

WORKING PAPER

A QuantCrit Analysis of the Black Teacher to Principal Pipeline

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June 2021

Working Paper 102-21

Version 1.0

Abstract: Purpose: The purpose of this study is to examine the characteristics and mediating factors involved in the pathways of Black teachers on route to the principalship. Research Methods: Guided by the tenets of QuantCrit, this research relies on Texas administrative data from 2000 to 2019. We use descriptive statistics and survival analysis to examine the characteristics of Black teachers and the factors associated with promotion to assistant principal and principal. Findings: Black teachers have a small chance of becoming principals. Only 341 (<1%) of 38,740 Black teachers beginning their teaching career between 2001 and 2019 became principals by the end of 2019. Examining Black teachers since 2001, this paper demonstrates that the average Black principal served as a teacher for 6.5 years and as an assistant principal for 6.3 years and obtained a bachelor's degree, master's degree, and a principal certification before being promoted to principal. Implications for Research and Practice: Based on the contrasting narratives offered through this work and prior quantitative analysis, this study poses important considerations for advancing interpretation and reporting the experiences of Black educators. Also, given the need for increased representation of Black leaders in public school settings, future research should consider inconsecutive employment patterns among teachers and principals in the public education sector as well as the experiences of Black educators from assistant principal to principal. This work poses implications for the role of systemic racism in Black teacher promotion and the anti-racist reform necessary to improve outcomes in this area. **Keywords:** Black or African American, teacher, principal, pipeline, empirical paper

Suggested citation: Templeton, T., White, C., Peters, A. L. & Horn, C. L. (2021). A QuantCrit analysis of the Black teacher to principal pipeline. University of Houston Education Research Center Working Paper 102-21.

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Publication status: This paper is a first draft for comment. A substantially revised version is under review with a journal.

Competing interests: The authors report no potential conflicts of interest.

Acknowledgments: The authors would like to thank Jeanette Narvaez and Sherry Lowrey for their support of the paper.

Disclaimer: This policy brief is a result of approved research conducted using data through the University of Houston Education Research Center (UH ERC). Results, opinions, recommendations, or points of view expressed in this policy brief represent the work and consensus of the authors and do not necessarily represent the official position or policies of the University of Houston, the UH ERC, and/or its funding organizations.

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Introduction

The *Brown v. Board of Education* decision had an indelible impact on the education of Black students. Often less discussed is the negative impact of this decision on Black teachers and administrators (Milner, Delale-O'Connor, Murray, & Farinde, 2016; Milner & Howard, 2004; Tillman, 2004). While pre-*Brown* schools serving Black children were led by Black teachers and administrators, post-*Brown* desegregation efforts effectively mandated the educating of Black children by White educators. Prior literature shows how this shift had the unfortunate and lasting consequence of decimating the pool of Black teachers (Milner & Howard, 2004) and, thus, the pipeline of Black principals (Tillman, 2004; Author, 2019).

Brown-related scholarship highlights how the legacy of Black education is inextricably connected to the historical oppression of Black people from the first enslaved Africans on American shores (Anderson, 2015). Teachers and school leaders are a central part of this narrative, as scholars (e.g., Milner et al., 2016; Milner & Howard, 2004; Tillman, 2004) have argued how underlying issues such as systemic racism and gender discrimination—which often prevent educators from advancing on the pathway to leadership—are regularly disregarded. After *Brown*, Black principals and assistant principals were often demoted to entry-level roles or forced to return to the classroom (Milner et al., 2016; Author, 2019), and these events have shaped the contemporary landscape of Black school leadership.

Racial and ethnic representation among teachers and school leaders has faced increased scrutiny in recent years, as federal data reflects low numbers of educators of color—particularly Black educators—across the nation. Black Americans make up approximately 13% of the U.S. population (U.S. Census Bureau, 2019); however, the public education system (K-12) comprises only 7% Black teachers and 11% Black administrators (U.S. Department of Education, 2019).

The profundity of this issue is also seen in the disproportionate numbers of White teachers (79%) and administrators serving a national student body predominated by students of color who represent 58% of the enrolled public school population (King, 2016; U.S. Department of Education, 2019). Scholars have linked the shortage of racially diverse principals to specific factors, including the increased likelihood that school leaders recruit and hire teachers whose racial, ethnic, or gender identity corresponds with their own (Myung, Loeb, & Horng, 2011). This narrative is even more complicated for Black educators whose collective trajectory in the field has been considerably derailed by post-segregation-era systemic racism.

Also relevant to this topic is the growing body of literature and data that links the racial and ethnic identities of teachers and administrators to student achievement (Dee, 2004, 2005; Egalite, Kisida, & Winters, 2015; Joshi, Doan, & Springer, 2018). As such, the shortage of Black teachers and administrators is detrimental to all students, particularly Black students who represent approximately 15% of the K-12 public school student population (Lomotey & Lowery, 2014; Milner, 2006; Milner & Howard, 2004; U.S. Department of Education, 2019). Despite the progress made over the course of more than 65 years following the *Brown* decision, Black students continue to face inequities in schooling that influence their educational outcomes (Lewis, Venzant-Chambers, & Butler, 2012).

Citing such factors as the decline in emotional, cultural, social, and academic supports, many have argued that the decline in the Black educator workforce is closely associated with the lower rates of achievement among Black students (Milner, 2006; Milner & Howard, 2004). Though scholars such as Griffin and Tackie (2016) note how these responsibilities add work to teaching loads, they remain an important consideration for student success. Prior research (e.g., Egalite, Kisida, & Winters, 2015; Joshi, Doan, & Springer, 2018) also shows that Black students

who experience racial congruity with teachers perform better on academic achievement metrics, reflecting specific considerations for prioritizing equity for Black educators within efforts to improve student outcomes.

Such strong evidence of historical marginalization spotlights the need for more longitudinal studies that intentionally examine the advancement of Black educators along the educational pipeline. As we know from extant research and theorizations on the study of racism in education, race is perhaps the most salient feature contributing to educational inequality (Ladson-Billings & Tate, 1995). Taken together, such empirical and contextual knowledge warrants the continued examination of Black teachers and principals through a critical lens that explicitly acknowledges and accounts for systematic racism.

