

Black Science Teacher Attrition as Political Struggle in the
United States during the post-Obama Era of 2017-2022

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Abstract

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The five-year period following the 44th presidency of Barack Obama has been marked by increased anti-Black violence, neoliberal capitalism, and U.S. imperialism and the continued deterioration of the social and political working conditions of the Black masses. In the years following the Department of Education arguably continues to fail to retain an adequate number of Black science teachers in the growing need for equitable and accessible public science education. This study collects and interprets the narrative-biographies of Black former science teachers by exploring their political experiences through storytelling of their life histories, educational experiences, and professional development before, during, and after leaving the classroom since the academic year of 2017-18, characterized here as the post-Obama era. Interviews and their transcriptions were analyzed using an anti-oppressive research methodology of self-thematization alongside a hermeneutic of a-priori codes that reflected political consciousness, identity, and activity in Black former science teacher's decision-making throughout their teaching career that may have led to their early retirement. Through a critical Marxist perspective of historical materialism and antiblackness in science education, the resulting narrative-biographies add to the expanding literature of science teacher attrition and Black political resistance in the United States.

Keywords: teacher attrition, science teaching, antiblackness, neoliberal capitalism, imperialism

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To my Aunty Pam. Thank you for inspiring in me and everyone who has known you the love of imagination, creativity, and compassion that allows the impossible.

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Glossary

Anti-Blackness: Anti-blackness, or anti-Black violence, is defined by Bledsoe and Wright (2019) as “a societal logic which assumes the inhumanity and thus spatial illegitimacy of Black populations” (p. 1). Anti-blackness both structures and proselytizes the material and relational conditions of society as well as the attitudes and actions taken to further subjugate and subdue the African diaspora.

Imperialism: Imperialism is defined structurally by Galtung (1971) as “a special type of dominance of one collectivity, usually a nation, over another” (p. 116). U.S. imperialism, specifically, speaks to the current and historical economic, political, militant, and cultural methods by which the United States of America has achieved its status as a neocolonial empire by maintaining its dominance by domestic and international violence.

Neoliberal Capitalism: Neoliberal capitalism is defined by McGuigan (2014) as a doctrine political economy, stage of capitalist societal development, “principle of civilization that shapes the socio-cultural makeup of people through socialization” (p.224). As an advancement of liberal capitalism, neoliberal capitalism presumes that an individual, market-based economy of equitable competition suffices the material conditions of a successful life.

Foreword

At the earliest stage of my work as an educator I recall volunteering for afterschool programs and subsequently working at out-of-school youth programming in and near my hometown of Springfield, Massachusetts. At the time, I was majoring in Astronomy & Space Sciences with little intentions of moving into the research field. My experience in science education had been harrowing, and I found more solace in the courses I would take for my minor in education through the University of Massachusetts School of Education and Sociology department. People, communities, and advocacy made more sense to me at that time than did thermodynamics, cosmological constants, and planetary atmospheric conditions on Mars.

Youth work, and consequently youth advocacy and social justice activism brought me uncomfortably close with the possibility of being a science classroom teacher. Organizations I worked for, such as the student-run community service education program Student Bridges¹, instilled in me a deeper understanding of the human and civil right to equitable education through practice, and a rational pathway moving forward as a youth advocate was entering into school systems and working and learning alongside communities much like my own. After graduating, I immediately entered an intensive one-year teacher education program that prioritized STEM education in high-needs areas, and incentivized remaining in the field of science classroom teaching for up to five years after the program ended with an annual stipend of \$10,000. By the time I had completed the program, I had been certified and licensed to teach in Massachusetts but was given the opportunity to teach in one of the largest school districts in the country in New York City. Life was challenging, but very exciting.

¹ Student Bridges is Student Bridges is a non-profit, student run agency that works to improve access and success for underrepresented students. More information can be found at www.studentbridges.org

In reflecting on my tenure as a science classroom teacher, I recall fond moments with my students and their community. I often found myself engaging in the practice of professional development with other like-minded educators who saw social justice and educational equity as a priority in urban schooling. I believed many of us to fight hard for creating insightful and engaging curriculum for our students, and I built lifelong friendships with colleagues and students alike that propelled my work further in the field of science education and social justice to the point wherein I applied for my doctorate at Teachers College, Columbia University.

Things changed abruptly for me in the year of academic year of 2019-20. By this time, I had taught high school physics for eight years in New York City public and charter high schools. Then, at my third teaching position, I had become quite comfortable in my pedagogy and curriculum at a high school in Flatbush, Brooklyn. The year began like any other, yet that upcoming January into February the SARS-COVID-19 pandemic would begin, and in many ways I consider the course of my life and work being significantly altered by the effect of the COVID-19 pandemic not only on the collective livelihood of my community but the revelation in the face of breakdowns in public health infrastructure that reveal the more virulent nature of anti-Blackness, neoliberal capitalism, and U.S. imperialism. I was one of millions of faculty, staff, and students that were pushed back into school buildings at the mandate of our administrative leadership to create a “New Normal” and “Build Back Better”². Simultaneously, I witnessed the ongoing torture of Black lives, public castigation for calls for abolition, and the intramural suffering of Black marginalized ages, genders, sexualities, and disabled bodies at the hands of the self-proclaimed politically left. I continued to pursue classroom science teaching as

² Terms used by the U.S. executive administration (former and current) to mark political and cultural shifts towards progress in the wake of domestic and international crisis.

an avenue of reconciliation for the possibilities that educational equity may offer in our collective liberation, even though the stakes were raised significantly above my head.

In the summer of 2020, weeks before returning to the classroom, I received a text message from a close friend and administrator in my school building. The text message posed a threat to my livelihood in the form of a reprimand from my principal over a social media post I had written months ago describing my experiences as a classroom science teacher. The post was in reference to my time working at a far more authoritarian charter school, but the principal whom I was working for at the time and as well the superintendent of the district thought my message inflammatory and accusatory; I was nonetheless threatened with legal punishment for speaking about my frustrations and understandings of the world. I reeled with indignation, searching for the social media post as quickly as I could. I considered perhaps I overstepped some boundary or stated some falsehood. The reality was that I had said something well within my right, and the disciplinary reach of the school district I worked for felt it well within their jurisdiction to address it directly. I made my decision at that very moment to leave the classroom entirely; I felt that if I could not find a social and political home in these institutions after searching for over eight years, I wouldn't find one at all.

It was not until a year and a half later that I realized that the conceptual and theoretical framework of my dissertation study should center this moment, not of my own political reckonings and challenges amidst domestic and international Black suffering, but of others. I considered that if I had at the time not been conscious of the variety of challenges I both overcame yet could not excuse while working as a Black, science classroom teacher, others may have similar or disparate contestations. This study is an attempt to explore the otherwise

peripheral narrative experiences of a small group of people within the science teaching workforce for whom similar questions, triumphs, and challenges may arise.

Chapter 1: Introduction

I would never have imagined leaving the science teaching profession when I entered my teacher education program, incentivized and to my knowledge adequately prepared to teach high school physics in the public schools of the United States (U.S.). A decade later I joined the estimated 270,000 teachers nationally who were expected to leave the teaching profession between the years of 2016 and 2026 (Torpey, 2018). My absence is described in educational and economic policy research as a labor force exit, or *teacher leaver*, a teacher who has voluntarily retired early from the profession. Teacher leavers are an ongoing phenomenon. In a survey of several hundred district and school leaders in the U.S. it was estimated “10 percent of their teachers retired or resigned at some point during or after the 2021–2022 school year” (Diliberti & Schwartz, 2023, p. 1), two percentage points higher than previous studies that averaged the annual attrition rate at eight percent just five years ago (Carver-Thomas & Darling-Hammond, 2018).

A year afterwards, reflecting on my social and professional experiences during science teaching I came to understand my decision to leave the profession as a political struggle and act of resistance; having entered the science teaching profession to directly serve students, communities, and their families I was instead inundated with unsatisfactory working conditions, inadequate compensation, political repression, and violations of my human and civil rights. I suffered even afterwards due to the outcomes of anti-Blackness, neoliberal capitalism, and U.S. imperialism that pervaded the politics of working in public schools. I was compelled to consider to what extent might other Black former secondary science teachers share similar narratives of

entering and leaving the field of science teaching in the U.S. as a political struggle and form of resistance.

1.1 Black Former Science Teachers

During my time as an educator, Black teachers in some areas of the U.S. were in high demand. Amongst U.S. school districts Black or African American teachers have represented only seven percent of public-school teachers in the U.S. as of the 2017-18 school year³, insufficiently corresponding to the racial diversity of 15 percent Black students in public schools (National Center for Education Statistics, 2023). According to the U.S. Department of Education (2020), of the 1,231,200 public school teachers of grades nine through twelve in the 2020-21 school year, 146,100 of which are natural sciences teachers, only 5.6% are Black. Historically, Black teachers historically persisted in the educational workforce despite “widespread dismissal of African American teachers after desegregation” (Walker, 2007, p. 774). Black science teachers are heralded as providing value to the teaching workforce, delivering cultural relevance, competence, shared experiences, community capital, and encouraging Black students in pursuing the sciences (Smith-Mutegi, 2023). Research has shown that Black science teachers exemplify both content-specific expertise as well as cultural relevance in their approaches to science teaching (Mensah, 2009), yet face challenges in high-need urban areas due to emotional labor inside and outside of the classroom at the intersections of race and gender (Olitsky, 2020; Riley & Mensah, 2023, 2024). For example, Black women science teachers care deeply about their student’s lives, encourage knowledge production and critical science learning, and resist oppressive school practices (Riley & Mensah, 2023).

³ U.S. Department of Education, National Center for Education Statistics, National Teacher and Principal Survey (NTPS), “Public School Teacher Data File,” 2017–18

Nevertheless, Black science teachers continue to leave the profession early. Carver-Thomas and Darling-Hammond (2017) find that during 2012-2013, “about half of Black teachers who left their schools did so voluntarily before retirement” (p. 171). In the same study Black women teachers specifically cited “specific issues with respect to their teaching conditions” (p. 172) including dissatisfying salaries, inadequate preparation and mentoring, and insufficient working conditions. Job satisfaction for Black women teachers has been shown to increase when working in urban areas, familiar educational and community settings (Farinde-Wu & Fitchett, 2018), yet working conditions in urban areas are stated to require much policy and reform. Studies with Black mathematics teachers show that the most impactful variables for leaving the classroom were teachers’ age and racialized microaggressions, which “happen at the individual level, but ... are perpetuated in institutions that are framed by discriminatory institutional practices” (Frank et al., 2021, p. 386). The challenge of retaining Black teachers in STEM is an ever-evolving issue of complexity in U.S. educational research.

1.2 Purpose and Research Question

The goals of this study are to: a) collect preliminary data and brief reflections of the reasoning Black former secondary science teachers in the U.S. had for leaving the profession in between 2017 and 2022, or *post-Obama era*, b) collect the situated and stimulated narrative-biographies of Black former secondary science teachers as social and political beings, and c) interpret the ways Black former secondary science teachers self-thematize their narratives amidst anti-Blackness, neoliberal capitalism, and U.S. imperialism by asking the research question:

How do two U.S. Black former secondary science teachers self-thematize their life histories, working conditions, and decision-making in leaving the profession during the post-Obama era of 2017-2022?

- a. What are the political factors and critical incidents that influenced two Black former secondary science teachers’ decisions to leave the teaching profession?

- b. How did two Black former secondary science teachers engage political ideology, consciousness, and activity in their curriculum, pedagogy, and professional development?

A narrative inquiry of Black former secondary science teachers' lived experiences and decision-making in a historical context adds to the wider existing literature on teacher attrition, teacher identity, teacher preparation, and teacher professional development, and the growing body of literature exploring teacher attrition through the lens of political resistance (Amitai & Van Houtte, 2022, Dunn et al., 2017; Dunn, 2018; Glazer, 2018a, 2018b, 2020; Marx et al., 2023).

In a Marxist analysis of the teacher as a member of the working-class proletariat Harris (1982) examines the socially productive role that teachers play in normal schooling that results in the occupational socialization of the teacher as an agent of capitalism. Teacher socialization, a form of occupational socialization, “embraces all of the influences which guide and shape a person’s involvement with a particular occupation group” (Macdonald, 1995, p.129). The prevalence of anti-Blackness, neoliberal capitalism, and U.S. imperialism in schooling institutions suggests that the Black science teacher is a political being constantly navigating the limitations and constraints of racialized, capitalist occupational socialization. I hypothesize that within their narrative-biographies, Black former science teacher’s self-thematizations and decision-making will show definitive themes of struggle and resistance to hegemonic teacher socialization amidst the political climate of the post-Obama era of anti-Black educational privatization and proletarianization of the field of U.S. science teaching.

As a theoretical framework, historical materialism is woven about this narrative inquiry as the social, economic, and political implications regarding the working conditions of the professional teacher as a relatively “new phenomenon” (Harris, 1982, p. 31). Historical

materialism, “an account of the dynamic relationship between two elements, the forces and the relations of production” (Scrag, 1986, p. 43), contains a political tradition of viewing the world and history through the material conditions between the working and ruling class. Historiological study of labor, resources, and contemporary political struggles are critical and evaluative of federal and state governance in education. I argue that through a theoretical lens of historical materialism that teacher attrition, specifically Black science teacher attrition, is not merely a phenomenon of individual choice and human capital as research suggests (Arviv & Navon, 2021). Anti-Blackness, neoliberal capitalism, and U.S. imperialism influence teacher socialization by worsening the working conditions of the Black science teacher. An acknowledgement of this political struggle provides clarity to the working conditions of Black science teachers as a phenomenon of proletarianization, or “new professionalization” (Buyruk, 2014, p. 1713), of the field.

This critical narrative inquiry explores the way Black former science teachers describe their experiences and decision-making to leave the science classroom at a distinct period in U.S. history: the academic year of 2017-18, following the end of the term of the 44th President Barack Obama, the first Black president in history, and the inauguration of the 45th president, Donald Trump. Significant social and political events have occurred domestically and internationally as the result of anti-Blackness, neoliberal capitalism, and U.S. imperialism during what will further be referred to as the post-Obama era as many have viewed the instance of the first Black U.S. president as a mythological progression of the country into a state of post-racialism, “[signifying] a society in which racial differences are no longer significant” (Love & Tosolt, 2020, p. 23). Some retain the Obama presidency as a marked advancement of the continued bipartisanship of privatization and the “expanded neoliberal restructuring of urban

education” (Lipman, 2015, p. 60). At the end of Obama’s presidency, what followed in the next five years was perhaps the most harrowing political period of the U.S for Black working-class people. Maleficent public health governance in the SARS-COV-19 response led to 1,127,152⁴ deaths, white supremacist uprisings, mass shootings, and increasingly violent police interactions reached between 600-800 per year⁵ despite claims of a more progressive society. Executive actions that could have been taken to regulate climate change, which disproportionately affects people of color in urban areas (Berberian et al., 2022), were weakened and rolled back by both Democratic and Republican administrations⁶. Following the overturning of *Roe v. Wade* in 2022, 14 states have made abortion illegal⁷. Currently, during the Biden administration, there are over five hundred bills across forty-nine states with anti-trans legislation⁸. The social and political landscape of this period has had an insurmountably detrimental effect on the socioeconomic welfare of working-class Black people in the internal colony of the U.S. in the 21st century. Situating a study of anti-Blackness and political resistance is unavoidable in the discussion of the working conditions of the Black science teacher, and I posit that regardless of the race or political ideology of the headship of the U.S. empire the effects of class antagonism, racialized oppression, and political subjugation endure as a feature, not a bug, of working and teaching in the imperial core.

⁴ From *the World Health Organization (WHO) COVID-19 Dashboard*, by WHO, 2024 (<https://data.who.int/dashboards/covid19/cases?n=c>)

⁵ From *Facts and Figures on Injuries Caused by Law Enforcement*, by the University of Illinois, Chicago, 2025 (<https://policeepi.uic.edu/data-civilian-injuries-law-enforcement/facts-figures-injuries-caused-law-enforcement/>)

⁶ From *What is the Trump administration’s track record on the environment?*, by S. Gross, 2020 (<https://www.brookings.edu/articles/what-is-the-trump-administrations-track-record-on-the-environment/#:~:text=The%20Trump%20administration%20has%20been,worst%20impacts%20of%20climate%20change>)

⁷ From *After Roe Fell: Abortion Laws by State*, by the Center for Reproductive Rights, 2025 (<https://reproductiverights.org/maps/abortion-laws-by-state/>)

⁸ From the *2025 anti-trans bills tracker*, by Trans Legislation Tracker, 2025 (<https://translegislation.com/>)

1.3 Significance and Implications

The group of leavers which I joined, dubbed *invested leavers*, are “fully certified teachers who left the profession after teaching for at least three years and who had previously invested in their teacher education either by completing a master’s degree in education or becoming a fully credentialed and certified teacher” (Glazer, 2018, p. 64). Invested leavers are teachers who have passed a critical threshold in teacher attrition beyond early career years with significant skills, knowledge, practices, and passions for education. The study of invested leavers in United States science classroom teachers has been discussed through the lens of economy, psychology, teacher preparation, and mental health (Newberry & Allsop, 2017). Teacher attrition research, which includes invested leavers as well as early career educators who retire prematurely, has within these same disciplines discussed the motivations, inequities, workplace disparity, and reasons for teachers leaving the classroom through the lens of political resistance.

In a nationwide survey of news reports and publicly available data on teacher shortages, Nguyen, Lam, and Bruno (2024) find that “at least 36,500 teaching positions are vacant nationwide” and “estimate there are 163,650 positions filled by underqualified teachers” (p. 21). In an analysis of three surveys distributed by the U.S. Census Bureau of the Department of Education, Garcia and Weiss (2019) find that high-poverty schools are less likely to retain highly qualified individuals, low teacher pay reduces interest in the job, and tough school environments and early career support are causing a “spiking shortage of highly qualified teachers” (p. 12). Science teachers were found “more likely to leave their school or the profession than those in other subjects” and “teachers are more likely to leave schools where there are more students of color and more low-income students, where salaries are lower, and where working conditions are worse” (Carver-Thomas & Darling-Hammond, 2019, p. 16). Studies of teacher attrition,

especially narrative inquiries of teacher's lived experiences, detail the socio-economic consequences of the rising teacher attrition rates in schools and districts contributing to the teacher shortage. Studies of teacher attrition shed light on the cognitive sociologies of labor that "fuel public dismissal of the teaching profession" (Wiggan et al., 2021, p. 68) and emotional labor that acknowledges the ways in which "leaving teaching can be an emotionally painful process that weighs on teachers for years after the decision is made" (Mawhinney & Rinke, 2018, p. 16).

Black teacher attrition exists and persists in the U.S. teaching workforce due to federal education policy (Milner & Howard, 2004; Shirrel, 2018; White et al., 2020), disproportionate educational opportunities, working conditions, and career options (Carver-Thomas & Darling-Hammond, 2017; Farinde-Wu & Fitchett, 2018; Madkins, 2011), outright displacement due to paradoxical diversity initiatives (White, 2016), racial microaggressions (Frank et al., 2021), and the economic challenges of working in high poverty racially segregated schools (HPRS's) (Djonko-Moore, 2016). Black science teachers throughout the history of the U.S. teaching workforce have arguably faced anti-Blackness, neoliberal capitalism, and U.S. imperialism simultaneously that dictates their laboring and working conditions.

Relatively few studies have been found that discuss science teacher attrition through the lens of political resistance. Using Fraser's (1998) bivalent conception of social justice, a critical dimension of teacher attrition in the U.S. pertains to the multiple dimensions of the experiences of Black, working-class people amidst sociopolitical struggles. A bivalent conception of social justice "treats distribution and recognition as distinct perspectives on, and dimensions of, justice" (p. 5), presenting an interpretative framework for constructing a critical qualitative study that

addresses the material conditions Black science teachers face amidst the enduring anti-Blackness and increased proletarianization of the field of science teaching.

I hypothesize that Black secondary science teachers who have left the profession will present a particular phenomenon in attrition of the science teaching workforce. As U.S. science education has come under scrutiny in the 21st century for its lack of diversity, equity, and inclusion (DEI) in curriculum (Mutegi, 2011) and pedagogy (Sheth, 2019), centering the experiences of Black former science teachers locates the intersections of anti-Blackness and sociopolitical struggles in science education, science teacher education, and research of the U.S. science teaching workforce. Provoking critical political thought which suggests that “what we might call ‘Black freedom’ is in distinct opposition to something called capitalism” (Walcott, 2018, p. 96), the results of this narrative inquiry explore the life histories of two Black former science teachers as testimonies of a working-class group with discrete and salient political experiences.

Organization of the Dissertation

This document is organized by chapters that discuss the review of literature used in interpreting the conceptual and theoretical framework of the study, research methodologies and practices central to participant selection, and the collected data in the form of narrative biographies followed by data analysis and discussion. Of note, the data collection and first stage of open coding occurred simultaneously as each participant was asked to self-thematize their storytelling. The narrative biographies were constructed from chronological, biographical text that summarizes many of their interviews. When possible, participants would engage in narration that is shown in direct quotes. I found it necessary to leave these quotations as close to raw data possible as they play a significant role in shaping the participant’s self-thematizations. The data

analysis chapter folds these narrative biographies about their self-thematized codes, usually phrases or sentences, and the implications and discussions sections seek to examine the particularity of the series of stories and participant backgrounds by contrast and comparison.

Chapter 2: Review of the Literature

This literature review has been compiled using several journals across educational policy, economics, teacher education, history, and contemporary issues in workplace conditions within the United States (U.S.) and abroad as well as the critical historical and philosophical work of authors of critical Black study such as Cedric Robinson, Saidiya Hartman, and George Jackson. Most of this review investigates literature in teacher attrition through individual school, district, city, state, and nationwide statistical analysis and qualitative review of teacher, leadership, teacher educator, and stakeholder narratives. Terms such as teacher attrition are often used synonymously with and alongside teacher turnover, shortage, supply, demand, exodus, retention, and incentive. Although the references used dominantly refer to a U.S. context, I utilize articles that discuss teacher attrition internationally with regards to U.S. exceptionalism, a conceptual framework in international relations that “provides a cultural mechanism for legitimating foreign policy decisions and practices that the United States would normally condemn in other countries” (Hughes, 2015, p. 528). This review contextualizes the U.S. within an international framework where comparisons can be drawn between definitions, factors, and effects of teacher attrition worldwide.

The analysis of literature begins with defining teacher attrition, engaging discussions of contextual and socio-economic factors and effects of teacher attrition and paying close attention to themes in demographic shifts in attrition such as racial identities and subject matter. Several literature analyses and meta-analyses of teacher attrition rates were included to discuss the: a) ways that teacher attrition is measured, b) factors that contribute to teacher attrition, and c) effects of teacher attrition. This analysis of literature finalizes with the selection of four texts that have come to develop the conceptual framework and theoretical interpretation of this study,

using 1) *Black Marxism: The Making of the Black Radical Tradition* by Cedric Robinson, 2) *Scenes of Subjection: Terror, Slavery, and Self-Making in 19th Century America*, 3) *Blood in My Eye* by George Jackson, and 4) *Afropessimism* by Frank Wilderson. Each body of literature advances the structural contexts of critical Black study that grounds the epistemological approach to this narrative inquiry.

2.1 Defining Teacher Attrition

Defining teacher attrition is challenging, as Macdonald (1999) argues in an analysis of government reports and empirical research “that understanding the extent and nature of teacher attrition is clouded by definitional and methodological problems” (p. 836). Throughout this review, I utilize the United Nations Educational, Scientific and Cultural Organization’s (UNESCO) definition of teacher attrition as “leaving teaching altogether, either to take another job outside of teaching, for personal reasons such as child rearing, health problems, family moves, and retirement” (Cooper & Alvarado, 2006, p. 18). The rate at which teachers leave the classroom is defined as “the number of teachers at a given level of education leaving the profession in a given school year, expressed as a percentage of teachers at that level and in that school year.” (UNESCO, 2017, p. 429).

Teacher attrition rates are estimated by calculating the annual number of teachers who leave the profession each year, often called leavers (Goldring et al., 2014). As opposed to movers and stayers, *leavers* represent a significant portion of the teaching workforce which creates teacher shortages for the upcoming school year. Studies attempt to measure the decision-making processes of leavers, yet navigating these discussions is challenging; as Ingersoll (2001) states, “the distinction between voluntary and involuntary [teacher attrition] is difficult to empirically capture” (p. 28).

Several terms are often used simultaneously to describe teacher attrition. Teacher attrition is included for example, in teacher turnover, defined as “all teacher movement out of schools or out of the profession” (Carver-Thomas & Darling-Hammond, 2017). Teacher mobility is often discussed as a contributing factor to teacher turnover, as well as retention and migration. This literature review does not include teacher turnover, although teacher migration between schools and districts is a contributing factor to the problem of teacher attrition. A focus on leavers represents what Small (2009) describes as a “deviant and unique case... because [it] provides for ways of developing or extending theories” (p. 21).

2.2 Measuring Teacher Attrition Rate

Several research articles, reports, and studies were found that attempt to measure teacher attrition through compiling articles, reports, and studies across international, national, and local databases or directly measuring local, district, and state surveys of teacher placement.

The Organization for Economic Cooperation and Development (OECD) collects data on estimated attrition rates of teachers at pre-primary, primary and secondary levels of education internationally. According to OECD (2017), which uses estimates of international teacher placement, attrition rates of all teachers from pre-primary to upper secondary public institutions range from 3.3% in Israel to 11.7% in Norway. In the United States, Carver-Thomas and Darling-Hammond (2017) use data from the Schools and Staffing Survey (SASS) and Teacher Follow-Up Survey (TFS), two nationally representative surveys of U.S. teachers, to interpret the decreasing pool of teachers in the classroom in the available teacher workforce at a “national attrition rate of about eight percent (8%) annually” (p. 1). In comparison to previous years, the U.S. teacher attrition rate has risen three percent (3%) in the past two decades, amounting to “about 90,000 additional teachers needing to be hired across the U.S. each year” (p. 3). This

percentage increases in the context of early career teachers, shown by a longitudinal study of the National Center for Education Statistics (NCES) Beginning Teacher Longitudinal Study (BTLS) for all public school teachers who began teaching in 2007 or 2008, finding that “among all beginning teachers in 2007–08, 10% did not teach in 2008–09, 12% did not teach in 2009–10, 15% did not teach in 2010–11, and 17% did not teach in 2011–12” (Raue & Gray, 2015, p. 3). Among these were leavers, a percentage that left teaching involuntarily or because their contracts were not renewed, at an attrition rate of “27% in 2008–09, 36% in 2009–10, 25% in 2010–11, and 20% in 2011–12” (p. 3).

Teacher attrition rates fluctuate in different contexts across school types, urban and rural settings, and geographic regions. Pivovarova and Powers (2022) utilize six years of statewide employment data in Arizona between the years 2009 and 2015 to compare annual attrition among teachers in traditional public schools and charter schools, finding that the “average exit rate among traditional public-school teachers was 13% compared to 20% among charter schoolteachers ($p < 0.01$)” (p. 10). Papay et al. (2021) constructed a longitudinal study spanning 15 school years from 16 urban school districts, estimated at 200,000 teachers, finding that “13% of all teachers leave their district each year”, and “19% leave their school each year” (p. 437). If no matter where we travel or look in the world, teacher attrition is present and ongoing, the working conditions of classroom teaching is highly salient in a discussion of the complexity of why teachers leave the classroom.

Recently, the rate of teacher attrition has been increased by the COVID-19 pandemic. In a survey of 2,000 teachers in the United Kingdom (U.K), Fuller (2021) investigate the effect that COVID-19 has had on their likelihood to leave the classroom, finding that “that teachers are now almost twice as likely to leave as they were before the pandemic” (p. 1). Goldhaber and

Theobald (2022) compare the attrition rates of teachers in Washington state across thirty-five years from 1984 - 2020, finding that the rate at which teachers left the public-school workforce increased by “almost one percentage point” the year after the novel coronavirus was discovered (p. 2). This increase is interesting as previous attrition models predict that at times of economic hardship, attrition rates often lower due to people hunkering down to maintain a stable job. As SARS-COV-19 had higher risks for Black populations globally (Williamson et al., 2020), an intersection of public health and occupational stability influences the attrition of Black science teachers particularly during this time.

2.3 Factors of Teacher Attrition

This literature review summarizes a number and variety of factors that influence increase and decrease the rate of teacher attrition, including but not limited to 1) teacher preparation and work-place entry, 2) economy and professional mobility, 3) school type, 4) working conditions, 5) racial identity, 6) subject-matter, and 7) political agency and activism.

Teacher Preparation and Workplace Entry

As early as pre-service, studies have shown that teacher preparation and work-place entry affect teacher attrition. Goldhaber and Cowan (2014) use Washington state administrative databases to measure the attrition rate of “all teachers who entered public school as a beginning teacher after the 1989-1990 school year” (p. 451) against the “probability that a teacher from a particular training program will leave Washington public schools or [their] current school...” (p. 452), finding that “graduates in five of the largest programs leave their schools at the same rate as out-of-state teachers, a 56% survival rate over five years” (p. 454). Later, Goldhaber et al. (2022) examine the linkage between student teaching placement and teacher attrition within 15 teacher preparation programs in Washington over 11 years, noting that “approximately 20% of

the sample of 17,626 teacher candidates leave within two years of entering the workforce” (p. 257-258). Analytical models show that “candidates with endorsements in hard-to-staff areas like STEM and special education are considerably more likely to enter the workforce than candidates with just an elementary endorsement” (p. 264a), with candidate endorsement being the “greatest predictor of workforce entry” (p. 264b). Yet, within this same sample, “teachers with a STEM endorsement, an English language learner (ELL) endorsement, and a subject-area (“Other”) endorsement are all more likely to leave the workforce than teachers with an elementary endorsement” (p. 265). Teacher preparation and work-place entry are significant factors in teacher attrition as they reflect workplace entry, preparation, and support within a labor market.

Economic Opportunity and Mobility

Teacher attrition both considers and is influenced by national and international wages and professional mobility in the field of classroom teaching. In one of the earliest economic studies found for this review, Stinebrickner (1998) analyzes data from the National Longitudinal Study (NLS) of the Class of 1972, a sample size of “341 of [individuals] who became certified to teach at some point between 1975 and 1985” (p. 128), finding that among variables such as demographic characteristics and school characteristics “increasing wages is likely to be more successful than attempting to improve working conditions at schools” (p. 134). Imazeki (2005) conducts an empirical study using a competing risk duration model of teachers from the Wisconsin Department of Public Instruction (DPI) between 1992 - 1999, finding that exit attrition is “sensitive to both [relative and absolute wage” (p. 447). Arviv and Navon (2021) use a database of 20,585 K-12 Israeli teachers to better understand the relationship between teacher attrition and human capital, finding that “on average, the teachers who decided to leave the teaching profession had more valued resources, in terms of both human capital and demographic

background, than did their colleagues who decided to persist” (p. 12). Teacher attrition is affected by international, national, state, and district economies. Every year, teachers make considerable decisions about whether to leave the profession based upon economic wage and comparable opportunities in other careers.

School Type

As discussed in the measurement of teacher attrition, several factors contribute to teachers leaving the classroom in various contexts, including school type, region, and setting. Across thirty-five (35) years and over 160,000 Illinois teachers, DeAngelis and Presley (2011) find that between “39 and 41% of Illinois teacher who start in low or high poverty schools respectively left teaching within their first five years” (p. 614), as well as greater percentages of teachers in urban and rural areas leaving than other school locales. Although teacher attrition in Illinois had improved since the 1970’s, “new teacher attrition rates at the school level were substantially higher in Illinois than those at the profession level and were alarmingly high in some schools” (p. 616). School districts size, government, and leadership play a role in teacher attrition, yet across districts attrition rates vary widely. Across 16 ‘mid-sized school districts’ in seven (7) states, Papey et al. (2017) finds “a five-year turnover rate of 55% across districts” (p. 442), with districts having “substantially different degrees of success in retaining teachers” (p. 442). Particular attention in teacher attrition has been paid to urban schools. Mawhinney and Rinke (2018) use emotional labor theory in a narrative inquiry of two (2) former urban teachers, finding that leaving teaching in an urban setting is an “emotionally painful process that weighs on teachers for years” (p. 16).

Several other contexts are worth consideration. These include consideration of school region (Ondrich et al., 2008), emotions and stress associated with school type (Farmer, 2020;

Ryan et al., 2017; Skaalvik and Skaalvik, 2017), and early career stage teacher attrition (Schaeffer et al., 2012; Schaeffer, 2013; Van den Borre et al., 2021).

Subject Matter

Teacher specialty area, subject-matter, and content expertise affect attrition rates. This literature review considers the subject-matter area of the sciences as historically research and policy have thoroughly discussed ways to increase the retention of science teachers who have often been in high demand (Gilbert, 2011; Morales-Doyle, 2017; Marco-Bujosa et al., 2020; Nguyen et al., 2019). In a small study of beginning Arizona high school science teachers, Patterson et al. (2003) find higher than previously thought attrition rates due challenges with school context, workload, collegial interaction, student motivation and discipline, and teaching assignments extending outside areas of expertise. Of the participants, attrition occurred at “disconcertingly high attrition rates at 19%” (Patterson et al., 2003, p. 20). In contrast, Gilbert (2011) argues that science teachers can make decisions about entering and leaving the classroom based upon career stability and alternative options offer mobility, offering a “need to conceptualize attrition not [only] as a negative outcome but a reality based upon the constructivist nature of teacher career development” (Gilbert, 2011, p. 411).

In a meta-analysis of quantitative studies in teacher attrition and retention, Borman and Dowling (2008) found that “compared to science and math teachers, the odds of attrition for teachers of any other secondary-level subject were 1.12 greater ($z = -72952.62$, $p < .01$)” (p. 387). In a broad study that included 158 science teachers, Ingersoll (2022) finds “mathematics and science teachers left teaching at higher rates, at a significant level, than other new teachers” (p. 19), yet after controlling for education and preparation their departure no longer held true at a statistically significant level.

Working Conditions

Teacher attrition has been described to be affected by several working conditions, including income, discipline problems, leaving to raise a family, and problems with parents (Harrell et al., 2004). Attrition occurs more frequently in schools with high enrollment (Geiger & Pivovarova, 2018), high levels of teacher dissatisfaction (Sutcher et al., 2019), and several school-related factors such as unmanageable workload, lack of professional autonomy, lack of professional development, and burnout (Doherty, 2020).

More recently teacher attrition has been discussed through teachers' lived experiences by acknowledging the social, emotional, cultural, and political perspectives of what worsens or improves teacher working conditions. Job satisfaction, school leadership, labor demands, and the ongoing COVID-19 pandemic affect teachers' decision-making in a variety of ways as well as professional and economic factors.

In a study across 166 public schools in Uasin Gishu County, Kenya, including 30 teachers who had left the profession, Mabeya et al. (2019) found that inadequate working conditions increase teacher attrition; “specifically, unfriendly working conditions, students' behavior and discipline, school leadership and administration, heavy workload, ethnicity, lack of professional respect and teachers not involved in decision making” (p. 99). Job dissatisfaction leads to higher attrition rates when teacher workload intensifies, less cooperation is available, and students are disciplined inadequately (Toropova et al., 2021); attrition rates are lower when teachers have greater autonomy and influence over school policies, supportive leadership and work environments, and higher teacher morale (Garcia et al., 2022); and workload intensification has been shown to be “detrimental to the health and wellbeing of teachers” (Creagh et al., 2023, p. 15).

School leaders and teachers have different perceptions of working conditions, causing unreasonable expectations and increasing the likelihood of teachers leaving the profession due to “a lack of trust and support in the school environment and [inadequate pay]” (Harris et al., 2019, 8). Wiggans et al. (2021) explores the cognitive divisions of labor within the teaching workforce: “the influence of social forces on the way people think about labor, and how people classify and value the importance of various forms of labor (Zarubavel 1991, 1997)” (p. 47). In a selection of both empirical and non-empirical studies surrounding the factors of teacher attrition and shortage, they discuss the influence of global capitalism stratifying people into different groups because of their cognitive labor, causing “individuals [to be] viewed in terms of what they do and not who they are” (p. 62).

Working conditions affect teacher attrition by causing teachers to make decisions about the teaching profession. In problematizing teacher attrition, Keltchermans (2017) discusses the definition and inquiry of why teachers decide to leave the classroom as having a sociological, or institutional, economic, public health, and human resource criterion which presumes that teachers have agency, meaningful professional interactions, ethical or moral imperative, and political and structural interpretation in their decision-making. In a previously mentioned study of six former Utah teachers conducted by Newberry and Allsop (2017), a state which “experiences a higher teacher turnover rate than other states” (p. 867), various elements of teacher working conditions combined and intensified to affect decision-making about leaving or staying in the profession. Although there are a variety of challenges that influence teacher’s decision-making, “timing and intensity of when one faces such challenges does matter but they are also mitigated by the strength of personal and professional relationships maintained” (p. 876).

The outbreak and global pandemic of SARS-COV-19 has drastically changed the working conditions of teachers, increasing teacher attrition and mobility (Goldhaber & Theobald, 2022). Notably, this attrition has sociological implications, as it was found that during the beginning of the pandemic “teachers [were] more likely to leave schools where there are more students of color and more low-income students, where salaries are lower, and where working conditions are worse” (p.16). How a global pandemic was handled by educational policy in the federal, state, and district level has significant consequences for teacher attrition in particular areas of the U.S.

Racial Identity

Racial identity affects teacher attrition, whether it be race of the teacher, student, or district demographic. The 20th century marks distinct sociopolitical events in the history of the Black teaching workforce in the U.S. owing to the integration of public schools, increase in Black student population across the country, and substantial decrease in the Black teaching population following, Plessy v. Ferguson (1896), Brown v. Board of Education of Topeka, Kansas (1954), and subsequently a half-century of civil rights movements for educational equality (Milner & Howard, 2004). Although “the Black community perceived Black teachers in high esteem before desegregation” (p. 290), following the Brown decision Black teachers found themselves facing colorism, gendered role-construction, reduction of Black teacher visibility, and tracking of Black students into lower academic areas amidst a teacher exodus in concert with systematic racism (Milner & Howard, 2004). Since desegregation, the Black teacher workforce has endured a consistent shortage in relation to the percentage of Black students due to limited educational opportunities, alternative career options, and standardized testing practices (Madkins, 2011). Despite social, economic, and political factors affecting the Black teacher

workforce, Black teachers persisted within schools in Black communities, demonstrating what Ladson-Billings and Anderson (2021) describe as a “deep commitment that... Black teachers have had to the Black community writ large...” (p. 96).

