compared to all other gender and race/ethnicity combination. Candidates from diverse racial/ethnic backgrounds were more likely to become principals when all other factors were controlled. However, there are significantly fewer Hispanic and Black candidates in the teaching pool, resulting in fewer prospective principals from these specific groups. These population discrepancies are particularly stark when looking at the population of male educators, where a majority of the male teachers and principals are White. There are already fewer men at any level of the educational employment pipeline, but digging deeper in the racial and ethnic backgrounds of male educators shows very few non-White candidates.

Since the route to the principalship has multiple required waypoints, it is important to consider action at each step of the path. School districts, particularly those in Texas, looking to increase the diversity of the principal population should provide leadership opportunities and mentoring to teachers from diverse and underrepresented populations. Many districts are taking a "grow your own" approach to leadership development, but even this approach is fraught with challenges, particularly when these

programs do not explicitly choose candidates more representative of the local school populations or fail to establish a support network of model school leaders willing to support and model effective practice (Toshalis, 2013; Versland, 2013). School districts and communities looking to not only diversify their school leader population but also ensure quality preparation should work closely with principal preparation programs. The most effective principal preparation programs include a field experience or internship element, but there is significant variability to the quality and type of field experiences future principals experience (Dodson, 2015). District partnerships with universities accomplishes two distinct goals. First, it allows school districts to align local needs and educational objectives to the principal preparation while creating a continuous feedback loop on leader preparation quality and preparedness. Second, it anchors the sometimes theoretical nature of principal preparation in practice, allowing principal candidates to make connections to local educational contexts.

Along with an increased focus on university and district/community partnerships, traditional universities should highlight the rate at which their graduates with a principal certification become principals, compared to the longer trajectory of alternatively-certified principals. These differences should be highlighted for potential future students, but also for districts choosing to hire these prospective principals.

Policy. A surprising finding from this study was that individuals from traditionally underrepresented populations have a route to the principalship that is less clear. Although principals of color do not comprise a representative proportion of the principal population when compared to student or teacher populations, they are more likely to experience the principalship sooner after certification, at least according to some

measures. The discrepancies in populations exist largely because the pipeline to the principalship has fewer persons of color. This highlights the need for potential policy changes throughout the PreK-16 pipeline that encourage and enable underrepresented populations to view education as a viable career choice. An example of this would be policies aimed at reducing behavior over-referrals of Black and Hispanic male students throughout their school experience, as disproportionate referrals decrease their opportunities to learn and increase their likelihood of becoming a school-to-prison pipeline statistic. Regarding the undergraduate college experience, universities should consider policies that enhance recruiting, retaining, and graduating students from underrepresented populations into teacher preparation programs. Providing supports specifically targeting populations underrepresented in the educational employment pipeline may ensure successful completion and certification of teachers who are more representative of the changing student populations in the state. Educator preparation is cyclical in nature. Currently, Texas students of color are most likely to have teachers who are White and female. As such, it reasonable to expect students of color to not view education as a potential career option for many of them, thereby continuing to perpetuate the cycle. There is evidence that students of color who experience a demographic mismatch with their teacher are subject to lowered academic expectations when compared to student-teacher demographic congruence (Gershenson, Holt, & Papageorge, 2016). Policies and practices aimed at increasing the diversity of college going students, particularly in teacher preparation may well increase the teaching population diversity and eventually lead to systematic changes in education that are more culturally sustaining and inclusive.

It is also important for SLPPs to consider the success rates of their students taking the principal certification exam. Were success rates of SLPP graduates taking the certification test publicly available, particularly for populations of underrepresented individuals in the principalship, it would allow individuals to consider potential programs based on the overall preparedness of their graduating student populations. The available information could be utilized by universities as they continually examine practice and consider approaches that would provide a greater benefit to their graduates in the future.

Finally, educational alternative certifications in Texas are more common than anywhere else in the nation, and Texas has a higher population of principals (and teachers) certified in a non-traditional setting. As this study has illustrated, principals prepared in an alternative certification program are less likely to become principals than their peers in Traditional university-based preparation programs. The justification for the number of alternative certification programs across the state are less clear. Traditional university-based principal preparation programs produce far more certified principals than there are prospective jobs for in the state. There is an argument in support of the variety of traditional preparation programs distributed throughout the state, and a need for additional and more detailed evaluation of these programs. However, for alternative certification programs, there appears to be less of an argument for their continuation, at least in their current composition. Should there be a documented need for alternative certification options, for isolated rural locations for example, those programs could be established on a case-by-case basis.

Future research. Although this study looks at the factors that contribute to becoming a principal for the first time, it makes no claims regarding quality of principals

during their initial appointment. Connections between principal preparation and student outcomes remain murky at best (Fuller, Young, & Baker, 2011; Davis & Darling-Hammond, 2012); however, there are a number of prospective measures of the principalship that warrant further consideration.

The first area of future research involves the time principals stay at their first principal job. Principal turnover has effects throughout the school ecosystem, but less is known about the factors contributing to principal longevity at a school. Understanding which factors impact principal longevity may provide further evidence of preparedness and additional supports required to continue the development of first-time principals.

Additionally, future research focused on the contribution of district leadership preparation efforts in combination with traditional preparation programs would highlight the unofficial leadership preparation that occurs outside of state or community oversight. Research examining the impact of district-based leadership preparation efforts in combination with traditional or alternative certification efforts would further clarify areas of leadership development that are beneficial or harmful to educational objectives.

Future research examining the impacts of educational practice throughout the educational employment pipeline continues to be an area of need. Studies that focus on the experience of principals of color and the barriers and facilitating factors they face as they attempt to be a principal are needed. Further down the pipeline, research interrogating the lasting impacts of culturally-biased state accountability measures on students of color is critical, as this is a factor that potentially keeps students from making it through school system, thus reducing numbers who make it to the principal applicant pool.