Unfortunately, discontinuity in the academic research regarding the Black teacher-to-principal pipeline stymies important progress. Though many have researched the path to the principalship (Gates et al., 2004; Fuller, Young, and Orr, 2007; Ringel et al., 2004; Turnbull, Riley, & MacFarlane, 2015), few quantitative studies have contextualized race and racism in a way that recognizes how the education system itself often serves as a mechanism to further the inequality of Black teachers and administrators. The experiences of Black educators in the teacher-to-principal pipeline reported in qualitative academic literature tell stories quite different from those described in findings reported in quantitative academic literature. While interviews and case studies of Black educators consistently report racial discrimination and inequity in preparation (Agosto, Karanxha, & Bellara, 2015; Brown, 2005), hiring and promotion (Cruzeiro & Boone, 2009; Ortiz, 2000; Smith, 2016; Tallerico, 2000), and support (Farinde, Allen, & Lewis, 2016; Griffin & Tackie, 2016), quantitative analyses at best report the likelihood of principalship among Black educators as compared to the White majority (Bailes & Guthery,

2020; Davis, Gooden & Bowers, 2017) and at worst minimize the racial disparities among Black and White educators by mischaracterizing and overgeneralizing specific findings without interpreting the inclusion of race variables (Crawford & Fuller, 2017; Fuller, Young, & Orr, 2007; Ringel et al., 2004).

Despite years of research on the topic, most quantitative analyses in the area of education administration do not accurately portray the complex and nuanced context that underscores the Black teacher-to-principal pipeline. Though scholars such as Davis, Gooden, and Bowers (2017) and Bailes and Guthery (2020) have made contributions that advance this area of research, few studies actualize the ways in which systemic—and often, gendered—racism influences Black teachers' trajectory and ability to transcend to leadership roles. The purpose of this research is two-fold: 1) to illuminate the subjective nature of analysis interpretation and reporting of Black educator experiences in prior quantitative analyses and 2) to conduct a quantitative analysis appropriate for exploring the realities that qualitative literature has exposed in the Black teacher-to-principal pipeline.

Guided by the tenets of QuantCrit, this analysis attempts to embrace the fullest possible range of limitations of the social construct of race in quantitative analysis—discrimination, misidentification, overgeneralization, and othering. Acknowledging racism, White supremacy, White logic, and oppression of Black students and educators throughout this work takes an important first step in truly transitioning quantitative analysis from a positivist to a post-positivist paradigm where context is meaningful. This analysis surpasses previous quantitative principal pipeline research by going beyond including race as a variable in a model to purposefully designing a quantitative study grounded by the realities experienced by Black educators.

The paper is organized to first describe the QuantCrit lens through which this work is conducted. Second, the reality of racial discrimination and inequity experienced by Black educators throughout the teacher-to-principal pipeline—consistently reported by qualitative analyses conducted over time—will provide important context for quantitative analysis design. Third, limitation findings for Black educators in previous quantitative analyses are reviewed. Finally, the design, findings, and discussion of the new quantitative analysis of the Black teacher-to-principal pipeline are presented as a new quantitative counter story.

Conceptual Framework

QuantCrit (Gillborn, Warmington, & Demack, 2018) is an emerging field of research that extends the use of critical race theory (CRT) (Delgado & Stefancic, 2017) from its original legal context (Bell, 1995; Crenshaw, 1988; Lawrence, 1990; Matsuda, 1987) to understand the subjective nature of methodological design, statistical analysis, and result interpretation. The developing principles of Gillborn, Warmington, and Demack's (2018) QuantCrit frame can be summarized as:

- Race is a social construct supporting hierarchies of power.
- Quantitative analyses are often conducted using White logic, performed using data collected in discriminatory fashion, and result in conclusions shaped by White supremacist ideals.
- Categories of data are social constructs susceptible to Eurocentric influence.
- Data must be given voice and insight by the subjects for whom it was collected.
- Racism in quantitative analysis should be exposed, and marginalized communities should be empowered to provide sensitive, useful research to support social justice and equality.

As Gillborn, Warmington, and Demack (2018) state, QuantCrit is not a novel concept, but it builds upon decades of critical investigation of the racialization of quantitative analysis. Specifically relevant in this analysis is the use of White logic (Zuberi & Bonilla-Silva, 2008) to design quantitative modeling and interpret results in a way that subordinates all non-White races by defining against the normative White, thus reinforcing the characteristics of the dominant group (Crenshaw, 1988; Zuberi, 2001).

For this analysis, QuantCrit provides a framework from which previous literature is critiqued for inappropriate overgeneralization of findings from largely White datasets to Black educators and a quantitative counternarrative is provided to empirically elucidate the experiences of Black marginalized populations in earlier research. Considering the unique subjugation, oppression, and discrimination Black teachers have faced throughout their history in the United States (Anderson, 2015; Tillman, 2004), this analysis seeks to provide a contemporary quantitative analysis of and understand the situation of the Black teacher pipeline to principalship in the conventional White narrative of previous literature.

Literature Review

Qualitative research contributes substantially to the growing understanding of how race, class, and gender inequality are deeply rooted within the path to educational leadership, often creating disparate opportunities and outcomes for teachers from marginalized backgrounds who are seeking to advance toward the principalship. As emphasized by Smith (2016), to understand the current administrative pipeline, it is imperative to consider the social context and history of the professional path from educator to leader in a school setting. More specifically, it is important to consider how the individual and collective insights gained from the use of qualitative methods (e.g., interviews, focus groups, and systemic reviews of literature) offer

knowledge of lived experiences that may not be gained through inquiries grounded in more quantitative paradigms. As argued by many scholars who rely on mixed- or multi-method research designs, both research paradigms are useful in examining how the inequalities embedded along this pathway generate issues and barriers that disproportionately impact Black educators, who often comprise the lowest percentage of K-12 educational administrators.