Racial identity continues to play a significant role in teacher attrition, that of Black science teachers throughout history. Although Black people in the U.S. and abroad are persisting in the teaching workforce, Black teachers attrition increases due to teachers perceptions of school climate in high poverty racially segregated (HPRS) schools (Djonko-Moore, 2016); educational policy that exacerbates school closures, rapid charter school expansion, and decentralized hiring practices (White, 2016); gender disparity among Black women teacher’s preparation, working conditions, school leadership, management, and policy (Carver-Thomas & Darling-Hammond, 2017; Farinde-Wu & Fitchett, 2018); national accountability policies such as No Child Left Behind (2001) (Shirrell, 2018); high minority turnover (Ingersoll et al., 2019); institutionalized racism and marginalization in educational accountability policy (White et al., 2020); racially disproportionate student-teacher assignments (Benson et al., 2020); and racial microaggressions (Frank et al., 2021).

Political Agency and Activism

Political identity, agency, consciousness, and activity thematically affect teacher attrition, representing a salient theoretical framework that implores further political research in teacher attrition studies. Dunn et al. (2017) finds among eight (8) former U.S. teachers who have resigned publicly that “[taking] a stand on political issues in the classroom” (p. 285) was thematic in their rationale. Teacher public resignation letters were understood to raise awareness of neoliberalism affecting student learning conditions, expressing solidarity as participants of larger teacher activist groups, and wielding personal narratives of positionality and identity to

fight for the profession from the outside (Dunn et al., 2017). Dunn (2018) continues to define the role of neoliberalism and neoliberal reform on teacher lived experiences to understand “what it means to prepare a new generation of teachers to work in an environment that is constantly pushing them down and burning them out” (p. 13). Neoliberalism, a political approach to economic government requiring free-market capitalism, causes teachers to leave the classroom due to effects of neoliberal policy reform on learning conditions and the effects of neoliberal policies on working conditions and beliefs (Dunn, 2018).

Glazier (2018) investigates teacher attrition similarly from a vantage point of “exit as resistance, as a refusal to do the job in certain ways or under certain conditions” (p. 63). Among a group of invested leavers had significant experience and credentials, despite competence and teacher self-efficacy, the decision to leave the classroom is influenced by a lack of pedagogical autonomy due to imposed curricula and power dynamics, standardized testing policy, and accountability measures requiring teaching to the test (Glazier, 2018). As well, an international study by Amitai and Van Houtte (2022) with twenty-one former teachers in Belgium find that “the majority of both novice and experienced teachers said they intended to stay but felt ‘pushed out’ by factors situated at the job level that ultimately drove them to quit teaching” (p. 9). Marx et al. (2023) interprets teacher attrition as an act of resilience by teachers of color against the normative and authoritarian climate of a dominantly white profession. Using critical race theory and a politically interpretive analysis of Foucault’s *body as text*, teacher attrition can be understood through “providing a genealogical explanation of how human bodies have been regulated and controlled over time” (p. 4). In addition to economic, social, and cultural factors that affect teacher’s preparation, working conditions, and professional identity, teachers leave the

profession each year due to decision-making that involves political resistance and activism to anti-Blackness, neoliberal capitalism, and U.S. imperialism.

2.4 Conceptual Framework

The remaining literature and review of selected titles in history and philosophy of critical Black study develop the conceptual and theoretical framework of this study, highlighting the interconnectivities of anti-Blackness, neoliberal capitalism, and U.S. imperialism and why each cannot be discussed alone. Education, and specifically schooling, have long been interpreted through critical theory which “seeks to take up the subjectivity of individuals and their experiences in a world complicated by capital, reproduction, and irrationality that cannot be wholly represented in numbers or pure logic” (Foley et al., 2015, p. 113). Critical theory in education has given rise to critical pedagogies and perspectives in the research of teaching and learning that disrupt sociocultural hegemony, critique normative ideology, and advance struggles for social justice, equality, and peace (Foley et al., 2015). Giroux (2018) outlines this phenomenon in the contemporary role schools play in the reproduction of a culture of positivism, stating that “schools’ function so as to mediate the social, political, and economic tensions of a society, ... in a complex and contradictory fashion” (p. 27). Cultural positivism, as a “material force” (p. 12), presents a crisis in modern interpretations of institutions that diminish historical consciousness by “reducing [political decisions in public discourse] to technical problems answerable by technical solutions” (p. 12).

Critical Black Study

The primary theoretical framework of this qualitative study utilizes a structural analysis of anti-Black racism, or anti-Blackness, alongside a historical material analysis of working-class struggle to interpret how Black secondary science teachers in the U.S. who have left the

profession share and thematize stories about their working conditions, decision-making, and political consciousness. Towards a bivalent conception of social justice (Fraser, 1998), a critical perspective addresses the structural and material conditions of Black former secondary science teachers' working conditions while acknowledging the phenomenology of anti-Blackness.

Although discussed extensively by Karl Marx, historical materialism is as well attributed to the critical theoretical and practical contributions of revolutionary activists and scholars such as Silvia Wynter, Claudia Jones, Anuradha Ghandy, Amilcar Cabral, Aime Cesaire, Steve Biko, Frantz Fanon, Walter Rodney, Kwame Nkrumah, Kwame Ture, C.L.R. James, and Cedric Robinson. For brevity, the merger of structural anti-Blackness and historical materialism is described here as a critical Marxist perspective.

I hypothesize that in acknowledging both concepts through a layered phenomenological interpretation, critical elements of political resistance will emerge simultaneously within each Black former science teacher's narrative both from the social reality of their material struggles as well as the structural realities of the gratuitous and unrelenting forces⁹ of anti-Blackness and anti-Black violence. My definition of political resistance considers both the ideological and agentic systems of belief, policy, and meaning that center the governance structures and systems of society by which individuals may be conscious or unconscious of throughout their daily lives. Political resistance, and thus political struggle, have often been lumped into the reductive form of electoral politics. Here, political resistance and struggle include political activity, resistance to policing forces that maintain rigid hegemonic structures, and the outcomes of political consciousness on the material conditions of the Black masses. In this way, politics is not divorced from everyday sociality such as navigating the workplace, interpersonal, and

⁹ <https://www.nytimes.com/2020/06/04/opinion/george-floyd-anti-blackness.html>

intrapersonal relationships. Black science teachers, as well as Black teachers at large, are a specific group of educational workers in the U.S.; our working conditions, lived experiences, and narratives mediated by Blackness and anti-Blackness through the political forces that imbricate our labor. This is not to say that the two participants of this study do not have their own agency in their decision-making and activity outside of structural and material influence, in fact I argue quite the opposite. The dynamics of power that exist between Blackness, anti-Blackness, and Black radicalism are sufficient historical forces that problematize and particularize their experiences.

The Black Radical Tradition and the Afterlives of Slavery

In 1983, Cedric Robinson published the first edition *Black Marxism: The Making of the Black Radical Tradition*, a historiographic interpretation of history and Marxism that critiqued the foundations of Karl Marx's assertion that slavery was only the primitive accumulation that preceded modern forms of capitalism. Robinson choreographs an interrogation of feudalism, European-African relation, and global history which posits that instead of being a period by which primitive accumulation occurred, African and chattel slavery were evolutions of European feudalism and racialism. By narrating the anachronistic transition of European social order by way of mercantilism and bourgeois ascendancy into Western expansion and modernity, Robinson's argument centralizes the African continent, slave rebellion and Black revolt, Pan-Africanism and Black intellectual thought, and modern capitalism. Even more compelling toward this study is that Robinson's claim advances a critique of socialism, or anti-capitalism, outside of Marx's European limitations, fostering a synthesis of the means of modern bourgeois social and capitalist economic exploitation as inherently antagonistic to the Black masses which has formed the Black radical tradition, a "dialectical negation of Western civilization" (p. 72).

Furthermore, Robinson's analysis posits that throughout history, forms of anti-capitalist revolt and reform have identifiably been intertwined with the Black radical tradition despite its widespread repression, and even to this day there exists a verifiable and contingent resistance to capitalist, bourgeois reproductive mechanisms amongst the Black masses. The Black radical tradition, as well as Black social and intellectual thought, are central to this study of teacher attrition and Black former science teachers, as the academic workplace exists as a method of capitalist reproduction. School faculty and staff, facilities and resources, and schooling ideologies and philosophies are intricately connected to productive mechanisms of gradation, standardization, authority, and punishment. The socially reproductive quality of schooling cannot be removed from the political, as the Department of Education, school districts, federal and state governments, and private and non-profit institutions acquiesce within the school site by determining the strata of skilled and unskilled labor of the masses and their productive roles.

Saidiya Hartman, in *Scenes of Subjection* (2022) employs a similar conceptual framework in evaluating the social and civil paradigm of 19th century life during and after the emancipation of slavery in the United States. Hartman's elaborate synthesis utilizes historical account, literature and media, and court documentation to counter the grand narrative of post-bellum civil life for the freed Black slave through an inquiry of agency, labor, and subjugated captivity. Central to this argument is that the convention of emancipatory conditions of the freedmen and former slave rendered simultaneously a legal transformation and racial burden that would continually mark the social life of Black people and the liberal civil life of the nation by cementing "the cogency of blackness as a legal classification" (p. 338). Hartman accomplishes this by repositioning the activity of chattel slavery as a series of ongoing traditions dubbed in later texts the afterlives of slavery, merging the quotidian social and civil debt owed by Blacks to

the state as a re-negotiation of everyday life. This distinction seeks to upend the narrative of slavery and Black suffering as merely brutal or violent act “only in the most spectacular circumstances (p. 30), interrogating Black subjugation as a form of violence itself that would come to narrate the agentic, physical, gendered, and sexual terms of liberal social order.

Through Hartman’s analysis it can be found the theoretical explanations for continued forms of subjugation into the 21st century and especially during the social and civil life of the Black masses during and after a Black president is nominated as head of state. At every moment since the nonevent of emancipation the social and civil order of the Black masses labor carries the same burden as the once freed slave of the 19th century. The same responsibilities, duties, and debts are organized against the Black flesh, straining our working conditions and social lives against the backdrop of liberalism, an individualist structuring of rights, properties, and freedoms that at no point were provisional to the Black social being. I argue that the afterlife of slavery contends with the modern situations with which Black science teachers find our self and social identity, labor, working conditions, and compensation. Although our decision-making is our own and we possess agentic contestations within the U.S. liberal order, there remains consideration towards the historical perspectives that subjugate our ability to seek sociopolitical redress and reprieve.

Blackness and Anti-Blackness

Blackness is sociologically and ontologically complex. To identify as Black and have and share in Black experiences is made complex by the means of production, desire, and the libidinal economy of social and personal experiences manifesting from the expansion of Western modernity about the alteration and evolution of society by the plantation economy. Wynter (1999) navigates this complexity through the sociogenic principle, building Fanon’s (2023)

sociogeny into an exploration of the meaning-making in history, culture, and consciousness of Blackness as a “sense of self” (Wynter, 1999, p. 48). Wynter’s sociogenic principle enlightens the deconstructions of racialism, interpreting Blackness as an indispensably contiguous “process of social conditioning” (p. 48). This principle drives stark contrast with the identarian politics of *race reductionism*, described by Reed (2020) as “the tendency to abstract racial inequities from discrete historical and economic processes and to treat race as if it operates independently of other social relations” (p. 12). I define Blackness here as a form of racialization that has resulted in the political consciousness of social groups of ethnically diverse members of the African diaspora who have experienced genocide, captivity, and erasure by systemic, interpersonal, and intrapersonal oppression; a collective consciousness forged by colonization and imperialism of cultures whose ancestors were racialized and subjugated by Western expansion, colonization, modernity, and white supremacy for our skin color, physical features, and relations to the continent of Africa inscribed in our flesh.

Blackness, as well as the political consciousness of the Black experience socially, politically, and historically, can also be seen as the antithesis of anti-Blackness, which has recently gained popularity in science education research as a framework that “attests to the lack of specificity in examining, understanding, and addressing Black existence, desires, and needs within the context of research, teaching, and praxis across all domains” (Morton et al., 2022, p. 136). A study of Black science teachers who have left the classroom offers ‘*particularity*’ towards an ongoing sociopolitical struggle in the field of science education at the intersections of: a) the narratives of Black secondary science teachers who have left the profession although they are significantly invested in social justice, their career, or teaching in a specific school

district or community and b) the political factors of science teaching amidst anti-Blackness, neoliberal capitalism, and U.S. imperialism in the domestic and international teaching workforce.

Particularity here refers to a perspective of historical analysis by Walter Rodney, Guyanese historian, political activist, and academic whose accomplished praxis can be seen throughout liberation theory. Described by Adeleke (2000):

By emphasizing the “particular,” Rodney deconstructs race, intimating that beneath the appearance of racial identity and solidarity that the nationalist school projected lay complex and ambivalent socio-economic imbalances. Rodney’s “particularity” situated an anti-imperialist and anti-capitalist (i.e., class) focus in place of the racial paradigm that traditionally propelled Pan-Africanism. (p. 51)

The attrition of Black science teachers problematizes the working conditions and contemporary material struggles that may cause teachers at large to leave the profession.

Particularity of the narratives of Black former secondary science teachers, seen as a multidimensional lived experience, may include the resistance to the anti-Blackness, anti-Black violence, systemic racial oppression of Black people, and the political struggles of Black teachers in the U.S. amidst neoliberal capitalism and U.S. imperialism. I argue these narratives prove pervasive in analyzing the labor of science teaching as disciplinary science is inextricably connected to the sociological architecture of Western and global society.

In a historical interpretation of the material and structural conditions of the teaching workforce in a capitalist society a metatheory of Wilderson’s (2020) *Afropessimism* is also applied alongside a critical Marxist perspective of historical materialism to analyze the phenomenological layers of political identity, agency, consciousness, and activism in former Black secondary science teacher’s lives, career trajectories, curriculum, and pedagogy. The term *afropessimism*, used as “a shorthand insistence that the subordination of Black interests and exploitation of Black labor are inherent to Western imperialism and Western modernity”

(Morton et al., 2019, p. 330), utilizes a hermeneutical analysis to interpret lived experiences and decision-making under political duress with anti-Blackness at the center of institutions of science, science education, and science teacher education. Anti-blackness, the psychological, social and political activities pervasive in U.S. institutions that structure anti-Black racism and racial subjugation, reflects a myriad of factors that intensify and complicate working conditions of Black science teachers.

A metatheoretical interpretation of anti-Blackness is necessary because of the divergent and obstructive mischaracterizations that identity reductionism, and particularly racial reductionism, integrate in critical theories of power, oppression, and justice. Epistemologically normative rationale for investigating teacher attrition, retention, and mobility author a view of diversity in science teaching as a mere consequence of investment in science teaching outreach and incentives. Anti-Blackness interprets the ways that “anti-Black violence murders [and] destroys subjectivity” (Wilderson, 2020, p. 163). Through an investigation of anti-Blackness, analysis and discussion moves from merely counting Black science teachers and their experiences as representative percentages of a population to offering critical contestations of the field and industry of U.S. science teaching.

Anti-Blackness in Science Education

Anti-Blackness, or anti-Black racism, is a specific type of racialized oppression inherent to the foundations of Western hegemonic sociopolitical order that mediates the interpersonal, intrapersonal, social, and political interactions at every level of lived experience. I argue that within the field and industry of education, anti-Blackness manifests throughout institutions of schooling and phenomenologically appears in the working conditions of Black science teachers, whether obscure or distinct, at several levels.

At the level of global, national, and international politics anti-Blackness and anti-Black violence are prevalent in the structural relations between Black and non-Black peoples. At a global level anti-Black violence takes forms such as lynching, castigation, captivity, carcerality, impoverishment, suppression, aggression, and philosophical antagonism as the settler-colonial plantation economy of the acclaimed most economically powerful nation in the world consistently attempts to obscure its relationship to Western colonization, white supremacy, and the surplus accumulations of chattel slavery.

At the social and interpersonal level, as anti-Blackness conditions the social relations between Black people and non-Black people and even within the intramural of Black social life. Whether in the workplace, classroom, street, or household, Black people live within the belly of the beast as the reproductive and generative measures of social life persist through the negrophobia/philia of Black non/presence. These social conditions are exacerbated, yet foundationally supported, by the *afterlife of slavery* which Saidiya Hartman in *Lose Your Mother: A Journey Along the Atlantic Slave Route* (2007) describes as “skewed life chances, limited access to health and education, premature death, incarceration, and impoverishment” (p. 6).

At the intrapersonal level, anti-Blackness exists as both a racial identity and metaphysical configuration of these conditions at the psychological level. Blackness mediates one’s relationship with self, understanding and meaning of agency and activity, and permeates the preconscious, subconscious, and conscious negotiations of identity, self-regard, and self-concept. So pervasive is anti-Blackness that educators, politicians, and academics who identify as Black can assuage their racial identity to support policy, practice, and epistemology that centers white supremacy, capitalism, and imperialism even at the detriment to their racial kin; such is the

overwhelming influence of global anti-Blackness on the lived experiences of Black and non-Black people that our psychological desires are affected by the ruse of human, civil, and libidinal rights.

In science education, anti-Blackness authors curriculum, pedagogy, and the material conditions of labor and production at the schooling site. Black teaching, and Black education, is forced to the periphery in an otherwise white, cis-heteronormative, patriarchal, ableist structure of preparation for the working and laboring class. Anti-Blackness shapes school districts, funding, type, and outcomes from Black and non-Black students and their families. So pervasive are the mechanisms of anti-Black racism that multiculturalism and identity (racial) reductionism have masqueraded as identity politics to thwart the possibilities of investigative polity in the schooling system for the purposes of capitalist exploitation. Science education, including science, technology, engineering, and mathematics (STEM) and science, technology, engineering, arts, and mathematics (STEAM) have arisen as transdisciplinary fortresses of accumulation with representational diversification heralded as a central component of advancing a post-racial neoliberal workforce. I argue that within the field and industry of science education, as well as its reforms, anti-Blackness and anti-Black violence mediate the narrative-biographies of Black former science teachers.

2.5 Historical Materialism and Proletarianization

Historical materialism is a branch of critical theory often attributed to Karl Marx's theory of history, "an account of the dynamic relationship between two elements, the forces and the relations of production" (Schrag, 1986, p. 43). Historical materialism has proven a useful hermeneutic in examining education and schooling as a *societal superstructure*, "[consisting] of those institutions which function to support and stabilize the production relations existing in a

particular historical epoch” (p. 44). Historical materialism is a form of *dialectical materialism*, a theoretical tool used to investigate the distinctions, contestations, and antagonisms of disparate, yet connected conceptual principles of social relations about the means of production. In defining teacher attrition, Macdonald (1999) develops an analysis of literature that includes factors, retention efforts, and workforce mobility as well as the theoretical perspectives in the research in teacher attrition at the turn of the 21st century through a material perspective:

While not always explicitly stated, much of the study of attrition is positioned within an individualistic, human capital theory perspective in line with empirical-analytic methods. Theoretically, this suggests that teachers consider monetary (income, promotion, other benefits) and non-monetary (conditions of work such as the physical environment, convenient hours, relationships with co-workers) factors in making career decisions alongside considering the costs involved in undergoing retraining for a new occupation and income foregone during this process. (p. 837)

The ways in which teacher attrition is studied can indeed be discussed through economic models. Economic influences, statistical models, and empirical language are prevalent throughout the analysis and implications of why teachers leave the classroom in the first part of this review of the factors of teacher attrition. Many included theoretical and analytical perspectives that align with Macdonald’s interpretation of an individualistic, human capital theory perspective. However, Macdonald suggests that the workforce and economic conditions of classrooms across the world have changed alongside the “intensification and proletarianization (disempowerment) of teachers’ work” (p. 844), offering an analysis of the material perspective of individualistic human capital that overlaps with historical structures of power, class, and economic productivity.

Proletarianization is a process by which the “autonomous, professional type of worker” is replaced within a bureaucratic system by the “white collar proletarian type of worker” through “extensive division of labor, authoritative market conditions, economic processes, and

deteriorating living and/or working standards” (Oppenheim, 1972, p. 213). An earlier study by Macdonald (1995) invited 22 beginning Australian teachers to participate in a qualitative inquiry of their dissatisfactions in physical education that may lead to leaving the profession. Teachers who had left or intended on leaving showed trends that included “alienation, limited autonomy and authority, routinization of work, and increased surveillance” (p. 139). The professional field of teaching is discussed further in research of teacher socialization, an occupational socialization whose intellectual traditions include the functional, interpretive, and critical perspective of how people act as members of a society of teachers (Zeichner & Gore, 1991). Although there are a number and variety of factors that have been shown to increase and decrease the rate of teacher attrition research analyses are dominantly mediated by an individualistic human capital approach that views teacher attrition as an internal problem of the education system. I argue that by observing the self-thematized narrative experiences of Black former science teachers and interpreting their stories through the lens of history, productivity, and power that the nature of individualistic decision-making plays a small part in the experiences of Black science teachers as proletarianized workers under the antagonistic political culture of neoliberal capitalism.

Proletarianization in Science Education

Proletarianization in the field and industry of science and science education manifests as the policies and practices of government and non-government organizations, educational institutions of teacher preparation and education, and the working conditions of classroom secondary science teachers. Proletarianization can be described as the routinization and increased workload of occupational labor accompanied by inadequate compensation and at times political suppression of dissent to unfair working conditions. Proletarianized labor has long been utilized to cheapen the cost of personnel while increasing the productive capacity of working-class

occupations, especially as methods of industrial and technological advancement replace and substitute human innovation. In science education, proletarianization can be seen from the global, national, and federal level to the district, school, and classroom as the professionalization of science teaching heightens the credentials, accountability, and incentives of classroom science teaching while the masses of science classroom workers suffer debilitating resources and working conditions. Proletarianization can especially be seen in the occupational socialization of a workplace or field, as expectations for work quality, time, and labor are as well mediated by disruption of political dissent and maintenance of the status quo.

Proletarianization is a historical and ideological economic mechanism for explaining the material conditions with which labor relations are affected by capitalism. During the Obama administration, under the guise of diversification of the educational and scientific workforce, private and public sectors were offered increased incentives to blend and merge their productive value. This includes but is not limited to the proliferation of charter school contracts, funding, and not-for-profit utilization of government grants and funding from the National Science Foundation for increased attention towards STEM in marginalized and often formerly industrial areas of the United States. The Obama administration's legacy of technological accumulation under the guise of multicultural progress routinized never seen methodologies in neoliberal capitalist expansion of the private sector in the schooling market, affecting curriculum, compensation, and even incentivization for Black students, families, and communities to enter the STEM workforce to compete in the 21st century globalized workforce. I argue that the narrative-biographies of Black former science teachers further describe the ongoing harm and challenges these policies put in place.

To develop on the work of scholars who have defined teacher attrition beyond teacher workforce, retention, and turnover that encompasses political resistance as a critical tenet of exit decisions from the field (Amitai & Van Houtte, 2022; Dunn et al., 2017; Dunn, 2018; Glazer, 2018; Marx et al., 2023), this study utilizes a similar structure in demographic survey and narrative interview protocol that explores situated narratives about working conditions and political environments Black former secondary science teachers endure as members of the working and laboring class proletariat within the anti-Black institutions of U.S. science education. This approach centers the tensions of professionalization and proletarianization within teacher socialization historically (Macdonald, 1995) by defining political resistance to three primary political ideologies rampant in the science teaching field: namely anti-Blackness, neoliberal capitalism and U.S. imperialism discussed in the next two sections.

Neoliberalism

Neoliberalism is “an ideology, a politics, and at times a fanaticism” (Giroux, 2005, p. 12) which supports a deregulated, privatized, market-driven economy, subsisting on the socio-cultural mythology of individual human capital. Bazzul (2012) urges science educators to “look more closely at notions of ideology, discourse, and subjectivity to confront neoliberal and global capitalist agendas” (p. 1002). Through a Foucauldian interpretation of the notion of governmentality in science education, “science’s marriage with capitalism, the corporate world and neoliberal values can then become a starting point for analysis” (Bazzul, 2012, p. 1010). Similar approaches to contextualizing political ideology in science education discuss neoliberalism in the scientific discipline (Weinstein, 2015), science curriculum (Weinstein, 2017), and science teacher preparation (Mensah, 2022). In a content analysis of twenty-three (23) teachers’ public resignation letters, Dunn (2018) finds that “the majority of reasons for leaving

are explicitly or implicitly tied to current neoliberal educational policies” (p. 14) including a debilitation of learning conditions, working conditions, and beliefs about teaching.

As a basis of global economic development, liberalism and neoliberalism require the desires and consumptive capacities of an advanced capitalist society, which through proletarianization, creates a majority working-class controlled by increasingly privatizing the means of production. Klee (2020), in moving beyond neoliberalism, argues that “[capitalism] diverts attention from structural issues by casting the blame for education and development problems elsewhere” (p. 16), using mismatch discourse to emphasize that “fundamentally, unemployment is not a worker supply problem but a structural problem of capitalism” (p. 11). Capitalism, fueled by neoliberalism, is “an economic system in which the private ownership of wealth (or capital) is structured toward the accumulation of more wealth (or surplus)” (p. 11, Madison, 2005). Calabrese-Barton (2001), in conversation with Canadian scholar Peter McLaren, suggests that “the marriages between capitalism and education and capitalism and science created a foundation for science education that emphasizes profitability and control at the expense of social justice and human dignity” (p. 852). Teacher attrition, as a workforce supply issue, is in turn politically embedded within discourse on neoliberal and capitalist ideology.

Racial Capitalism

Racial capitalism, defined by Robinson (2020), refers to the development and subsequent structures of the expansion of capitalist society in racial directions (p. 2), and has politically constructed the reproductive mechanisms present within educational institutions that harm Black people. Studies of capitalism advanced to highlight critical concepts Marx and other historically materialist thinkers of the modern era may have overlooked although themselves advancing European radicalism. One such distinction is the racialized effects of ruling-class development

during European colonization and exploitation of the African slave, and its subsequent refinements in the context of Western civilization. These developments in a capitalist society are critical of Marxism, extending the theoretical framework of historical materialism to include the material and structural process of racialization transcendent in the European formation of the bourgeoisie. This transmutation of Africa through colonialism and chattel slavery has thus remained in synthesis with the continuing Black radical tradition of the transformation(s) of socialism and communism as negations to Western modernity and expansion (Robinson, 2020, p. 42).

In an analysis of the Chicago Public Schools (CPS) market-based school choice model and STEM initiatives, Morales-Doyle and Gutstein (2019) find that “the intersection of racism and capitalism can be concretely seen in the racialized labor force preparation of CPS STEM education” (p. 532) through curriculum restrictions, educational tracking, and narrow definitions of citizenship and work-place preparation for Black students. Although Robinson’s interpretations of racial capitalism emerge from European feudalism hundreds of years ago, these investigations fuel Burden-Stelly’s (2020) ‘modern U.S. racial capitalism’ as a “racially hierarchical political economy constituting war and militarism, imperialist accumulation, expropriation by domination, and labor super exploitation” (p. 3). Black former secondary science teachers as racialized proletarian subjects of the political conditions of capitalism both inside and outside of the science classroom deserve further study in the research on science teacher attrition and teacher attrition.

Imperialism

Palladino and Worboys (1993) offer “that for most of humanity, the history of science and imperialism is the history of science” (p. 102). Imperialism, “capitalism at that stage of

development at which the dominance of monopolies and finance capital is established” (Lenin, 1917, p. 265), has inarguably changed forms throughout history from a British imperialism of western expansion by colonization to a U.S. imperialism which “no longer seeks direct territorial control of the rest of the world” (Cole, 2017, p. 163). Imperialism wields racialization, privatization, and weaponization of foreign policy to advance neocolonialism through a globalized market, laying the foundation for the creation and promotion of western modern science, or white modern science (WMS), which “tries to make sense of the nature of the world through reason (only)... and feels itself to be the trustee of all knowledge” (Boisselle, 2016, p. 4).

For revolutionaries such as Vo Nguyen Giap, referenced by George Jackson (1990), U.S. capitalism has already reached the stage of imperialism as at the end of World War II it proceeded to take advantage of the weakening of other Western imperialist powers, becoming the most powerful and richest (p. 131). I argue that U.S. imperialism and the ideologies of western imperialist expansion worthy of further study in science education and have reached the lived experiences and working lives of Black secondary science teachers through this advancement.

Chapter 3: Research Methodology

3.1 Methods

Critical Narrative Inquiry

Exploring social and political struggle requires a research approach that is both sensitive to the precarity of its participants' material conditions as well as their narratives, especially when they represent targeted groups and communities. In the field of social work, Danso (2015) developed a framework of qualitative research study design using anti-oppressive practices in recognition of the fact that “research can be just as powerful in propping the status quo and supporting the evolution of societies that privilege some people and inhibit others” (p. 273). Anti-oppressive practice (AOP) “provides a framework for understanding how difference has often been used to oppress people” (p. 273). A transdisciplinary approach recognizes the material conditions, cultural competencies, and power dynamics present in interviewing participants such as the two Black former science teachers in this study and is critical throughout the research process if it is at all possible to enact social change (Danso, 2015).

Gunn (2022), in addressing critical inquiry in narrative investigations of Black women's experiences with criminalization, justifies the importance of anti-oppressive practice in health care and social work. With each participant, of importance is assisting participants in “naming one's intersectional experiences..., reframing the meanings attached to their past in ways that cultivate greater clarity and understanding..., and reflectively reclaiming their stories” (p. 43). An anti-oppressive research methodology in the field of science education requires awareness of the political economy of knowledge production, which under capitalism has the capacity to act as a tactic of ‘intellectual imperialism’; “the role of education and research in the service of political and economic imperialism” (Alatas, 2022, p. 17).

Critical research acknowledges the power dynamics of society, as well as inherent power struggles throughout the research process between participant and observer (Merriam & Tisdell, 2015). Black science teachers are a minoritized and marginalized group in the teaching workforce with little research found in teacher attrition studies discussing their narratives and decision-making for leaving the profession for political reasons or with political resistance in mind. A critical narrative inquiry seeks to understand the life histories, career trajectories, and political activities of two Black former science teachers in the U.S. by as best as possible maintaining the integrity of their voice, story-telling, and agency throughout the data collection and analysis process.

Interpretive Phenomenological Analysis

An interpretive phenomenological analysis (IPA), which Eatough and Smith (2017) state is “concerned with the detailed examination of personal lived experience” (p. 1), has been used in psychological studies to “grasp the texture and qualities of an experience as it is lived by an experiencing subject” (p. 3). Through several layers of interpretation participants share their narrative-biography and their stories come to be understood through the complexity of how individuals navigate their ‘lifeworld’ as well as the political contexts that thematize their experiences while entering, working within, and leaving the profession. Interpretive phenomenological analyses utilize small and situated samples while engaging the experiences, thoughts about their own experiences, and language used when storytelling (Eatough & Smith, 2017). Meaning-making happens through cycles of interpretive layers, acknowledging the complexity of lived experience and constructing thoughtful reflections on one’s own history by considering broader political themes.

A structural analysis of anti-Blackness and a critical Marxist perspective of historical materialism provides the framework for this analysis by contextualizing cognition, emotion, and reflection in the practice and professional development of both science teaching and social life. Throughout participant selection, data collection, and the analysis process the two interpretive layers used in this study combine into a hermeneutic of anti-Blackness and proletarianization in science teaching and the working conditions of Black former science teachers discussed in further detail in Section 3.4 and added for easier reference in Appendix A.

3.2 Participants

The inclusion criteria for this study are secondary science teacher leavers who identify as Black and were recruited, prepared, and have taught for at least one year for U.S. public or charter schools before the academic year 2017-18 and had retired early from the teaching profession and not returned to the classroom during the post-Obama era following that year. Political reasons include, but are not limited, to changes in local, state, and federal government; administration, legislation, and/or policy; school setting, type, and/or region; increased standardized testing and accountability, unsatisfactory working conditions, intensification of labor, and/or inadequate wage; relationships with school administration and leadership, burnout and stress, racial microaggressions, and/or political repression.

Recruitment

In September 2023 a recruitment poster was distributed throughout social media (Twitter, LinkedIn, TikTok, Discord, etc.), personal and professional networks (NYCORE, Science for the People, STEMTeachersNYC, and STEM Teaching and Learning departments) inviting Black former science teachers to participate in two virtual semi-structured 90 minute interviews to share stories about their personal, social and political identities, career development, and

decision-making in leaving the profession. The recruitment flyer featured a QR-Code and link to a Google Form of a 10-item preliminary questionnaire with one open-ended prompt inquiring about their decision-making to leave the profession (Appendix B). If selected for the study, they were sent an email confirmation with informed consent forms and a Calendly link to schedule the first 90-minute interview in the following two weeks.

A potentially significant challenge in recruiting former teachers was that they were no longer in contact with their teacher education programs, former schools or districts, or had accessible email addresses through professional websites like LinkedIn or their prior school websites. Unless a former teacher had resigned publicly, finding letters or gathering information from news or social media about their decision-making was not possible outside of their close friends, family, and communities. To combat this challenge, I employed a similar snowballing strategy to Dupuis (2023) asking “contacts and participants if they knew other former teachers who meet the study’s definition of ‘invested leavers’ and who might be willing to be contacted”.

Through snowballing recruitment, former teacher participants can be found by personal and professional outreach, social media, and internet research (Amitai & Van Houtte, 2022; Newberry & Allsop, 2017; Marx et al., 2022). Participants were selected based upon convenience, as did Dupuis (2023) locating Idaho teachers who were conveniently sampled for a high likelihood that each participant “has an interest in the educational climate of the region” (p. 39). Recruitment details and contact information were stored in the Research Memo Document and email addresses and phone numbers were collected from a QR-Code and Google form link to store personal information securely in my password-protected Teacher’s College account. From September 2023 to February 2024, outreach continued with weekly intervals of social media posts and numerous communications to email listservs and professional networks to

expand the participant pool for selective purposive sampling. Emails were also sent to national Black teacher associations, friends and acquaintances in the field of science teacher education, and authors who had written about Black teacher resignation.

Sampling

Selective purposive sampling “relies on the judgment of the researcher when it comes to selecting the units (e.g., people, cases/organizations, events, pieces of data) that are to be studied” (Rai & Thapa, 2015, p. 5). Participants were accepted based upon a predetermined selective criterion established using the brief online questionnaire about their identity, teaching background, and decision-making in leaving the profession. Specifically, the questionnaire identifies: (a) former public secondary science teachers who self-identify as Black; (b) teacher leavers as defined by Mawhinney and Rinke (2018), whom “had taught at least one year within a public or charter school or district, left teaching on their own accord prior to retirement, and entered the teaching profession through either traditional methods or through alternative routes” (p. 8) between 2017-2022; and (c) former teachers who described inadequate working conditions, compensation, and job fulfillment in their decision-making to leave the profession. Below, I briefly introduce these two Black former science teachers and their background shared through preliminary questionnaires.

Participant A, who chose the pseudonym Alex Dawes and prefers the pronouns he/they, identifies as a Black, Caribbean-American, disabled, queer, 29-year-old genderqueer man with a master’s level education. Alex entered the field of teaching in the summer of 2016 through a non-traditional alternative leadership development organization and left the profession two years later by 2018. Alex was selected to join this study because they fit the selection criteria, and as well indicated both in the preliminary survey and open response that their decision-making to

leave the field included a reflection of the compensation and working conditions of being a classroom science teacher.

Participant B, who chose the pseudonym Carmen Cooper-Clark and prefers the pronouns she/her, identifies as Black. Carmen entered the field of teaching in the summer of 2011 and after teaching at the middle school and high school level at two different schools had left the role of classroom teaching eight years later in 2019. Her teaching preparation was also a non-traditional alternative program. Although Carmen's time in the classroom was longer than the other participant's, she identified similar working conditions and notably described challenges to the integrity of her pedagogical and curricular approach while teaching in the classroom.

3.3 Data Collection

Semi-structured Interviews

This narrative-biographical study is inspired by the implications of several quantitative inquiries of former and current teachers who have either left or planned to leave the profession. Carver-Thomas and Darling-Hammond (2017) draw from nationwide surveys key statistical factors that contribute to relatively high numbers of Black women teachers in the U.S. leaving the profession: inadequate compensation, teacher preparation and support, and unsatisfactory working conditions. Attrition factors due to racialized microaggressions of Black mathematics teachers in the U.S. who have considered leaving the profession have been studied through wide scale critical race quantitative intersectionality (CRQI), an integration of critical race theory (CRT) and quantitative analysis (Frank et al., 2021). Although teacher attrition is caused by several factors, the particularities of the experiences of Black former science teachers may contextualize specific forms of political resistance, protest, and struggle seen throughout history.

The term *particularities*, as discussed by historian and political activist Walter Rodney's (1986) speech at Queens College, New York City on "*Marxism as African Liberation*", can be summarized by the following:

I have already cited Cabral in another context, and he reappears in this context. The way in which he is at all times looking at the *particularities* of class development in contemporary Guinea-Bissau. Looking at the potential of classes in Guinea-Bissau at this point in time. And therefore, he is, of course, making sure that Marxism does not simply appear as the summation of other people's history, but appears as a living force within one's history.¹⁰

Through narrative inquiry, lived experiences of participants can be categorized into stories, which assist in "encapsulating teachers' knowledge of teaching as well as their identities" (Zhu et al., 2020, p. 3). This study interprets the story-telling former teachers use which acknowledges their personal identity, social identity, and professional identity as fluid intersections of political awareness, agency, and activity in life and science teaching. These stories, or anecdotes, can "[become] a set of data separate from the interview as a whole, allowing for a different kind of analysis" (Glazer, 2020, p. 4).