The Texas principal certification process and exam has recently changed in a substantial way. The long-term effects of this significant change are not yet known, particularly its impact on principalship certification achievement. Principal certification programs, both alternative and traditional, are going to be impacted by this change. It is likely principal preparation programming and populations will also change as a result of these recent modifications to the certification exam. Research examining changes to the prospective principal population would provide a valuable foundation for future research regarding certification processes and inform policy decisions on the topic.

Finally, Texas is a large state with a highly diverse population. A replication of this study in other state context may yield different results or confirm the findings of this study. Due to certification and educational differences in each state, a replicated study using data from another state would only enhance the understanding of the factors impacting principalship attainment.

Summary and Conclusion

The results of this study provide an additional level of detail to the broad and complex world of principal preparation. This study examined the factors that contribute to principalship attainment over time. The student population in Texas schools continue to experience a rapid demographic shift, yet this is not the case for those serving as principals. The reasons for this discrepancy are unclear, as are the impacts on student performance. What is known is that the pipeline to the principalship is far less diverse than the general population. It is not possible to consider the unbalanced demographics of the principalship without considering the entire educational ecosystem. The relationship students have with the educational system impacts their educational choices

throughout their academic tenure, from elementary to high school, and even to college and into the workforce.

If scholars are going to move conversations about student achievement and race and ethnicity out of the theoretical realm and into practical arenas, efforts must be undertaken to diversify the educational workforce. A broader representation of teachers and school leaders are needed to support the multitude of cultural, gender, economic, and educational differences present in today's classrooms. Critical realism calls for an ongoing critique of the social structures of principal preparation. The research presented here moves a step closer to understanding this issue of inequality present in principal preparation. Past research on this topic highlighted the existing disparities. The results of this study highlight that advancement from certification to the principalship is not as unequal as previously thought, although non-White principals are more likely to find themselves in "high demand jobs" (Sanchez & Thornton, 2010, p. 5).

Becoming a principal requires successful completion of several tangible steps. Because of these multiple steps along the way, the population of individuals eligible to pursue the principalship at any given point is more limited. Although a lack of a diverse principal population may be the result of certain demographic or educational factors, it is also highly likely impacted by factors earlier in the educational pipeline of principals. To fully understand the scope of the challenges, it is important to work backward from the principalship. Those choosing an educational trajectory that includes the principalship are influenced by experiences throughout their educational careers; for example, culturally-biased state accountability measures keep people of color from making it through school system and thus reduce the numbers who make it to the principal

applicant pool. Systems of support for students from populations underrepresented in teacher education should be established in high school, if not sooner, and continue throughout the university experience. Critical realism calls for a continued evolution of research as each additional layer of information is revealed.

APPENDIX SECTION

APPENDIX A

School Leader Preparation Programs of Texas (including type and rank).

* = UCEA Member Institution

Research University (according to 2015 Carnegie Ranking)

- Baylor University
- Rice Ed Entrepreneurship Program
- Rice University
- Southern Methodist University*
- Texas A&M University*
- Texas A&M University-Commerce
- Texas Christian University
- Texas State University*
- Texas Tech University
- University of Houston*
- University of North Texas*
- University of Texas - Arlington
- University of Texas - Austin*
- University of Texas - El Paso*
- University of Texas - San Antonio*

Doctoral University (according to 2015 Carnegie Ranking)

- Dallas Baptist University
- Lamar University
- Prairie View A&M University
- Sam Houston State University*
- Texas A&M University - Corpus Christi
- Texas A&M University - Kingsville
- Texas Southern University
- Texas Womans University*
- University of Texas - Rio Grande Valley*

Masters University (according to 2015 Carnegie Ranking

- Abilene Christian University
- Angelo State University
- Concordia University
- Houston Baptist University
- LeTourneau University
- Lubbock Christian University
- Midwestern State University
- Our Lady of the Lake University
- Southwestern Assemblies of God University
- St Marys University
- Stephen F Austin State University
- Sul Ross State University - Alpine
- Tarleton State University
- Texas A&M International University
- Texas A&M University - Central Texas
- Texas A&M University - Texarkana
- Texas Wesleyan University
- Trinity University
- University of Houston-Clear Lake
- University of Houston-Victoria
- University of Mary Hardin-Baylor
- University of North Texas - Dallas
- University of St Thomas
- University of Texas - Permian Basin
- University of Texas - Tyler
- Wayland Baptist University
- West Texas A&M University

Baccalaureate / Faith-Based University (according to 2015 Carnegie Ranking)

- Arlington Baptist University*
- East Texas Baptist University
- Howard Payne University
- Huston-Tillotson University
- North American University
- Schreiner University
- Southwestern Adventist University

Alternative Principal Preparation Programs

- 21st Century Leadership
- A Career in Teaching-EPP (Corpus Christi)
- American College of Education (Principal Program only)
- Argosy University (Principal Program only)
- Harris County Department of Education
- Houston ISD
- IteachTEXAS
- Region 01 Education Service Center
- Region 02 Education Service Center
- Region 03 Education Service Center
- Region 04 Alternative Certification Program
- Region 05 Education Service Center
- Region 06 Education Service Center
- Region 11 Education Service Center
- Region 12 Education Service Center
- Region 13 Education Service Center
- Region 14 Education Service Center
- Region 18 Education Service Center
- Region 19 Education Service Center
- Region 20 Education Service Center
- Teachers for the 21st Century
- ZZZ Entity for Testing & Training

Institutions without a 2015 Carnegie Ranking (omitted from analysis)

- Sul Ross State University - Uvalde/Rio Grande
- Texas A&M University - San Antonio
- University of Phoenix University

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