With this in mind, the following review of qualitative literature highlights the central issues impacting the Black teacher-to-leader trajectory, such as the dissipating pool of Black classroom teachers (Carver-Thomas, 2018; Madkins, 2011), the unique challenges experienced by Black educators in school settings (Griffin & Tackie, 2016; Farinde, Allen, & Lewis, 2016), and issues of inequality in principal-preparation programs (Agosto, Karanxha, & Bellara, 2015; Karanxha, Agosto, & Bellara, 2014). Aligned with the critical framework of this paper, prior research describing racialized and gendered issues related to hiring and promotional practices associated with the principalship is included. To enhance understanding around the full spectrum of the pipeline and the influence of Black principal representation, the experiences of Black school leaders are reviewed as well.

Black Teacher Shortage

The Black teacher shortage is just one area where such inequalities become evident. In describing the limitations of *Brown*, Ladson-Billings (2004) reminds us of the retaliatory efforts evoked by White school leaders, which ultimately led to the forced exit of Black teachers and administrators during the desegregation era. Scholars have linked this significant loss of Black educators post-*Brown* to the present-day shortage of Black teachers (Madkins, 2011; Milner, 2006). In other research, the lack of Black teacher representation in schools is attributed to factors such as disparate K-12 educational opportunities, issues of inequality related to college

access and success, inadequate teacher preparation, and cultural bias in standardized licensure examinations (Carver-Thomas, 2018; Madkins, 2011).

Unpacking the interracial statistics of the Black teacher shortage reveals disparities along gendered lines and reflects additional nuance of the racialized gaps in educator representation. Though Black women are underrepresented in the profession as compared to women of other racial and ethnic backgrounds, they comprise the majority of the Black teachers in school settings (Farinde, Allen, & Lewis, 2016). Based on this trend, researchers have cited the paucity of Black male teachers as a particular imperative for improving the racial diversity of the teacher workforce (Ingersoll & May, 2011; King, 2016; Sandles, 2020).

Black Teachers' Experiences

Black educators report a variety of racialized and gendered experiences that result from working in school settings. The spectrum of concerns includes paltry school conditions, climate-related issues, and lack of support from administrators (Carver-Thomas, 2018; Griffin & Tackie, 2016). Black teachers are often clustered into schools labeled as lower performing or urban and they often educate higher numbers of Black, Hispanic, or low-income students (Farinde-Wu, 2018). Some, however, have the opposing experience of isolation that can come from serving as the sole representative for their racial group (King, 2016).

Griffin and Tackie's (2016) analysis of focus-group data collected from 150 Black teachers reveals a host of other racialized experiences, including being perceived as "subpar educators" and feeling devalued, both of which can be tied back to the intentional degradation of the Black teacher workforce in the era immediately following *Brown*. In the same study, teachers described the realities of overdependence as disciplinarians and working exponentially harder yet receiving less acknowledgment than their White colleagues. Despite efforts to recruit teachers

from diverse racial and ethnic backgrounds (Ingersoll, May, & Collins, 2019), the public education system has difficulty placing and retaining Black teachers (Carver-Thomas, 2018). The concerns conveyed by Black teachers through qualitative research often lead them to depart their school, district, or the even the profession altogether (Farinde, Allen, & Lewis, 2016; Griffin & Tackie, 2016).

Leadership Preparation

Principal preparation and certification are integral parts of the process to becoming an administrator, and prior scholarship has illuminated how racial and gendered discrimination in the area often influences the leadership trajectory of Black teachers. Educational administration and leadership programs often lack specific attention to racial diversity in admissions (Davis, Gooden, & Micheaux, 2015; Leonard & Daly, 2017), which leads to underrepresentation of Black men and women (Brown, 2005). University leadership and faculty are deeply implicated in this problem, as Karanxha, Agosto, and Bellara's (2015) conceptualizations of "the hidden curriculum" illustrate how candidate selection processes in graduate programs can produce stratified outcomes for students of color.

Race and Gender in Leadership Preparation

The intersectional nature of race and gender is also relevant to the principal-preparation conversation. Despite their majority representation in the teacher workforce, women are generally underrepresented in leadership training opportunities (Darling-Hammond et al., 2007). Furthermore, Burton and Weiner's (2016) work highlights how women who seek to engage in such opportunities may face uniquely gendered experiences. Such realities are compounded for Black women—whose experiences are impacted by the intersections of race and gender—as evidenced in disproportionate rates of rejection in educational leadership programs (Agosto,

Karanxha, & Bellara, 2015). In addition to inequities in access to these spaces, prior research also notes that most programs fail to address race, gender, and other equity issues in their program structure (López, Magdaleno, & Reis, 2006) or provide adequate mentorship and guidance (Mansfield, Welton, Lee, & Young, 2010), leaving Black female educators with significant barriers to career advancement.

Hiring and Promotional Practices in Educational Leadership

Educators of color who manage to access and navigate the principal-preparation space often face discrimination in hiring and promotion that are tied to perceived fit for educational settings (Cruzeiro & Boone, 2009; Ortiz, 2000; Smith, 2016; Tallerico, 2000). Research from Cruzeiro and Boone (2009) and Tallerico (2000) demonstrates how gender and racial identity lay a role in advancing to leadership roles in certain contexts. Ortiz (2000) shows how structural inhibitors (e.g., White male-dominated search committees) often preclude non-White candidates from promotion to administrative roles. Grounding their work in a critical race theory, Smith's (2016) integrated review of prior literature and empirical research on the hiring and promotion of educational administrators shows how Black teachers' efforts to become administrators are obstructed by racial and gender bias in hiring and promotional practices. Based on their efforts to understand the impact of structural racism on Black leadership, this review was limited to studies that explicitly documented African American experiences, understanding, and outcomes. The disproportional likelihood of Black teachers being placed in low-resourced or urban schools directly influenced their ability to access the social and cultural capital needed to navigate school environments and advance to leadership roles. This work speaks to the racialized nature of interviewing and cites *Hazelwood School District v. United States* (1977) along with examples of research that show how bias in the employment process impacts Black applicants. Smith further

describes the realities of White racial dominance, illuminating how stereotyping and bias prevent applicants whose traits are not aligned with the standard image of school leaders (e.g., White males) from entering the administrative workforce. Based on the findings, Smith posits that educational environments replicate stratification patterns found in the broader social context and notes that the lack of African American representation among K-12 administrators “may be an indicator of intentional or consequential racism within the employment practices of the profession” (p. 129).