Semi-structured interviews are facilitated by approximately 38 items that adapt Keltcherman's (1993) 'self-thematization theory', "in which several research techniques are combined in an iterative cycle building on each other as the participant continues to live in the experience" (Newberry & Allsop, 2017, p 868). Self-thematization "captures teachers' narrative sense-making of [teachers] career experiences, including their strong emotional aspects and meanings" (Keltchermans, 2016, p. 36).

Participants were invited via Calendly to sign up for interview slots using Microsoft Zoom audio and visual meeting software after receiving their informed consent form and

¹⁰<https://www.marxists.org/subject/africa/rodney-walter/works/marxismandafrica.htm> From *Marxism and African Liberation*, by Walter Rodney, 1975 (<https://www.marxists.org/subject/africa/rodney-walter/works/marxismandafrica.htm>)

preliminary questionnaire. Each participant was invited to share their life history through interview items that encompass personal and social identity, career trajectory, and open-ended prompts about their decision-making throughout their personal and professional lives leading up to their decision to leave the classroom. Interviews were audio recorded for transcription using Microsoft Zoom's audio recording software and saved in a professional email account provided by Teachers College through Google Drive. Interviews were scheduled between December 2023 and March 2024, allowing three months of possible data collection.

The narrative-biographical interview consists of questions about the autobiographical, agentic, and reflective stories of each participant's decision-making in entering the profession, developing as a Black science teacher, and dealing with working conditions that led to leaving the classroom. Two 90-minute interviews were held which adapted Keltchermans' (1994) procedure of 'stimulated autobiographical self-thematization', "[aiming] at making teachers look back, reflectively, at their own career (autobiographical) and to stimulate them to 'thematize' their experiences" (p. 96). Questions include what political events affected their lives and working conditions as a science teacher, relationships with peers, administration, students, and their communities, pedagogical practices, curriculum development, and reasons for retiring early. The first round of interviews occurred between January and February 2024 within two weeks of each other, the second round were scheduled one to two weeks after the conclusion of the first.

I agree with Kelchtermans' (2016) in that "the narrative-biographical perspective allows us to understand the emotional dimension as intertwined with the technical, moral, and political dimension in teaching" (p. 40). Participants were stimulated to share *critical incidents* throughout their interview by being prompted to go into detail during stories that appeared particularly vivid, emotional, or salient to the theme of the study. Critical incidents represent

“significant experiences that caused an intrinsic and compelling need to reconsider and revise one’s deeply held beliefs and the practices built on them” (p. 34). The critical incidents throughout participants’ life histories and careers enrich knowledge about the phenomenon of teacher attrition alongside social, historical, and political influences in the U.S. affecting working conditions, workforce supply and demand, and occupational socializations of teachers during a specific period and for a particularly marginalized community.

After each interview I reviewed and edited transcripts alongside each audio recording for accuracy and audio transcription errors. Files were saved with participant pseudonym and date of recording to preserve anonymity in a password-secured Google drive with Teachers College, Columbia University accounts. After interview transcripts were complete, participants were sent a document of their recording via email as well as a request to choose their pseudonym for anonymity. Narrative-biographies were written that summarized each participant’s interview, using anecdotal quotes and chronological, biographical storytelling to shorten the length of each section. Narrative-biographies were sent to each participant to receive confirmation that the summations were accurate and representative of their life history and lived experiences. One of the two participants affirmed that the narrative-biographical storytelling I wrote from their interview transcripts were accurate.

3.4 The Analysis Process

Qualitative life histories and emotional labor theory have been found to elucidate the challenging emotions of urban teachers who have left the profession (Mawhinney & Rinke, 2018). As leaving teaching can be seen as an act of resistance, Foucault’s body as text has been used to acknowledge the role that power structures play in decision-making (Marx et al., 2023). This study interprets emotional labor alongside each of these generative autobiographical

themes, prompting participants to reflect with items such as, “How did this event make you feel?”, or “How do you feel now reflecting upon this experience?”

Open-Coding

To allow these critical incidents to emerge, an adaptation of Keltchermans (1994) stimulated autobiographical self-thematization lead participants through prompts about their story-saying that generated overall themes they felt described their experience. Prompts such as: “You just provided a story about entering the profession during your teacher education year - what word or theme would you associate with this particular experience?” were used at the conclusion of each section of the interview. Self-thematization co-constructed open coding through vertical analysis which treated each participant’s life history as the unit of analysis (Kelchtermans & Ballet, 2002). Adapting Morales-Doyle et al. (2021) interpretative analysis of access, dissent, ethics, and politics in pre-service science teachers each participant was invited to ascribe a theme or unit of meaning to parts of their stories by prompting questions such as, “How would you define that experience?”, or “What do you think this decision meant to who you were as an individual, teacher, or member of the Black community?”. Using a field journal, I recorded participant’s themes as units of meaning alongside time stamps during the interview and confirmed with each participant in the member-checking process whether they still felt each theme appropriate. These self-thematizations served as open codes that the participants conceptualized themselves, offering reflexive opportunities to both interpret their own life histories and actively participate in the meaning-making of the data within this study through segmented vertical analysis. Each theme was then analyzed within and outside of the interview transcript segments in which it occurred. I identified the salient terms or phrases in each, such as “humility” or “integrity” and created line by line codes of the entire interview transcript for each

participant to identify both the frequency of general concepts and ideas as well as their connection to the participant's thematic selection.

Axial-Coding

Participants were invited to share in detail their specific experiences while in the teaching profession, representing intersections of their shared experiences and critical incidents that shaped their professional development into and out of the science teaching workforce. Following the interview and member checking, transcript documents were separated by each participant's pseudonym and demographic information, recorded in a table saved on a separate document to preserve anonymity.

Axial coding was then used to construct a horizontal analysis across each participant's life history that contextualized their experiences socially, economically, and politically concerning their working conditions as science teachers using the codes developed in the initial interview and their preliminary questionnaire. Participant's thinking about their working conditions often displayed the emotional and cognitive labor prevalent in teacher's decision-making to leave the profession (Mawhinney & Rinke, 2018; Wiggen et al., 2021). Each participant was invited to self-thematize their storytelling, identifying moments which they feel aligned with the victories, defeats, and ongoing struggles of science teaching in relation to their students, curriculum, leadership, collaborations, mentorship, administrative support, school district, and state or federal policy and accountability. Self-thematized codes were then interpreted using constant-comparison analysis, a grounded theory approach which provides descriptions, several criteria, and creates deeper inquiry about the nature of participant's reflections about their stories (Boeije, 2009).

Selective-Coding

The final coding cycle utilized the situated and stimulated autobiographical self-thematized interview transcripts and self-ascribed units of meaning by the participants to construct a critical thematic analysis of participants' reflection of their life history, career trajectory, and incidents that they believe lead to leaving the profession. Selective coding "enables the researcher to select and integrate categories of organized data from axial coding in cohesive and meaning-filled expressions" (Williams & Moser, 2019, p. 52).

The final stage of coding compared the open and axial coding to identify critical incidents in narrative-biographies that reflect the political realities of teacher attrition within a *rhizomatic analysis*. A rhizomatic analysis encompassed the multitude of branches and roots of the experiences of these two Black former science teachers, and their self-thematizations provided codes that contextualized the dimensions of the decision-making in leaving the profession as equipped by life history, professional development, and political resistance in context. The metaphor of the rhizome, as utilized within Deleuze and Guattari (1988), has been applied to the work of science teaching to typify that which is subterranean, hidden without discrete units or points' (Lee, 2008). This analysis concluded with a description of the core concepts of political agency, consciousness, identity, and activity in Black former science teacher's narrative-biographies by situating their experiences in the profession as not only determinant of their individualized professional development and decision-making but as well the social, political, and economic landscape following the post-Obama era of academic year 2017-18 that may have shaped the critical incidents, choices, and trajectories of their careers.

Themes developed during open-coding (self-thematization) and axial-coding (constant-comparison) are interpreted alongside major historical incidents of social and labor relations as

well as an interpretive phenomenological analysis to drive inquiry further about the nature of Black science teacher attrition amidst anti-Blackness, neoliberal capitalism, and U.S. imperialism in the science teaching workforce. The interpretive phenomenological analysis was guided by the theoretical and conceptual literature selected about two primary concepts that overlap yet comparatively attenuate to specific and circumstances hypothesized to appear in Black former science teachers' narrative-biographies: *proletarianization* and *critical Black studies*. Table 1 uses definitions from the literature of historical materialism and teacher occupational socialization to interpret the myriad of ways research historically has identified the phenomenon of proletarianization, a transformation of a field or occupation which intensifies the productive capacity of a group or type of worker or member of the proletariat while limiting the wages, mobility, and working conditions for the purpose of surplus accumulation. Table 2 uses definitions from the literature of critical Black studies to identify the language and ideologies that locate Blackness and anti-Blackness as structural phenomena in the quotidian social life of Black people, especially that of Black people further marginalized by cis-heteronormativity, patriarchy, ableism, classism, and other multiplying factors of systemic and social oppression.

Table 1

Interpretive Phenomenological Analysis: Historical Materialism

Proletarianization and Teacher Socialization

“Extensive division of labor, private and public bureaucracy affecting working conditions, wage as primary source of income, and collective bargaining.” (Oppenheimer, 1972, p. 213).

“Rationalization, codification, routinization, fragmentation, and subordination to bureaucratic authority” (Macdonald, 1995, p. 130).

“Stress (tension, frustration, anxiety, anger, and depression), economic growth and recession, large-scale population shift, decline in teachers’ status, living conditions, attitudes towards family responsibilities, health, and ethnicity, insufficient incentive, intensification of work, and substandard working conditions” (Macdonald, 1999, p. 840-841).

“...Taylorization, standardization and bureaucratic controls, improved division of labor, advancements in technology, transfer of knowledge and power to management, and loss of autonomy in work performance” (Buyruk, 2014, p. 1712).

Table 2*Interpretive Phenomenological Analysis: Critical Black Studies*

Blackness, Anti-Blackness, and the Black Radical Tradition

“Blacks are still doing the work of the greatest slave state in history. The terms of servitude are all that have been altered.” (Jackson, 2020, p. 10)

“...Blackness is defined here in terms of a social, relational and structural position rather than identity; blackness incorporates subjects normatively defined as black, the relations among blacks, whites, and others, and the practices that produce racial difference. Blackness marks a social relationship of dominance and abjection, and potentially one of redress and emancipation; it is a contested figure at the very center of social struggle.” (Hartman, 2020, p. 94)

“Blacks are constituted by a violence that separates the time of the paradigm (ontological time) from time within the paradigm (historical time). At every level of abstraction, violence saturated Black life. To put it differently, for Black people there is no time and space of consent, no relative respite from force and coercion: violence spreads its tendrils across the body, chokes the community, and expands, intensifies, and mutates into new and ever more grotesque forms in the collective unconscious through literature and film.” (Wilderson, 2020, p. 218)

“Black radicalism, consequently, cannot be understood within the particular context of its genesis. It is not a variant of Western radicalism whose proponents happen to be Black. Rather, it is a specifically African response to an oppression emerging from the immediate determinants of European development in the modern era and framed by orders of human exploitation woven into the interstices of European social life from the inception of Western civilization.” (Robinson, 2020, p. 73)

These two tables were not exhaustive of the conceptual and theoretical milieu of historical materialism and anti-Blackness yet were instrumental in formulating a rhizomatic analysis of the self-thematizations and comparisons between the units of meaning of the participant's narrative biographical storytelling and the structural phenomena of sociopolitical life of Black being and personhood. I argue that the material and structural conditions of Alex and Carmen's life histories, approach to science teaching, working conditions, decision-making to leave the profession, and critical incidents of their narrative biographies were further contextualized by the social and political ramifications of living, teaching, and being during the post-Obama era and characterized by physical, epistemic, and social violence.

3.5 Validity and Rigor

Narrative-biographies are rich, explorative story-telling methodologies in qualitative research that require extensive consideration of the validity and rigor about peoples' lived experiences through interview transcripts. As the primary researcher I attempted to provide a space for the participants to reach the highest order of reflection, thematization, and evaluation of their own life history through open coding without my interpretation. The data collection features a biographical narrative with at times longer quotes of the interview transcript to maintain the verity of their voice, including the exact verbal, grammatical, and linguistic choices. The analysis section of collected data from interview transcripts will contain the participant's own retelling, inference, and reflection as exemplified by thematic codes chosen during the semi-structured recorded interview.

As a Black former science teacher who left the classroom teaching profession in 2022, subjective bias about my own experiences and decision-making precludes the conceptual and theoretical framework, interpretive phenomenological analysis, selection and discussion of

literature, and implications for further research. Throughout the research process I attempted through critical theory to situate and stimulate storytelling and the synthesis of these narrative-biographies through self-thematization practices that place the researcher's role as active, interested and non-evaluative listening and observing (Kelchtermans, 1993). A situated self-thematization process requires that participants are shared updated transcripts to facilitate member checking, a process that aids in creating "a continuous dialogue for clarifying stories and interpretations over the duration of the study" (Mensah, 2019, p. 14). Prompting Black former secondary science teachers with the opportunity to thematize their narratives allow for perspective drawing and subjectivity in story-telling. This rigor follows the methodology of culturally competent anti-oppressive practice (CCAOP), which in the field of social justice research "offers a perspective that draws on strengths and capacities first, rather than a primary focus on "problems and deficits" (Danso, 2015, p. 577).

Internal Validity

It is undeniable that throughout the research of teacher attrition, as a Black former science teacher, my experiences having left the profession for political reasons influence the architecture of this qualitative study. My positionality and standpoint reflect a strong fitness for developing research processes that deliberately attend to the nature of narrative-biography as a storytelling of one's own experiences in one's own way. The decision to embed this study in anti-oppressive practice, to situate the data collection protocols to be as flexible as possible through virtual recording, and the detailed interpretation of theoretical frameworks and text surrounding Black science teacher attrition were not arbitrary. I posit that self-thematization can biases by allowing participant's reflections of their experience to drive the coding process, allowing participants the opportunity to unfold their stories and interpret their narrative through a

cycle of metacognition situated and stimulated by the research process yet uninhibited by my experiences and perspectives.

As well, before conducting interviews, I generated an autobiographical storytelling of my decisions to leave in a researcher's journal. Throughout, several key themes were acknowledged that developed a 'strong objectivity', requiring that "the subject of knowledge be placed on the same critical, causal plane as the objects of knowledge" (Harding, 1992, p. 458). When I decided to leave the classroom and for quite some time afterward I did not possess conscious or competent notions of the political shifts of my identity nor my professional development changing drastically after leaving the teaching profession. As frequently as possible, I attempt to ground my conceptions and interpretations in the rigorous literature of critical Black study. This approach is adapted from Schaeffer's (2013) autobiographical narrative inquiry in "[wondering] how [teachers] negotiate the disconnected stories, and interruptions within the midst of their shifting identities" (p. 270). The narrative-biographies of the two Black former science teachers presents a snapshot of their lives, incomplete of the entire story, but attuned to their life history, decision-making, ambitions, feelings, and experiences as Black science educators.

External Validity

The particularities of how Black former science teachers who have left the field conceptualized, relate, and thematize their narrative-biographies are generalizable towards an interpretation of teacher attrition as a strategy by which to interpret science education, science teacher education, and the professional development of science teachers. I argue that Black science teachers who are leaving the field may see their displacement from the classroom as a political act of resistance, utilizing an interpretation of institutional oppression in both schools and the sciences that directly supports white supremacy, capitalism, and settler-colonial

occupation that shapes the modern world. Alternatively, they may see their decision-making as involuntarily, attending to their direct material conditions and adverse working conditions of science teaching that consumed their cognitive and emotional labor. Research in teacher attrition has included topics of stress, burnout, racial microaggressions, and social and political struggle (Farmer, 2020; Frank et al., 2021; Madigan & Kim, 2021; Ryan et al., 2017; Skaalvik & Skaalvik, 2017). The generalizability of Black former science teacher's stories conveys a particular critique of 'interest convergence', differing from Milner's (2008) definition which "stresses that racial equality and equity for people of color will be pursued and advanced when they converge with the interests, needs, expectations, and ideologies of Whites" (p. 333), and instead acknowledges that throughout history these interests and needs have converged, yet continually uphold enduring tenets of anti-Blackness through socioeconomic and political subordination of anti-imperialist, anti-capitalist, and abolitionist implementations of radical and socially just interventions in the field of science teaching.

3.6 Expected Contributions

What might Black former science teachers' social, economic, and political stories tell us about working conditions of the field of science education in the U.S.? What might these stories infer about the process and ideological presuppositions by which institutions recruit, train, prepare, and develop Black science teachers for the U.S. teaching workforce? Black former science teachers' narrative biographies interrogate the political climate of the working conditions of a science teacher, as well elucidating their love of community care and aid that Bazzul (2019) may argue "align more with social and political movements, transdisciplinary possibilities, and different modes of ethical living that might open viable futures for life on a damaged planet" (p. 304). Developing political activity in science teaching, as Das et al. (2020) states, "can

potentially facilitate a development of connections between contexts of diverse struggles against globalized forces of exploitation” (p. 3). Galamba and Matthews (2021) argue that there is a need within science education to “contribute to the formation of democracies and against authoritarian and fascist policies” (p. 601). Black former secondary science teachers’ narrative-biographies illuminate the pervasive practices other science teachers of the future may need to know to avoid further exploitation, anti-Blackness and proletarianization if they decide to remain in the profession.

Attempts at exploring the intersections of Black science teacher attrition seldom incorporate a political framework that situates science education and education as crucial operations in the struggle to define and pursue Black liberation. Black liberation, or Black Freedoms, defined here as an ‘authentic possibility’, “a challenge of the imagination to produce new modes of living that might be in accord with some of the most radical global “Indigenous” calls for a different kind of world...” (Walcott, 2018, p. 97). I argue that Black former science teachers’ experiences are integral to radical Black liberation as within their narrative biographies arise reimagining of scientific knowledge, skill, and practice outside of the weaponization of anti-Black violence, neoliberal capitalism, and U.S. imperialism worldwide. Wilderson (2020) states that Black liberation requires a recognition of the totalitarian effects of anti-Black regard. By this measure, Black liberation requires critique of not just the world and its natural order but the social and political world made manifest by the interwoven and extradited outcomes of Western modernity. I argue that due to the manifestations of anti-Blackness, Black life, labor, and suffering is undeniably political.

Educational researchers, cultural anthropologists, and political theorists of critical Black study agree that progress and reform is reactionary at best if it does not acknowledge the

deconstructions of the afterlife of slavery in all settler-colonial, anti-Black institutions. This study problematizes teacher attrition within the U.S. Department of Education and its affiliate schools and institutions as well as the private and commercial sectors which the government at large depends upon to uphold anti-Blackness, neoliberal capitalism, and imperialism. In order to degrade the working conditions of Black people who choose to be science teachers, teacher attrition may prove to be a pathway of dissent by which we actively resist, persist, and struggle politically against harmfully hegemonic ideologies ubiquitous in teacher socialization. Deciding to leave may serve as a proactive response to the occupational socialization of classroom science teaching and the sociopolitical conditions that render an already uneven playing field at-will ignited beneath our feet.

Organization of the Findings

In the next two chapters, the findings and analysis of the participant's interview transcripts is detailed through two parts. Part 1 consists of the narrative biographies of each participant constructed from their interviews and Part 2 of the review of self-thematization, axial coding through constant-comparison, and selective coding through rhizomatic analysis of the interpretive phenomenological framework (Appendix A, Tables 1 & 2). Throughout each participant's narrative biography in Part 1 a biographical summary of major turning points and trajectories of their life histories were written to provide context and scaffolding to their storytelling, shown as both short and longform quotations. Although unorthodox I found it was necessary to preserve the language and phrasing of the longform quotations as each is detailed by the participant's personality, affect, and narrative style. Particularly long quotations are characterized as larger narratives, enumerated alongside the self-thematizations that represented interview segments during which they were stimulated to reflect upon their own stories (Theme

1, Narrative 1, etc.). In Part 2, I utilized line by line coding to identify the frequency and salience of each self-thematization as open codes through vertical analysis of each participant. The second and third stages of coding provide the connections via constant-comparison between both narrative-biographies of the critical incidents of each participant in accordance with the research questions of the study and a selective analysis of prominent themes and concepts using an interpretive phenomenological analysis that offer implications and discussions for the research in teacher attrition, field of science teaching, and research in science teaching.

Chapter 4: Findings Part I

Additional Details on Data Collection and Analysis

For three months recruitment postings for this study were promoted on social media, sent to individuals and listservs, and messaged through several personal discussions between friends, colleagues, and coworkers. At the time of approval through the Teachers College Institutional Review Board (IRB), I was almost a year and a half removed from the classroom working as an adjunct lecturer at the City University of New York with limited contact with secondary schools and networks. Despite several waves of recruitment posting I found resources and programs that did not yield participants for this study. This was most likely because the criteria for participation was highly specific and theoretically a part of a small percentage of the former teaching population. However, on social media while using my personal account which had amassed close to 1,000 followers since creating the account in 2010 almost 15 years ago, two Black former secondary science teachers responded to my posting via comment replies and were interested in being a part of the study.

It is of note some of the incredible people and organizations who received my call for participation and responded in kind, perhaps seeing the value and salience of the question of Black science teacher attrition. I reached out to the New York Collective of Radical Educators (NYCORE), Science for the People (SftP), and STEMTeachersNYC, although the latter did not respond. I created a spreadsheet of about thirty organizations and chapters of the national organization for Black school educators, as well as professors at Teachers College, Columbia University, University of Massachusetts Amherst, the University of Chicago Illinois, and Barnard College. A relatively small amount of people responded directly to these emails, but the largest observable response and snowballing of recruitment occurred through social media. With

consecutive retweets, responses from other social media accounts, and “likes” the engagement peaked at around three weeks of persistent posting, reaching potentially thousands of individual timelines. Within two weeks, the two participants who had shown interest in this research study were filling out the criteria for participation. Both identified as Black former science teachers who had started teaching after the academic year 2011-12, had taught in a secondary school setting, and had retired from the field of teaching and not returned to the classroom after their resignation.

Additional Details on Narrative Biographies and Analyses

Each participant agreed to share their experiences virtually via Zoom interview with audio recording. The interviews occurred over the course of two sessions, approximately one to two weeks apart due to scheduling, and three hours long. All interview questions, as well as detailed storytelling of the participant’s life history and experiences while teaching, appeared appropriate for this length of time. Audio transcripts were exported to separate text documents and reviewed by both the participant and I for accuracy. Pseudonyms, as well as modifiers to preserve anonymity were applied throughout each transcript and sent to the participants for review.

What follows is an analysis of the participants narrative biography through stimulated and situated self-thematization. At three intervals throughout the interview, participants were asked to reflect on their experiences and recollections by describing themes they believed encompassed a particular period of their life and career. Generally, the intervals occurred at separate stages of the interview items content: considering the a) early life and upbringing of the participant, including familial and schooling experiences before entering the classroom, b) the teaching career of the participant, including their teacher preparation, pedagogical approach, and

working conditions while in the field, and c) their decision-making to leave the field of classroom science teaching, including critical incidents and personal and professional life after leaving the classroom.

The data analysis section of this study consists of two parts. For each participant, their self-thematization will be discussed for each of the three sections. What follows is an interpretive analysis of the content of their interview transcripts alongside their self-thematized open coding. I find an interpretive analysis necessary to further color the narratives of the participants across the landscape of history, political consciousness, and the material and structural conceptual framework that shapes this study's research questions. Within the implications and discussion section I include a rhizomatic analysis, according to the interpretive phenomenological analysis (IPA), of the similarities and differences of each Black former science teacher's narrative-biography. I include at some points discussion of my own autobiographical narrative when appropriate in developing the approach of anti-oppressive research practices in educational research to meet the needs of investigating the political atmosphere of Black science teacher attrition.

In stimulated, auto-biographical self-thematization, Kelchtermans (1994) discusses the importance of interpretation and abiding by the "rules of thumb" when engaging with participants' personal lives, stories, and subjectivity. Subjectivity, in this case, represents an individual's recollections as intrinsically complex and displayed across multiple worldviews and ideologies both apparent and unapparent to the observer. In this case, as often as was possible, the narrative interviews were semi-structured; the goal being to elicit this type of subjectivity. The purpose of this project is not to extract information and knowledge from the participants but

to provide an opportunity for agency in their storytelling and discussion of their experiences that illustrates the life experiences and working conditions of two Black former science teachers.

At the beginning of each interview I expressed that the intention of the interview items and other data collection tools were to investigate participants' experiences against the backdrop of political thinking, including both an awareness and consciousness of national and global politics. Although it is unlikely a person can be aware of every single political event or the connections between local political events on an international stage, the interview items intended to position both the researcher and participant as political subjects. This formatted each interview and subsequent analysis with sensitivity to the political landscape and meaning-making of participant's perspectives of classroom science teaching and acting as members of their respective community.

I found myself before each interview taking copious notes of each participant's preliminary survey. I considered that my role as a researcher, although inherently extractive, would best be led by transparency if as often as possible I regarded the participant as a whole person. I was careful throughout each interview to take further notes, listen actively, and whenever possible remain open and curious. It was incredible to find shared experiences and subjectivities, and I shared openly as they arose in conversation. Laughter, knowingly nodding at each other's recollections, and at times explaining my own emotions in response to their stories became necessary to make clear my investment in their narrative. As well, each participant would also express similar interests in the reasons for the study, methods and approach, and excitement for what and where the research would lead.

Interviewing via Zoom or virtual recording can be a tepid affair as many educators and people in general have experienced heightened virtual communication throughout the beginning

of the COVID-19 pandemic, quarantine, and social distancing. Although it is the safest way of interviewing, there are layers of discontent and amiability available to the virtual interview that are worthy of discussion. None of this was discussed explicitly in the interviews, but the setting of my position I found interesting enough to report. Although my office chair is uncomfortable and my recording setup was facilitated on an old MacBook Air, meeting with each participant was quite enjoyably like a phone call. I will not disclose where and how the participants entered each Zoom call, but I believe it relevant that time seemed to move quickly even though the interviews lasted an hour and a half. In the middle of each interview, I asked if a pause was needed to take care of any physical or other needs and at the end of each session I attempted set aside ten minutes before time was up as I did not want to surpass their ninety-minute time block without their consent. These small moves were made with the intention of maintaining a boundary as a researcher to avoid inconveniencing the participants and as well respect my own time constraints. As well, boundary-setting attempted to increase the amount of trust between researcher and participant by remaining transparent, honest, and eager to hear more about their experiences in full.

To represent the narratives and self-thematization of this project, a chronological biography was written for each participant using robust quotes that feature direct storytelling throughout several periods of the interview. There are small alterations made to remove redundant words or to clarify sentences wherein participants were speaking freely and would change their responses mid-sentence. Overall, after reviewing each transcript alongside the field notes taken, my goal was to capture as much of the participant's life story both before, during, and after teaching in three major sections prior mentioned. The final section of each narrative-

biography includes a reflection provided by the participant on their current life and endeavors, discussing their time after retiring from being a classroom educator until the present day.

4.2 Participant A - Alex Dawes

Our first participant, with the chosen pseudonym Alex Dawes, was born and raised in the northeastern region of the U.S. in what they describe as a “super Black city” and a “super Caribbean place”, wherein local restaurants, bakeries, and churches represented their family’s culture, history, and community. They were the youngest sibling in a household of Jamaican and Anguillan ancestry. They describe that growing up with such things as a local bakery down the street was important to them, as well as being around others of Caribbean ancestry in a predominantly Black community at the heart of their metropolitan city.

Upbringing and Adolescence

As the youngest sibling, a part of Alex’s upbringing was shaped by their older siblings’ educational opportunities. At the age of four Alex recalls their first relocation to another town nearby which contrasted heavily with their birthplace, consisting of majority middle and upper-class white people. This new neighborhood differed occupationally, consisting of wealthy white families who were doctors and engineers. Alex describes that his older sister, who at the time was in middle school, was in the honor roll. However, the school itself was “testing at some of the lowest levels in the state”. This brought their parents shock, triggering the relocation. Alex recollects their parents explaining this to them as a necessary sacrifice to pursue a better education. Notably, Alex describes, “When my sister came over to the new school district, not only did they recommend that she stayed back a grade, she also got D’s that whole first year that she was in a new town.”

Living within a very different racial and socio-economic background Alex's social and educational upbringing continued to be shaped by their family's closeness and the support of their community. Alex describes their upbringing in a new suburban setting like the hit Nickelodeon cartoon, "Rocket Power". Sports, play, and cul-de-sac games were a frequent occurrence, and Alex's father being their soccer coach displays a continuing familial bond. Alex shares that their relocation period wasn't necessarily far away geographically but the cultural differences of living in an upper-middle class suburb were drastic. They describe still attending the same church, frequenting the same bakery, and visiting family and friends from their previous community often.

Educational Experiences

Driven primarily by curiosity throughout most of their early schooling experiences, Alex found themselves achieving high grades in courses and subjects in which they found the most interest. They were involved as early as the fifth grade in programs like student council and remarked fondly that their father even made buttons to promote their school election campaign. Alex's early educational experiences were shaped by their sister's school transition and family move. Relocating to a different neighborhood and school district meant attending primary and secondary schools that, although with more resources, were very different demographically. This led to some distinct experiences with white children and affluent culture that are often overshadowed:

...The white kids in my schools were wilding. Let me tell you...I got invited to participate in alcohol and drugs when I was in seventh grade [laughs]. Yeah, in seventh grade, and this is what I like to tell people because people like to act like, "Oh like kids in these areas don't know." Like, no, you don't understand. They have way more leeway. Their parents buy them everything. They host the stuff with the parents at home. So that was kind of wild too and I was not with that. I was even a little prude.

In high school Alex remained involved in sports and developed their interest in the sciences through participating in a career and opportunities program in the medical science field. It was expected that they would be pursuing college so this career program being linked to nearby university was no coincidence. Through a close friend of their mother they were encouraged to pursue research in the field of medical science, which would later lead to the development of further interest in the field of biomedical engineering. Alex discusses a significant aspect of this program being the encouragement of minorities to pursue the sciences:

One of the significant things about this is a lot of the research labs that they place people in were led by Black and brown people. So, I met a notable Afro-Caribbean scientist, who invented the term “regenerative engineering”. He is one of the most foremost scientists of the century. He has two awards from President Obama, one for mentoring and one for scientific achievement [laughs]. So, you know, you’re talking about the Obama era, this is kinda the context. But yeah, I just got super lucky that my mom forced me to do that.

Alex recalls being reluctant to join, as some teenagers perhaps would, but remarks that the program led to their love of biomedical science; so much so that they even convinced one of their best friends to attend one of the weekend courses. Coincidentally, both continued to pursue science careers throughout undergraduate and graduate school. Alex and their best friend went on to continue participating in the career opportunities program in the medical science field, following a pipeline towards studying biomedical engineering in their undergraduate studies.

Narrative 1

Each interview began with asking participants to share a story that they believe captures a bit about who they are. Alex recounted a story that fits well with this period in their life as it took place while they were in high school. For background, Alex was consistently involved in sports throughout secondary school. As both a varsity athlete and avid supporter of other athletes they attended other sporting events and often could be found leading the fan section in cheers and

chants. This incident began when a friend of theirs began reciting a chant that Alex describes may or may not (“definitely was not”) appropriate for a school event:

One of my friends said something in retrospect that was very inappropriate and started a chant inside of this fan section. Okay... [laughs] very inappropriate, but it was also a predominantly white school and that was the culture of the school. Anyway, this chant happens - the whole crowd goes crazy - and he ends up getting pulled out of the game immediately. He got pulled out of the stands, removed from the situation, and then he ended up being banned from all athletic events... ever in high school, okay? So, if that tells you anything about how wild this chant was, right?

Alex recognizes in hindsight that whatever words were chanted were identifiably of concern, but that did not change the fact that they and their peers felt that the punishment was in many ways incongruent with the offense:

I took this personally, okay? It just didn't feel fair to me that he was being singled out because literally the entire crowd participated in this chant, right? Granted, the person who starts it, yes responsible, but also like why this? Why a permanent ban from games? So, I'm messaging with my friends trying to figure out what to do, and we started organizing around this in high school.

Alex and their friends mobilized rapidly in response to their friends' disciplinary punishment. Alex wrote a two-and-a-half-page essay about the unfairness of the ban and its contradiction with school policies. A petition was drafted and passed around to the student body, amassing over 400 signatures in less than a day and hand delivered to the athletic director with a demand to overturn the ban:

It failed miserably. He was still banned [laughs], you know, they actually called us into the principal's office the next day and kind of like were chastising us for doing all this and explaining why the ban needed to stay in place and stuff. And again, in retrospect, from the perspective of an educator, I think they were absolutely correct by the way [laughs]. But I tell that story just because, like I feel like it touches on me like going against people in power and trying to galvanize folks around like a shared cause, even when I was super young.

Alex describes during this narrative that a part of their spirit for organizing came from their cultural background:

...My parents had always taught me to fight for things. If you feel like you've been wrong, you fight, you know? I can't tell you how many times my parents have stormed up into my schools, demanding explanations for things. [laughs] And you know, I have a Caribbean background - my dad is Jamaican, my mom is from Anguilla, and I just learned about so many Caribbean people who stood up for, you know, justice throughout my life.

Alex continues to share that they believed this story encompasses well a bit about who they were because they recall gaining somewhat of a reputation throughout school with their friends of being charismatic and justice-oriented. They even remark that they had adopted a nickname, "Reverend Dawes", from their preacher-like approach.

Political Identity and Consciousness

At an early age, Alex recalls to a high degree the presence of identity, culture, and political thinking in their upbringing:

I sat and watched political shows with my dad most nights of my life [laughs]. Like sitting around watching, like Bill Maher, and you know MSNBC or whatever and then talking about it with my dad is like one of my fondest memories with my dad. And he showed us so much media about the state of Black people and like kind of the political realities in America.

Alex describes receiving several messages from their parents and community about their racial and ethnic identity. These messages were often initiated through popular films and shows such as *Higher Learning* (1995), a critically acclaimed movie directed by John Singleton about diversity and racism on a college campus, or *Panther* (1995), an equivocally acclaimed dramatization of the history of the Black Panther Party for Self Defense. Alex discusses that these films were often accompanied with conversations with their family, bolstering both an experience with race relations in the U.S. as well as a political analysis:

He also showed me this documentary called Life in Debt. And it's about how both the US and Britain imposed all kinds of limits on Jamaica's economy and through issuing loans that would end up being like insurmountable debt ended up killing basically Jamaica's economy and any chance for self-sustainability. And he showed us these things really young, right? I have older siblings, so he's really showing it for them and I'm also getting

it but I'm getting it way younger than I should have [laughs] like I remember being traumatized by some of the stuff. All of that to say politics were very, very present in my life growing up.

Alex notes that the presence of political discussion stems from his family's ancestral background coming from the Caribbean. Towards a historical analysis of colonization, messages about racism and specifically anti-Blackness were prevalent and consistent. Complexity remained, Alex remarks, as along with the salience of racial and ethnic identity there existed complicated views and beliefs around assimilation. A form of liberal political thought also emerged:

My parents are, in the environment I was in, super liberal. Right, and I say liberal not in like believing in America necessarily, but liberal as in kind of like some of the practicality that they argue, and also pretty assimilationist being immigrants. So that's the other thing I feel like they took on some of the anti-Blackness that comes with assimilation. And so, I feel like that colored some things, right? Like. They were cool with me partaking in like Black Caribbean things but warned against Black American things. They put parental controls on BET, cause they were showing too much rap videos, you know what I mean?

Theme 1: A Belief in Mobilizing

After discussing their upbringing and early childhood, Alex was asked to engage with stimulated self-thematization of their experiences and narratives shared thus far. They stated, "Yeah, I think I might call that like... a belief in mobilizing. I think that was just me being like, 'Oh, people can be convinced to do things together.' Especially if it's something that they care about."

As Alex entered college at a nearby state university this belief in mobilizing became increasingly applicable. Not only had their interests in pursuing biomedical science developed, but the identity politics that surrounded race and gender were at the forefront of their ideological development. At the beginning of their undergraduate career in 2012, the murder of 17-year-old Trayvon Martin took place in Sanford, Florida. Alex remarks that the similarities between the

neighborhood his family had relocated to, and the area Trayvon Martin was assassinated sparked an evolution in their political thinking:

I think [my politics] really evolved though when I moved away, went to college and well, it first had a real evolution around Trayvon Martin. I just remember thinking about how often I walk around my neighborhood. How people really don't know me there [laughs], how you know I walk around with hoods a lot and I was like literally around the same age. And I was like, damn, I'm no longer going to feel safe walking around this neighborhood. I didn't before and I'm certainly not going to now because what that exposed was just how many people were justifying the killing. It wasn't just about the killing. Parents warned us about the dangers of being Black in a white community, literally my whole life out of survival and warned us about the police and all that stuff, but I think seeing people really justify it felt like a different level - cause now, you understand people are gonna be looking out to be able to act on these same justifications. So that was definitely a really pivotal point for me.

Notably, Alex's early racial ideological development proceeded alongside gender identity. Alex started organizing on campus through programs that mobilized men around feminism, issues of domestic violence, and sexual violence against women. Alex began realizing some connections between stories they had heard from friends and family members who were women and the situations they dealt with and would share with them throughout their lives:

So, I just started connecting a lot of dots and so many of my friends in high school had actually dealt with sexual violence and like I was the first one that they told. I had those experiences and I think it wasn't until college that I realized like, oh, this is a systemic thing. This is by design. This is part of the structure of our society. And so, I was doing that kind of feminist organizing.

Alex's organizing activity and conceptual development led them to interrogate some of the disparities that were present between minorities and access to higher education by highlighting the pathways for undergraduate students interested in classroom teaching and teacher preparation programs. Alex attempted to develop programs that targeted this issue, all the while experiencing development in their political consciousness. The summer of 2014 the murder of 18-year-old Michael Brown in Ferguson, Missouri led to yet another moment of political reckoning:

Yeah, when Michael Brown was murdered in the summer between my sophomore and my junior year, a lot transformed for me. Because that's when I really connected with some of the Black organizing that was happening on campus. We formed like a multiracial organizing coalition, and I was leading a whole bunch of demonstrations and actions on campus literally for the next two years around racism that we were experiencing on campus and police violence and those kinds of things and that's I feel like that's what pushed me beyond liberalism and like just like an inherent belief in America's ability to repair itself.