Though a complex combination of factors converges to influence the overall shortage of teachers and leaders (Darling-Hammond & Podolsky, 2019), historical and contemporary scholarship points to a clear systemic disadvantage for Black teachers (Madkins, 2011; Milner & Howard, 2004; Smith, 2016; Tillman, 2004). The well-documented experiences of Black educators paint a picture of a White-dominant workforce in which racism, oppression, and marginalization obfuscate the efforts of many Black educators to successfully navigate the preparation, teaching, and leadership spaces. Such factors should be considered when analyzing and interpreting empirical data on promotional patterns and outcomes among this population.

A Critical Review of Prior Quantitative Analyses

Unlike numerous qualitative studies, quantitative analyses aimed at examining the teacher-to-principal pipeline have failed to center the Black educator. Conducted using large, national data sets or administrative data from state repositories, previous quantitative studies examining the teacher-to-principal pipeline have often overgeneralized model results to the entire educator population, inappropriately interpreting the opposing nature of race variables or discussing limitations of generalizations to only the White population. Worse, some publications

provide misleading interpretations of coefficients of race variables absent context to convey mistruths about the Black teacher and principal population.

Seminal truths grounding quantitative investigation into principal pathways were established by research conducted in response to concerns of impending administrator shortages in the late 1990s and can be summarized as: 1) more than 85% of principals have teaching experience; 2) women are underrepresented in the principal position; and 3) the student demographic makeup of the school impacts principal pathways (Gates et al., 2003; Papa, Lankford, & Wyckoff, 2002). These early analyses, though they generalized findings to the entire population of principals, were limited by complete disregard for the race or ethnicity of the principal (Papa, Lankford, & Wyckoff, 2002) and the analysis of the cross-sectional National Center for Education Statistics Schools and Staffing Survey sample data sets with multicollinear regression analyses (Gates et al., 2003).

In the case of Gates et al. (2003), the authors stated that they found no relationship between salary and the race of the principal. However, the authors' interpretation of results failed to convey the concept of *ceteris paribus*, or all other factors held equal. Said differently, by including several other varying characteristics of principals and schools that employ principals in the model, the absence of a relationship between salary and the race of the principal was found only as long as these other confounding factors were held constant. A more appropriate interpretation of the relationship of Black principals and salary from the entire model is that similarly experienced Black principals in urban settings with similar populations of students earned roughly the same salary. This conclusion is far different from the blanket statement that no relationship exists between race and salary. Despite the glaring omission of principal race or

the overgeneralization of findings, these early papers are often cited to describe characteristics of all principals, including Black principals.

The passage of the No Child Left Behind Act (2001) brought a second wave of quantitative analysis of principal pathways concerned with the recruitment and retention of high-quality principals to lead schools in the era of increased accountability measures. The second wave of studies explicitly examined the effects of the race of the principal but interpreted decontextualized results in ways that misrepresented racism and oppression experienced by Black teachers and principals. Using state-level administrative data sets, three studies—one in Illinois, one in North Carolina, and one in Texas—employed logit models to understand the relationship between individual and school characteristics and the likelihood of becoming a principal. In Illinois, Black teachers were reported more likely than White teachers to become assistant principals and more likely than White assistant principals to become principals (Ringel et al., 2004). North Carolina's analysis reported that Black female teachers were twice as likely to become assistant principals than White female teachers, but no more likely to transition from assistant principal to principal (Gates et al., 2004). Fuller, Young, and Orr (2007) reported that Texas Black teachers were more likely than their White peers to obtain a principal certification but less likely to be employed as a principal.

In each case, the results discussed were absent a proper explanation of the underrepresentation of Black teachers and principals in the education workforce. In each of the three states, Black teachers comprised a small component of the teaching population. Findings of Black teachers being more likely to become assistant principals (or obtain certification) minimized the problems of underrepresentation and discrimination of Black educators in the entirety of the public school system. Without first understanding that in order to have any Black

principals, they must be promoted from a small pool of Black teachers, which makes them by default more likely to become a principal in the vast sea of White teachers, the reader is misled into believing that Black teachers are provided more of an opportunity than their White peers.

The most recent quantitative analyses of the principal pipeline either do not consider race (Bastian & Henry, 2015)—including analyses commissioned to evaluate the Principal Pipeline Initiative funded by the Wallace Foundation (Turnbull, Riley, & MacFarlane, 2015)—or iterate the discussions of earlier work that White male privilege dominates the principalship (Davis, Gooden, & Bowers, 2017). A host of similar studies are also challenged with the interpretation of race variables in modeling. In a publication rooted in seeking representative bureaucracy for the Latino community, Crawford and Fuller (2017) included Black race as an individual characteristic in their logistic regression but did not interpret the tabular results of Black individuals being more likely to become a school leader, more likely to become an assistant principal, and less likely to become a principal than White individuals in the study.

In the strongest demonstration of contextualized systemic racism in quantitative analyses, Davis, Gooden, and Bowers (2017) published a critical quantitative inquiry that drew parallels between the decreased likelihood of Black educators becoming principals resulting from their quantitative hazard models and previous experiences of Black educators documented in qualitative literature. The authors acknowledged the advantage afforded to White men in the principal pipeline and the lack of quantitative analyses published to better understand systemic bias (Davis, Gooden, & Bowers 2017). Despite this modest advancement in the quantitative space, exploration into factors that influence the Black teacher-to-principal pipeline remains absent from literature.

Summarizing the findings of sparse previous quantitative literature, Black teachers were found more likely to receive principal certifications and become assistant principals and less likely to become principals than their White peers (Davis, Gooden, & Bowers, 2017; Fuller, Young, & Orr, 2007; Gates et al., 2004). However, outside of unjust, decontextualized comparisons of Black educators to the normative White, there exists no quantitative analysis examining the factors that might mitigate or promulgate discrimination and inequity experienced by Black teachers in the principal pipeline—something that is well documented in qualitative literature. As such, this study seeks to fill the gap in literature by engaging race-conscious modeling strategies informed by QuantCrit to overtly consider the historical oppression of Black teachers and principals in the education workforce.

Data and Method

The historic oppression, marginalization, and subjugation of Black educators set apart their experiences from those of other educator groups, particularly those of White educators who overwhelmingly comprise the public educator space. Qualitative literature has documented the ways in which systemic racism and oppression uniquely shape the Black teacher and principal experience, yet the unique experiences of Black teachers seeking principalship are missing from the quantitative narrative. The intention of this study is to provide an accurate quantitative counternarrative of the Black teacher-to-principal pipeline, insofar as the limitations of a statewide administrative and education data set will allow.

Guided by the tenants of QuantCrit, the discussion of data and method purposefully begins with a review of the racism and White supremacy of demographic data collection and statistical analysis. As explained in detail below, this study uses a statewide administrative and education data set to gather information about the individual and campus characteristics of

teachers and schools. We use this data set to recognize Black teachers: those who identified themselves as *Black or African American* when applying for a job in the Texas public education system or when applying for a teaching certification with the State Board for Educator Certification.

First, race is a social construct developed primarily to justify the subjugation of one population by another. The term *race* propagated in the 18th century as a marker assigned through phenotypic characteristics that served as a means to justify slavery by dehumanizing the African people colonized and enslaved by Christians (Smedley & Smedley, 2005). Grounded in this hegemonic ideology of White supremacy for economic gain, racialized science bourgeoned to further support efforts to separate Black people from White. By the late 19th century, eugenics was promoted as irrefutable science to support racial stratification. Francis Galton's eugenic assertions of biological superiority of the White race provided fertile ground for Karl Pearson and Roland A. Fisher to develop the statistical tests that serve as the cornerstone of statistical analyses used in social sciences (and this work) today (Zuberi, 2001). The original mal intent of both the classification of race and tools of statistical analysis haunt the study of racism and White supremacy in education today.

In this work, we recognize the Texas public school classification of *Black or African American* educators as a group of people similarly oppressed and marginalized by the lingering phenotypic consequences of racial stratification. We study this infinitely diverse group of people using the label first assigned to subjugate for empowerment—in order to illustrate the journey of Black educators without comparison to White so that the misinterpretation, lack of interpretation, or overgeneralization of statistical results of previous work does not cloud the Black narrative. By recognizing the origins of the social construct of race and basis of statistical analyses, we

conduct our study aware of (though not without) the subjective nature of quantitative analysis (Gillborn, Warmington, & Demack, 2018).

Data

The data for this study is from the University of Houston Education Research Center (ERC), which holds a repository of administrative data from P-20 oversight agencies and the Texas Workforce Commission from the mid-1990s to present day. Specifically relevant to this analysis, the repository contains individual-level demographic, certification, administrative, campus, and district data that allows for teachers to be followed from educator preparation and certification throughout their career in the Texas public school system. The temporal boundaries for this research are the 2000-2001 and 2018-2019 school years—the extent of individual and campus-level data available for this study. The data set was built by identifying Black teachers employed as a new teacher of record in Texas public schools from 2001 through 2019. Then, teachers' service records were used to create variables for employment in the public school system each year. Individual demographic information, as well as certification and preparation, were added for each teacher in the data set, as well as campus-level characteristics for the campus where individuals first served as a teacher, first served as an assistant principal, and first served as a principal. Using this longitudinal data, duration variables were created for the time from first teaching year to assistant principalship and to principalship. For the purposes of this study, individuals in the data set were only those employed continuously in a Texas public school.

Person-Period Data Set

For the survival analysis, a person-period data set (Singer & Willet, 2003) was structured so that each observation represented a year a person was serving in the public education system.

The event is the individual being assigned a principal role code. Time begins when an individual was first coded as a teacher of record in the data set, commonly referred to as their first year of teaching. The event time is defined as the time from the first year of teaching to the first assignment principal. By design, the data set used for the preliminary analysis is right-censored (Singer & Willet, 2003). It begins with the individual's first year as a teacher of record but does not capture all the possible years in the future in which teachers could become principals.

Model

In order to compare results to existing literature, the analytic approach will be to replicate the discrete-time hazard modeling that Davis, Gooden, and Bowers (2017) constructed from the guidance of Singer and Willet (2003) using a data set of Black teachers. The discrete-time hazard model, rather than the continuous time model, is appropriate because the role codes for individuals in the data were reported once per year and do not capture the fluidity of some mid-year moves (Singer & Willet, 2003). In this research, the discrete-time hazard, denoted by $h(t_{ij})$, the hazard is the probability of a teacher (i) becoming a principal (event) at the beginning of the academic year (j). The model can be formulized with the equation:

$$h(t_{ij}) = \Pr[T_i = j | T_i \geq j],$$

where T donates the time period (j) when the teacher (i) becomes a principal. Notably, conditionality is inherently important in the discrete-time hazard model (Singer & Willet, 2003), so the data set was restricted to include only the first transition of those individuals who oscillated between teaching and principal positions.

Additionally, the survivor function aggregates the probability of teachers not becoming principals over the period. Survival, or in this research not becoming a principal, can be denoted by the equation:

$$S(t_{ij}) = \Pr[T_i > j],$$

where the survival function for individual teacher (i) in time (j) is the probability that the teacher will not become a principal.

Results

As a first, important step in our analysis, we describe the landscape of Black teachers and principals in Texas. For context, in 2001, 14% of the total 4,059,619 students in Texas public schools identified as Black (Texas Education Agency, 2001), and in 2019, 13% of the total 5,416,400 students in Texas public schools identified as Black (Texas Education Agency, 2019).

Descriptive Statistics

Black Teachers

In the data set of 38,740 Black teachers serving as a teacher for at least one year between 2001 and 2019, 73% identified as female. Though standard teaching certificates were not a requirement throughout the entire time period spanning the data set, 84% of teachers held a standard teaching certificate. Of those, 68% were prepared for their teaching certificate through an alternative certification program rather than a traditional university-based program (11%). The campuses employing this largely female group of Black teachers—predominantly prepared through alternative certification programs and in their first year of teaching—served high average concentrations of low-income (71%) and Black (34%) students.

Black teachers in the data set taught in the classroom for an average 6.5 years. Of those teachers, 1,288 became assistant principals and served in the role for an average of 6.3 years. Of those 1,288 Black assistant principals, 308 became principals. An additional 33 Black teachers became principals without ever serving as assistant principals.