Towards the end of the first part of the interview, Alex reflects upon this period of their life during high school and undergrad and the U.S. presidential elections and slogans that were prominent at the time:

I was actually just gonna say around that theme, is some of that around Obama too? I feel like that was definitely a message that was promoted with the whole "Yes, we can" thing and the way that Obama promoted his campaign was definitely like a collective action kind of lens that I feel like wasn't as prominent. Granted, I was younger. But looking back at history and like the things I learned about other people's campaigns it doesn't feel like that was as prominent of a message.

Indeed, the electoral campaign of the 44th president of the United States, Barack Obama, the country's first Black president, occurred from 2008-2009. Although preceding Alex's graduation from high school and first year of college, Obama would maintain a political message of "Yes, we can/Si, se puede" throughout his first and second term from 2009 - 2017. Obama's campaign is perhaps most known throughout history for its targeted approach in utilizing the credos of mass mobilization and collective action to inspire the youth vote. According to a report by the Pew Research Center (2008), during the 2008 presidential campaign 66% of those under age 30 voted for Barack Obama making the disparity between young voters and other age groups larger than in any presidential election since exit polling began in 1972.

Becoming a Science Teacher

It was during their undergraduate studies and amidst ongoing mobilization efforts that Alex's pathways intersected with the opportunity to become a classroom teacher. As discussed in

part one, Alex's experiences with the medical science opportunity program in high school engaged them in awareness of educational opportunities within their community and heightened their awareness about the educational inequity gaps for marginalized groups of people. When asked about why they chose to pursue classroom teaching, and specifically science teaching, they stated:

I would blame the medical science opportunities program. So, because of this program [laughs], I had actually done some peer mentoring of younger people as I advanced through it. When I was going away to college, they placed me in a bridge program, one of those programs that preps you for what you're going to learn. So, we were taking our freshman year courses over the summer in preparation for the courses. And that exposed me to the engineering outreach center at my university. The engineering outreach center was mostly focused on getting minorities, I'm using their language - I don't really say minorities anymore, but that's what they called it [laughs]. It was getting, making sure engineering students who were minorities had a good grasp on the school were prepared for all this stuff, right? And I wasn't trying to do this bridge program, at the time, the medical science opportunities program had a separate summer research opportunity for people going to college at the time and that program got canceled. So, they were like, "Hey, that program got canceled, but they got this other bridge thing that you can do." I didn't want to be away from this summer because I was seeing this girl at the time. [laughs], and I was planning on having a very lovely summer before I went to college. And instead, I ended up living up at the university campus for the summer involved in this educational engineering outreach center, right? This is where I met so many folks who end up being like a huge part of my support system. But long story short, this engineering outreach center, they did tons of outreach in other K-12 schools throughout my state focused on getting minorities interested in science and engineering.

Alex's involvement in both the medical science opportunity and engineering program opened pathways for paid opportunities during college promoting engineering education in local schools. Alex recalls the experience sparking both an interest and joy in speaking with school age youth about the sciences.

Driving around, doing activities with kids, making them fall in love with science and engineering. And I feel like that was when I was really like, okay, I really love teaching. And I could see myself doing this long term, you know, and it was specifically about science education like the way that kids' eyes light up. When they see stuff, [laughs] you know, there's almost no better feeling. Like, for real for real, there's almost no better feeling. And I feel like it just stoked so much curiosity.

Coupled with this early experience engaging with young people around science and engineering, a non-traditional alternative teacher education program was present on campus and actively recruiting students. Although some alternative programs are known for their models of fast-paced teacher recruitment, Alex was selected to serve a specific role. Alex recalls the manager at their campus having “a different vision for what it means to engage people around education”, and subsequently Alex was hired to teach people about educational inequity, mobilizing different organizations and teacher education programs who otherwise may not have wanted to work with alternative teacher preparation programs. Throughout their undergraduate experiences, activism, mobilization, and political education seemed to be reoccurring themes in their decision-making and participation:

So, I feel like a combination of those experiences really made me like, okay, like, “Yes, education, but specifically science education.” I can use what I’ve learned about biomedical engineering to inspire kids just like I was and then I was also like science education can be a way that we transform our economy like transform realities for our communities, get people opportunities, this, that and the third because I had that educational inequity lens too so... So yeah, I think those were like some of the key contributing factors around that time.

Ultimately, as senior year of undergrad arrived, Alex was met with the decision on whether to pursue graduate study in biomedical engineering or enter the classroom:

I had already gotten an offer for a full ride from my same mentor that I met in high school who was a notable scientist. He just wanted me to continue, because I was doing research through college too, he just wanted me to continue into a PhD. He was like, you already have years of research under your belt. Come get this money. Do this, right? But I was also super involved in the education sphere. And I felt like I wanted to teach in the classroom. Because I knew I wanted to be like a college level professor. But I felt like if I did my PhD, I was never going to get a classroom experience, you know?

So, I was really worried about that and just like not being a good enough professor because I never taught in a classroom. And I, and I heard from so many people, teaching K-12 is what’s going to best prepare you to be a true educator. We know there’s so many professors that don’t know how to teach. I was also auditing classes at our school of education during undergrad. Cause I had so many connections with those professors and that was a really cool, like, preparatory experience that I had, and I was

also considering just staying for the fifth year for the master's in education. So that I would be truly prepared [laughs].

Teacher Preparation

Alex chose to join this alternative teacher preparation program straight out of college with the incentive being that the program offered opportunities to prioritize teaching in one's own community and partnered with local school districts to secure placement after the preparation program ended. Alex attended a summer institute in a nearby large metropolitan city in the northeast, wherein further transformative experiences around educational inequity persisted. Notably, in many metro cities, the advancement of charter school networks caused tension between neighborhood public schools and private schools. In the U.S., metropolitan cities consist of some of the most racially segregated school district policies in the country (The Century Foundation, 2022). Although Alex's summer institute wherein teacher preparation took place was rather brief, they still found time to engage in notable collective activism surrounding the 2016 murder of 32-year-old Philando Castile in Saint-Paul, Minnesota.

They share a brief anecdote about this experience organizing as well as having mixed feelings about activism in an area they were unfamiliar with:

Yeah, and when I was in institute actually, I believe it was when Philando Castile had been murdered and, you know, folks had already known me for doing student organizing and stuff like that. So, folks were like, 'We gotta do something. We gotta do something', and I was like, bruh, [sighs] you know, I was just kinda exhausted and jaded. I had been just coming off all this student organizing, but I decided to host a rally. We were staying at a nearby university campus at the time. So, we hosted a rally. Which I had a lot of mixed feelings about actually because I was like, this is a bunch of people here from across the country. We don't know the city like that. Like, I didn't feel like it was a good idea.

But also, part of the reason why that particular summer institute was so Black is because all of the nearby city placements were like, super Black [laughs]. You know, so I would say probably like 30% of the people there were Black and so those folks were like we want a space to come together around this and we, you know, obviously we care so.... we decided to host a rally. It ended up being like hundreds of people that pulled up. And folks were just so activated around police violence that they were like, 'We want to

march!', and I wasn't planning on marching in a city that's not my, you know, like, [laughs] but some of the folks who are there or who are actually from the city were like, "Yeah, we want to march." Let's do it.

Alex shares that the rally consisted of several miles of marching, leading into the downtown area of the city the summer institute was held in. Their march merging with other nearby rallies reinvigorated the atmosphere of protest surrounding anti-Black police violence. Alex recalls the march gaining local media attention and radicalizing members of their program cohort around social justice issues. It was also mentioned however, that there were some contradictions that arose between this experience and that of preparing to become a classroom science teacher.

Within some alternative teaching programs, the preparation component exists within a notably short and intensive period. This program would match pre-service classroom teachers with summer school programs, something Alex discusses their thoughts about in detail. In particular, Alex drew inquiry surrounding the decision-making to utilize students who were in need of academic support for the purpose of training new teachers:

Something else really significant that happened during that institute is... so we were teaching summer school. That's the way the model works, it's over the summer, so you pull up to these schools and you teach summer school and you're getting trained but also the kids do need to learn to get prepared. Which I see as sacrificing a huge important educational opportunity for these students to be with literally untrained teachers, right? So, there's a problem behind this. But one of my students, I was teaching seventh grade science over summer school, and one of my students' close friends was murdered in the city. And he came in the next day - It was a couple of them who were upset - but one of them in particular came in shaking, and he was acting out... and this is someone who I had really started to build a really good rapport with... and I just like ended up shutting the class down and letting folks talk about it.

And then, you have a supervising teacher who's from the actual school who stays with you, right? And she was so mad at me, bruh. She was so upset that I shut the class down. She thought I should have just reprimanded this student. And. I was just like, bruh, I know I'm new to this, [laughs] but I don't really care if ... she was white too..., I don't really care what you're talking about right now. Honestly, like you haven't even acted like you cared about these students at any point throughout the summer. But that also just like, I don't think I was really thinking about what to do when kids are coming in with

that level of like recent trauma, you know. They talk about trauma-informed education, you know, these kids are coming in with a lot of experiences. It's different when yesterday somebody got shot and they still report to the classroom the next day. So, I feel like that was really like a transformational training experience.

Alex would go on to complete their five to six weeks of training. Although they felt concerned about the limited amount of time preparing to be a classroom teacher, the alternative teacher education program they were a part of had a coaching system that provided continued support, materials, and access to teaching alumni networks. In comparison to what they had heard from other educators, they felt relatively supported in their transition into the classroom. Alex did mention however that they felt somewhat less prepared when it came to the “teaching mechanics”, as friends and colleagues who were trained in traditional education programs were more likely to learn pedagogical practices, theories behind them, and have opportunities to practice them extensively through practicum courses or mediated experiences with students in classroom settings.

Approach to Science Teaching

Owing to the system of the non-traditional alternative program they were prepared in; Alex's first school placement would be in a nearby and familiar metropolitan area in the state in which they were raised. They would teach middle school science for two years at an independent charter school founded in the 1990's. The school itself was founded by an activist in the community who themselves recognized education inequity and subsequently became a school with close ties to the community and a relatively large amount of Black faculty and staff with “99%” Black students. The middle school was one of two, split into an academy system, with the one Alex worked at prioritizing science, technology, engineering, and mathematics (STEM). Alex primarily taught seventh and eighth grade science courses, and describes themselves then as a “charismatic, energetic, young educator” working in a school culture that felt like the ABC's

2021 hit mockumentary sitcom, “Abbott Elementary”. In addition to the four periods of core subject-area classes they would also teach special courses and an advisory period as a part of their ordinary school day.

Narrative 2

I asked Alex to share a story about their time working as a classroom science teacher.

Interestingly the story came from a moment they were not necessarily teaching science:

There was a day when all the girls at my school were gone because they were taken out of the school because they were taking them to see Hidden Figures. Why they were only taking the girls - I don't remember. [laughs] I feel like it was a good story for everybody, but all the girls were gone. Okay. So, they're like, Mr. Dawes, Mr. Dawes, are we still gonna have class? I was like, “We're not gonna have class, but we are going to talk today.” So instead, I did more like an advisory period all day with my boys. Right? And we ended up, instead of, you know, because the context of the day was like they were going to watch Hidden Figures. So, I was like, okay, so let's talk about what women experience in STEM. We're in a science class we're talking about Black women not being appreciated, respected, this, that and the third.

So, I showed them like a video I think that was like 20 min long or something that basically goes through the statistics of like women in STEM, specifically Black women in STEM, and then some anecdotal narrative stuff about what their experiences are like and then I had a discussion with my students about - does any of this feel familiar? Have you noticed any of these dynamics in our school? It was a STEM charter school, right? So, I was like, “Have you noticed any of these things in our classroom around folks not believing that they can do this and how does this compare?”

At this point Alex describes more context about the demographics of their classroom and the school at large. The student population being majority Black meant that some of the top performing students were Black girls, who as Alex recalls “were hugely disrespected amongst their peers”. Because of the field trip, the normal classroom size of 14 or 15 students was combined to twenty-five to thirty from the seventh and eighth grade. What transpired was an incredibly heartfelt idea from one of the seventh-grade students after learning from and discussing experiences of Black women in STEM:

So, I wanted them to figure out an action that the whole class could do together. And this did not come from me, I promise you. One of my seventh graders suggested, “What if we

write notes of affirmation to all the girls and leave the notes on their lockers before they come back.” Right!? And I was just like, “Wow.” I was like, “We can do that!” I got index cards, I got posters - that’s easy work. So literally I put on some music. We sat, they were pretty quiet throughout it, and they’re just like writing all kinds of notes like you - “You are a queen, you are amazing, you’re super smart. Don’t let anybody try to take your power away.” This, that in the third, and then all the boys were super excited because I let them run around.

All the boys like ran around with tape and these notes that they made and posted them on their lockers. And then when the girls came back from their field trip. I let them record kind of like, you know, the reactions basically. And the girls started crying when they came back. It was such a beautiful, picturesque moment like I literally couldn’t have planned it any better than that. And of course, they went back to disrespecting and stuff [laughs], because they’re middle schoolers but at least we were able to reference those conversations and also, I think they just developed a different sense of like community, beyond that, you know. I think the jokes changed and were more like a little less cutting after that conversation that we had.

Alex’s approach to science teaching evolved throughout their time in the classroom. They describe having autonomy in their early development of both curriculum and pedagogy, in some ways they stated, “maybe too much [autonomy]”. They were hired alongside three other novice classroom science teachers at their school, as everyone else had left the year prior. During their first professional development week in preparation for the academic term, they were sequestered from other faculty to develop the fifth through eighth grade curriculum based on the Next Generation Science Standards. Without examples, they spent the entire week producing curriculum and lesson plans:

Luckily, like I said, I was a part of a network of other teachers who taught science in the area, and I started collecting curricula from other science teachers. The issue was the curriculum wasn’t tied to Next Gen; they were tied to the old state science standards. And so, we needed to do a lot of shifting and remodeling, comparing the old standards to Next Gen and figuring out, okay, so this lesson lines up with this next chance standard, this, that and the third.

The small team of new science teachers would pool their resources and develop this curriculum, and Alex would include several cross-connecting approaches to science teaching that utilized their early education experiences, training in educational equity, subject matter

knowledge from their undergraduate career, and inquiry and project-based learning strategies that inspired interest in broader topics in scientific content knowledge:

I think the approach that I had was definitely trying to make the content matter. I was very like trained in like leading with phenomena so you know, where you start a unit or a lesson arch with phenomena that's going to really grab their attention, make it interesting, and this was promoted by Next Gen too, but taking the phenomena and really stoking their curiosity and excitement that I often did like a question formulation technique where students could brainstorm questions that they wanted to answer over the course of the unit and I could be like, "Okay, these are questions that I have in the curriculum already, these are ones that are not in the curriculum, but we can find ways to get to them." This is how I started literally every single unit.

Alex's approach to science teaching involved reflection, goal-setting, and opportunities for students to acknowledge and investigate their improvement. Students in Alex's courses would perform pre- and post-unit reflections with opportunities to test into an advanced placement section wherein they could focus on extended learning activities and independent projects. Alex recalls that his idea came from his own eighth grade science classroom learning.

Alex describes involving a social justice lens to their approach throughout their years as a classroom science teacher, each unit including "some sort of social justice, broader picture, or broader impacts" between scientific content knowledge and society. I asked them to expand, wondering how this might have felt to implement over the first and second years of their early teaching experience:

I think my second year I just got a lot more comfortable framing things with the social justice lens. I think my first year I was just trying to not ruffle too many feathers or whatever. My second year I was more like, 'Okay, if we're gonna do this, then we're gonna do this for real', and the first year I was doing a lot of conversations through the advisory period I had. My students just had so many life questions and so we would talk about things in that space. Second year I was much more intentional about making it a part of the phenomena that we were talking about.

So, for example, when I'd covered genetics with my eighth graders the whole unit was about birth certificates and sex differences. So, this is how I introduced it, 'What is the difference between gender and sex?' This is how I introduced how sexes are formed.

This is how I introduced being intersex, we talked a lot about being intersex and how that happens scientifically and then also what are people's experiences when they are intersex in our society. So, when I say the whole thing was about birth certificates, the main question was - "Do you believe that people who are intersex should be able to change their sexual identity on their birth certificate?" And they had to form like a persuasive argument around that using their knowledge of science.

I was very interested in this approach because it conveyed both utilizing cross-cutting concepts but also reaching far beyond the requirements for middle school grade level learning. Given Alex's life history and story-telling this approach was on-brand with their upbringing and early educational experience consistently having an approach to social identity, activism, and resistance. I presumed that this type of social justice-oriented pedagogy and curriculum that I would engage in my own classroom often led to some residual and often challenging conversations. I inquired further about how it was received by students, parents, staff, and other faculty. Alex had this to say about the genetics unit in particular:

Some of the parents were a little upset about this - some of the *students* [emphasized] were a little upset about this. And I explained to both of them, I was like, 'Look, they're not being graded on their opinion. They can say no. They just need to justify it by showing an understanding of the sides and I'll be fine with that.' We're trying to teach persuasive thinking and persuasive writing and an understanding of the science behind chromosomes and all those things, right?

So, I think that's an example of how I tried to integrate some of these conversations, you know, I pulled articles about birth certificates and all that stuff that the kids were reading. So yeah, I think that's what I mean by like things evolved a little bit because during my first year I wasn't doing anything like that because I just wasn't confident enough about how to shape the unit around something like that, but yeah, I think they liked learning about what's happening in society in general. And of course, they're Gen X kids too so they had the social justice warriors who were like eating it up to and you have the conservative folks who are like, I don't believe this. I'm like, 'That's cool. You know, we have space for that.'

Alex would teach throughout the years of 2016 and 2018, with the summer of 2016 being their teaching preparation and placement in the middle school science classroom they would spend their career. By November 2016, the 58th presidential election was held between former

Secretary of State Hillary Clinton and celebrity businessperson Donald Trump. After a controversial race, the Donald Trump went on to succeed the 44th President and first Black president of the United States, Barack Obama. Alex recounted this political event, and as well their continued political ideological formation, evolving during a time when an outspoken white supremacist, xenophobic, bigot would become Commander in Chief of the nation. At a school setting with a majority of Black students, a significant of whom having experiences with anti-Black immigration policy, Alex reflects on what it meant within their role as a classroom educator to meet the moment:

I think my ability to meet political, big political moments, with a certain amount of emotional presence is what really evolved when I was a teacher. I think my tendency towards the rallies, the big public things, you know, demonstrations, the fighting back stuff had been there before but how I show up in care for a community is what really developed as a teacher because you're so a part of a community, you know, I was living in the city I was teaching at the time. You're just in it. You're in it in a different way. I remember I didn't teach the day that Trump was elected.

My students just were reeling, a lot of them were immigrants. They were like "Is my family gonna get deported?", that kind of stuff was coming up. And yeah, they just wanted space to process. There's definitely a theme here, by that I mean not teaching [laughs], but also, yeah, I was thinking there would be a moment where something political would happen and my students would come in not ready to talk about science, you know. So yeah, I think [my political views] definitely evolved, and I think I also just got an understanding more about local organizing when you're a student organizer and you're organized around like student issues, you're kind of disconnected from the broader environment outside of that school environment.

Perhaps as a result of an increasing awareness of involving themselves politically with the local community, Alex would begin attending local meetings of the board of education and learn more about local politics and investigating how the dynamics of school systems and segregation impacted policies like school funding. They would become more involved in community advocacy around the closing of a historically Caribbean neighborhood school, one which their father attended, that was chosen to be shut down and turned into a charter-magnet institution. Alex would learn more about disability justice, disability funding, and the inequity of

resources afforded to students with accommodations throughout their teaching career, and in a short time in the classroom equip themselves with critical thinking surrounding their students, curriculum, and community that engaged politics.

Theme 2: Connections through Humility

Much of their developing political and social ideology would also come from their relationships with students in their classroom. Alex shares a narrative surrounding an interaction with one of their students with whom they had a substantial amount of rapport. He denotes this story as having a particular effect on his transformations as an educator and activist:

I don't remember what we were doing, he was one of my students who just acted a fool very often, very super rambunctious like, his personality was basically like Desiigner¹¹, you know, and he would sing 'Panda'¹² a lot, you know what I mean? They were very comparable in some of the chaos there. Which in retrospect looking back I really love, I loved him. But, also, it was pretty disruptive, right? And I was upset, this was in my first year of teaching and I really didn't have a handle on classroom management stuff in the way that I needed to. And you know, I was giving him the good old classic Black American, 'If you act like this out there, then society is not going to treat you the same as I'm treating you!', this that, and third, like, you know, 'They're not going to be as forgiving!'.

And I will literally never forget this moment, he said, 'Mr. Dawes, just because you're Black and just because you're young and just because you're Caribbean, it doesn't mean you understand us. You're not even from here.' That's what he said. 'You don't understand what we're going through.' That's what he said, in front of everybody. And he's screaming this at the top of his lungs. And it just, like, hit me in my chest. You know, it's like something that you know.

But I had been riding on those similarities to build a rapport. You know, I had just a very different relationship with my students than a lot of the other teachers that were in my school. They used to call me Uncle Dawes when I was teaching [laughs]. And which I was like, this is blurring some lines, but whatever, you know, like I would show up to my students' parents like repasses and stuff like that and I feel like I was just riding on those, like, kind of cultural things that we shared. And he really checked me for that, and I feel like I really needed that as a reminder, like, it doesn't matter how much you relate or how much you have invested time into this community this, that and the third. You need to remember that there are differences here that are important. And I feel like that really shaped how I show up, like, politically too. And not getting too comfortable, you know, and kind of respecting that. And maintaining a certain level of humility. So., I think that was really important [laughs].

¹¹ **Desiigner** is an American rapper, singer, and songwriter.

¹² "**Panda**" is the debut single by American rapper **Desiigner**.

For the second time during this first half of the interview, Alex was once again prompted to self-thematize their experiences. They go on to share the following reflection which in many ways connects their social and political ideological development to their classroom teaching experiences:

[pauses] Hmm... maybe it is about the humility. I'm thinking something like, like "connection through humility" or something like that. I don't know, I think being a teacher humbles you. You know, in a really great way and yeah, it teaches you kind of like how big the world is in a way. I feel like I would have never, like, had the rapport I had with my students if I wasn't both humble and also able to be humbled more, you know? It was so important to let go of that like power, power over somebody else, in order to have the kind of relationship I wanted to have with my students, so. I don't know. I think I sacrificed a lot; I sacrificed being able to squeeze a little bit more learning out of them or whatever, but I think in exchange I have lifelong relationships with my students who still email me. I had a student last year send me his report card in high school. This is someone who was failing consistently and was expressing that he didn't care and he's like, 'Look, Mr. Dawes, I got all A's in science class.' You know. So, I feel like because of the humility, I was able to really connect.

Working Conditions and Decision-making to Leave the Classroom

As a belief in mobilizing and developing connections through humility resound thematically throughout Alex's life history, educational experiences, and entrance into the workforce of secondary classroom teaching the third and final part of the interview turned towards the specificity working conditions throughout the two academic years of their teaching career: 2016-2018. Alex's classroom teaching career would consist of impactful relationships with students, staff, and other faculty alongside working conditions which in contrast would lead them to consider leaving the profession. During the demographic and preliminary questionnaire, Alex indicated that during their time in the classroom they faced heightened cognitive and emotional labor, concerns about policy and safety, microaggressions, increased workload and surveillance, lack of administrative support, and behavioral management. Ultimately, their decision to leave was a mixture of compensation and working conditions. They stated during

their preliminary questionnaire, “With the time and labor demand, the pay just didn’t make sense. I ended up leaving for a PhD program but absolutely would’ve considered continuing to teach if I thought I could make a comparable living to a biomedical engineering career.”

Working Conditions: Relationships. Alex’s description of the school culture of their STEM academy charter middle school familiarized itself to that of Abbott Elementary, a popular hit TV show that casts comedic and dramatic light on the plights of public-charter school personnel and their relationships. The school itself was founded by an activist in the 1990’s, consisting of a staff that was mostly Black, a student body that was predominantly Black, and an off-site school administration that was primarily focused on test scores and school performance. Alex’s introduction to the administrative structure of the school began as soon as their interview with what they recall as the CEO (“I don’t know, the titles in charter schools is weird, but whoever the head honcho dude was...”) who also was a descendent of the person who founded the school. From the administration to the relationships among faculty and staff Alex describes, “It was kind of like a family environment.”

Alex discusses relationships with students, staff, and faculty as overall supportive, “down to the custodial staff down to the secretary.” They do however note that the relationship with administration was tense:

Their offices weren’t in our building, they were off in a different area. They were obviously very focused on, maybe not obviously, very focused on test scores and performance. But did not really have a lot of expertise in teaching and education. Like, we were not really respected or seen as educators that knew what they were talking about.

Intimate and supportive relationships could also be seen throughout their time in the classroom and interactions with parents and community members. Alex recounts even being supported by their schools on-site administrative leadership regarding their approach to science

teaching and involvement of social justice in their curriculum. While including conversations about gender and evolution in their biology units, they recall:

A couple times, not too often, I had support from the principal and dean in my school who understood social justice stuff as an asset that I was bringing to this school. So, I was really grateful for that. Cause I think if I was at a neighborhood school, they were literally just giving a curriculum and being told like, ‘Do this’ [laughs], you know. So yeah, I got lucky in that regard. I had some defense, but my principal, mind you, was constantly beefing with the administrators for teachers. From them trying to control things that we were doing in the classroom. So, there was that kinda relationship and like camaraderie within our building. So yeah, I think she probably protected us a lot.

Alex’s relationships with students, as described briefly in their thematization of “connection through humility”, was recognizable both inside and outside of the classroom. With a familiarity of the surrounding community, Alex found themselves becoming more involved with students, their families, and their interests. Students knew that they were involved in sports throughout their lives, so they pleaded for them to oversee extracurricular activities. Their prior involvement in STEM outreach programming facilitated programmatic collaboration with robotics activities, leading to a school victory in a regional competition. Alex recalls these moments fondly, stating, “Yeah, it was the first time a team from this large metropolitan area ever won in the state [laughs]. It was a team full of Black kids, of course, so that was really a beautiful moment.”

Working Conditions: Facilities. Alex’s workday consisted of six periods a day with four core classes, a special class, a forty-five-minute planning period, and an advisory class. A part of their day also required a rotational staff obligation, such as monitoring the cafeteria or the hallways. This small amount of time to focus on classroom teaching resulted in a feeling of being understaffed, adding to the tensions with school administration. Their classroom itself was in the basement of the building, adjacent to the cafeteria. With no windows, elevated foot traffic, noise volume, and a high likelihood of extra students stopping by during their lunch period, the facility

of their science classroom proved to be a challenge as it was not a room with adequate science teaching equipment:

And then in addition to that, my classroom had a stage like, I think the whole room used to be one of those spaces where you have a stage on one end, like, a big gym slash multi-purpose and they divided it by putting a wall up. So, I had a stage in the back of my classroom, which was a huge safety risk, right? Like kids used to be just running up and down there, this, that, and the third ... So, when I thought about the working environment these were the things I thought about. I was like, I didn't have service because I was in a basement. Oh, the noise, the students coming in and out. The stage situation. The physical environment was a lot for sure. But again, this building wasn't necessarily designed to be a school in the way that it was. It was repurposed that way.

Labor and Compensation

The physical and cognitive labor while working as a science classroom teacher was taxing. Alex commented, "I don't think there's ever been a period where I've worked as much as I did when I was teaching. And I've had three jobs most of my life [laughs], but it was just a different level of intensity having to work outside of school." At one point they would be working full-time as a classroom teacher and holding a Saturday job with the medical science opportunity program they were a part of during undergraduate study. Alex describes this strenuous schedule:

I was literally just like working around the clock pretty much from like an hour when I got home to like, you know, figure out food or whatever, I was just working and working till I fell asleep. Then on the weekends is when you catch up on grading, you know. So that was definitely extremely difficult, and I realized like the hours here are exponential. I was also teaching the Spanish club for kindergartners through second grade. I was coaching our soccer club, as well as basketball. So, I was also just doing a lot of stuff at the school outside of the normal situation, but I also felt like... yeah, the students just wouldn't have had any of those things going on. Because it was the way that those clubs worked was that teachers had to volunteer to do it, they just didn't have enough support, so that's why I ended up doing all that. But even outside of that just like the workload for the classroom stuff was just, like, ridiculous.

I asked to what extent they believed the working conditions and inappropriate facilities might have to do with the type of subject they were teaching in comparison with the courses that were more attached to standardized testing such as mathematics and English language arts:

I mean, I think the reading and math classrooms were the real classrooms, the ones that were really set up for that. Now, you know, maybe they put me back there because there was a sink in there. I don't know, but the room was like a shared space. Chile, it was shared for the specialist classes, so the music teacher also used that room and also the music, all the instruments, all the music stuff was stored in my classroom, because that's when they learn music, so they're using my space as probably the more multi-purpose kind of situation. Yeah, absolutely and it definitely contributed to the working conditions too because the students didn't see it as a science classroom that always looked the same and this, that, and the third, everything has its place. We were so often moving things around to accommodate the different needs. They used to have like, like night meetings for some group in my classroom as well. So, I just came back, and it just was arranged differently. Gotta put the tables back [laughs].

Political Activity

While navigating the extensive workload and off-putting facilities of the building, social and political events happening outside of the school building influenced Alex's working conditions as well. Locally, school closures were happening around the large metropolitan area in which they were teaching with more traditional neighborhood schools being turned into magnets or charters that attracted students and families with targeted educational goals. Alex felt it was their duty to be organized with other teachers in the communities that were in neighborhood schools, and recalled it influencing their working conditions:

I think, [sighs], my administration definitely caught wind of me not being like a charter champion. They definitely tried to send us to meetings, meetups, conferences among other charter schools and stuff like that. And I found that the culture between charter schools and the city and non-charter schools were definitely a little divided, you know?

Those tensions were definitely very, very present. I felt like what was happening around wages at that time was a big deal too, because I knew other folks from other schools from my alternative teaching program. I knew that us first year style teachers in these charter schools are being paid almost \$10,000 less than the neighborhood schools were. So, I've started talking to other folks at my school about that [laughs]. Like, why is it that that's happening? We're being asked to do more; we have less break time or being asked to do more professional development. You know, it was kind of weird because you

like to hear stuff like working at charter schools is so much easier, you have less surveillance and all this stuff and that didn't necessarily feel like it was the case comparing it with some of the things that folks at neighborhood schools were sharing with me.

Alex's organizing effort and political activity ramped up around the 2016 presidential election campaigns of Trump and Clinton. While they were teaching they would contribute to collective actions such as buying empty seats at Trump campaign events in the area, rallying outside of the convention center (which escalated into a "bit of a clash"), and vocally advocating for neighborhood and community school policies that resisted charter expansion. As Alex discusses, there were challenges to separating the presidential election campaign from their experiences as a teacher. Although teaching in predominantly Black school setting, the type of conservatism that reached across both aisles of electoral politics could be find in the daily conversations with their students:

I had my students asking me about sex and like having a desire for sex education that the charter school refused to supply, they didn't have a class. And I made the tough decision to talk to them about it during my advisory period. And I told them that we could only use scientific terms so that we could say we were studying because we have a body systems unit, right? So, I was like, you know, if we say we're doing reproduction in body systems and stuff like that, I think I'll be okay. Let's just make the conversation about that [laughs]. Yeah, but yeah, I think some of the conservatism that can kind of run through charter schools were definitely precedents as well.

Social pressures also contributed to their working conditions, especially when it came to creating space for conversations about topics made controversial due to conservatism and the increased surveillance it requires. As a classroom science teacher experienced in biology, medicine, and the natural sciences social topics that centered sex and gender education had now come up multiple times in the interview. I asked Alex more about how these types of conversations and lessons affected their working conditions:

I did have some calls from my parents. I don't think it was that one, but I think it was when we were talking about the birth certificates and stuff like that when we talked about

evolution too. I got some calls about that as well like, ‘What are you, what, what are you teaching my kids and why? We don’t want them to learn about this stuff.’ And I just explain to the parents, ‘Whether you want them exposed to this now or not, these kids are going to experience these things in the real world. They’re asking me about them.’ And you’re not really probably going to like it. Be able to prevent them from at least thinking about it, you know? And that’s why I’m talking about it because it’s already around them. If it wasn’t ever going to be relevant to their lives or anything like that, then I’d probably think I have a less strong argument for introducing things that are helping them understand stuff, you know? So, I did have some difficult conversations about that.

Deciding to leave the profession.

Alex’s preliminary questionnaire indicated that a dominant part of their decision-making to leave the profession was based upon comparisons of the compensation and labor of working in the biomedical science field as a professional scientist and as a classroom science teacher. Throughout their early education experiences, their interest in professional science work was clear throughout their undergraduate career as working with several opportunity programs and having a notable mentor in the field of science offered clear pathways to graduate science education. Alex states that they never intended on remaining in the field of classroom teaching their entire career but wanted the classroom experience before pursuing a degree in higher education and potentially becoming a professor. Of several factors influencing their decision-making there would come a point ultimately when they would leave the science classroom. At this point in the interview I asked them to share a story about a time when they began thinking, “It’s time to go.” Alex’s story-telling begins interestingly enough at the point they decided to enter the classroom in the first place:

When I decided to teach, I didn’t talk to my mom for like three months or something like that. She was really upset with me. She said I was throwing my life away. She’s so dramatic [laughs]. She wrote “Dreams deferred”, and me getting a PhD on a piece of paper and burned it. Okay. So, this is where my mom was at emotionally when I decided I wasn’t gonna go to grad school and I was going to teach, and her worry was that I was never going to turn around and go back to grad school and I pursued my education in that way.

I didn't feel like that was a worry because I knew I wanted to be a college professor and it felt like I had to do grad school in order to get there. But she was super worried. Over the course of teaching, I feel like within six months of it I was like, I could definitely see myself doing this for the rest of my life [laughs]. You know, like it wasn't even there wasn't even a question and like I thought I still to this day I tell people like if I could have seen myself really being able to make a living doing that I would still be there, and I never would have seen graduate school. I never would've fussed with any other parts of my life because I was really having a great time doing it.

It is not uncommon for members of the teaching workforce to have interest in other professions. Workforce development and retention programs for classroom teachers especially provide incentives to convince novice and early career teachers that teaching is a noble and worthwhile occupational pursuit. However, it does not seem as if Alex necessarily required these incentives - an interest in educational equity, passion for the sciences, and interest in working with staff, faculty, and students that shared similar backgrounds might have been sufficient. Alex described his rekindled interest in looking at graduate school programs as an initial product of curiosity:

The fall of 2017 was I guess when I started really looking into schools again and stuff like that, I was starting to feel like I was losing my sharpness scientifically. I was starting to feel like I wasn't being challenged intellectually in the way that I wanted to be and I kinda missed knowing about cutting edge stuff. I felt like the information I had was becoming outdated. And when you're doing research, you're at the cutting edge of whatever's happening, you know? I was talking to my students about that - we were in the body systems unit at the time. I remember I was just like, "Wow, I actually don't know what they're working on right now. I kind of miss knowing that."

So, I think that curiosity made me start, cause I was really considering not going back to grad school, it felt like it was going to be this huge chunk of my life where virtually I was gonna get paid the same as I was when I was a teacher, in fact less than that [laughs]. And I didn't know that I needed it anymore. I was like, 'I'm enjoying this.' I enjoy teaching enough where it doesn't feel like I need to go to grad school or become a college professor to be happy, you know? Yeah, but I think that like I feel like that desire to sharpen my mind some more is really what like pushed me over the edge into doing into like applying versus not applying and then once I got into that process then, yeah, I felt like that's when I like started to have conversations with my students.

Retrospectively, upon being in graduate school and doing research again, they recall:

I just wasn't as passionate about it, as I thought I was going to be. And I think teaching is a large part of that. Like I just missed, the classroom and I were back doing cutting edge stuff again, but that didn't feel as rewarding as it did before. I don't know. But, but yeah, that's where my head was at, right?

Alex might have had several internal and external pressures throughout their time in the classroom that prompted them to leave the profession. In addition to their mother's feelings about them attending graduate school, their opportunities in a biomedical engineering career were still prevalent. Because they remained close to both the area they were raised in and attended undergraduate study, they kept in close contact with former colleagues and mentors at their university. They would visit and receive advice about falling into a comfort zone in the area and recommendations about learning more and growing in different environments. They seemed conflicted at this point in their storytelling, considering the feelings they had then and currently about their eventual move from the northeast U.S. to a large metropolitan city in the southeast of the country to attend graduate school:

Yeah, honestly to this day I don't know if that was the right decision. Cause you do learn more when you like to move away from home and this, that, and the third but I think now where I'm at with it is like...I don't know. Sometimes you don't need to learn certain things. Moving to the southeast has been very, very hard for me, consistently. And not just because of grad school. So. So yeah, you know, I sometimes wonder if I had stayed, stayed connected to the school and stuff like that, what types of different things would I have been able to build in that community that I'm more familiar with.

While looking for graduate school programs Alex had made the decision to leave classroom science teaching and began announcing their choice to staff, students, and their community. Notably, the school staff's small community was supportive. Alex received somewhat more complex messages from their student's parents who were inquisitive yet proudly supportive of their intentions to pursue higher education and a Ph.D. To this day, Alex warmly comments, their parents still bump into their students' parents in public. Enthusiastically, they

ask about, “Are you Mr. Dawes’ Dad?” Alex’s parents still share their interactions - inquiring about how they are doing and how their career has fared since leaving the classroom.

The most emotional response came from their seventh and eighth grade students, especially the seventh-grade students. Alex shares how this conversation went with this group of students and how they chose to respond in the moment by offering consolation that their student-teacher relationship was not coming to a definitive end:

My seventh graders were distraught. They were also, you know, they’re seventh graders, so, they were also just like emotional on a different level, that specific class of seventh graders were collectively more emotional than any other group of kids that I’ve ever worked with, you know? And it wasn’t because of the age. It was just like where they were and they were super vulnerable with each other too, which I thought was really beautiful. A lot of them were like each other’s playmates since they were kids, that kind of thing, so I think that was part of it, yeah, they were really upset.