Black Principals

Following the 38,740 Black teachers throughout their career, 341 (<1%) served as principals for at least one year between 2001 and 2019. Seventy-five percent of the campuses hiring Black teachers in their first year of teaching were located in the four largest urban areas of the state: Houston, Dallas/Fort Worth, San Antonio, and Austin. Elementary schools hired the largest proportion of Black principals (45%), followed by middle schools (25%), mixed grade level schools (17%), and high schools (13%).

Of the 341 Black teachers who became principals between 2001 and 2019, 56% identified as female. Fifty-three percent of Black teachers who became principals were prepared for their teaching career through an alternative certification program, and principal certifications were held by 97% of Black teachers who became principals. On average, Black teachers who were promoted to principal did so after six years of teaching and seven years of serving as an assistant principal. Most Black principals held a principal certificate (91%), and most served as an assistant principal (90%) before becoming principal.

Just as Black teachers began their teaching career in schools with high average concentrations of Black and low-income students, the Black teachers who became principals began their principalship in schools with high average concentrations of low-income (70%) and Black students (32%). The similarity in the type of campuses served by Black teachers and Black teachers who became principals is not exclusively because Black teachers became principals at

the campuses where they began their teaching career. Only 7% of Black teachers who became principals ascended into the principalship at the same campus where they began their teaching career, and 16% were promoted to principal at the same campus where they first became an assistant principal.

Life Tables

Between 2001 and 2019, 38,740 Black teachers entered their first year of teaching, and 341 of those Black teachers became principals. Table 1 displays the life table for the Black teacher data set. The table displays hazard ratios for becoming a principal at each year within a teacher's career. The data set initially includes 38,740 first-year Black teachers. Between Year 6 and Year 7, for example, the 15,420 teachers who remained in the data set had a 0.16% chance of becoming a principal. At the end of the period analyzed in this study, the 570 Black teachers who remained had a 0.53% change of becoming a principal. The chance of becoming a principal (hazard) is greatest between the 16th and 17th year of a teacher's career.

Table 1

Life Table

Period	Interval	Teachers Not Yet Principal	Teachers Became Principal	Censored	Hazard Function	Survival Function
0	[0,1)	38,740	0	3,773	0	1
1	[1, 2)	34,967	3	4,809	0.0001	0.9999
2	[2, 3)	30,155	2	4,588	0.0001	0.9998
3	[3, 4)	25,565	6	3,775	0.0002	0.9996
4	[4, 5)	21,784	15	3,429	0.0007	0.9989
5	[5, 6)	18,340	8	2,912	0.0004	0.9985
6	[6, 7)	15,420	25	2,150	0.0016	0.9969
7	[7, 8)	13,245	34	1,345	0.0026	0.9943

8	[8, 9)	11,866	32	1,438	0.0027	0.9916
9	[9, 10)	10,396	38	1,421	0.0037	0.988
10	[10, 11)	8,937	31	1,506	0.0035	0.9846
11	[11, 12)	7,400	36	1,469	0.0049	0.9798
12	[12, 13)	5,895	30	1,360	0.0051	0.9748
13	[13, 14)	4,505	23	1,101	0.0051	0.9698
14	[14, 15)	3,381	19	893	0.0056	0.9644
15	[15, 16)	2,469	17	613	0.0069	0.9577
16	[16, 17)	1,839	15	666	0.0082	0.9499
17	[17, 18)	1,158	4	584	0.0035	0.9466
18	[18, 19)	570	3	567	0.0053	0.9417

Survival Analyses

The survival models employed in this research were designed to include the covariates of prior research so that the specific effects of these covariates on Black teachers becoming assistant principals and principals could be analyzed in this study. The resulting model predicting the likelihood of Black teachers becoming principals is displayed in Table 2. The table shows the coefficient, standard error, odds ratio, and significance for each independent variable included in the model. To ensure the proper fit of the model, the deviance (-2 times the log likelihood of model) was compared to a null model with only period intercepts. The deviance figure of the full model shown below in Table 2 (2455.281) significantly decreased from the deviance figure of the null model deviance (4630.951), indicating a better fit. Of notable exception in the model are the variables indicating whether or not the individual served as an assistant principal, had a standard teaching certificate, or attended a principal preparation program. Because the overwhelming majority of Black principals shared the same characteristics, insufficient variance within the population mandated exclusion.

Table 2

Discrete-Time Hazard Model Results

	Coefficient	SE	Odds ratio	p≤x
<i>Period Intercepts</i>				
Period 2	-10.9278	1.2549	0.0000	***
Period 3	-10.3651	1.2515	0.0000	***
Period 4	-8.3785	0.9005	0.0002	***
Period 5	-6.6792	0.7999	0.0012	***
Period 6	-6.5531	0.8337	0.0014	***
Period 7	-4.8400	0.7734	0.0079	***
Period 8	-3.8768	0.7621	0.0207	***
Period 9	-3.4056	0.7608	0.0332	***
Period 10	-2.7563	0.7568	0.0635	***
Period 11	-2.6344	0.7628	0.0718	**
Period 12	-1.9983	0.7608	0.1356	**
Period 13	-1.6728	0.7660	0.1877	**
Period 14	-1.7267	0.7773	0.1779	**
Period 15	-1.2907	0.7825	0.2751	
Period 16	-0.9210	0.7931	0.3981	
Period 17	-0.4384	0.8035	0.6451	
Period 18	-1.1659	0.9449	0.3117	
<i>Individual Characteristics</i>				
Female	-0.6301	0.1349	0.5326	***
Alt. Cert. Program- Teaching	0.0807	0.1320	1.0841	
Teach Years	-0.2661	0.0867	0.7664	**
Teach Years Squared	-0.0227	0.0057	0.9776	***
<i>First Teach Campus Characteristics</i>				
% Black Students	-0.1872	0.3716	0.8293	
% White Students	0.5442	0.3645	1.7232	
% Low-Income Students	-1.3875	0.4150	0.2497	**

% At-Risk Students	0.0265	0.4263	1.0269	
Mixed Grade Level School	0.0292	0.2068	1.0296	
Elementary School	-0.0891	0.1867	0.9148	
High School	-0.2238	0.2405	0.7995	
Enrollment	0.0001	0.0001	1.0001	
<i>Prior Campus Characteristics</i>				
% Black Students	0.6173	0.3513	1.8540	
% White Students	0.7086	0.3939	2.0312	
% Low-Income Students	1.7662	0.4474	5.8486	***
% At-Risk Students	-1.1325	0.4151	0.3222	**
Mixed Grade Level School	1.0424	0.2195	2.8361	***
Elementary School	0.3547	0.1785	1.4258	**
High School	-0.0459	0.2338	0.9557	
Enrollment	-0.0015	0.0002	0.9985	***
Constant	3.4690	0.9169	32.1048	***

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

Black teachers were most likely to become principals in Period 14 as signaled by the largest significant coefficient. This aligns with the increasing hazard ratio throughout the career of Black teachers (Table 1). The fact that the coefficients of the number of teaching years and the squared number of teaching years share the same sign also confirms that the likelihood of becoming a principal increases with the length of Black teachers' careers. Examining the individual characteristics of Black teachers, Black female teachers were only 53% as likely as Black male teachers to become principals. Despite the large proportion of Black teachers

prepared by alternative certification programs, the type of preparation program had no significant impact on a teacher's likelihood of becoming a principal.

The characteristics of the campuses where principals were hired in their first year of teaching had little influence on their likelihood of becoming a principal, with the exception of the percentage of low-income students served by the school. An increase in the percentage of low-income students served in a teacher's first year of teaching was associated with a decreased likelihood of that teacher becoming a principal. Examining the prior year school characteristics (or school characteristics with a one-year lag), the percentage of low-income students served is positively associated with the likelihood of the teacher becoming a principal, but the percentage of students at risk of dropping out of school is negatively associated. In comparison to serving at a middle school in the prior year, Black teachers were almost three times more likely to become a principal if they served at a mixed grade level school (e.g., K-12th grade) and 1.4 times as likely to become a principal if they served at an elementary school. Finally, the size of the school, indicated by enrollment, was negatively associated with the likelihood of becoming a principal.

Discussion

The purpose of this research is two-fold: 1) to illuminate the subjective nature of analysis interpretation and reporting of Black educator experiences in prior quantitative analyses and 2) to conduct a quantitative analysis appropriate for exploring the realities that qualitative literature has exposed in the Black teacher-to-principal pipeline. Addressed separately as a critical literature review and as a quantitative analysis, this discussion melds results of each to review past subjectivity and offer new, historically contextualized quantitative insight into the experiences of the Black teacher-to-principal pipeline. Acknowledging the social construction of

race and development of social statistics as mechanisms of oppression (Gilborn, Warmington, & Demack, 2018; Zuberi, 2001), this discussion intends to center the Black educator narrative and give voice to the Black educator community.

School desegregation resulting from the *Brown v. Board of Education* decision resulted in a drastic reduction of Black educators in the public education system. Desegregation efforts left Black teachers unemployed and Black administrators demoted (Milner & Howard, 2004; Milner et al., 2016; Author, 2019; Tillman, 2004), and the effects of the diminished Black educator pool are still felt today. From 2001 to 2019, Texas public schools enrolled an average of 650,000 Black students each year. Over that same time period, 38,740 Black teachers began their teaching careers, an average of roughly 2,000 new Black teachers per year. These teachers were mostly female (73%) with standard teaching certificates (84%) prepared through an alternative certification program (68%). Black teachers taught in schools with high average concentrations of low-income (71%) and Black students (34%) compared to the average Texas public school campus, which serves 61% low-income students and 13% Black students. Of Black teachers who began their teaching career between 2001 and 2019, the average teacher tenure was 6.5 years.

Following the 38,740 Black teachers who began teaching between 2001 and 2019 through their career, 1,288 Black teachers in Texas became assistant principals and the average Black assistant principal tenure was 6.3 years. Of those 1,288 Black assistant principals, 308 became principals. An additional 33 Black teachers became principals without ever serving as assistant principals. Over the entire 18-year data set, only 341 (<1%) of the 38,740 Black teachers became principals.

The finding of only 341 Black teachers becoming principals in an 18-year time span in a state as large as Texas sits in stark contrast to the early reports of quantitative literature

demonstrating Black teachers being twice as likely as White peers to become assistant principals (Fuller, Young, & Orr, 2007; Gates et al., 2004; Ringel et al., 2004). By focusing on the increased likelihood of Black teachers becoming assistant principals (Fuller, Young, & Orr, 2007; Gates et al., 2004; Ringel et al., 2004) or obtaining principal certification (Davis, Gooden, & Bowers, 2017), previous literature constructed a positive narrative of Black teachers being promoted along the administrative pipeline. Though the advantage of the White male teacher in principal promotion was stated in all previous papers reviewed, centering the Black teacher experience constructs instead a glass ceiling for promotion.

In addition to the small number of Black teachers who are promoted to principal, the time Black teachers typically serve before becoming a principal is also absent from previous literature. Davis, Gooden, and Bowers (2017) reported that a teacher was most likely to become a principal six years after receiving an initial administrator certificate, but the Black teacher experience centered in this study paints a different picture. Before being promoted to principal, the average Black teacher served 6.5 years in the classroom and then an additional 6.3 years as an assistant principal. After obtaining at least a bachelor's degree, a teacher certification, a master's degree, and a principal certification, Black teachers typically have an average of 13 years of experience in order to be considered for promotion to the principal position. When the Black teacher is centered, the narrative of promotion to assistant principal and principal is quite different and is more consistent with qualitative research.

Prior research also indicates that a lack of opportunity for professional advancement may influence the decision of a teacher to leave the field (Sutcher, Darling-Hammond, & Carver-Thomas, 2016). This is a key consideration given the ways in which the departure of teachers has been shown to impact student achievement and schools more broadly (Carver-Thomas &

Darling-Hammond, 2019; Ronfeldt, Loeb, & Wyckoff, 2013). Said differently, the lack of potential for upward mobility exhibited through these trends along the principal pipeline may contribute to teacher turnover that potentially exacerbates the existing Black teacher shortage (Darling-Hammond & Podolsky, 2019; Madkins, 2011) and impacts efforts to advance equity in student outcomes.