I told you that was the group of kids that used to call me Uncle Dawes. And I explained to them though that I wanted to be a college professor and I was like, “You know, I’m doing this work here and when folks like you and folks like me go to college, they also need teachers like me, you know? I needed teachers like me when I was in college, and you know, I liked to encourage you all to get there but also what’s going to happen to folks like you when you get there? And they were just like, “Hmm, I guess that makes sense.” And I was like, “Yeah, by the time when I finish up my PhD, I could even be your college professor - how awesome would that be?” And they were like, “Wow, like, they’ll be so cool Mr. Dawes.” You know, so I feel like I kind of tried to soften the blow that way. But yeah, they were really upset. They were super upset. But they were also really excited for me, and I explained some of the research I was interested in doing and they had known about this because I talked extensively about it.

The off-site school administration with which there were tensions throughout Alex’s time in the science classroom were not also pleased with their resignation:

My school administration tried to offer me more money to stay, and they were really not happy with me leaving. That’s what I forgot to say. They were not really having me leaving it was all like we’ve invested so much in you when you do so much at the school, this, that and the third... like [laughs]. Yeah, actually, as a gag amongst me and my folks in my building, the letter of resignation that I sent, I put like a rose emoji on it. Like that’s how tense our relationship was - that I sent an emoji on a resignation letter. But yeah, things were not good at that point. But things had already tense been between me and them, you know, for other reasons. So yeah [exhales], but you know I had the support of the school community [laughs] which was always important to me.

Critical Incidents

Before moving forward in the interview, I wondered whether these mounting tensions escalated at any point during their time in the classroom. I asked Alex about this tension in conjunction with their decision making to leave the classroom. I introduce this critical incident because it is chronologically where it appeared during the interview. Critical incidents shed insight towards not only the maturation of challenging working conditions and difficulties throughout the occupation, but irregularities and peculiar events that consist of heightened emotional, cognitive, and physical labor above what was already abnormally elevated. Alex goes on to share their third and final narrative of the interview, an incident that occurred with a student in the school in need of dire assistance. This story was in response to the question of whether there were any moments during Alex's classroom teaching during which they knew it was time to leave. The following transcript is written as dialogue because this was one of the first times I unmuted to clarify out of sheer incredulity as the story was being shared.

Narrative 3

Alex: Our school had one of my children, one of my students arrested basically. Because of the protocols that they had. He had like, he had like pushed a teacher. He was hiding throughout the school running around, and he was running around with scissors. This is someone who had a lot of things going on like a lot of flare ups like this basically. But he ended up running into my classroom, I told you kids ran into my classroom a lot. And we had closets in there, that locked, he had locked himself inside of one of the closets in my classroom.

Interviewer: From the inside?

Alex: Yeah, on the inside, yeah. Yeah, and he had keys, but he took my keys off my desk, so I couldn't get in. So, all we knew was that he had had an altercation with the teacher, that he was clearly in distress for some reason, ran into my classroom with scissors, and locked himself inside. And he starts, starts threatening to harm himself. And myself, we cleared everybody out of the classroom eventually, because folks came, like, you know, and then it was just like me, the dean, we both had really good relationships with this student. And I just remember being so distraught, like, that he might even think about

doing anything like this. But yeah, after a while we were able to convince him to open the door and this, that, and the third.

And usually, the protocol for this is like, you ride in the ambulance to the hospital because since he was threatening self-harm he had to get evaluated. But the first responders were police. And they came and they were trying to put handcuffs on him, and they were trying to have him ride in the squad car instead of the ambulance to the hospital. And, you know, we got into it with the police, you know, like, he wasn't even threatening to harm anybody else. He's just, you know, whatever. And they were really trying to treat him like he was about to be in jail the next day kind of things like, and, anyway, the administration really was being super, super callous. Super on like not supportive of treating him, treating him just like very carceral, like. Our school, actually, we don't have expulsion, like, they got rid of those and they damn near try to avoid at every turn suspending anyone as well. Cause we, you know, we've all seen the data with those things, but they really wanted to kick him out of school and come after his dad for being negligent and all this stuff. And those of us who are in the school building were, like, just wanting to support him, wanted to, get him, a para[professional], all this stuff, but the administration in so many ways was just trying to, like, worried about protecting the image of the school. And that was like a big point of rupture for me.

You know. And they never, they never like. They never got it. Why? Why not have expulsions and stuff like that? Again, it felt like it was just another image thing. You know, but here you are, talking about this student who clearly needs a lot of support. His mom had died in like a fire in their house when he was younger and he was still dealing with a lot of the grief of that, you know? Very apparently. You know, a lot of students come in with traumas and stuff like that, I think the school system doesn't do a good job when those traumas start really looking like trauma though. You know? And. Yeah, I remember just being so upset with the admin at my school about how they were trying to handle that. We actually ended up being able to argue with the local district public schools, they're supposed to send money over for any student that has IEP to the school where they're at. District public schools were not doing that, so we didn't have any funding to get him an academic assistant and stuff like that, but we ended up running them down, eventually getting the funding. And he was just like a night and day thing as he actually had the support, he needed but the school administration would have never seen that through. So that felt like a huge turning point for me. It was in my second year that that happened. Yeah, stuff like that happened often though where the school administration was on a different page about how to care for students than we were as teachers.

Life After Classroom Teaching

Alex would go on to a graduate program at a university in the southeast U.S. in another large metropolitan area. As they describe, "My life felt easy for maybe a month after teaching."

They would spend that summer teaching at the medical science opportunity program and reflecting on what felt like far more free time. Throughout the following years, their relationships

with students would continue via email and a few return visits to their school. Students would send emails asking for references, proudly showing off their report cards, and stories about their applications to nearby high schools. Through social media, they would receive updates via their parents, and during holiday breaks they would receive warm welcomes upon returning to their school building. Due to a lot of turnovers, their visits became less frequent, and issues with school administration would continue to distance their relationship.

Regarding their decision-making, they state, “I didn’t regret the decision, but I might have been happier teaching. I was feeling that, and I didn’t know if it was like, grad school was miserable for everybody kind of thing or if it was like I felt super out of place that was the other thing.” Their Ph.D. program consisted of people who had just finished biomedical engineering master’s programs and those who just recently had completed undergraduate study. They describe a small age gap and having relocated to a brand-new area in the south possessing less institutional knowledge about their program. Although they would meet other Black people, and not too many Caribbean people, the culture shock of living and working in a brand-new area was a considerable challenge.

An upside they describe would be participating in a teaching assistantship and becoming a graduate teaching fellow. Being able to apply their expertise in the K-12 setting was an advantage, yet it reminded them of how much they missed the classroom. They would go on to even volunteer at a mentorship program for high school age students interested in research, remaining connected to youth. Notably, they stated, “It was a mess because the person who was running it didn’t care as much about supporting students as again, and the support system I had at my university, it was just so different.”

Theme 3: Beyond the Walls

For the last sequence of the interview process, I ask Alex how they would thematize their experiences deciding to and leaving the science classroom:

Hmm. [pauses] I'm thinking of something like "Beyond the Walls". Like, I think I've just understood what it means to be an educator outside the classroom. Like, how many different learning spaces there are...I've come to appreciate so much more like the things people learn outside of the classroom. From their family, you know, from their life experiences. I'm realizing there's so many more educators and those who like will ever see a classroom, you know, and for a while there I felt like there was some tension.

When I was in my third or fourth year of my Ph.D. I was like, you know what? I don't even wanna do research anymore. I just wanna be a classroom professor in colleges and I'll just teach, I'll take on the workload from all the folks who don't love teaching. I'll do it. You know, so I got there, before I realized that I didn't want to finish my Ph.D. And I think part of the reason why I felt comfortable not finishing the Ph.D. is because I was like, "I just want to be an educator." That's when I felt like I became clear that that's what this was always about, that's why I was melancholy when I got back to grad school, and I wasn't appreciating the cutting edge and curiosity about it as much. I realized part of the reason I like research is because I can then go talk about some discoveries that I made, like that was a satisfying part. I don't know, not that actually doing the research is fun, but it has its limits, you know, without the human connection to it.

Alex currently works at a non-profit organization as an education strategies director, doing training and education work. Having embraced the identity of a lifelong educator, they reflect upon continuing regardless of compensation and notoriety:

I will be a teacher through and through. The things that I learned when I was in a classroom have been incredibly transferable to so many other situations. I feel like I was really pissed off throughout grad school because I was like, 'These professors don't know how to teach, and I know for a fact they don't know how to teach now.' When you're in undergrad you're just angry, like, 'This doesn't feel right or whatever.' After going through a teacher prep program and going back into those classrooms, I just couldn't take it seriously. I was like, 'These folks don't care about learning.' [laughs] They can't, they can't care about learning you know so it's just changed the way I've looked at so many situations where people are supposed to be supported in their learning, but they're not, you know, so yeah, beyond the walls I would think is where I've landed.

Before wrapping up the interview, Alex would have one final recording statement to share regarding their experiences in the classroom, the working conditions of the occupation, and the political connections between schools, administrations, and communities. This statement

summarizes their reflections on teaching, teacher labor, and the role Alex believed politics to play in public education. As well, Alex offers words of encouragement towards what the field of public education would look like if it weren't strictly beholden to our government:

I think that I hear people talk a lot about what teachers need in order to be successful. And I've been learning more and more about the labor movement like unions, all that kind of stuff. I knew about teachers' unions when I was teaching because I think the headquarters of the local state teaching federation were in my area or something like that. I used to always see the building. I feel like our educational experiences need to go even beyond organizing teachers, they need to include organizing students and parents, establishing more cooperative styled schools. Because I feel like that introduces some of the participatory decision making that can happen, and designing learning experiences and making sure teachers have the support that they need, and all that stuff.

And you know, I feel like public education is like a crucial element of any society. It just feels so deeply connected to what's happening on the national stage like when they put Betsy Devos who is a proponent of privatizing education as the Secretary of Education seat, we already knew what time it was gonna be on, you know. And part of the issue with like these public domains, public sectors of society is that they are beholden to the government that exists, right? So, we're seeing what's happening in our schools now because they're beholden to what our government is on. So, I don't know, I just want to, like we're talking about how the things outside the classroom impact like how we show up as educators and whether we stay, I just want to encourage folks, we can design learning solutions for our own communities, and I think we should, I think we need to.

Alex's narrative biography includes rich storytelling that exemplifies their personal and social identity, political thinking, and approach to science teaching. Their reasons for both entering and leaving the field of science classroom teaching are evident in their approach to social justice, educational equity, and science learning. In the next findings chapter, we explore participant B's narrative biography using the same formatting.

4.2 Participant B - Carmen Cooper-Clark

Our second participant, with the chosen pseudonym Carmen Cooper-Clark, was born and raised in the northwestern region of the U.S. within the proximity of a large metropolitan city where many of her educational experiences took place and attended college two hours away. Almost immediately after graduating from college (“Cause I wasn’t staying there, I had to go!”), she moved across the country to another large metropolitan city in the northeast where she would attend graduate school, an alternative teacher education program, and serve as a teacher for eight years in the public charter system before earning her doctoral degree and becoming a professor and teacher educator.

Narrative 1

At the beginning of our interview, I ask Carmen to provide a story that she believes shares a bit about who she is. After some thought, she shares:

Well, last week. I was feeling down. Who knows what about? Probably the ways of the world and my own little life. I reminded myself that I was feeling like I needed to do something, because I am the owner of my own happiness. So, I cannot wait for happiness to walk through the door. We gotta go find some of that joy. So, I had gone on a walk that morning. Actually, I woke up that morning. I was like, ‘I’m ready to be outside in the world, let me just go for a walk.’ And I actually walked 2 miles - I was meeting with a friend and colleague to talk about something. But anyway, my walk was full of music. I was playing Beyonce’s B-day. That’s what it was. Because I gave a full concert on this walk. Like I was just moving, making eye contact...

Carmen’s story continues even after this walk as her spirits were lifted and the vivacity of the Beyonce album continued to boost her mood. She states, “B-Day is a very sexy album. She is not married yet. She’s only on her second album so she’s making a statement. It’s a lot of growls, lots of intense... It’s a lot of fun.” Upon returning home she felt she had to keep the energy going:

So, then I went home, and I played a concert that I had not watched in maybe 5, 10 years, which is Beyonce’s “I Am” world tour DVD where she was full on, just... is ridiculous

and I did dances... One thing I learned is my knees are not the knees that they used to be because I grew the energy to try to do one of the pop-up things to Naughty Girls and I didn't pop back. I said, 'Oh, okay. I'm glad we live alone because that would have just not been so cute.' But that made me feel... like it was fun. I have the first 30 min of that concert - she's doing too much! - it's the energy that she exudes in those 30 min and I exude in my whole week so it's very fun to participate in that and like get a quick escape in order to refill some joy. And that helps me throughout my day. I think I had therapy right after that. But then the rest of my day I was building this like lightness and was like, "Let me be about my work and yes I'm a bad bitch and I can like do anything and I can hold on to, you know, whoever I am."

Carmen goes on to share how she believes this story represents something about her personality, her approach to the world, and the things that she enjoys:

I am someone who feels all my feelings but then can be overwhelmed by them and needs to seek things in order to be a useful person to myself, which includes music. In this scenario, it's Beyonce because she is so over-the-top, it's hard, she's infectious. Like that kind of energy of just being super intentional and diligent about what her art is, it's nice to connect with, despite all of her beautiful flaws. So, it's fun to hold on to what she does with her music and our concerts.

So that made me feel like I could be a good person to myself and find some joy. So, I enjoy singing. I don't know about my neighbors. You know, I have new neighbors now and My apartment is. I don't hear a lot of things. I don't know if there's kids around, but it's like ten o'clock in the morning during this concert, but so far no one's no one's knocked on the door because I'm screaming like screaming-singing. Beyonce and I are on the same level. Like we are just doing the thing. So, those are fun things for me when I'm either outside but in my own world or inside in my own world. Having a good Beyonce moment.

Adolescence and Upbringing

I surmised that an affinity for musical expression and a good Beyonce moment might have had roots in Carmen's upbringing. I continued by asking for how long she can remember being the singing and dancing person she was that day:

Have I always been this musical... what was it like, growing up... So, I have a new therapist and we're on our third session and her thing is she likes to focus on childhood. One of her questions is, Carmen, did you have one?' We still have a question mark on if I had a childhood but, and in terms of what it was like, it was... fine. Very, very, very much education childhood. So, I am a first-generation college student and the whole shebang was, 'We are doing this thing every day, Carmen, so yo ass can go to college!' So really my life was reading and doing the school thing and I never played a sport. I still don't know that I've ever played the sport. But whatever, I was a unified-school district

student, meaning I was in Title 1 public schools. We have one year where I got to play instrument, so I played the clarinet in the in fourth grade and I was fucking excellent.

Carmen explains that this story comes to mind because just recently while traveling about her city she came across a jazz event at a popular music center in her city - "I don't think I read the description, I just saw Black people playing instruments. I was like, let me take my friend and go. It was really fun". Immediately recognizing a jazz band member playing the clarinet she reflected on how brief her time with the instrument was - "...By the time they got to fifth grade, there was no more music program. So yes, my real identity as a kid had a lot to do with school."

Growing up, Carmen's family was relatively small with family members she was close to having passed away before she was 12 years old. She reflects on her relationship with her familial household which seemed to consist of her parents and younger sister. Her parents worked a lot, and her father worked the graveyard shift at his job so that he could attend to the children's needs during the school day while her mom worked a more normal weekly schedule. She describes her dad as being quite hands on with her education:

So, like he was very intensely around, which is beautiful and cool except when you're the kid and you're like [Carmen mimics being exasperated]. I mean, I wasn't doing anything like I didn't really socialize enough to get in, I never got in trouble, but even if I was the kid that was like I want to do, I don't know if I wanna have a boyfriend or if I want to do whatever. There was little room for the thing like Mr. Cooper-Clark was big like it was all Mr. Cooper-Clark - Head of the PTA is your daddy. He's picking on the teachers, and it's ridiculous. So, not great, not great. I mean, it was cool because I remember in middle school all of the kids would talk about how they didn't have dads or whatever. I was like, oh, mine is making up for all of y'all's problems. And let me tell you, there's problems on both sides of this story, okay? Jesus, he was always around, always doing a lot, which is beautiful. So, he was excited to have his kids. And really honed his identity with being a father.

As compared to her vocal father, her mother she described as more action-oriented:

So, like when I tell stories about what it was to grow up in their household, I have a lot of stories about my dad, but that's just because he yapped a lot. My mom would just do things to ensure that she had a good moral character, but she wasn't necessarily like over-communicating why she did those things.

Carmen shares that her upbringing in a pro-Black household was very prevalent in her social and racial upbringing. She states that before the term “hotep” was co-opted, her dad would have been considered a hotep, definitively. Carmen’s childhood consisted of verbal, outright messaging of “Pussy power, Black women power things”. She shares a brief story of her seventh birthday gift including an especially challenging depiction of the history of the Trans-Atlantic Slave Trade:

My seventh birthday gift was to watch *Roots*. That was my birthday gift, to me, at *seven*. There’s lots of rape in *Roots*. Okay, alright. Trauma, trauma, trauma so yeah it was like we’re gonna watch *Roots* and we’re gonna talk through each chapter, I forget it’s like you know like the episodes, we’re gonna talk about your takeaways, we’re going to make sense of it what it was to, you know, see these narratives, what are you getting from it or whatever. They’re just, so that sort of is an example of who my dad was as a father, which is like, we’re gonna have these hard conversations and we’re going to see *Beloved* when it comes out. I’ve seen *Beloved* once, Okay. So, my understanding of my Blackness was not a question. And because it’s something I’m coming to grips with now, I didn’t know that white people really existed outside of being a teacher. Like white kids, I didn’t know white kids were a real thing. Of course, they’re on TV, but even my dad was super serious about what TV we watched.

I remember once my sister and I were trying to watch *The Mask*, we were not at home, we were at my great grandma’s house. I’m trying to watch *The Mask* and he walks in this room. He just fucked up our whole experience because there was this white woman on TV and clearly, she was the sex symbol or whatever and he was like, ‘No, this is not the epitome of beauty. We gon’ watch, whatever.’ I just want to watch Jim Carey and have a good time. That’s what I’m here for. I’m eight. Now, of course, he’s right. Like we get all these implicit messages about who we are and like what is valued. Blah blah blah, sure. And I would just like to watch *The Mask*. So, like we didn’t watch Disney films, or if we did it was only the *Lion King* - big deal going to go see the *Lion King*. He let us watch *Aladdin*, I think. But that was a long time, like my high school years were mostly my friends being like, “Okay, so we gotta watch some of these movies because you don’t get any of the references.” Me, in the social setting, I don’t know what they’re talking about, like this is not my shit.

In addition to positive reinforcement about her race, gender, and ethnicity, Carmen then returned to the musicality of her adolescence. She remarks, “Music was always being played in the house”, as her dad could be found singing and performing, she would be found singing with a bit less of the performance. This moment she reflects on in her first story of singing loudly and

proudly in her apartment, "...It's my time to try to hit a Minnie Riperton note!", is perhaps reflective of the early influences of musical activity in her home.

Early Educational Experiences

Carmen goes on to share that primarily she would grow up in a household that centered education. Her activities were mostly singular or solitary such as reading and playing instruments. Her parents were very intense about school, understanding the landscape of her hometown at the time, and believed middle school was critical. They searched for the best types of schools that would foster her education, saving money since she was born to provide her and her siblings educational opportunities to a private, Christian, dominantly Black middle school in the neighborhood. The school itself was very protective, having a gate that separated the school grounds from the surrounding area, but was very close to where she lived.

Carmen's relationships with her family, community, and school did come with challenges. A privatized Christian school led to some questions about curriculum, her identity, and relationships with family income, and by the time she would reach high school, they had run out of money. Her younger sister was able to go the private school route for a brief period but would eventually attend a public middle school. Carmen remarks on how tragic this was, recalling a moment where during her sister's birthday they couldn't pick her up on time because the school had shut down due to a shooting on the block. Issues of gang violence were prevalent in her area and these lockdowns were a routine thing that influenced the communities in which they lived.

Carmen would go on to attend a magnet high school with specialized curriculum built to attract students with certain interests and career goals in the sciences. Carmen recalls this being a big deal, "I think it was starting to spearhead my educational journey." The support from her

family provided a lot of enthusiasm around forging her own pathway through school, and although they could not afford a private high school a magnet high school in the area was the next best option. Carmen recalls wanting to be a Doctor of Medicine, specifically a cardiologist. The high school she chose to attend would have a focus on medical sciences and Carmen remembers having to take a more precarious route to be able to apply and attend by using a close relative's home address to qualify for a voucher to apply:

I got into that school, which was pretty groundbreaking for, or like a real shift, or cementing that I would be able to go to college. Because the school literally like it's not like any school I've ever seen on TV, you know. On TV, it's always like the cheerleader is the, I don't know, popular person or like we watch football like high school culture is other than capitalistic, I can't remember. I can't. It is its own thing, where this high school likes the social conversations like who's gonna go to Stanford, you know, like the question is - I was just like that was the thing that we're talking about and in this very, like, we're a whole bunch of nerds. It's like a whole bunch of nerds went to a school and we are really close with our teachers because we love education, and we want to be scientists.

The magnet high school's affinity for medical sciences dates to its twenty-year existence and partnership with a nearby hospital. By the 11th grade, students could enroll in a medical science residency at the hospital. This program would facilitate access for a dominantly Black and Latine student population to engage with career interests in the medical field. Carmen notes that these opportunities came with quite stringent academic policies as well as a strict focus on college and career readiness:

So, for instance, because of course I was in school government and all the things I knew the numbers of our graduating class. Our freshman year, we started with 500 and we graduated 323 by the time we got out because while, really, while really supportive of our academic pursuits, they did not allow for us to fight or to, but it was easy to get expelled. And I remember the no fighting thing being like, it felt like... I used to fight as a kid, is what I think I'm trying to say, but it was really intense to tell me I couldn't fight off school grounds. And a lot of people got expelled for those reasons. So, there were times where I really wanted to fight somebody. And I was like, well, "I'm not gonna get expelled", so I didn't fight [laughs]. But I was really like, "Meet me at this address". It's not like I get that I can't fight in school, like that makes sense to me, I understand

boundaries. But if I give her an address and she meet me there. That's not yall's business, but anyway.

Alongside Carmen's ability to navigate these strict policies, attending a school with close partnerships with local medical institutions offered opportunities for higher quality science programs and workplace internships. Carmen's interests shifted from wanting to be a cardiologist to a forensic pathologist. The school-hospital partnership would open their morgue to students wanting to specialize in forensics and Carmen recalled enthusiastically applying to experiences that would allow her to learn more about the hands-on work required in the field.

Carmen to reflects on this opportunity being both favorable and intense:

It was great. Most of it, like I would say 50% of it, was just sitting and looking at the logs and stuff but we had access to human cadavers, of course, and brains and hearts and things. I saw my first and only in my life, dead baby in a bag and a freezer, like, we were just like in the morgue. I think I can't imagine that I was by myself like the only student. But because I'm saying we, there must have been another human present. But anyway, I got to do the morgue for six weeks. I got to do internal medicine for a large part of the semester and then at the same time, unfortunately, the hospital had this huge controversy because of inadequate management, more people were dying unnecessarily.

So, at the same, let's say fall semester, I was at the local hospital in the morgue and internal medicine, but then this hospital shut down, so the high school had to figure out where we were going to go. And we knew that a nearby university was going to acquire a local hospital. So, we actually started to take the bus to the nearby university's medical program. So that's what I did my second semester. There I know that I shadowed a nurse. I was in the ICU unit, which was really intense because I didn't know that I had a normal experience, the people that I shadowed were very trusting of me. Like I know I pulled a tube out of a person. There was a cold blue and somehow, I'm participating in the code blue, "I shouldn't be in this room. Why am I in this room?" But fine. I know that I like, I, they call them, I think candy stripers. But those people, I think, are adults. I don't know that I was supposed to be like changing actual human's [candy stripers]. I was in ICU, which for the most part is pretty calm because you're just doing a lot of things. Like you have some traumatic event but then most of it you're just resting and we're just making sure you stay alive. But them code blues came fast! Okay, so I had to do my codes and do my thing, whatever. And then of course, you know, I did aid, you know, got an A and all that kind of stuff.

Carmen would graduate high school with a 4.2 GPA at the top two percentile of her state's student graduating population. Her intentions were to leave her immediate area for

college, and hopefully leave the entirety of the west coast. As a first-generation college student she would receive consistent messages about the importance of 11th grade and college admissions. While joining a mentorship program in a more affluent area she described receiving even more specific messages about what types of schools to pursue. This was perhaps when she began to narrow her sights on private liberal arts colleges, including some of the most prominent women's colleges in the country. She shares a notable tragedy about her attempt at reaching out to college admissions offices to secure her acceptance in some of these programs:

I have a tragic story with my target school. I did not get in, although it was my number one, this one admissions person, may she rot. I mean, it's fine. I'm sure she's a lovely person, but like I emailed her all the time. I felt good about her. She was the undergraduate, like, some sort of liaison, something, you know, I would just email her all day. 'What about this? What about this?' Anyway, long story short I did get in after they had communicated this to the scholarship organization, I was a part of that I did get in - something changed because my mom made too much money, but not enough money for me to afford to go, but too much money for them to allow me to be in some sort of program - so they took my acceptance. But I wouldn't have known that if I wasn't in this organization that I thought I got in. There's a tragic story where I called to let them know I didn't get in and they were congratulating me because they thought I did get in. It's really sad. It's not nice.

In addition to rejection from her target school, even some of the acceptances Carmen received were less than ideal. Having applied and been accepted to a well-known women's college in the northeast, she would be invited to tour and stay overnight to get a feel for the campus and school community. Aboard what may have been her first flight out of the west coast, she would land in what she humorously dubbed, "one of these terrible places". They would lose her luggage, and upon arrival be matched with three Black students that lived on campus whom she would stay with for the remainder of her time. Although they were likable, she could not help but notice how mundane student life would be on campus. Her dream was to travel to a large metropolitan city on the east coast where her dream school was. Eventually, she would settle for a state university:

So that's how I went to my university, because I visited that college in the east coast one weekend and then the next weekend the state university had their admitted student's day. And if I had the energy, I could show you the book that they gave us because they are really crafty there.

When I got there, they put this book in my hand called the Black Book. And it was this book of all these Black children and all the things they can do and they showed us the Black hall where all the Black freshmen live and I was like, 'Fine, if I am going to be unhappy because I can't be at my dream school then I will do this', at least they have, and like two alum from my high school, I didn't necessarily like them, but they were too familiar faces and I liked them. Whatever. I'm going to college. The life dream will be met even if it's not in my lovely east coast big city. So, that's how I ended up at my college. That shit was a lie, it was 2.7% Black, two hours north so ... I don't know. So that was not great. I mean, a very close Black community, which also was a deficit. But then it was a culture shock, cause I, like I think I said early, I didn't know white children existed. So, they tellin' me I'm the first Black person they've ever talked to and I'm like, "Same bro, neither one of us want to be here. Okay, can I just do my job?"

Political Identity and Consciousness: Early Upbringing

Given her educational experiences, some of which being shaped by the quality and type of schooling available, I found this part of the interview an adequate moment to transition into Carmen's understanding of her political thinking throughout her early life:

I imagine for some being Black is not a political view, but for me it is. So, the things I forget to say when I talk about Blackness and that because of my lived experience now I have learned that I need to add is we also didn't have money, we didn't come from money, we migrated. I am a second generation in our large metropolitan area on the west coast which means my people, both sides, are from Louisiana. Either northern Louisiana or central Louisiana and on both sides my great grandmother and my grandmother moved to the city in the 1940s. So, our politic and our way of being was centrally colored by the fact that we are from Louisiana and came here to escape 'in your face' racism. And then came here to try to find some semblance of peace or, you know, not wealth, but money, jobs.

I had just talked with my dad about something. I know that we worked there in Louisiana. There was a Shell company or something and that was a lot of work there, or there was some work there, but then that closed down and so a lot of people left because that one source of whatever was gone. Okay, so what that means is literally my great grandfather who I grew up with for the earlier part of my life sold fruit and nuts through a truck like - that is how he made money. That's in my dad's side. On my mother's side, my mom's mom, my Nana, she worked really hard to buy a house. So, in my life, in my childhood, wealth was [gestures vaguely] yeah..., but my parents', up to my parents, the idea of wealth was owning a home. So, it was a big deal for my grandma, Nana, my mother's mother to buy the house that I grew up in. So, she bought that house in the

seventies and with no support from her parents, her father, her mother had passed by then. No support from him, which is the whole other thing, church and all the, whatever.

But anyway, shoot, politics. So, oh, that's what I was trying to say. Something that, when I think about Blackness, and as far as my political view, I think I'm coming from what I only know, which is that we're working-class people who pull things together collectively in order to fight for what we have. Hold onto what we have and then of course give to future generations and to be in community with one another. Which is not, you know, not a view of, I don't know, individualism, capitalism, whatever, whatever. So as a kid and as an adult I don't know that we really use words like, you know, are you a capitalist or whatever? Or a communist I think is what I'm trying to say.

Carmen's relation to identifying as Black and Blackness as a political view compares in some ways to her father's intensity about his own political views. She describes having to watch MSNBC all day - "Politics were a part of the normal conversation". Before she was able to vote, she was not necessarily politically involved, but knew enough to know about government corruption and the stealing of elections. These everyday conversations and events she would participate in was enough for her to be able to assemble perspectives of which "just let me know what empire and sham that America is."

Carmen's political development would continue throughout undergraduate school where she would pursue a bachelor's degree in sociology. As part of her program, she would read sociological texts, such as the works of Karl Marx, and write about the history of empires as well as some of the reasons behind why society is what it is and the presence of violence in these systems. Although initially her plan was not to pursue teaching, she recounts the impact sociology would later have on her pedagogy as she would feel connected to how her father had raised her to be politically clear in her curriculum. She recounts a narrative about the blending of her political self and classroom teaching in some of her early years teaching middle school social studies:

So, like an example of me being my political self in the classroom, literally the first lesson out the gate was as I had my students read three texts. We did a comparative analysis, before I knew what that word was. The first thing we read was the story of

Christopher Columbus, and we read a fourth-grade story of Christopher Columbus. And then we talked about it like, ‘Who is, according to this text, who is Christopher Columbus?’ Then we read Howard Zinn’s narrative about Christopher Columbus. And you know, we stopped for the big words or whatever, but we went in - Tainos, 1500’s, rape, wearing people’s teeth as necklaces, we went full shebang. So, we talked about that, and the core question was like, so we now have this counter-narrative about Christopher Columbus and the historical impact of this figure. And if you compare it to what happened with this fourth-grade narrative, is it okay that they have these different tellings of the same historical figure? And they were like, well, you know, the kids are not really ready for all of that, and like, you know, that’s it’s really hard when you’re eight to conceptualize this level of violence.

My gotcha though for my kids was like, ‘Cool, cool, cool, cool, cool. Now let’s read the seventh-grade history textbook about Christopher Columbus, cause you’re telling, cause what do you think that you should know? Like what truths are you open or are you ready to learn? Do you believe that you’re at the age where you should be told different truths?’ And they were like, ‘Absolutely!’, ‘We ready, we’re grown, we’re twelve!’ I said, ‘Okay.’ [laughs] So then I opened up their textbook and so then they read, of course, it was comparable to the fourth-grade things are really passive or said nothing. So, then they were all in an uproar about who gets to tell what narrative and that they are clearly being lied to and what does it mean to know history and to own history and that sort of kicked us off [laughs].

It was this beautiful thing where you have just instinctively made sense of what education could feel like. I wasn’t necessarily making a political point, but I knew that I was teaching and like I knew what education was and I knew where I was teaching and I knew what I wanted of my own education and didn’t necessarily get, especially in history. A parent wrote me a letter - I think my mom still has it - just thanking me for that lesson. I don’t know why they knew about it, but they were like no one’s really talked to my kid this way. So anyway, the rest of that year was really beautiful. Everything was about finding truth and how to know something’s truth and whose stories do we want to know about and tell.

Carmen described her political views at that time as active in how she shifts, teaches, and what she chooses to talk about and what narratives she chooses to share:

I know that, you know, I’m always siding with the oppressed and here for the collective good. Depending on, you know, what decade it is, is that a communist or socialist or democratic or whatever. They all are sometimes fucked to me. So, I don’t know that I have a full word for what the thing is. Black liberation, which of course expounds to global Black liberation, which expounds to all people of color. So that’s my shit. I don’t know if I have a word for it. I’m sure if you ask me at like, 20, I’m a communist. I don’t know what I would say now [laughs]. Because words mean things and I don’t always know if I know what other people’s definitions of these things are, but I am here for the healing of all people, and those most marginalized.

At this point in the interview, I became interested in the connections Carmen was making at an early age via her family's involvement with both her schooling and political consciousness. I wondered whether she thought there was a correlation between the political atmosphere of the United States, her city, or her upbringing and her educational experiences. I gave an example of my schooling being affected in the 1990's by district regulation and school choice. Inner city schools having policy challenges meant that the more resourced school options often existed farther from the metropolitan area. I would without knowing opt for a bussing program that would allow my attendance at a middle school several miles farther than local schools my friends would attend. Carmen's response reflected the contrasts between dominant cultural narratives urban neighborhoods, schools, and students faced as well as the reality of the school type being affected by these political boundaries:

Well, yeah, I mean, my parents told me then at middle school, like when I was told I had to go to the Christian school, because my cousins didn't go. My cousins went to public school. They were really clear that these schools don't have nothin' for you. And I knew. See, I don't know if this is of course a part of the political landscape because of red lining and the way that systems of oppression work but... I remember as a kid at maybe eight or nine asking my mom if we lived in the hood because on TV, they would talk about the hood but like they would use my cross streets, but I didn't feel like I lived in that place. So, I knew that, meaning I didn't live, I didn't feel in danger ever or rarely - [perhaps] moments. I rarely felt like anybody on my block was trying to harm me, cause nobody on my block was tryna harm me. You know, that's also just how the hood works.

The ways of people described where I was from did not honor or make sense of the deep community that we have and had. But I knew that school was not a safe space for a lot of people, including myself. Shit, I knew the schools were bad, we always knew the schools were bad. We talked about it as kids, like amongst kids. We knew the schools were the school we were at, before I got to my magnet school, we knew they weren't good. When I got to fifth grade, although I was the pupil throughout that entire time there, I walked into fifth grade at a second grade reading level, but I didn't know I was at a second grading reading level, until I had a Black woman teacher who also had a PhD who tested us, and was willing to look me in the face and say, 'You know, Carmen I know you've been, oh, that was the word, people speak so highly of you and to you about how great of a student you are, you can't read. So, we're gonna do something about it', and we did something about it. But I knew then that school my teachers didn't give a fuck.

Theme 1: I Don't Have no Money!

Carmen's educational experiences and upbringing to this point were painted vividly through storytelling of her family's involvement in her education, her relationship with the surrounding community and approach to education, and her growing political awareness as a Black person navigating a search for career and educational opportunity. Similar with our first participant, I asked Carmen to self-thematize this part of her life up until she had chosen her college and pursued her degree:

Shit, "working". Yeah, I had 3 jobs in college. And simultaneously had a lot of jobs. That's not your question, you asked me about themes. I like this theme question. I definitely didn't ask my participants what they thought was that. Growing up without money is definitely a theme, and the implications of that which of course, fed my hunger to conquer this thing but also just made it that much harder to do. Yeah, I didn't have any money. I felt at home in the concept of school. By then, even at so let's say high school and college, I felt really good about what I was trying to accomplish and the people I was around. It's just nerdy Black kids talking about whatever the fuck all day. That was cute. That was cool. So, themes. I don't have no money. Theme two, nerdy Black kids. Theme three, yes, I'm gonna say familial support, it shifted when I went to college, but still a part of the conversation. So those feel like themes for the things I've shared so far.

Carmen's interpretation of the layered experiences of her childhood and upbringing are central within her storytelling. These layers are quite like the methodological approaches taken by scholars within Black critical studies, such as Hartman's (2022) *Scenes of Subjection*. Hartman's analysis of the concept of self, agency, and subjugation during the 18th and 19th century for the enslaved Black harmonizes quite well with this thematic description in that both consider multiple often competing or contradictory narratives that nuance our discussions of subjective experiences. Carmen is both sharing the challenges of poverty and class amidst racial inequity in their schooling experiences while acknowledging the safety and joy felt while engaging with other nerdy Black kids as she fought for a supportive school environment. All

these moments were as well colored by the support of her family, who can be considered role players in the ongoing development of her political consciousness.

Carmen would go on to attend undergraduate at a nearby state university, initially continuing her pursuit of a career in the medical sciences as a chemistry major. Throughout however, she would become exhausted by undergraduate sciences and the requirement she felt that there was “always one answer or a correct answer”. In searching for more open-ended responses and critical questions she would change pathways towards sociology. Similarly, to our first participant, a non-traditional teacher preparation program would become her pathway and as well a step toward accomplishing her dream of living across the country in her desired large, metropolitan city.

Becoming a Science Educator

Upon graduating, Carmen would spend the summer preparing to move across the country. The alternative teacher preparation program was present on her campus during her senior year. While contemplating post-commencement opportunities, Carmen reflects on how being a first-generation college graduate left her with a challenging outlook:

So, the way I was thinking, I was like, well, I know I don't wanna be no damn teacher, but also back to being first generation, my entire family's dreams was to get a college degree. You get a college degree at twenty-two. So, when your whole family's dreams is done, what I'm supposed to do now? I'd have nothing else. Like. my life's work is at twenty. They didn't tell me anything else to do after that. So, I definitely knew I was graduating because also none of my peers graduated on time. So that wasn't even really a part of the conversation. I didn't know what a master's was. Literally, I didn't know what it was. And this white woman was walking around campus and like, “Hey, do you know what you're doing after college?” And I said, ‘No’, I would get a sociology degree, but I didn't know what I was gon' do, so that was my choice.

This opportunity would offer a free ticket to the east coast; the plan being to take two years to teach and figure out what comes next. The program required a six-week intensive

preparation period, wherein Carmen would be matched with a participating teacher and school in the metropolitan area.

Teacher Preparation

Carmen reflects on the complex series of events that led to her teaching career. She comments on the non-event of preparation during her six-week summer programming. She recalls receiving feedback on how to talk to Black parents, to which she remarked, “well I called my mama every day so what are we talking about here?” Towards the end of the summer preparation, she would interview with three separate schools. A hurdle approached however because in the city and state she was training in, a master’s degree was necessary to teach. She would attend a local graduate school of education that had just started that year. Having paid her way through undergraduate using private student loans there came a point when her loan servicing company had begun calling and asking for repayment. Recalling her first theme, “I don’t have any money.”, her attempts at reconciling her repayment came to a halt when she discovered that the graduate school of education, she was enrolled in was not yet accredited and would thus not allow her a deferment period for her private student loan payments.

Here we see the continuing advocacy Carmen took towards her education. Not having the same privilege to dodge student loans as other members of her cohort, she immediately reached out to her alternative teaching program and demanded that they enroll her in an accredited institution that would both secure her teaching placement and as well allow her to pursue a graduate degree. She would end up at a top-ranking private university in the area continuing her social studies while beginning to teach science.

Ultimately, this program would not be the way Carmen became a science teacher as her initial placement during and after teacher preparation was social studies. We notice from an

earlier story that developing curriculum for middle school social studies allowed Carmen to engage with her social and political self in the classroom, teaching thorough and real history about the world and engaging her students in inquiry around counter-narratives about colonialism, European expansion, and displacement. Eventually her pedagogical talents would find themselves in her science classroom, and when asked what brought her to science teaching, she exclaimed:

Betrayal! What brought me to yeah, [laughs] fucking betrayal, man. So, like I said, I was an excellent social studies teacher. I was breaking ground in my school in Harlem. And then because of quote unquote budget cuts, I had only taught seventh grade social studies and I supported the seventh grade English teacher. So, I would lead-teach my two classes, it could be two groups of students and I would co-teach her ELA Class.

So that was my full position, but they started to truncate the teaching load, so it was no longer an option to just teach seventh grade social studies. So, they told me a week before the school year ended, you got a couple options. You can teach fifth grade, [whispers] 'Hell no'. For the record, no, I do not speak to people under a certain age, or you can teach sixth and seventh grade science. Those are my two options. Because they gave the seventh and eighth grade teaching positions, social studies teaching positions, to my peer and friend who had the same expertise as I did, but he was having a personal relationship with the assistant principal. So, they gave him the job because he was the eighth-grade social studies, I was the seventh-grade social studies teacher and they decided that he would be better at teaching social studies. And so, I had to have it come to Jesus because I knew I wasn't gonna talk to a fifth-grade student.

Carmen would find herself a year later beginning her classroom science teaching career while studying for her master's degree, switching subject matter content from social studies to science within one summer. As previously mentioned, her alternative teaching program only consisted of six weeks of intensive preparation. When tasked with teaching middle school science at her first school placement, a public charter school, I wondered what the administration provided to assist her. My assumption was that with such little time to practice creating curriculum and teaching, there would be some mentorship or coaching opportunity that supported her. My assumptions were quickly proved incorrect:

Betterlesson.com. So even when I taught history though, home girl, that assistant professor was like. So, you like, I know you teach 1500 to 1865. Here's some big events, "Go". And that was Better Lesson. Which is, one of the other reasons I taught the way that I did, so politicized or whatever, was because of nothing else there, so I did what made sense. But so, yeah. My curriculum was Better Lesson, and I didn't teach eighth grade science so there was no test. So literally, nothing. I can talk more about how I shifted that for the program, but no, there was no. Because also I was going to school, I was getting my masters. I wasn't under my alternative program; I was getting my master's at an accredited graduate school to learn how to teach history. So, hell no, Betterlesson.com. I know someone gave me what units I had to teach, but in big titles like, "Cells. Plant Cells." [laughs] like I got the titles of units, yes.

Approach to Science Teaching

Three years later, Carmen would have almost four years of teaching under her belt and have finished with her master's program in social studies curriculum and pedagogy. In the classroom, she would only have spent the first year teaching social studies, and the latter three teaching science. I asked Carmen to share a story about what she felt was her approach to science teaching, to which she began to share an impactful story about her working conditions, pedagogical approach, and an opportunity to be recognized for her ability to navigate science teaching with social and political integrity:

Narrative 2

My fourth year of teaching, I earned an award from the Department of Health called Health Equity Champion Award. So that was in 2015, so the story there is that the Commissioner of Health is a Black woman, and she came to my class, and this was a big deal for most of the reasons, one, you know the commissioner of health in a large metropolitan city. I think the second largest health organization in the country, I think second to the CDC. So that felt like a big deal, but I guess the story is I was in my fourth year of teaching and I was hanging out with my friends one weekend and I was talking to them about what I was doing with my students, and I must have had student products at home because I was just talking and rambling on and I shared it with a friend and she was like, 'Carmen, this is not normal science teaching.' I was like, 'What do you mean?' She was like, 'This is... I ain't never seen a kid create brochures like this or kids thinking about health equity or disseminate the information for the purpose of, you know, the uplift of their community, but also considering things like structural racism.' She was like, 'I have never seen students use their science knowledge in this way!' I remember that week on I sort of was just like curious, like, just sort of sitting with her because it was a positive thing she was trying to communicate. She was, like, excited about it, but

her excitement was puzzling because what I was doing was just what made sense. I wasn't attempting to be necessarily exciting or like, what if this thing that my kids are doing? I actually really at the time probably still had a... I struggled a lot with showcasing what was going on in my classroom, although very proud of it.

I felt and probably still feel, like, the product is in the know the, the story is in the product. I wasn't a real "show me" type teacher. I'm not a show me type person where my colleagues were really like "Principal or dean, come see what my students are doing!" I was like, if you're interested, you'll come see. I'm not gonna be flashy or whatever like it just is what it is. And I knew that they didn't value science anyway and they were really hands off with me because my students were quote unquote good or controlled. So, I wasn't in the mood for any of that. So, it wasn't normal for me to talk about my student work outside of with students and families.

But yeah, so when she went on and on, she was all excited and I was like, "OK!", so I sort of mulled over it in trying to consider what I was doing. And then let's say a week or two after that conversation with her, she was like, Carmen, I shared, cause I think maybe she asked for a brochure and I begrudgingly gave her one because I really feel like precious artifacts to me, actually I'm looking at them right now. They feel like really precious sheets of paper. They're literally on a construction paper. I do not like the idea of people touching them. But I think I gave her maybe one or two and she was like I swear I was just having a casual conversation with my boss, her boss was the commissioner of health, and she was saying my boss got really excited without me even like pimping the ideas she just like was floored by the things that students were creating.

So, I was a bit skeptical of that because I was like, 'It sounds like you went to your boss and was like look at this thing.' She's like, I swear I did and it was a happenstance that she had seen these artifacts and got really excited about it and so excited that she wants to come and see your class despite the fact that you work at a sort of a charter network because I didn't realize that, I didn't care to know or, apparently the Department of Health, it was a bit controversial for her to visit a non 100% Department of Education school. So when, I remember when they like she came in her black car and they came and were like, it's actually a pretty big deal that she's here because she's sort of going across some version of enemy lines in order to, she, we don't, they, the department, the Department of Health was trying to make sure that it didn't look like she was trying to make sure that it didn't look like she was sponsoring a charter school, was trying to make sure that it didn't look like she was sponsoring a charter school, but instead really trying to give an award to this educator, me. So anyway, they created this award called Health Equity Champion Award, but I knew they were coming, the kids knew they were coming, and that meant I had to tell the school that they were coming. So, because I didn't realize how big of a to-do it would be, but I knew the Department of Health is coming. So let me make sure that at least my principal knows what stranger is walking into the building.

So, we made a big thing. I have pictures of it where the kids show like these big posters, they had but we could, I had created, I had helped the students create student government at the school. So, we had a class president and a vice president and a board or whatever. So, they had decided that they wanted to speak to the commissioner, and they decided they wanted to have these big posters. So, we stood in, I think, I probably taught 4 sections that I thought said seventh and eighth grade. So they all came at one

point, maybe their lunch or something, I can't remember the logistics, but we all stood around her and they wanted to present like what they talked about so they presented their brochures to her and they presented their ideas about how we could use science and they presented their ideas about what they wanted her to do because also that was the big thing of the course is like, we need to, we must demand those in power to make change. So, they had demands and you know, a 12–13-year-old version of demands of what they thought was necessary for, to have change in their community, and specifically in terms of rates of diabetes so they talked a lot about predatory marketing, and not having healthy foods at their bodega and that kind of thing. So, they wanted to share that, but they were so excited in a way that I don't know that we knew what we were being excited about, but we had a visitor. We were excited to share. So, it was this really beautiful thing. And she was really nice. She liked to ask questions when they interviewed her. I'd have, let me see. I'm not gonna go through the drama but I could show you a picture if you want, of this like 30 maybe 60 students standing around and she's in the center and like the president is like asking her questions and she's answering and whatever. So, this is a really sweet thing and I think a part of the story that gets to me was my school at the time trying to make sense of what I was doing.

Carmen goes on to mention how this award and visit from a prominent figure in the city to the school building brought significant attention to her pedagogical excellence, much of which was limited by working conditions at her school that will be discussed in detail in later sections. This story also highlights evidence of an approach to science teaching grounded in awareness and attention to student interest and background. Carmen's approach to science teaching as well as engagement with her students interested consisted of science projects and fairs, research papers, and investigations of the impacts of stress on Black women that featured further community involvement and extensive learning outcomes for her students.

Unfortunately, Carmen found that this school would not provide the best opportunities for her development as a teacher. In addition to providing little to no curricular support, forcing her to rely on websites like BetterLesson.com to construct her unit and lesson plans caused her to have to advocate for administrative support for her professional development each consecutive year. One year she recalls continually petitioning her administrative leadership to send her to a national conference for science teaching. By herself, she would fly to the Midwest to attend a

convening for science curriculum, pedagogy, and laboratory supplies. Attending as many seminars and workshops as possible, Carmen would use her networking skills to secure free supplies for her students. She goes on to describe what this meant to her approach to science teaching as it freed up her ability to engage critically and meaningfully with the science content she was mandated to provide outside of her initial training and with little subject-matter support:

I didn't have a curriculum, so my approach to teaching was to find what's out there and try to get my students to talk as much as possible. So, I knew quote unquote inquiry-based teaching was the right way to go that just made sense. My approach to teaching anyway was always like if I'm talking, then we have a serious problem. So, I knew that upfront. I don't know that I was vocal about it, but it was obvious. We always have routines. I was really big about routines even then. With like, we're gonna start, I called it a catalyst, we would start with some, like, it was the 'do now'. But we would start with a catalyst, and it would probably be some question and it would be some discussion about the question and then I would introduce a thing and then most of it was inquiry-based no matter what, constructivist. And, and then of course as illuminated in the previous story. My big thing was always, so what are the students gonna do with the science knowledge? So that was my big thing because I was so, so I said in our last meeting, the way I taught history was so purpose-filled and the students were with me and I was like, oh, I can do this. So, like I was refusing to just have a completely different experience.

Carmen's tenure with her first school would soon come to an end as she transitioned to a different school in the same city. Her first impression of this how this new school environment would support her autonomy occurred during the interview, wherein after a thirty-minute demo lesson, she was invited to simply walk around the school. As she walked into people's classrooms, she recalled seeing inspiring instruction, numerous resources, and was made aware that at this school setting she would receive direct coaching from an experienced teacher in her subject area as well as adequate material to teach effectively with high quality tools. Compared to the chaos of her current school she sensed that this opportunity might offer a chance for her to hone her skills in a more supportive environment. As well, it brought into consideration some of the relational dynamics she set out to create between her teaching, her students, and their education that were worthy of reflection for her pedagogical practice:

I have one story, and it's not my favorite story, but it's representative of what that middle school is like. I think three or four years after I left the middle school. Oh, it couldn't have been that long. Maybe two years after I left, I came back to visit the school. I don't know why. And I walked into a class and there was a collective gasp, [laughs], because they were like... [laughs] And I remember like I'm excited I'm smiling and I'm like, you know, really in that they were like, 'Oh shit, it's Miss Cooper-Clark!' I was like, all right. It was a collective just, we gotta, like, get ourselves together because Miss Cooper-Clark is here, we don't know why, but we left this like, this whole, you know, be serious thing, we left. And it really reminded me of how different my class was because of the... well, yes, we got to have beautiful conversations and students created things, also wasn't no foolishness in terms of how you show up in this space. And I remember when I would leave my classroom and I would see my same students in other people's classrooms acting a damn fool and I would walk in they'd be like, "Nah, not, like let's figure ourselves out because Miss Cooper-Clark is here."

A new and resource-rich school would come with sacrifices. This new school environment came with a particularly rigorous mission statement of educational excellence alongside the rules and policies of how to achieve them. Yet Carmen would approach her new position with fidelity, describing herself as being raised as a child to follow the rules and be good at whatever she is doing. All of this considered, she would also be thrust into the role of teaching an entirely new subject - physics. Carmen describes her concern with being able to develop relevant and socially reflective curriculum in yet again another new subject area while also adhering to the compliance-based ideology of a new school environment. What also struck her as salient were the reflections upon her pedagogical relationships with students from her previous school that navigated their preferences in how they were taught:

I remember the summer after I left the middle school, the thing I told myself is I really struggled with the idea, that my students were being their best selves before Miss Cooper-Clark, like that really bothered me. That when I would walk into other classrooms and they were like, "Oh, Miss Cooper-Clark's here, so now I'm going to answer the teacher's questions, now I'm going to engage in this thing", that really bothered me because it meant, if Miss Cooper-Clark is not here, I don't see myself actually as this being. It's more of a performance. And I knew my time with them was finite, and if my lessons weren't grounding as something they could take with them over time, then they were going to lose that when they were no longer in my sight or with me.

So what I told myself, which now is a tragedy, but it may... it was logical then, what I told myself is I was going to be much less relationships based, in that I wanted, I

wanted to find a way for my students to be excellent for themselves and I don't necessarily I don't mean excellent in the way that I don't I didn't mean like respectability politics and that kind of stuff, but I wanted them to be who I wanted them to be excellent as defined by them for themselves, not for Miss Cooper-Clark. So, I actually was really intentional about doing less of the human thing and more of the like we'll get like the, not a teacher thing but no, if it's not human thing, then what is it? Like trying to connect with them through physics and less connecting them through the people thing. And that made me really, really celebrated from my school. It did not make me an amazing teacher for my students.

As she rose to the challenge of a new school type, age group, and subject area, Carmen describes noticing just how much the school favored her approach - "Cameras all the time. What is Miss Cooper-Clark doing? How does she teach them?" Although both schools were public charter schools, the stark contrast outside of the different age groups was the heightened amount of attention she would receive for her pedagogical performance. Carmen's approach to science teaching remained inquiry-based and constructivist, and oddly enough this was at times frustrating for her students.

"Miss Cooper-Clark, you don't teach." [laughs] And I was like, "What you mean?" They were like, 'You don't tell us nothing. I was like, 'Okay,' they were like, 'You always ask us questions to our questions, that's not teaching. Miss Cooper-Clark, answer my question.' Then I would have to share with them the understanding and process of learning. Me being the holder of knowledge is not you are learning. It is what feeling good about, oh, I got the right answer versus me is like, oh, can you defend your thinking? Do you have evidence just to sufficiently answer this claim? That is the question that I have for you, sir. What do you think? That'd be, that was frustrating thing because the teachers, I learned, had really low expectations. So having the answer was excellent versus being able to defend a thought and actually come up with thoughts.

Political Identity and Consciousness: Becoming a Science Teaching

Having taught in entirely in public charter schools, Carmen's recollection of the comparisons between school types struck particularly close to home for me – as teaching in different settings always came with sacrifices that affected my decision-making - autonomy or surveillance, performance or pedagogy, high expectations or administrative push-back? This moment in the interview struck me as an appropriate time to bring back the question of Carmen's

political thinking. With the experiences of teaching Black students in a large metropolitan city who, like her, were in search for educational opportunities that would change their material conditions, in what ways had her political understanding changed over time?

Well, Blackness is why I taught and teach. Yeah, I only like what I'm creating, I just wrote a sort of asynchronous module for my current students in their secondary methods course. And I'm asking them who they plan to teach and it's not a judgment question, but I really want pre-service teachers to be clear about who they are in terms of their position or identity and then who they plan to teach and why and you all need to say you want to teach Black children. Please don't if that is not your intention but who do you plan to teach? Who are, I have them reading about schooling, how did your experience with schooling affect whether you had to engage in border crossing or not influence who you want to teach and who you are and then what your position will be when you are in that classroom.

But I think the reason why I want them to go through that activity is because, one, I want them to see and understand that it's a choice. And that their lived experience informs that choice. So, for me, Blackness as a politic, yeah, this is my way of being, so. I chose to teach in only predominantly Black spaces. I chose to teach in a historically and predominantly Black part of the city, I didn't necessarily know I was going to teach actual African-American students, that was fun when I was in. I was like, oh wait, there's actual African-Americans. Okay, cause I've never considered myself that term anyway. But then I was like, oh no, y'all, okay. And then when I moved to a different part of the city, we talkin' like predominantly like, 98% of the students are Black. There they were Caribbean American as well along with Black American. But there is no me teaching without understanding Blackness as my politics.

Carmen shares that to her the term African-American or Black had primarily meant that they had migrated from the U.S. South, often delineating genealogically from the Trans-Atlantic slave trade. Her move to the east coast had brought her in contact with students and communities for whom migration to the U.S. from the African continent happened considerably after 19th century emancipation. A growing knowledge of the Black diaspora and the varied and shared experiences of Black people internationally was an eye-opening experience. Even in her personal life, while meeting people and being asked, "Where are you from?" Carmen recalls being quite confused with the question's premise. For perhaps many living in large metropolitan areas, moving to the U.S. from a different country in the 19th and 20th century offered new cultural and

structural insights about what African American means as an ethnicity vs. what Blackness unites as a politic about our shared experiences. Carmen reflected on these interactions reifying both her understanding of Blackness as a politic as well as substantially widening the complexity of working within the Black diaspora.

Theme 2: Working Outside of my Integrity, Behind-Closed-Doors Excellence

I asked Carmen to self-thematize her experiences considering the period from when she had finished undergraduate to continuing into her teacher preparation program, moving across the country, and working at two distinctly different and equally challenging school settings as a Black science teacher. Her response reflected much of what was to be considered about the sacrifices and distinctions between working at each school type and the development of pedagogical practice outside of performance she felt necessary at both:

The theme for working at the high school is ‘working outside of my integrity’. The theme for teaching the middle school was ‘behind closed doors, excellence’ maybe. Like my students learned a lot. They did things that were innovative of the time and apparently still innovative, unfortunately, and that being exciting. But that wasn’t necessarily a celebrated thing in the institution because of sheer lack of asking and caring. Another theme. So, if I were to connect both, something when I did my dissertation of an elder Black woman science teacher elder shared is the phrase, ‘the person doing the talking is the person doing the learning.’ And that, when she said it, I was like, I want to cry because I feel so beautifully succinct and representative of what I’ve been trying to do, share, hold and be a teacher. So, I think across both institutions for sure the person doing the talking with the person doing the learning and I was trying my best even when parents and students were resistant and had to get over the frustration hump that was definitely a theme of my teaching.

Working Conditions and Decision-making to Leave the Classroom

During the third part of the interview, we turned to discussions of the working conditions Carmen faced whilst starting her teaching career at a public charter middle school in a large metropolitan area and transitioning to teach in a public charter high school in the same city but with very different expectations.

Working Conditions: Mentorship and Support. Carmen's first school, like other public charter school types, received the same funding and assessments as public schools. Their charter however, specific to the school and network, meant that school and network administration would come from outside of the Department of Education. "So there was another person that would come in and tell me how to do a job that they couldn't do themselves." As well, the school was placed in a district it wasn't supposed to be, a tactic of bureaucracy that alters the relation between capital development, funding opportunity, and legislative boundaries surrounding city and school policy. The test scores students achieved would be paired with those of a more affluent, white student demographic leading to more rigorous pressure on the pedagogical staff and students to outperform demographically. Every two or four years, the cyclical reporting structures for assessment would reflect on the school's success, foretelling potential budget cuts, administrative policy, and pedagogical direction.

As Carmen described her preparation and introduction to science teaching as minimal, having to come up with their curriculum using web resources such as BetterLesson.com for both history and science was extremely challenging. This lack of instructional support would persist throughout her time at the middle school, calling upon her story-telling of achieving an award for her pedagogical approach from outside of the school and the school leadership being late to catch up. This exchange reflects tensions of science classroom teaching excellence that rely upon performativity and social capital instead of political integrity and critical thinking, as Carmen's administration seemed to only pay attention to her pedagogical excellence when it was marketable and profitable to their expansion:

My vice principal at the time after the cameras and everybody had left, they were like, "Carmen, what happened today? Like this it seemed pretty big. Like who came? Who came to visit you?". I should say at this point they knew I was leaving that school. So, it sort of was like a pretty cute "FU" in terms of y'all never figured out how to help me get

better or never figured out how to actually, because I did a lot of year after year applying for things like I wanna be better supported in teaching science or I have these skill sets and would like to support other teachers.

I always got not selected and when I would ask questions just to make my application better for the next year it would more or less be behind closed doors, they were like, “Well it’s because you’re not our math or ELA teacher. And that’s where we need the expertise”, the thing that we are trying to get them better out of is within that content, not really honoring the fact that good teaching is good teaching despite the content. So, and then of course subsequently because I was the only person of color on staff, maybe by that point, in my fourth year, there was a Dominican woman, so the only Black woman on staff, it also just created this dynamic of who was in these like pseudo leadership roles and things but anyway, it was... I don’t know what the word is, not cheeky, but it was curious having this huge honor and then them literally being remnant. They had no idea what I was doing in that class. They didn’t understand. They didn’t care to see it.

Carmen recalls the energy shifting significantly when during her second year of teaching overall she was moved to teaching eighth grade science with a tested examination. She describes a pressure on test preparation that wasn’t as prevalent when teaching at lower grade levels. Extra funds were even provided to do test preparation over weekends and during breaks. Carmen reflects on her students doing well by comparison and the administration and school leadership finally offering to pay her more to teach once they had realized her pedagogical approaches were congruent with higher standardized test scores.

Carmen sensed during her time at the middle school that there was a significantly smaller investment in the science subject matter. At certain times throughout the school semester, she would abruptly be asked to teach mathematics as students who were not performing well on consequential exams, which as we recall are directly tied to the charter schools’ successes, were forced to systematically truncate their science instruction. Throughout her time at the middle school, Carmen would be tasked to teach nearly every subject except Spanish. Even after the school day had ended she would assist with teaching English because of her skills in social studies. During the significant amount of the school year she would be asked to teach

mathematics instead of her primary subject-area, she recalls students sharing their frustration and resentment at this sudden change of subject matter in their classrooms:

I knew that, you know, the math teaching math and knowing math, not the same. But also, they were really resentful of how we got to do so many fun things and have critical conversations and create and be and do and, we had an energy in science and math just was not that energy. So, they were not happy with me either, and of course I was like, ‘I didn’t choose this. I’m not happy either.’ So that definitely was a clear message of where value was in literal time.

Searching for professional development, Carmen recalled consistently approaching her school leadership to request better mentorship and preparation opportunities. After some time, she recalls them becoming quite direct and honest, “So I think after a while people got transparent with me, and said like, ‘We need to talk to you, girl. You keep applying for these things and it’s not gonna happen because you don’t teach math [or] English.’” She would receive professional opportunities outside of her subject and discipline, yet she found these offers to exist more in the cultural systems of the school. Asked to handle punishment, discipline, and classroom management more akin to an academic dean, she replied, “Hell no, I’m not doing that.”

Working Conditions: Cognitive Labor. Throughout Carmen’s experiences working in two different school settings there were different working conditions to consider. At the middle school, there were virtually zero resources for science teaching. Carmen humorously mentions that there were no textbooks for science available. BetterLesson.com was a free resource, yet still she was left to figure it out on her own. She would join an organization called Donors Choose, in which teachers in need can petition for donations for better resources for their classroom. Through Donors Choose Carmen was able to get a document camera for her classroom, a considerable improvement from her prior setup wherein like classrooms of the 20th century she would have set up a screen projector with transparency paper. When she had the opportunity to

attend a national science teaching conference, she gathered the resources via networking to get a frog dissection lesson for her seventh and eighth grade students. Donors Choose would continue to fund her classroom and learning supplies for the coming four years.

At the high school, Carmen recalls finding an extreme contrast to the number of resources available. An actual physical laboratory space and lab supplies - “And I remember my interview day, I was such a sucker. Like they were gonna get anything out of me because there was a Keurig, what, I mean, I’m good... coffee!? I can just get coffee at any time.”. At the middle school, teachers would have to ration reams of paper or go to a nearby Staples and use their state-supplied teaching bonus of \$250 to get supplies. At the high school, the teachers’ workroom was outfitted workplace amenities like a fridge and colored printer with ink.

Carmen received ample instructional support at the high school. The vice principal at the time being a former physics teacher, she would have access to lesson plans going back a decade, as well as laboratory investigations and a space to set them up. For the first time in her fifth year of teaching, she would have a coach - a Black women chemistry teacher. Carmen remarks fondly on how much that type of support influenced her working conditions:

She helped me with the art of teaching science, in some ways she also was going through a conflict thing in terms of like us doing this no excuses thing but because the vice principal was a physics teacher it allowed me to get funding to go to a summer program to learn how to teach physics in what I still consider to be the best way, which was modeling, the modeling framework. So, I spent my first summer after teaching ninth grade physics for the first time in that workshop so I could really transform my teaching, which made me a really great physics teacher...

Although there were still challenges as the school began to shift to a formalized curriculum, taking the “whole spirit” out of her teaching, the modeling framework and supplemental support offered made significant progress in her development. Carmen recalls fighting back as often as possible to adjust the formalized curriculum:

It was a conflict because I, like I said, I'm a rule follower. And that meant they begged me to do the curriculum and I did, and I was like, 'Y'all are killing me.' You know, like we were really making some progress with that modeling framework, and they tried to convince me that the new curriculum was following it, but it was still... They can't help themselves with how controlling they wanted to be. They really fuck things up. And then I ended up being the curriculum writer for physics. And then I got back to what I wanted in that way. So that was another thing.

I felt prompted by my transitions between different schools during science classroom teaching to inquire further at this point about the experience of working in different environments. Primarily, I wondered if Carmen had a preference. Her response began with incredulity and humor, as the thought of having to choose between the two seemed to offer harrowing experiences from each vantage point. Carmen stated that she would have loved to merge the two. At the middle school, nobody seemed to care about her approach to science teaching. With limited surveillance she felt able to accomplish great things. However, lacking and having to advocate for resources and professional development was far less than optimal. She reflects:

And if I had a coach where I'm like, hey, I'm really trying to make sense of this, whatever, whatever, whatever. Can you help me do that thing? That also would have been great. There would have been less, losing of sleep. Cause at the high school there was an algebra teacher, Algebra 2 – 11th grade algebra teacher, a Black woman, and I just sat and watched her teach for lunch. Literally I would be eating my sandwich and eating pedagogical excellence for lunch because it was just like, oh wait, the way she turned this phrase or the way that she got them to engage or the way she did this or she transitioned, it was just like, I want to see, I want my classroom to feel like this. And it felt like she had done what my goal was, to get students to really see themselves as amazing and excellent and not be performing for her. So, I just wanted to eat that up all day. So, if I would have had fellow teachers even, they didn't need to be my coach, but somewhere to just sit and eat that up at middle school I would have really thrived without the conflict of being in a no excuses school.

Working Conditions: Emotional Labor. I wanted to know more about Carmen's most recent science classroom teaching experience at the high school. It had seemed that this would be her last teaching experience before deciding to leave the classroom, and although the working

conditions had improved somewhat with regards to resources for science teaching and mentorship, there were still unfavorable experiences. Carmen described a normal day at the high school as consisting of four periods of ninth grade physics. At times, periods would be more challenging if they were right before lunch or right before the end of the day. She recounts the school day being and feeling extremely long. In some years there she would have additional lunch duty, and in some later years the length of the day would shorten. She remarked, “Them charter schools was wild.”

Of the eight blocks throughout the day, each holding one period, four would be teaching and one would be meetings with her coach. Once, if not twice a week, she would meet with her teaching coach to discuss her classroom observations. Twice a week, she would be observed by the teaching coach or a member of the school culture staff. These observation cycles would consist of follow up meetings, adding to her administrative workload. Carmen’s lesson plans were due two weeks in advance to her coach, and on free periods (or “preps”) when she was supposed to be doing lesson planning, she would find little time to both relearn the content knowledge of physics and develop curriculum and activities. Her lesson planning would extend into her weekends. In a brief story, Carmen shares how the stresses of both reviewing knowledge of an unfamiliar teaching subject area and these requirements would lead her into emotional distress and her first panic attack; the pressure of the rigorous schedule, heightened labor requirements, and intensified pressure to advance her pedagogical skill leading to physiological distress:

We would have days of practice (DOP). So, this charter network at the time had schools in multiple states. Five high schools in total, at that time, and we all had to come to a central place during periodic times of the year. And the first one was in August and the day of practice is sort of like these curriculum developers are teaching you how to engage with their curriculum. And those things were fine. Like I said, I love learning. I’m like, ‘Oh, teach me, you want me to do this?’ I can do that shit well and I’m really good at that

and excited to do it. But then like going to my hotel, like being with them all day, and then like not having processing time and not having silent time because then it was like, ‘Oh, now we need to have like some team thing and then now you need to have like some team thing and then now you need to have your full curriculum map up to December finished and we’re all gonna co-work”, and I remember walking to my hotel room and probably sharing the whole room while I was sleeping with somebody, I didn’t know, you know, and I had what I now know as a panic attack and I was just like, “This is... I don’t know, girl!”

So anyway, my weekends though, for sure, either Saturday or Sunday, if not both, was me trynna to make a lesson plan to make sure that I could have my lesson plans due. And after a while I had to talk to my coach, my dean, you know, it’s like, I know she always had this agenda for our hour-long meeting and I was like, I need 20 min to talk about me. Because you keep asking me to do all these things and she had feedback because then I had to because it’s like two weeks in events, lesson plan, but also iteratively I guess or at the same time she’s giving feedback to whatever I submitted before I need to for revisions, I need to implement the feedback and send it back to her. So, like that being our cycle, and that our meetings also include a lesson planning part and then sometimes those are different meetings, lesson planning meetings and classroom observation meetings. And I would tell her I need 20 min on your agenda because I’m really struggling. And me crying every weekend, our meetings, not doing anything every weekend is not sufficient. We never really got a relief from that first year, but so that was my day and other things I didn’t get paid for. So, on other days of practice, we didn’t get additional funds.

By Carmen’s second year at the high school, she was asked to be grade level chair. This responsibility would require attending grade level meetings after school, grading interim assessments (quarterly examinations), inputting and analyzing data to come up with plans for how they were going to respond to the data in their teaching. By the time Carmen reached several years at the school, both of her Black women coaches had left, and she had become the associate dean for the sciences while still teaching a courseload. She would receive a teacher in residence (TIR), who was also a Black woman and an alumnus of the school. Carmen would be teaching her how to instruct physics while she was still learning to teach it, and although she had become an excellent science educator there was a remarkably extensive amount of unpaid labor woven into her daily responsibilities. Towards the end of this recollection, she exclaimed, “I’m so glad I’m not there anymore. Oh, my goodness. Jesus.”

Political Identity and Consciousness: Working as a Science Teacher

Carmen's entire tenure as a classroom teacher would last from her teaching preparation during the summer of 2011 until the summer of 2019. Over eight years spent in the classroom reflects a changing social and political atmosphere in the U.S. as former president Barack Obama's term would continue until 2017 and former president Donald Trump's president would begin January of the following year. At this point in the interview, nearing the final narrative and self-thematization, I asked whether the effects of political events found their way into Carmen's working conditions. She recalls events such as the sentencing verdict George Zimmerman, the self-certified vigilante and murderer of seventeen-year-old Trayvon Martin, in fact shifting her decision-making to remain in the classroom despite her planned career trajectory:

Yeah, when Trayvon died, I was considered before he died, and before the Zimmerman verdict, I was considering leaving teaching. Like I said, I'm sure it was the first time we met, teaching was not the plan. You know, I was supposed to be a two-year teacher or "take a break and figure things out" teacher. So around year three or year four I was feeling really good about my classroom but, and it's like, "Oh, this is great. But this ain't my life." I knew I wasn't supposed to be doing like... I'm not a career teacher. So, I was considering leaving the classroom. I was like, "Oh, I did it." And then, Trayvon was murdered, and... Oh, I remember when the verdict came out, I was, I know it was in a predominantly Black neighborhood. I remember just crying on my bed.

And just, the way that I was raised was very understanding of political events. So, like, understanding what a lynching was or what it was to be let's just go with Black in America was a part of my childhood in a way that I knew wasn't necessarily a part of a lot of my peers are childhood, not as explicit as my dad was. And there was a part of me that had allowed myself to accept that my current students didn't, not that they didn't need that but like things had changed for Black folks in that it wasn't as starkly in your face in terms of just straight up murder of children. And I relaxed a little bit and then when he was murdered and Zimmerman was acquitted, I remember being like, wait. Well, first, things haven't changed, which I knew, but I thought the kid version, like what was necessary for them to understand about their being, softened a little bit. Like, cause there were some things that I learned in college that I was like, okay, this feels right or I wish I learned this earlier, but I don't know I just was feeling less urgent about it. I don't know. But then when he passed, I was, like, "Okay, well, I can't leave yet." Like there was, they put a fire in my gut to keep trying to do the work, which probably was why I was so distraught when I reflected on myself and saw myself in the no excuses thing that I was doing. I was like, this is not it. Absolutely not it.

So yes, that feels like a political event. What's it called? Stealing of an election was another one of those, but I wasn't emotionally present enough to talk to my kids then. Yeah, I remember, yeah. And I was in a school where they, like the staff, really wanted to talk about everything, and, uh-uh, I wasn't emotionally present to go there with them where I was emotionally present to talk to my middle school students, but also it was not a safe space in that high school. So. It definitely didn't make me want to stay longer. I didn't know what I was going to do, but you know, by then I was figuring out if I want to do a PhD program. I was probably applying by then.

Carmen described the institutions in which she was working draining her in ways she hadn't realized. In addition to challenges she was having in her personal life with family, the morning after she received the news that Trayvon Martin was murdered she recalls losing forty-five conscious minutes during her Uber drive to her school. Attempting to navigate both the triggers and dissociations that come with Black death and suffering, namely lynching, Carmen recalls not feeling emotionally present enough to tackle the school day:

I remember people just yap yap yapping in this really white liberal angry thing and I remember having things to say, but also a whole bunch of people were saying things that were fine and accurate but not complete. But also, I was probably more trying to attend to myself and trying to figure out what I was gonna say to my kids. I remember that being a big thing. And feeling like I was gonna cry in front of my kids by the time I got the first period, and I was like, we gotta get it together. I do not cry in front of students. That is a rule of my teaching at the time, probably still. It was a depleting place, so probably...also I'm not, as a human, emotionally aware enough to always know why I am at a limit, but I know I was at a limit. I don't know... I remember looking in their eyes and feeling distraught and lost. Where hope is typically like it's a part of the Black narrative and part of my narrative, whatever, but I was looking in the eyes and I was like, I am so sorry [laughs]. I do not have hope right now. I don't. And I don't know. It was a very distressing time - is a very distressing time.

Deciding to Leave the Classroom

Towards the end of our second session, as we began to wrap up the last part of the interview, my questions turned towards identifying a critical incident or moment wherein Carmen felt it was her time to leave the classroom. Carmen shares her third and final narrative of the interview, a moment during which the intensified working conditions and stress of her position led to yet another physiological outcome:

Narrative 3

So, the context of the time, I am a doc student, I am an adjunct professor, and I am a full-time teacher. Which included being an associate dean. So, I was coaching the other physics teacher, so they had reduced me down to teaching, coaching him to teach physics while I was teaching one class with him. Which also meant taking over a class because he was doing so terribly quote unquote classroom management, that I had to teach a class so that he could see the art of teaching. But I coached, I coached and taught physics. Coached Algebra. Biology. Chemistry. So anyway, it was fourth period, the class where I had to, where I was the co-teacher for the physics teacher, he was teaching, and I was in there. So, my core role instructionally was supposed to support the scholars with IEPs. But in the end, what ended up happening was this... I'm coaching him while he's also teaching. And that classroom was... the culture in the classroom wasn't positive.

But I remember I was in class, and I left class the period after lunch, and I had this extreme pain in my arm. And I realized that I had been holding, I used to teach with clipboards because people would always come up to me and say stuff to me and I can't keep things in my brain, so I always had a clipboard so I would like to have something to make sure I met their needs or whatever. But I was holding my clipboard and I realized I had been holding it so tight that I had injured my arm. And I was... it was... I don't know, it helped me see how the word I guess is violent, but like how clinched and how unnerved and unsafe and whatever I was.

Because I was trying to survive in this space, but I must have been holding on without realizing, I was doing my job. But I'm realizing then I was like, 'Oh, I'm not. This is not well [laughs]'. I must really be stressed and triggered to be in our memory when I released it like my arms, I was like, 'Oh shit.' So that's when, no, it's like I think I need to figure out something else. And then after I did not actively pursue anything else, but it was definitely a feeling like maybe it's time to do something else. Because by that point, I was a doc student in classes with two Black science teacher educators at one of the largest graduate schools of education in the United States. The conversations allowed me to be really reflective about the things I was doing, and how they were dishonoring who I was. So, I was starting to be able to see again and think again. So, those little nuggets were already happening and then that clinching, that that was really just, but for whatever reason it felt like, "Yeah, girl, we gotta do something else." I don't know what something else is, but this ain't it. So yeah, so that was the moment.