This research, framed and contextualized by critical race theory (CRT), takes into account how the history of the U.S. public education system post *Brown*, the permanent nature of racism, and other intersectional considerations impact Black teacher outcomes. In doing so, this paper supports and augments the growing body of work on the principal pipeline (e.g., Bailes & Guthery, 2020; Davis et al., 2017) that demonstrates how the experiences of Black teachers and school leaders are complicated by and beyond —systemic racism and gendered power dynamics. The results of this analysis support the findings of Davis et al. (2017), which assert that the pathway to the principalship is neither race- nor gender-neutral by showing decreased likelihoods of Black educators, particularly Black women, advancing to the principalship.

Limitations

For this analysis, the data set was limited to Black educators in Texas with consecutive employment in public education, thus it does not include all Black educators. Those teachers who moved on to take district administration positions, instructional coach positions, or other central administrative positions were not included in this analysis. Also missing from this analysis is a measure of the performance of the campuses of employment. Lastly, the results of this study of Black educators in Texas should be generalized with caution, given the specific context of the state (e.g., demography, educational attainment, economic needs).

Future Research

Future analysis of the Black teacher-to-principal pipeline needs to consider the teachers and principals who have inconsecutive employment in the public education sector. An estimated 20,000 Black educators were excluded from this analysis due to large gaps in employment in the public education sector. The promotion patterns of these individuals should be examined in order to better understand the full range of Black educator experiences.

Additionally, Black assistant principals should be examined in more detail. Since only 308 of the 1,288 Black assistant principals were promoted to principal, some additional barriers to promotion may exist and need to be investigated—especially given what extant work has identified about “tapping” practices and the decreased likelihood of White school leaders to promote non-White educators (Myung, Loeb, & Horng, 2011). Also related is the degree to which the principalship serves as a pathway to district leadership. The results of this study show how the promotional pathway becomes increasingly narrow at various junctures (e.g., Black teacher-to-assistant principal, Black assistant principal-to-principal, and Black elementary school principals-to-high school principals). Moreover, in light of these results as well as Bailes and Guthery’s (2020) findings related to rates of promotion from assistant principal-principal among women, extant work on the disciplinarian role of assistant principals in urban schools (Williams et al., 2020), and trends in mobility among assistant principals (Bartanen, Rogers, & Woo, 2020), further research is needed on the policies and practices that shape the patterns exhibited by Black assistant principals along the pipeline.

Furthermore, such evidence makes way for the posturing of how a promotion to assistant principal may be considered in light of Bell’s (1980) theory of interest convergence, which emphasizes the ways in which advancements toward racial equality will be pursued when they serve to address a need or provide a benefit for White people. Black teachers are less likely to be

targeted for promotion, more likely to assume a less-distinguished role when they are promoted, and face the possibility of overreliance as disciplinary managers. In other words, the promotion of Black educators to leadership roles may be attributed—theoretically—to systemic interests where the loss of power is mediated by a gain in both the perception of progress and the ability to rely on Black leaders to fill roles often considered less prestigious.

Conclusion

The educational system is both influenced by and replicative of the larger systems of power in motion in the United States. As a result, racism and sexism are features of the mechanisms that are intended to serve as conduits of professional progression, creating precarious dynamics that influence outcomes for marginalized and minoritized groups—in this case, Black teachers and school leaders. In this paper, the QuantCrit framing provides an opportunity to explicitly focus on and consider the role of race and racism, which, by definition, requires acknowledgment of the degree to which this issue is related to social and institutional power. Viewing public education through the lens of CRT and engaging in considerations around power can shed light on and help make sense of the historical legacy and current-day practice of denying Black educators opportunities for advancement. In the same ways that enslaved Africans were denied access to education as a mechanism to maintain power, the Black educational communities continue to experience racial subjugation through educational policies that aim to keep whiteness as the default (Gillborn, 2005).

In recognizing that the statistical disparities and mediating factors for Black educators are attributed to racialized power structures, we must also acknowledge that reluctance to alter policies and structural practices that facilitate race- and gender-based inequities makes organizations complicit in perpetuating racism. In the case of Black educators, such action would

include specific, race-conscious efforts to right the wrongs that occurred post *Brown*—anti-racist reform that includes efforts to recruit, retain, and promote Black teachers and principals. In other words, organizations must put at least as much effort into reforming structures and building a more inclusive system as was put into forming racist structures and building a system of subjugation.

As evidenced by the gains and losses made by Black Americans over the course of the past 60 years, these truths are complex. What some would call “the false promise of equality” brought on by *Brown* and other civil rights-era policies has led to tension between access and subjugation. This is evidenced by the many court cases and systemic barriers post *Brown* that sought to weaken Black educational and professional attainment. Though we typically consider this as applicable to students, there is mounting evidence of the ways in which this concept extends to teachers and administrators. To make lasting change, we must acknowledge and wrestle with the degree to which the disparities in Black educational leadership are related to this country’s vested interest in maintaining whiteness, which impedes progress for Black people at every interval of the educational pipeline.

Many K-12-focused pieces espouse the need to address the disparities between the growing population of non-White students and the lack of teachers and leaders of color (Dantley, 2005; Fuller, Hollingworth, & An, 2019; Ingersoll, May, & Collins, 2019). Scholars have also posited that the lack of representation of among Black school leaders is a result of systemic racism (Milner & Howard, 2004; Tillman, 2004). By using this literature to accentuate inquiry on Black teachers in the principal pipeline, it becomes increasingly clear that the field is not absent of theoretical presumptions or empirical knowledge of what causes such inequities. This QuantCrit-grounded counter story provides support for the notion that there is perhaps less of a

gap in the literature or knowledge base undergirding the Black teacher-to-principal pipeline; it is more so that the role of race and racism has consistently been omitted in quantitative analyses and that qualitative literature confirming the lived experience of Black educators is often ignored. With regard to addressing disparities, the major gap more likely resides in the will to drastically alter research approaches and educational systems so they center the populations experiencing the inequitable circumstance.

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