Carmen expressed feeling a lot of guilt throughout her time in the classroom when it came time to leave the middle school position, feeling terrible about leaving the space yet determined to seek a more supportive teaching environment. She would come to learn that they had never replaced her, and the students would not have a full-time science teacher after four years during which the administration could have hired new faculty. Although friends would say, "Girl it's time, get yo ass out", she reflected that she was a good teacher but also that she didn't

need to be the teacher that she was at that school. She also knew she was good at helping other people become better teachers. Later, she would work within the public-charter network as a physics and chemistry curriculum developer and instructional specialist for all five high schools. Her decision to leave the high school was met from the principal with anger and disappointment, which unfortunately led to the principal pre-emptively sharing with the leadership team Carmen's resignation without consent. Although Carmen was integral to the space, serving as the welcome teacher, hallway teacher, and being a part of everyone's classroom through her impactful rapport, she was unable to share with them herself in a way that was meaningful; representative of their time spent together. Staff had come to appreciate her honesty and candor about what was wrong about the schools' functions, yet she was left with a feeling that she was working outside of her integrity. She would later come to understand just how culturally and racially relevant her science pedagogy was and how congruent her experiences would be with developing a career supporting other science educators.

Life After Classroom Teaching

Since 2019, Carmen's decision to leave the classroom has resulted in a continued to search for a safe space in the educational industry. She would transition to a hybrid job working across multiple states and school districts for the public charter network while creating curriculum, meeting virtually with teachers, and navigating classroom visits to support other educators. While continuing to pursue a doctoral degree, she would be adjunct teaching at the very school she was rejected from while applying to undergraduate programs years prior. At one point in 2020 she would be working two full-time jobs simultaneously, defending her dissertation, and finishing her doctoral program. She notes that much of her challenges while teaching at the high school would show up in her purpose-filled dissertation. In March of 2020,

the country would face the beginning of the COVID-19 pandemic and lockdown/quarantine period:

I proposed my dissertation proposal in June 2020, which meant from March to June I was just in my office all day. Either doing my job but on weekends I got to dedicate to reading and writing and proposing the dissertation study that I wanted to do, and it felt so good to be learning about these frameworks, Black feminist theory, Critical Race Theory, culturally relevant pedagogy that gave me language for the things I was trying to accomplish. And also gave me language for the things for a while, what felt like I was working outside of my integrity, but then to also do a study with Black women science teachers was just this beautiful gift that I was able to give to myself and bestow upon them and then doing this sister circles was just tier worthy of just excellence and amazingness and so different, starkly different from what my work was.

And I remember being frustrated at the time because on those Saturday mornings where I was dedicated to writing my dissertation proposal, I would say out loud, like, I just wish I was able to do this all day. Like this is all that I want to do. The stupid-ass talking to these teachers who have low expectations for kids or being in these schools, because also you know my story about holding the clipboard essentially, I went to a job where I would go to other people's classrooms all year. Because of lockdown that wasn't very long, which was good for me mentally. But I essentially went from watching really corrosive things happening in my own classroom because another teacher is teaching or in my own classroom to going to other schools and seeing it can be even worse. And that being really stressful.

At times Carmen reflected on her upbringing, frustrated that she wasn't raised with the type of money that meant navigating a doctoral program would feel like "not being paid to think". She wished she would have been able to pay rent while doing her study. After completing her program, she would enter the job market, learning that the next steps toward being an assistant professor offered their own challenges. She would work as an assistant professor in culturally relevant pedagogy for what would be a \$15,000 pay cut, requiring her to keep two jobs because one was fully remote. She would be working for an educational program at a Hispanic serving institution across the country in the west coast, teaching a 70% Latina population and making further professional connections while working with students of color. Eventually, she would learn about a prestigious university in the east coast searching for new faculty and apply and work as an assistant professor. This university would be more aligned with her research

goals, assisting her ability to get published. With this new position, she would be able to have one job, cover the bills, and continue to impact the field of education with her expertise and approach to culturally and racially relevant science education.

Theme 3: Getting Back to Self

It was at this point our time was coming to an end and I asked Carmen to, if possible, apply a theme to this part of her life, since leaving the field of classroom science teaching:

Yeah, so this part of my life. This semester in particular, last Saturday I submitted a paper that I had been working on for a long time and I feel really good about it. But so, this semester in particular feels like the theme would be “getting back to self”. In a way, quitting my job in November felt like a beautiful gift to me, even if I’m stressed about money for a multitude of reasons. It is this beautiful gift of like, ‘Okay, Carmen, you’ve been going on and on and on about you wanting to be able to dedicate your time and your purpose to this and now you get to,’ so it feels like getting back to self. And because of, thinking about fall semester, it is such a white ass institution and a very privileged white ass institution, I found myself, let’s say November-December, struggling with the students here and the depth of whiteness. I still haven’t put my finger on it. My colleagues tell me it’s because I was teaching an elementary science methods course to white women, different kinds of white women. So, I don’t know if the audacity is like a different spice. Because of course I’ve been educated since 2011 I’m used to white women.

I’m used to coaching. I’m used to being a teacher educator since 2015. I am like, ‘That is not a new concept for me.’ Something was really different and corrosive in the water. And definitely I don’t feel like people have my back enough to be in order to, like, being in that kind of space, so that was hard. It is hard but it was hard for sure. And what I was able to really put my finger on around December is because I live here, I really am struggling with place and space. Because I’m used to, ‘Okay, I’m a teacher educator and I talk to these women who say all kinds of stuff but still teach our kids - I go home. I eat my dinner and go, you know, and be around and like exist.’” And having these really general complacent, not so great conversations or being questioned or whatever the things are, and then walking seven minutes and being in a different part of the city where people violate my space all the time.

Carmen goes on to share one final anecdote before our final interview ends:

I was in a text message conversation last night alone, me trying to read my Tony Morrison conversations and be in this wine bar and it’s happened to me now two times, where somebody just comes up to touch me and it really, it, it unnerves me. And I don’t feel physically or psychologically safe in these spaces. I just wanna be back in a predominantly Black area. So, I need to of course be more intentional about that. So, I think that’s where the conflict is, like, I can’t afford to live there because I just would.

Which is crazy to me. I just want to go back to my home on the street where I used to live there. I would just live there and like I left this area when I was young and cute to come visit. Living here I think I'm, you know, finding a groove, especially this semester, but having been outside of my office in some of the ways that I am with folks and whiteness, cause also the other students are doing some stuff too. And then, living in the predominantly white part of the city is not good for me psychologically. So, there's a conflict there.

Carmen's narrative biography is replete with reflective and critical attribution to the social life and working conditions of a Black person navigating educational and career opportunity, social and professional mobility, class, and polity. From an early upbringing situated with political messages and understanding of her Blackness, womanhood, and intellectual acuity there were many challenges throughout her pathway to science education that were met with integrity, advocacy, and awareness. As Carmen continues her work in the field of science education, having achieved considerably despite these challenges, there exists continuous search for places and spaces in which she feels valued and effective in serving the communities to whom her principles most apply.

Chapter 5: Findings Part 2

Self-Thematization

Participants were asked to share a thematic interpretation at three points through the interview that are used as units of analysis: a) upbringing and early educational experiences, b) pathway and approach to classroom science teaching, and c) working conditions as a science teacher and eventual decision-making in leaving the profession. Of note is the frequency that each theme also appears outside of the discrete units in which they were prompted. It was found during the analysis that the self-thematized codes themselves provided both surface level narratives that were perceivable throughout the interview transcripts as well as deeper, interpretive connections that existed throughout each participant's storytelling about their lived experiences surrounding Blackness/anti-Blackness and their working conditions whilst secondary science classroom teachers. These connections both elaborate and further synthesize the conceptual and theoretical boundaries of the research questions. There appears several formative discussions of the nature of anti-Blackness, neoliberal capitalism, and U.S. imperialism in science education that affected the working conditions and decision-making of these two Black former science teachers in their approach and exit from the classroom as well as throughout their life histories that demands further consideration of the concept of political struggle and Black science teacher attrition.

5.1 Open Coding

Open coding is a step in the analysis process of qualitative data wherein codes are applied that interpret themes in sections or segments within a data set. The data collection process within each narrative inquiry consisted of interview transcripts in which the participants thematize their own story-telling. These self-thematizations were used as codes to dive deeper into their

narrative-biographies and interpret the general frequency of their descriptions as units of meaning associated with the central topics of the interview and for the purpose of interpreting the research question: How do two U.S. Black former secondary science teachers self-thematize their life histories, working conditions, and decision-making in leaving the profession during the post-Obama era of 2017-2022?

Self-thematization in qualitative research has been shown to prime and prompt participants to both share their recollection of events and moments as well as interpret these events through thematization, a process by which one evaluates the general themes or critical subtexts of parts of their lived history (Kelchtermans, 1994, 2002, 2016, 2017). The outcome of self-thematization is evident in both participants' narrative-biographies at several moments in their life history throughout their storytelling. The following analysis consists of: a) each participant's discrete self-thematization used as open coding to discover the interconnected stories within their narrative-biographies in which these themes arise, b) the detailed comparisons of each participant's self-thematization through axial coding that respond directly to this study's research questions, and c) a selective coding using the interpretive phenomenological framework of anti-Blackness in critical Black study and proletarianization through historical materialism that develops a rhizomatic analysis of their working conditions and decision-making to leave the profession during the post-Obama era.

5.2 Participant A - Alex Dawes

Alex's narrative-biography consists of three situated and stimulated thematic self-interpretations as phrases occurring at each section of the interview. Throughout their upbringing and early educational experiences, a "belief in mobilizing" was identified, in which through family history and organizing Alex was aware of their experiences navigating authority,

institutions, and sociopolitical events as powerful foci for people to work together to fight for common causes. During their pathway and approach to science teaching, “connection through humility” exemplifies moments in which Alex interprets the shared geographical and racial similarities with the students and communities in which they were teaching. Alex’s reflections consider the critical relational connections regarding humility needed in recognizing the multiple identities that represented both socio-emotional opportunities and challenges to connect further with their students. Lastly, “beyond the walls” represents Alex’s considerations of a life after classroom teaching that consisted of many similar interests and passions in educational equity not confined to the four walls of a classroom in the traditional form of schooling. Below, we explore these specific themes as a collection of the storytelling and critical incidents that may have prompted them from the narrative biographies provided.

A Belief in Mobilizing

Mobilization is a form of activism that has existed throughout social history, and even perhaps before historical record. Defined here as the united and coordinated movement of bodies, minds, and communities around shared experiences and motivations, in the modern world virtually all political effort centers some sort of mobilized activity. In community and grassroots organizing, mobilization may look like educational or communication campaigns to spread awareness, petition or referendum signing, marching, rioting, rallying or other public expressions of unity or grievance.

“A belief in mobilizing” appears frequently throughout Alex’s storytelling, as well as descriptions of their identity development throughout their adolescence; growing up in a community that represented their Afro-Caribbean culture and relocating to an extremely different neighborhood and school district while also receiving consistent messaging and support from

their family and caretakers around the history of colonization, immigration, civil rights, social justice, and liberatory resistance of the Black masses across the North American continent.

Alex's thematization of "a belief in mobilizing" is directly evident in their shared narrative of resistance to their high school friends' disciplinary punishment from school authorities. Drafting statements, galvanizing other students to sign petitions, engaging in activism and advocacy, and vocalizing dissent all appear throughout their first story.

At several moments "a belief in mobilizing" becomes apparent and colors Alex's narrative about their personal and educational upbringing. From family and community to professional development, Alex's attention to mass mobilization and coalition-building for social justice connects critical incidents that occurred throughout the 21st century to their decision-making. The ability to maintain a rigorous and dedicated political integrity is evident as there is little to no separation between moments when injustice and harm were met with vocal and practical resistance. Alex's statement that "people can be convinced to do things together" rings true in both the 21st century and as well throughout history as mobilization and community-building. Mobilization has been central if not critical to the Black radical tradition in combating the practices of dehumanization and racialized oppression (Robinson, 2020). This theme also highlights the connection between Afro-Caribbean heritage and rebellion, wherein mobilization about shared struggles was tantamount to the ever-present resistance to colonial occupation, chattel enslavement, and violence brought throughout the continent throughout the Trans-Atlantic Slave trade and post-Civil War struggles for liberation and civil rights across the Americas.

A Friend in Need

Alex's story of a friend in need of support after a raucous high school sports activity left them banned from attending future athletic programming presents a window towards an early practice of a belief in mobilizing. From Alex's narrative biography their participation in participatory leadership such as student council or government as well as their description of how their friends would often refer to them as "Reverend Dawes" point to a reputation among their peers of their involvement in organizing around issues. What began as a jubilant exercise of school culture would become problematized by the administration's insistence on punishing an individual, they deemed responsible. Alex retrospectively acknowledged that a retaliation for what was said during the event was reasonable yet from the standpoint of a disciplinary action on an individual for group efforts I argue there to exist an assemblage of political consciousness and youth activism in the students and Alex's response. We see evidence in this "belief in mobilizing" in practice as Alex accrues hundreds of signatures from other students and marches into the athletic administration's office to contest their peer's disciplinary punishment despite the possibility of failure.

Teacher Preparation and Anti-Black Violence

While pursuing an undergraduate degree, between their sophomore and junior year, 18-year-old Michael Brown was shot and killed by police officer Darren Wilson in Ferguson, Missouri. Conflicting accounts of the event of the shooting would send Ferguson as well as the nation and global community into an uproar, as extrajudicial killing by the police has been a hallmark of anti-Black violence since the inception of the police force as the slave patrol of the union.¹³ Alex would meet the grief and justifiable anger of the moment by furthering their

¹³ From *The Origins of Modern-Day Policing*, NAACP, 2025 (<https://naacp.org/find-resources/history-explained/origins-modern-day-policing>)

participation in organizing and mobilizing their community: joining and forming multiracial organizing coalitions, leading demonstrations and actions, and connecting the dots between Brown's murder and the antagonism of the police on campus. A "belief in mobilizing" becoming evident once more in their self-thematization about dealing with injustice as a community.

We find other places wherein this theme arises before, during, and after Alex's time as a science classroom teacher. In their teacher preparation, the summer before their first year in the profession, Alex's time was spent in a different city learning how to teach in an intensive, alternative, non-traditional teaching pathway program. This very summer, thirty-two-year-old Philando Castile was shot and killed during a traffic stop by police officer Jeronimo Yanez. Alex would at the time be quite experienced organizing, taking on the additional responsibility of preparing to be an educator and coordinating a rally. We see that even when fatigued the outcome of channeling community efforts to resist injustice and name oppression were a consistent part of Alex's approach to social justice and coincidentally occurring during their pre-service teaching preparation.

Connections Through Humility

Humility is a complex emotion shaped by our desire to recognize ourselves as more than just individuals, but a part of a vast intercommunal web of experiences, skills, and knowledge. To be humble is to interpret that one has more to learn or experience and is a critical facet of working within communities, especially when they are not one's own. Alex's thematic description of "connections through humility" presents the emotional paradigm of interconnectivity required to engage authentically with others, whether by recognizing one's own mistakes or perceiving grace and joy in one's position. It is of no coincidence that Alex's second

theme arises from their continued development in political consciousness as well as continued work in the science classroom.

Hidden Figures. Alex's central narrative that begins the second part of the interview discusses their approach to science teaching, which funnily enough turns out to be a story of what could be considered a non-pedagogical day. During a school field trip for the girls from the middle school to attend a screening of the movie *Hidden Figures* (2016), featuring notable Black actresses such as Octavia Spencer, Janelle Monae, and Taraji Henson, Alex's task was working with the classes of seventh and eighth grade boys that remained in the school building. Alex had mentioned that they had been exposed to feminist organizing and activist spaces during undergrad, and in combination with their knowledge of educational equity decided to turn the day into an exposé of the challenges young Black women face amidst schooling and scientific career aspiration. As the story dovetails into an incredible moment where both Alex is connecting further with their students and encouraging them to make connections about their gender-marginalized peers, the students were led to a moment of realization that resulted in action. What Alex describes fondly as a heartfelt moment wherein their students were both learning about the challenges Black girls face in the field of science and offering affirmations in the form of notes on their lockers, we see relational approaches that result in students forming closer connections with each other around central communal issues. Alex was able to both initiate these discussions in real time with little prior planning and as well create an environment wherein Black boys developed encouraging and embodied activity that centered their peers of a more marginalized gender. Alex notes as well how these connections led to changes in the students' interactions moving forward, increasing in small ways the comradery across gendered identities.

Homegrown Science Teaching. Alex had the opportunity to both teach and develop community in an area they grew up within, offering intimate proximity with staff, faculty, students, and parents who would perhaps share cultural similarities in ancestry, language, food, and communal practices. We see that the charter school Alex had worked with was also known to their community as well. Alex described the Abbott Elementary-like feel of being a young Black professional, interested and able to serve their community, working alongside other administrative leadership and staff that may have shared similar values. Arguably most of what appears foremost in this narrative is the relationship Alex would have with their fellow staff, students, and their families who shared similar cultural and racial backgrounds.

Alex includes epithets that feature this communal relationship as a part of their science teaching and work as a classroom educator. They would be close to students and their families socially and geographically, bumping into them in grocery stores or around the city at similar bakeries or church events. Their students would refer to them affectionately (like their high school friends) as Revered Dawes, owing to perhaps the charisma and/or candor brought to their interactions. This definitive rapport would be challenged and challenging at times, but overall may have provided a feeling of homegrown community service.

As a classroom educator, this proximity may have offered opportunities to develop rapport and meaning behind student relationships as well as their pedagogical approach, yet the critical incident I notice from their story-telling arises in the moment where a student calls out their possible presumption that this intimacy was bulletproof. “Mr. Dawes, just because you’re Black and just because you’re young and just because you’re Caribbean, it doesn’t mean you understand us. You’re not even from here.” Alex’s reflection on this moment explores whether this may have been a call-out or *call-in*, an integral interpersonal moment of transparency,

boundary-setting, and relationship building. Alex offers how crucial this moment was in both how they proceeded to develop as an educator as well as a member of their community. It is very likely that the instances of familiarity overshadow difference, and as will be discussed later, these opportunities present ways of engaging in the politics of identity and interconnectivity that construct and at times deconstruct our abilities to reach people in meaningful ways. Alex described this moment as a turning point of recognition that getting too comfortable could be a detriment to their goals of reaching others with whom they sought connection.

Beyond the Walls

Classroom education, as a particular style and approach within the larger paradigmatic institution of schooling, is regarded as a salient space for pedagogy and curriculum. The U.S. consists of states with hundreds of school districts, and thousands of schools varying by type, grade-level, funding, and administration. Compulsory schooling mandates that virtually every child in this country is put through the classroom education system, yet according to Alex's third and final theme there exist other ways of interacting with teaching and learning. "Beyond the walls" may represent a call to examine how both the classroom, as well as the public and private institutions it is directed by, are walls/boundaries/barriers that are permeated by the social and political challenges that surround them. From much of Alex's narrative biography and as well their approach to science teaching, the following two instances represent both these walls and what is beyond, surrounding, and between them.

A Student in Distress. Students with disabilities, including students with specific emotional needs, are victim to ableist oppression at the educational, administrative, and policy level of schools. Special education services in some of the most highly populated and under-resourced school districts and buildings are often understaffed and underfunded, rendering

educational support staff thin and challenged to meet the variety of resource and skill needs students with disabilities require to succeed academically. In their narrative surrounding critical incidents in which they had decided it may be time to leave the field, Alex may also be describing these conditions and the role many classroom teachers attempt to engage in supporting these student populations. Alex's story centers a student enduring physical and emotional distress at the loss of a parent and how the result of an inattentiveness to their needs manifested during the school day; locking themselves in the science classroom cabinets, which were locked from the inside, and the using Alex's school keys to do so. Alex, acting in tandem with classroom educators who take the role of caretaker seriously, utilized their rapport to bring the student to some sort of safety and immediately afterward bore witness to the involvement of the anti-Black carceral state in this student's aftercare. Instead of providing medical health practitioners, childcare specialists, or psychiatric services, this student's first interaction afterward emotional distress was with police officers and school safety personnel who accompanied them to the hospital. Here we see Alex reaching beyond the walls of their classroom, into their communal relationships with this student, extending themselves outside of their pedagogical role as a science teacher to assist in this student's well-being. The result of the day ending with the student in custody renders both a traumatic and integral context towards what the walls of the classroom may mean, and why reaching beyond them and existing simultaneously inside and outside of them may have been central to Alex's political and ideological development around educational inequity.

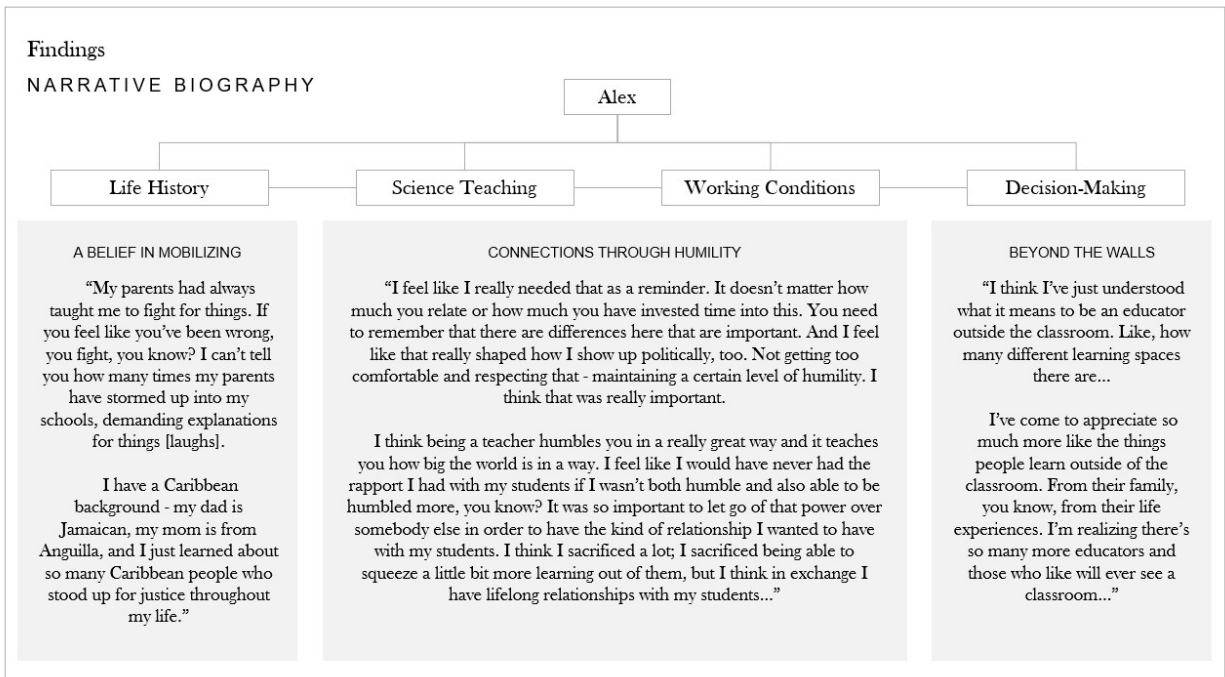
Organizing for Care. There are similarities here between the themes of "a belief in mobilizing" and the theme of "beyond the walls", connecting Alex's continuing work outside of the classroom to their experience within. Alex's retelling of the story did not end with this

incident. In their recollection, the ambivalence of the administration in the handling of this critical incident was worthy of further organizing and action. Alex mentions their involvement in the subsequent request from the district and city for more specialized support services for students with disabilities, emotional and physical. I would go so far as to render this moment sociopolitical, as Alex collaborated with others to achieve pushing the school district to provide this funding regardless of the contentions between the funding streams and organizational policies of charter schools and public schools in the area. We are left with the realization that although school settings claim to provide safe spaces for all students and often have substantial budgets and resources to do so, there are at times choices made and malpractices committed that deputize individuals to act as agents of change.

As Alex left the field of teaching, they would relocate to a new city in the southeastern region of the U.S., attending graduate school for biomedical engineering in congruence with their earlier ambitions of being a college professor. Moving beyond the walls of the classroom meant continuing their work with regards to educational inequity and living in a new location meant learning from their surroundings in new ways. They found interesting comparisons between the graduate education they were receiving and their experiences teaching middle school level science, namely just how many instructors at the level of higher education had little classroom teaching experience. Their continuing choices not to pursue a Ph.D. granting them the ability to return to the workplace with invaluable transferable skills yet a nostalgia for the classroom. Alex's statement, "I will be a teacher through and through", alludes to the continuing connections made within the field of classroom education as well as the extensive possibilities that exist within opportunities to teach and learn outside of the classroom that offer different challenges. Currently, as an educational strategies director in the non-profit sector, a lifelong

commitment to the qualities of communal care and learning service remains an integral part of their approach to organizing and mobilization work.

Figure 1: Summary of findings, narrative-biography of Alex Dawes



5.2 Participant B - Carmen Cooper-Clarke

Carmen’s narrative-biography consists of three situated and stimulated thematic interpretations as multiple phrases occurring at each section of the interview. Throughout their upbringing and early educational experiences “working, Nerdy Black kids, and familial support” was identified in which Carmen’s reflection on her upbringing developed recollections of her family’s experiences with class and labor and its effect on schooling as well as her educational autonomy growing while pursuing her school choice and academic interests. During her pathway and approach to science teaching “working outside my integrity/excellence behind-closed-doors” arose as a central theme. Her science teaching career itself began with “betrayal” and navigating the working conditions amidst two school types and age groups within a similar public-charter

system offered contentions with her own personal and political approaches to teaching predominantly Black children and inspiring her own professional development despite administrative neglect. Lastly, “getting back to self” shows us how Carmen’s story continues bridging her educational experiences and political development into on-going challenges in the industry of education as a teacher educator and professor while still navigating similar sociopolitical contentions at her workplace and the city in which she lives.

I Don’t Have No Money!

Socio-economic status in the U.S. attends to the material conditions of a person’s life, aspirations, and struggles. Carmen’s description of her upbringing and early educational experiences is highlighted by her family’s involvement in her and her sister’s education. In a two-parent, working-class household even the district with which they were allowed to attend public schooling would be affected by their household income, zip code, race, and class. Carmen’s discussions of the intersection of socio-economic status and opportunity appear as early as her and her sister’s school choice, the family saving up to afford private school, and the money “running out” and leading to her younger sister’s attendance at a different school type than her own.

Nerdy Black Kids. Carmen would mention a couple of times that her high school experiences were the beginning of what she felt was her educational autonomy. She would perhaps register her address under that of a family friend or extended family member to gain access to the application process at a specialized magnet school that would attract student interests for its designation by name and/or policy as focused on a certain type of educational outcome. Carmen’s choice of a medical science-oriented school put her in proximity with other students who were similarly invested in their education. “Nerdy Black kids” attends to the

possible expansive personal identity held in community with like-minded Black students as well as perhaps a hopeful outlook on mobility and career options as the college admissions loomed nearby.

“Nerdy Black kids” perhaps also alludes to the intersections of race and class preceding this theme in Carmen’s narrative-biography. As she would become a first-generation college student, there exists a connection for many young Black people across the country who from their grandparents and parents would receive the motivational aspiration to utilize education as a gateway to new and better opportunities. Educational mobility as class mobility, career aspiration as societal access. The “Nerdy Black kids” of Carmen’s story are possibly the similarities she would share with a cadre of her Black peers perhaps given these same messages. Consistent throughout this narrative are the moments of parental and familial involvement in the schooling process via her father’s advocacy and presence and the extended families general support of her achievement.

Familial Support. In addition to the support for her academic achievement the presence of Carmen’s family throughout her narrative displays instances wherein social, racial, and political self-concepts may arise. Carmen shares that her household was staunchly pro-Black, a position taken against anti-Blackness by many that promulgate counternarratives of Black racial identity against what George Jackson calls a “morbid, traditional fear of both blacks and revolution” dominant and hegemonic stereotypes embedded in this country and world (Jackson, 1990, p. 125). The thesis of the Black Power movement extends throughout Carmen’s interpretations of self and the world around her, at times in complicated ways. The retelling of receiving a viewing of *Roots* for her seventh birthday stands out especially as discussions of the history of slavery, Black resistance, and politics were commonplace at home. Many of the

familial structures that supported Carmen throughout her upbringing seem to promote a raw, straight-forward discussion of the intersections of race and class within her life. From the neighborhoods she would grow up in and the dominant narratives about growing up in the hood that she found herself able to analyze and combat, the role that family plays weaves from the joy of singing and dancing to old and new school R&B to the historical trajectory of her Black grandparents from the south relocating to the west coast in search of better opportunities for their children.

Working outside my integrity

Carmen's pathway and approach to science teaching are also connected to themes that arose within their early educational experiences. As the familial support around education, social justice, and career aspiration led Carmen to become a first-generation college graduate, becoming an educator perhaps meant continuing to imbibe the same understandings of the world throughout her pedagogy and approaches to professional development. Interestingly, within the field of classroom science teaching, Carmen would find challenges to her professional growth despite exceptional practice and rapport with her students. Before and throughout science teaching, trajectory away from home and into a large metropolitan city in the east coast in some ways required a consistent self-concept. "Working outside my integrity" connects the struggle between having a deep knowledge of self and acknowledgement of one's own skills and convictions against systems and individuals who would seek to render these concepts as lesser than. We see within Carmen's first position as a social studies middle school teacher into her first few years of classroom science teaching this integrity plays out within her pedagogical excellence, relationship with her own professional development, and that of her students.

Behind Closed Doors Excellence. Carmen's first narrative tells the story of working inside of one's own integrity despite receiving little to no recognition. After pursuing an undergraduate degree and entering her teaching preparation program the lengths that Carmen had to go through to ensure a job position and opportunity to succeed are formidable. However, once within this first school position we find Carmen blending her racial and political consciousness directly into her teaching. While transitioning to be a science teacher we find Carmen's public charter school administration both able and willing to prioritize some subjects over others. This normative occurrence in U.S. public schooling constituted by standardized testing places funding and school supervision by state at the hands of examination scores by district for the subjects of English, Language Arts and Math. Especially in large metropolitan areas, wherein the scramble for school funding is especially tenuous between public and charter schools, Carmen's public charter encultured a mixture of both challenges. While teaching science, Carmen shares that she was notably dismissed for both professional development and adequate classroom resources. With little mentorship, coaching, or curricular support, she had managed to engage in pedagogical and instructional practices that exemplified culturally relevant and responsive teaching perhaps long before she would come to know these terms.

While sharing this notable approach to science teaching with a friend we see Carmen find herself in an opportunity to be both recognized for her professional acuity and as well able to highlight her student's subject matter knowledge and advocacy. The narrative theme of "behind closed doors excellence" highlights this tension as Carmen shares how impactful this moment was for both her and her students as well as her administration feeling left out of the loop and hard pressed to understand how they could have missed an opportunity to support one of their most impactful educators. As the narrative ends Carmen shares yet again how close this event

brought her and her students and highlighted for herself the integrity in her work. Although she would come to leave this school, she continues to reflect throughout her narrative-biography on just how much she was able to do with so little resources for science teaching and how much of it came from remaining within her integrity all throughout.

The one doing the talking is the one doing the learning. We find as Carmen's classroom career continues she can land herself a position within a new schooling environment, one in which she will receive multiple mentors, coaches, and resources for science teaching. In juxtaposition however we see how the theme of "working outside my integrity" arises as a new school environment brings closer supervision, extensive classroom management, behavioral adjustments, and Carmen finds herself reflecting on her previous approaches to developing rapport with students in the classroom. Within this new school she would engage differently within her pedagogical approach, mentioning that while visiting her previous school she noticed students seemed to shift their behaviors upon seeing her and not for themselves. Carmen's pedagogical transition would engage students in a classroom environment wherein they would find excellence and achievement on their own terms and for their own ambitions. Carmen's development as an educator would grow at this time as well, watching and learning from Black women science teachers who structured classrooms in such a way wherein "the one doing the talking is the one doing the learning".

With this newfound position and pedagogical approach, at a school setting that acknowledged educational excellence, Carmen would be found at the center of their attention. This new setting would be accompanied by Carmen's decision to pursue a doctoral degree in science education wherein philosophical context added language to the pedagogical moves Carmen made around racial and cultural relevance with her students. Unfortunately, this

transition also came with a decrease in Carmen's autonomy and ability to diversify her curriculum to meet the needs of said integrity. In particular, the school shifting towards a more standardized curriculum in the sciences presented challenges to what Carmen describes as the "soul" in her curriculum. After pushing back and eventually moving the needle back towards the type of relevant and responsive teaching necessary, Carmen was moving throughout the field of education both in her studies as well as in her career serving as curriculum designer for the network and becoming a teaching coach. The message of "the one doing the talking is the one doing the learning" seemed to both further Carmen's conviction in her own pedagogical excellence as well as elucidate how much of her external school environment was causing her to work outside of her integrity.

Getting back to self

Throughout Carmen's narrative-biography, there seems to be a continued theme of personal and professional identity development. From her early upbringing of pursuing educational autonomy, she describes pursuing certain opportunities and the challenge of not being able to attend her top college. From her approach to science teaching, we see consistent work with students and their self-concept, utilizing the scientific discipline to inspire them to analyze the world around them and push for advocacy and change. The final theme, "getting back to self" is described from the point of departure from the classroom into the more recent years of Carmen's life as this journey continues.

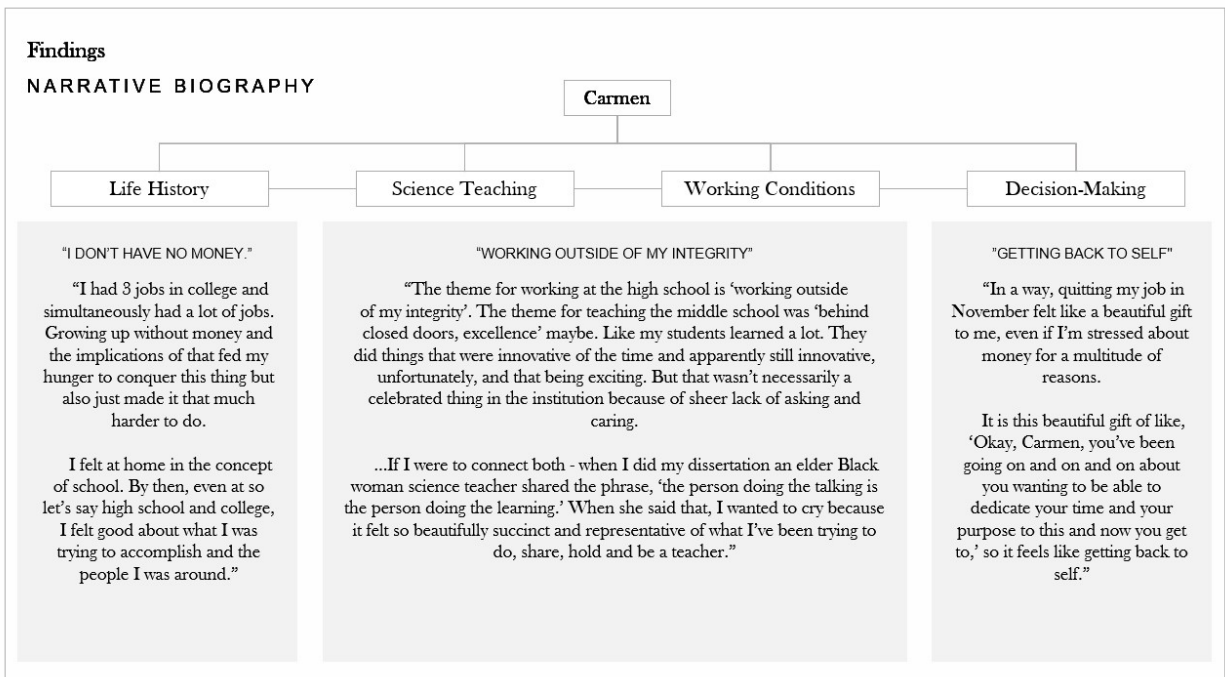
Excellence in Science Education. Carmen's educational autonomy began in pursuing the medical science discipline in high school, surrounding herself with like-minded peers and other nerdy Black kids. She pursued a degree in the sciences initially, finding undergraduate science education too rigid and closed for the type of analysis she felt necessary and pursuing

sociology instead. Her origin story as a science teacher was a return to this rigidity, but now in control of the pedagogy and curriculum she sought to merge the critical analyses of culture and society into her science teaching. Currently, Carmen is a teacher educator and professor of science education, encouraging educators to interrogate their relationships with schooling and teaching through cultural analysis for the purpose of social justice.

A part of Carmen's "getting back to self" stems from their interests and aspiration towards excellence in science education. Now living in a city, she had dreamed of moving to, and having taught at the same university she would not have been able to attend, the "getting-back" has been a pathway forged by her acuity and conviction. At times working two full-time jobs and at many still combating gendered, racial injustice and cultural bias we find Carmen situated to both develop professionally and personally in a career field deserving of access for all people, especially other nerdy Black kids.

Continuing Conflicts. Towards the end of our interview, we see the theme of "getting back to self" arise in Carmen's continuing conflicts both in the world of science education and in her personal life. The area she lives in is predominantly white and affluent, lacking cultural connections to the Black diaspora that she grew up with. As well, although she finds herself having tenure in both science education philosophy and practice, she meets resistance in her field as an educational professional at the university level. White students, faculty, and systems continue to present resistance to multicultural awareness and implementation of pedagogical practices and curriculum that serve the city's large foundation of students of color. When speaking to her students now about the stakes of racially and culturally relevant science education she asks, "Why do you want to teach here?" as a continuance of the type of self-conceptual development they will perhaps need in the years of classroom teaching to come.

Figure 1: Summary of findings, narrative-biography of Carmen Cooper-Clark



5.3 Axial Coding

Alex and Carmen were thoughtful enough to share their narrative-biographies over the course of two, ninety-minute interview sessions that consisted of story-telling, emotional reflection, and interpretation about their upbringing, family and home life, educational experiences, political thinking, pathway and approach to science teaching, relationships with students and staff, and decision-making to leave the profession. In both narrative-biographies, even after leaving the field, a continuing development in both teaching and learning is seen through Alex transitioning to be a movement educator and Carmen to higher education as a science teacher educator as well as their analysis of the world and society. Within this secondary stage of thematic analysis, I attempt to as best as possible dive deeper into their narratives while not distracting from the purposeful self-thematization they both utilized in describing their own experiences. To maintain the complexity and particularity of their individual experiences, this step in the coding process must attend to their described social identities and experiences without

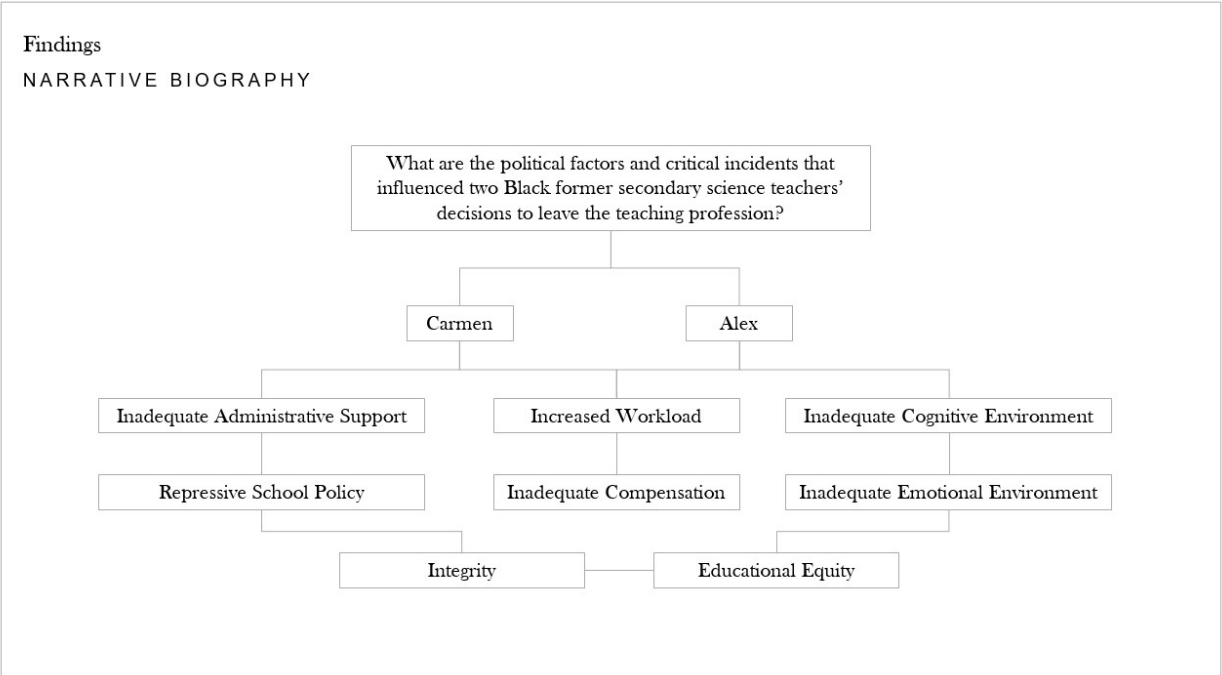
treating them as separate and discrete aspects without context; an intersectional approach to qualitative research methodology shown to engage with the lived experiences of those marginalized by society (Wyatt, Johnson, & Zaidi, 2022).

The following consists of the results of axial coding, comparing the salient narratives and critical incidents mentioned throughout each Black former science teacher alongside the research questions that shaped this study. Key terms and concepts from the research questions informed the comparison both across everyone's narrative-biography, preliminary questionnaire, and demographic survey. As well, concepts that appeared in both Alex and Carmen's self-thematizations, descriptions of their life history and working conditions, and critical incidents that led to their decision-making in leaving the field of science classroom were grouped together in four emerging themes that directly address the research questions of this narrative inquiry.

5.4 RQ - What are the political factors and critical incidents that influenced two Black former secondary science teachers' decisions to leave the teaching profession?

As Alex and Carmen self-thematized by providing their descriptions of themes from their story-telling several factors arose that detailed their decision-making to leave the teaching profession. Axial coding allowed for emergent political themes via historical and theoretical context that were shared throughout the preliminary survey, open-ended questionnaire, and narrative-biographies. The following outcomes discuss the: a) inadequate compensation and increased workloads, b) inadequate administrative support and repressive school policy, c) inadequate cognitive and emotional environments and d) a continued search for integrity and educational equity outside of the classroom.

Figure 2: Summary of findings, political factors and critical incidents in decision-making to leave the teaching profession.



Inadequate Compensation and Increased Workload

Alex and Carmen’s life histories, working conditions, and decision-making in leaving the profession are punctuated by their material conditions. Both had achieved bachelor’s degrees in their desired field of study, yet within the increasing occupational qualification and certification of professionalization of the science teaching field would have to pursue extended learning by either workforce development such as an alternative teaching program or graduate school education to pursue a stable job. The compounding effects of student loan debt, housing affordability, opportunity cost, and socioeconomic inequality lead to searching for postgraduate opportunities that would simply be able to pay the bills, yet both Alex and Carmen’s understanding of educational inequity, Blackness, and social justice propelled them to consider that central to each of their individual goals would serving students and communities as

educators for at least some small amount of time, whether to gain necessary skills for future educational or community work or pursue other career fields.

Under neoliberal capitalism the relationship between material conditions and occupational opportunity is purposefully connected to market-based individualism. Subjects of neoliberal capitalism are tasked with finding an occupation within a career field that is both profitable enough to suffice an ever-increasing living cost as well as maintain adequate physical and socioemotional health. The market-based demand for different fields of undergraduate and graduate study, preparation, and training are thus organized by an individual's human capital; the social and political affinity with which by their privilege and acquiescence to society people can accrue more lucrative job opportunities. Neoliberal capitalist ideology argues that all occupations exist on an even playing field by which any individual can gain access if they simply work hard enough, a falsehood of meritocracy that is ill-equipped to face the sociopolitical realities of the tenuous relationship between the ruling class and the worker. Black and marginalized gender identities seldom share the benefits of social and human capital afforded through rigorous individualism. Even when possible, these merits come at a cost to intercommunal development of the Black masses, especially that of the working-class.

Corporations and institutions have taken advantage of this treacherous economic terrain to recruit individuals at younger ages to join workforces with higher needs, such as the field of classroom teaching, targeting recent graduates of colleges and universities in an attempt to offer entry pathways other than university preparation programs and placement in school districts with little to no workplace security in the form of historically organized teachers unions and workers compensation contracts. The tactic of rapidly supplying the teaching workforce is discussed in critical Black studies such as historiological investigations like E. Franklin Frazier's first edition

of *Black Bourgeoisie* (1957), who documents affluent freed Black communities of the emancipated north sending Black formally-educated adults to the south to teach literacy and arithmetic alongside championing education mobility and Puritan assimilationist values. Teacher preparation and education programs have been utilized as a pipeline to increase the workforce diversity in low-income areas for over a century towards that cause, masquerading as social welfare organizations with assimilationist ideologies that proffer educational mobility as a surefire method of class mobility and evolution of the poor Blacks from their proclaimed retched dispositions.

Alex and Carmen would enter the field via rapid and intensive teacher preparation programs, with little to no prior scaffolds for learning educational philosophy, praxis, or skills other than what they identifiably learned from their own experiences. Alex's inadequate compensation and increased workload would inevitably be the factor by which they would make the final decision to leave the field of teaching to attend graduate school in biomedical engineering and pursue a doctoral pathway. The inadequate compensation was evident in their administrative officials attempting to bribe them with higher pay to remain in the classroom. Already working for a non-public school, Alex's compensation would already be a lower pay than the local public school district. Alex notably discusses that this lower pay was met with higher demand of their cognitive labor in developing lesson plans and curriculum from scratch, working in after school programs for the betterment of school culture with little incentive, and being tasked with running a classroom in a challenging facility not equipped but more so haphazardly fashioned for science education.

Carmen, who had brought self-thematized notions of class consciousness to her narrative even before this analysis, was interpreting the relationship between her parents' occupations,

their housing, their neighborhood schools, and her ability to purchase her first pair of expensive shoes for dress-down Fridays. A similar teaching pathway would be offered, in which recruitment for the occupation of teaching begins early after graduation; Carmen would find herself in an unaccredited teaching preparation program putting her in danger of defaulting on her student loans. In both of Carmen's schools she would come to work in, there remained inequitable educational environments. At the middle school, Carmen's search for lesson plans and curriculum could easily have been provided by a previous teacher or the school purchasing a curriculum for the building. Having to generate lessons with no mentorship or supervisory support, Carmen's frustration with the lack of professional development would lead her to find a different school to teach within altogether. Although a different school setting would possess extensive resources for science teaching and mentorship, the workload demand would lead to an increasingly rigid curriculum that stripped the soul from her teaching.

Neoliberal capitalism is a policy and governance choice predicated by the internal and external relationships of the U.S. political economy amidst a global marketplace that vies for Western national superiority. It has been shown that neoliberalism pervasively alters the process by which teachers construct their sense of belonging and conceptions of the profession (Kraemer-Holland, 2022). Science education and Black education are inextricably connected to this matrix of subjugation as the political economies of rivaling Western, white nations and nation-states expand and extract resources from the Global South via routinization and ideological repression of their own populations. Alex and Carmen were teaching within a historical period in which this exploitation has advanced into the technological age wherein professionalized occupations expect higher workloads and decrease compensation under the assumption that individuals enter the workforce highly trained and specialized. Instead, albeit

Alex and Carmen are highly qualified and culturally situated to run science classrooms, their efficiency is truncated by the excessive demand and inadequate compensation for their workload. As the U.S. violently expands its jurisdiction over scientific and technological advancement, the proletarianization of the field of science teaching becomes mandatory as both an increasingly scientifically knowledgeable workforce is required yet only from an exclusive, privileged, and politically repressed stock of human capital.

Inadequate Administrative Support and Repressive School Policy

Alex and Carmen's tenure as classroom science teachers would invariably cross paths with these neoliberal structures at the level of administrative and district support that organized and oversaw their job positions and working conditions through repressive school policy. Both having worked in charter and public-charter schools, and Alex having even noting throughout their narrative-biography the political tensions that existed between community schools and district funding for highly selective, often zero-tolerance charter schools and their disciplinary policies colored their classroom experiences. The level of administrative support in both narrative-biographies mentions continued stratification among the disciplines and subjects taught in which students receive standardized testing. At the middle school level especially, a prioritization of English language arts (ELA) and mathematics standardized test scores is distinctly tied to school funding. Throughout Obama's presidency, this incentivized structure whereby exclusive charter schools and rigorous testing environments claimed to be bastions of an approach to multicultural educational equity for underserved children marks some of the most tumultuous pedagogical paradigms in U.S. history, including but not limited to the expansion of the charter school market economy and advancement of social inequalities for urban, minority youth (Mora & Christianakis, 2011). Far from being a promise to promote advocacy for

educational mobility and employment, the following Trump presidency followed suit in taking advantage of the disparate political regime of the U.S. anti-racist and multicultural standpoint to declare new political territory in exacerbating the effects of educational inequity by state via executive order. The bipartisan battleground of electoral politics encroaches the district, school, and classroom to both profit from the exploitation of educational worker labor while claiming it is for the benefit of the nation's children and not the political economy of patrimonial state interest.

Alex and Carmen's political struggles can be seen in their resistance to repressive school policy that proletarianizes their working conditions. Although supported by their direct administrative leadership in the school building, Alex would frequently challenge and advocate on behalf of their students against the administrative board of their charter school. The critical incident in which a child would experience socioemotional crisis and be met with carcerality could have been avoided entirely had there already been hired and trained personnel to handle and meet the moment. Instead, the school policy meant a police officer instead of educational professionals accompanying the child to the hospital. Alex's self-thematized belief in mobilizing would lead to the school having better resources to handle further events of a similar order, yet notably in their decision-making to leave the classroom the emoji used in their resignation letter signifies continued disapproval and disavowal of the handling of the community's children. Carmen would witness a similar repressive zero-tolerance school policy in both roles and school types at the middle and high school level, appearing earlier in her narrative during her own educational experiences. Particularly at her public charter high school, the predilection towards restricting the curriculum teachers could use would push Carmen to advocate for the type of informed, constructive curricular practices that had worked for her students for years, yet seemed

not to suffice at the administrative level in favor of rapidly denaturing high-stakes standardized testing alignment.

These incidents and aspects of the narrative-biography of two Black former science teachers are indicative of the culture and climate of reformist educational policy amidst neoliberal capitalism. Liberalism guides the federal, state, and local platforms of educational equity and workforce development the practice and implementation with assumptions of equal economic playing fields and demographically aligned reform ill-equipped to meet the measure of exploitation that faces working class people of color and especially Black people living in the 21st century advancements of the plantation economy. These policy choices and political maneuvers are often passive, yet detrimental, as the effects reach all the way into the lives of two Black classroom science teachers simply attempting to do their best work for communities of children and families seeking adequate science instruction in school sites marketed to them as progressive and highly effective.

Inadequate Cognitive and Emotional Environment

It must be highlighted at length the effects of the environmentally degrading working conditions on the cognitive and emotional wellbeing of these two Black classroom science teachers. Most of the educational research found in the literature review of this study often points to how demanding classroom teaching as virtue-signaling of necessary economic labor. Throughout their narrative Alex and Carmen were asked to work above and beyond the average capacity, which can be seen from both their commitments to providing exceptional curriculum and pedagogy as well as navigating the intensifying working conditions of the sociopolitical atmosphere surrounding their lives and Black social life in general. The type of rigor and intensity asked of their emotional and cognitive labor, far from virtuous, represents further the

gratuitous expectations placed on Black workers for the purpose of exploitative and extractive labor accumulation.

Both Alex and Carmen were required at either all points or many points of their teaching career to begin the year without access to a curriculum. The cognitive expectation to both prepare and revise a year's worth of educational activity requested Alex and other novice science teachers at their charter middle school to co-construct a year of curriculum in a separate room during the week before school began while other teachers had engaged in a whole staff professional development. Alex, whom only the summer prior was officially prepared to teach in a classroom, had less than two months of formal exposure to the classroom setting. Fortunately, the time spent in the classroom as an educational equity advocate and working with teachers during their undergraduate are verifiably salient experiences that perhaps authored their ability to rise to this unnecessary challenge. It must be problematized how if that had not been the case what little preparation Alex would have received to come up with these lessons on the fly during the first days of school and subsequent 180 days of the academic year.

Similarly, Carmen, would be tasked with two distinctly unnecessary challenges at each school she taught. Having similar non-traditional teaching preparation, she would rely upon a website with free lesson plans to construct her curriculum at the middle school level. At the high school level, she would be tasked with teaching an entirely new subject of physics to students who otherwise would have been learning a curriculum with which she was more experienced and pedagogically familiar. These vapid shifts in requirement are cognitively demanding as they require conceptual knowledge, skill development, and pedagogical tools specific to each subject that allow for creative and explorative lesson planning. The reality that both Alex and Carmen were able to provide their students with thorough, culturally relevant, and critical curriculum is

evidence not of the profundity of the task but of their own exceptional practice. The intensified cognitive demand of both creating these curricular materials and delivering them while grading and adjusting throughout the week and school year would have been monumental tasks for any classroom educator.

Alex and Carmen are Black science teachers who would work and learn alongside Black children. What was shared between them is not reducible to their race, but it is worth discussing here the emotional and cognitive ramifications of the globally pervasive anti-Black political climate that affected their ability to develop appropriate instruction, student rapport, and maintain healthy social and emotional health. Emotional workloads consist of the everyday toil of both managing and evaluating one's own feelings, needs, and desires while working with the material resources provided to survive. Alex and Carmen, beyond being science teachers, are living and breathing beings with social and emotional needs. The time spent addressing the cognitive demand of classroom teaching was already considerably grim, and both would find themselves attempting to emotionally navigate anti-Blackness in social and civil life as concurrent events (or rather non-events) bled into their science classrooms and were found throughout their narrative biographies.

For Alex, this began as soon as the summer of teaching preparation, when the murder of Philando Castile would lead to organizing a mass march and rally in support of Black life and in dissent of the governance policies and agents of the state that terminate that life at whim with qualified immunity. What followed even that summer was an incident wherein a young Black person would be checked out because of the gun violence killing one of their friends. Alex's retelling of this narrative elucidates the lack of care and emotional latitude available to provide space for students when they are grieving in the wake of anti-Black violence. Even within one's

own communities the intramural erasure of Black life via firearm is an outcome of social and political subjugation and the summer school supervising teacher's admonishment is representative of the repressive nature that same anti-Black violence requires. We find later Alex attempting to soothe their students during the first inauguration of President Trump, a virulent white supremacist who continues to threaten migrant, refugee, and immigrant populations with racist xenophobia echoed by red and blue administrations and amplified by his radically conservative constituency to this day. As Alex worked with other children of Afro-Caribbean and West Indian ancestry and cultural background their fears relevant parts of the classroom experience. This is unmistakably the cognitive and emotional toll required when laboring amidst structural anti-Blackness and anti-Black violence.

Carmen's narrative biography reveals a similar attempt at reconciling the emotional toll and weight of anti-Black violence left in the murder of Trayvon Martin, a Black child killed by a vigilante while walking around his own neighborhood at night. Carmen shares how finding out the news of this killing was particularly challenging even though she had grown up knowledgeable of the anti-Black nature of the world and frequency of the modern lynching which constitute Black suffering in the U.S. internal colony. She struggled with the words to share with her students that would in any way comfort them about their safety. Carmen would bear the emotional weight of resisting crying, perhaps an attempt to show how brave and resilient they must be in the wake of such atrocities, as well as listening to the conversations had by other adults in the building who perhaps share in their reverence of such violence but "couldn't quite get to the heart of the matter or say the right thing".

The cognitive and emotional workload shared by Alex and Carmen are, I argue, evident of political struggle. In a modern world structured foundationally by racialization,

criminalization, and genocide and the stakes of anti-Blackness, anti-Black violence, and the proletarianization of the field of science teaching under neoliberal capitalism and U.S. imperialism create the stifling political climate under which they would be tasked with mentoring and nurturing Black children.

Integrity and Educational Equity

Black people in the U.S. have been searching for educational equity for centuries and it is arguable that such an equity can be achieved in totality owing to the very origins of this nation. Since the alleged discovery of the New World of the North American territory of Turtle Island, coterminous of the brutal colonization and genocide of the Indigenous native peoples of continental and oceanic landmasses, the settler-colonial order of human and civil rights has been organized by aspiration and assimilation towards white, cisgender, heterosexual, patriarchal, anti-Indigenous and anti-Black ideology. The very educational system of the U.S. originates from the restrictive exclusivity modernity of the enlightened European academy, regulated by feudal class, royal privilege, and religious prosecution. The Trans-Atlantic Slave trade was but one machination of an ideological oppression that prioritizes the continuation of the plantation economy that built the modern world. Alex and Carmen find themselves at the turn of the 21st century daring to resist and dissent from this normative political order in science classrooms. Their presence in some ways buffering the institutional oppression that regulates the Black children in the belly of the beast to detrimental educational conditions known; underfunded, overpoliced, restrictive and zero-tolerance schools in the afterlife of slavery.

Alex, who engaged with and organized around educational equity during their undergraduate career, would leave the classroom and continue to search for ways to teach, learn, and community beyond the classroom walls. They share throughout their narrative-biography

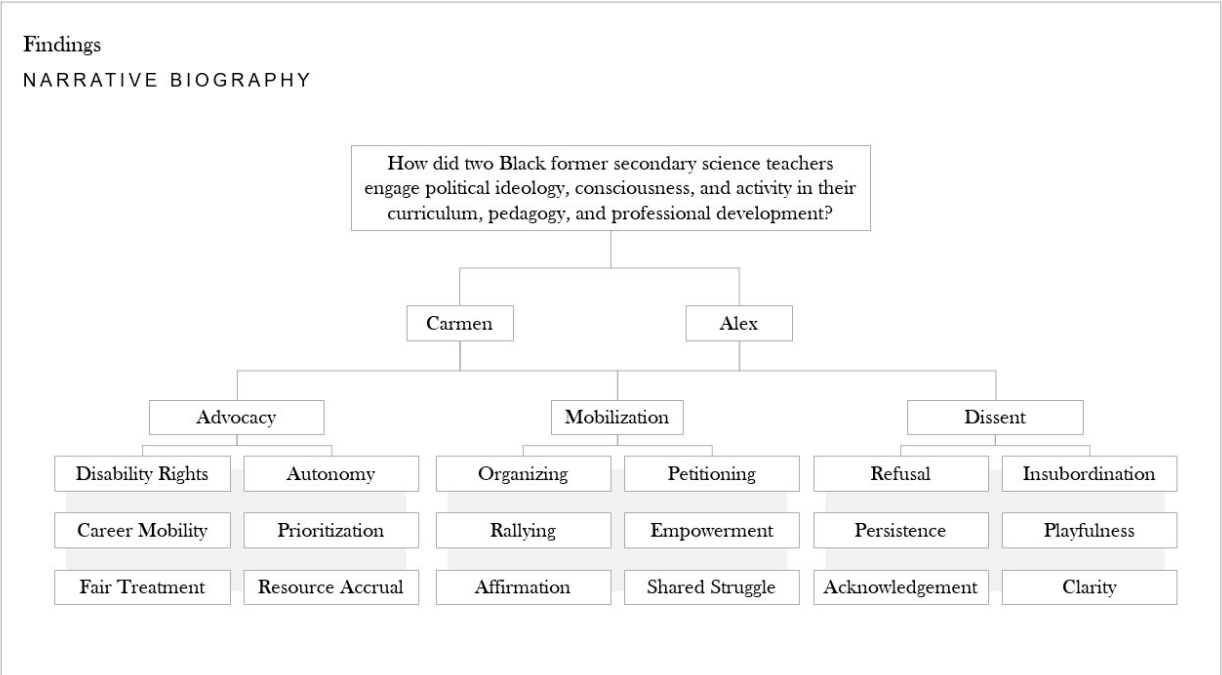
that they would have been quite happy continuing to teach, enjoying the presence of their students and their communities as well as teaching and learning how to teach in a familiar neighborhood and city. They made the uncomfortable decision to continue their education, relocating to an entirely new part of the nation, and even maintained connections with students and their families long after their retirement. As a professional organizer, they find themselves utilizing the methods of relationship development, facilitation, and mobilizing others continually, stating “they will remain a teacher through and through”.

Carmen’s self-thematization mentions “working outside of my integrity” in a spurring epithet that approaches the reasons this narrative inquiry takes place. The integrity can be considered the foundation of the sociopolitical dissent of seeking justice and educational equity found in many educators and activists. To enter the field of teaching, Carmen’s integrity brought rich, engaging lessons to Black children about history, public health, medicine, physics, and biology. The cost of this integrity would be receiving little to no support in advancing her craft and being dismissed for requesting better opportunities for professional development that would inevitably increase the learning happening in her classroom. As she moved to the high school, this integrity would remain yet be challenging to maintain as the school prioritized performance, complacency, and discipline over critical, soulful science education. Carmen’s search for a space and place to return to her integrity continues throughout her career as a science teacher educator, instructional coach, and mentor as navigating the anti-Black institution of academia and misogynoir of the society it organizes.

5.5 RQ - How did two Black former secondary science teachers engage political ideology, consciousness, and activity in their curriculum, pedagogy, and professional development?

Alex and Carmen's narrative-biographies and self-thematizations to reveal at least three ways in which political resistance to neoliberal capitalism, imperialism, and anti-Blackness interact with their curriculum, pedagogy, and decision-making before, during, and after participating in the industry of classroom science education. At several instances of their self-thematizations and within thematic analysis, Alex and Carmen's ability to: a) advocate for themselves and others emerges as a crucial tenant in their interactions with Black children and their communities, school administration, and their own educational experiences, b) organize and mobilize others to share political struggle in common interests and activities, engaging shared beliefs in sociopolitical justice within and outside of the science classroom, and c) display the crucial political resistance of dissent, and at times the outright refusal, to accept the status quo of normative practices that engender neoliberal capitalism, imperialism, and anti-Blackness in science education.

Figure 3: Summary of findings, political ideology, consciousness, and activity in Black former secondary science teacher’s curriculum, pedagogy, and professional development.



Advocacy

Advocacy, as an emergent political resistance of awareness and shared struggle, counterattacks the hegemonic distortion of the individual against the normative background of society. Alex and Carmen could be said to have been given the tools for advocacy since their upbringing, being raised with at times challenging but always critical discussions of Blackness, anti-Blackness, and the racial violence that supplicates the world. I argue that to advocate for oneself and others, especially when attempting to defy stereotype, suppression, and repression is a hallmark of the Black radical tradition in that it presents a resistance to authority of and over our stories lest they be told by our oppressors. Alex and Carmen’s internal and external advocacy are showcased in a myriad of ways throughout their educational experiences, approach to science teaching, and decision making to leave the classroom.

Alex began advocating for themselves and others as early as their first school election. One of their earliest narratives of speaking out against the administration of their high school when their friend was suspended speaks to a resistance to simply let things be. Evoking disappointment in authoritative positions and expressing disdain for administrative processes requires courage and emotional intelligence, as especially at a younger age the factors of ageism intersect with that of other identities to render young people's disagreement as rebellious for the sake of boredom, and not political clarity of fairness and equitable rights. Alex's continuing social and political development throughout undergraduate school as a feminist and educational equity advocate would lead to their work with young people and educators in the realm of the educational industry. The unequal opportunities that face children of color in the sciences being a part of their science learning, and developing an approach to science education that could be seen throughout their teaching. Advocating for student disability rights, fair treatment, community school, and their student's rights to a critical education are all examples of acting and speaking out for self and others.

Carmen's self-advocacy would begin early into their narrative-biography as well, as the choice to pursue a specialized education in medicine and the sciences granted her the educational autonomy, she was searching for amidst the familial support she received to get a quality education. In applying for colleges, she would self-advocate throughout her application process, attempting to get into both her dream school and one she deserved for her academic achievement. When preparing to become a teacher, after finding out that her teacher preparation school was unaccredited putting her in danger of paying student loans, her advocacy for self-admonished the teacher preparation pathway she was offered pushing them to provide her an accredited opportunity for a master's degree. Carmen's advocacy extends to others throughout

their work as a science teacher and educator, convincing administrators and school leadership to prioritize her professional development and increasing the quality and quantity of educational resources for her students, providing them access to social and ideological development about the natural world and the processes which render it unacceptable and inequitable. The narrative shared during her time teaching when a local health official visited her classroom was marked by encouraging students to advocate for themselves and their communities through questions and statements about the public health environment of their neighborhoods in search of solutions for themselves and their families in some of the metropolitan city's most in need areas. Carmen continues to advocate for herself as a professor at a prestigious, predominantly white institution and space as she works and evokes racially and culturally relevant education for her pre-service teachers and their students.

Mobilization

When people become vocal about justice and their rights there tends to emerge a current of fervor and emotion around action to procure that justice, often in the form of physical movement and assembly. Alex and Carmen both represent throughout their narrative-biographies not only the ability to advocate for themselves and others but to mobilize people to share in beliefs and understandings while actively struggling to change their world. Mobilization occurs under many conditions, but the charisma, conviction, and empathy shown by these two Black former science teachers is endemic to their experiences as well as the Black radical tradition.

Alex, who's self-thematization includes mobilization at an early stage, exemplifies strategies of mobilization throughout their narrative. The ability to stand up against school administration by convincing hundreds of their peers to sign petitions vouching against the discipline a classmate had received, whether accurately or not, represents their convincing

nature. Often, as mentioned, they would be referred to as “Reverend Dawes” by peers and students alike, for what may have been their charismatic approach to speaking with and listening to others. The mobilization can be seen in their approach to science teaching, as throughout their undergraduate experiences and time within their teaching preparation program they would speak with, rally, and march alongside others in response to educational, racial, and social justice at large. Alex’s mobilization techniques and applications extended into their classroom as well, engaging students in discussion around gender and misogynoir in the sciences and perhaps spurring their young male students to act with affirmative notes and messages to their female counterparts. Alex’s mobilization during the final narrative before they’ve left the classroom shares further how rallying others to fight for students’ disability accommodations in the classroom and school would preemptively prepare for similar crises wherein carcerality could be avoided entirely for a student in psychological and emotional need.

Carmen’s mobilization efforts can be seen in their self-mobilization to apply for a school in a district they had to find a way through, gaining an educational opportunity and joining other “nerdy Black kids” who would share similar desires and aspirations for the future. The ability to advocate seen in their efforts to continue their teaching education program and enter the field are mirrored by mobilization as at each level they would lead with conviction to fortify the pathway ahead to fair treatment. Most evident however is their effect on the students she would teach, allowing them to see their own city through a new lens of history and nature and leading them to question the resources their communities were provided and how inequitable their health outcomes were in comparison to others. Notably, Carmen would assist students in developing a student government at that same school as well as science fairs, expositions, and demonstrations of their understanding to the community. Carmen’s effect on her surroundings would be seen

after she left middle school, as students may have felt mobilized to behave and engage in particularly critical ways when she was around. At the high school, Carmen's mobilization alongside other Black women science teachers both veteran and novice would lead to their dissertation research topic area and methodology, creating "Sista Circles" by which other Black women science teachers can learn, share, and explore their pedagogical approach to providing quality educational opportunities to their students.

Dissent

Dissent is more than simply a differing opinion on a political or social matter, and throughout the narrative-biographies of two Black former science teachers the political resistance of dissent is seen clearly within and outside of their contributions to the field of science education and science classroom teaching. Alex and Carmen both exhibit dissent as political resistance and struggle against the educational inequities that face Black children, working-class children, and children of color in their classrooms. As well, I argue that Alex and Carmen's acknowledgement of their working conditions and investigations of their reasoning for leaving the classroom also offers a form of political dissent exhibited by two Black science teachers working amidst neoliberal capitalism, imperialism, and anti-Blackness in the U.S. during the post-Obama era.

Throughout their narrative-biography, at several instances, Alex mentions the tensions that existed between themselves, other educators, and their school administrative board of directors. A noteworthy aspect of their time spent as a pre-service science teacher during a summer school program indicates early positions of dissent. When students showed up to the classroom, harried by the challenges of anti-Black gun violence and requiring an emotionally safe space to share their fears, Alex deviated the class session to suit students' emotional needs

instead of attempting to barrel through their summer schoolwork. Much to the chagrin of their supervising teacher who argued instead for the need for them to learn, Alex's dissent displays what may often throughout their career have been crucial efforts to give students the opportunity to feel, express, and communicate their challenges that inevitably would have gotten in the way of that learning regardless.

Tensions with the school administrative board, Alex describes, would extend throughout their time with the teaching field as the policy demands and authoritative nuance that directed school funding, disciplinary code, and student outcomes would be disconnected from the on the ground needs and responsibilities Alex found with their students each day. In many ways, their time within the classroom itself could be seen as dissent, for the sheer number of extended hours spent planning lessons and supporting students outside of the classroom displays an outright refusal to allow young people a subpar science education. Alex's decision to leave the classroom was even met warmly by most of their staff, students, and student's families owing to the valuable rapport Alex had built in the classroom throughout their tenure, yet notably Alex mentions leaving an emoji on their resignation letter to the administrative board. This emoji, an unconventional and yet playful take on Alex's dissent towards the school's leadership and policy decisions, is a microcosm of the ongoing and enduring resistance Alex's presence in the classroom and in the lives of the students they worked with presents to an educational system that both represses their ability to teach science and their student's ability to learn.

As well, Carmen exhibits dissent at several stages of their narrative-biography as the outright refusal to teach in the unsupportive conditions she was expected to work within were met with integrity and push-back. Carmen would refuse inadequate teacher preparation, dissenting from the position that she should follow suit along with her counterparts in their

teaching preparation program without accreditation, when the schools in which she planned to teach had real requirements that would blockade her from having access to a job. Carmen's refusal and dissent from the conditions under which they began teaching, being given little to no curricular support, professional development, or mentorship were met with consistent attempts and triumphs to attend teaching conferences, be recognized for her pedagogical excellence by city officials, and refuse to be dismissed by administrators giving her the run around about why she was not prioritized when it came to teaching support.

Carmen's refusal and dissent from a place within her own capacity as a teacher to continue working without guidance, finding a new school to work in where she would receive mentorship and supervision and the proper quality tools to teach. These moments of dissent are both political and pragmatic for at each stage the approach and choice to differ were necessary to achieve change. Here we also see that Carmen's decision to leave the field would be based on a myriad of factors, but the critical incident is one in which a level of heightened awareness of her working conditions and the cognitive and emotional workload intensification would lead her to harming herself, squeezing a clipboard so tight that it had bruised the inside of her arm. The dissent here is in refusal of the expectation to continue facing working conditions of the proletarianized worker, who is taught to ignore aching pain for compensation. Carmen's dissent in many ways represents the revolutionary act of self-care in the acknowledgement that her pedagogical and curricular excellence were coming at a cost to their physical and emotional health.

5.6 Selective Coding

Through the process of selective coding, I attempt to “fuel expression and facilitate the construction of meaning” to locate within and through these interviews and narratives an

interpretation of historical materialism (William & Moser, 2019, p. 53). An interpretive phenomenological analysis (IPA) engages two pre-selected themes that were predicted to appear, as well as comparisons and peculiarities of these themes to the broader historical context in which they lie (Appendix, Table 1: Historical Materialism & Table 2: Critical Black Studies). I argue that Alex and Carmen, as Black science teachers, are members of a specific group of the working-class who have both endured throughout history a perspective and structural relation towards society. As Black people, Alex's family stemming from the African diaspora via Caribbean ancestry and Carmen's family relocating to the west coast from the U.S. South, the IPA was expected to interpret the dialectic nature of the Blackness, the Black radical tradition and oppressive structural fabric of what Christina Sharpe in *In the Wake: On Blackness and Being* (2016) refers to as "the weather" of societal anti-Blackness. As science teachers Alex and Carmen had chosen occupations which have been subject to occupational socializations and working conditions which have been both prioritized and proletarianized under neoliberal capitalism and U.S. imperialism. I argue that the emergence of these selective codes throughout self-thematizations and the narrative biographies of two Black science teachers speak to the nature and political struggle of the field of U.S science education, educational research, and research in teacher attrition.

The IPA serves as a *rhizomatic analysis*, looking in-between and about the narrative-biographies of two Black former science teachers who have taught during the 21st century and have decided to leave the profession during the post-Obama era. A rhizomatic analysis attempts to situate the discussions and self-thematizations of Alex and Carmen's story-telling and decision-making alongside a historical tableau that includes and precludes the U.S., international, and global modernity in which their labor as science classroom teachers occurred (Lee, 2008). In

the rhizome I theorize that at the intersection of science education and Black education the stories and critical incidents of two Black former science teachers allude to considerations for teacher attrition as a form of political resistance and struggle.

Anti-Blackness and the Black Radical Tradition

The Black radical tradition permeates the lives of the Black and African diaspora for generations beyond chattel slavery, locating the struggles, contradictions, inquiries, and antagonisms of a modern society forever changed both materially and structurally by the extraction of the African continent. Cedric Robinson evokes in *Black Marxism: A History of the Black Radical Tradition* (2020) that the history of the modern world's material relations stems from the origins of racialization in feudal Europe, wherein the ethnic and geographic relations between the masses and their labor were altered by colonization, nationalism, and racial subjugation. This relation forged the identity of the bourgeoisie that would “transform capitalism into a world system” from the former substantive feudal societal order (Robinson, 2020, p. 17).

A racializing structure provided what would become centuries of dehumanization both for the purpose of both primitive and modern accumulation. As an antagonism of the category of the social human and laboring worker, the Slave would be transformed by chattel slavery and Middle Passage into a commodity by the Western fortifications of gendered, racialized structures that would advance the economic production of plantations. The Trans-Atlantic slave trade marking one such shift by which Western social and civil life would witness the legal codification of slavery alongside the discovery of the New World. Ecological, environmental, industrial, political, and social ramifications would be felt across the globe as the reproductive labor of chattel slavery would replace that of the domestic, offering imperial powers access to untold wealth, scientific discovery, and natural resources. Robinson discusses, sharing in the

same dialectic of prolific theorists and historians of the material world such as C.L.R. James, Walter Rodney, and Frantz Fanon, that this alteration would set precedent for the Black radical tradition, the negation of western modernity and capitalism and its “ability to create entirely new forms of human experience stripped bare of the historical consciousness embedded in culture” (Robinson, 2020, p. 170).

Robinson (2020) contends that Black radical tradition is evident in the on-going, intergenerational struggle of the Black diaspora and African continent as the resistance to chattel slavery and its afterlives of racial order and anti-Black violence present throughout history. Alex and Carmen, including their ancestors and relatives, arguably share in this struggle throughout their narrative of both learning of their ancestry and sociopolitical developments as individuals. Their narratives are colored by the love and support of their families throughout their upbringing, as well as the political development of their consciousness towards race, Blackness, and social life in the U.S. Their interactions with students, faculty, administration, and communities are arguably shaped by Blackness as within each stage of their narrative the racial context of their approach to community, social justice, and service are fortified and extended through their ongoing relationships with Black students, families, and communities (Milner & Howard, 2004).

Alex’s Afro-Caribbean ancestry points to this history. The city on the east coast in which they were raised populated by Black, Caribbean, or West Indian people throughout the 1900’s would have meant that his parents would grow up while seeing populations move towards the larger northern cities for a part in the growth of industrial and commercial trade and job opportunities as well as housing. Neighborhoods would start small, with perhaps one or two families migrating from the Caribbean or southern U.S. and forming communities that would come to frequent and originate businesses and cultural locations of similar ethnic, racial, or

socioeconomic background. Alex's parents being of Antiguan and Jamaican ancestry paints this narrative with further depth, as the history of how African and Indigenous people of the Caribbean would meet to form their lineage stems from centuries of interactions on the eastern coast of the North American continent and the islands and archipelagos that reach from its shores towards Central and South America, Europe and Africa from as north as present-day Canada. Alex's recollection of frequenting churches and bakeries with people of similar ancestral background shows the ethnic and cultural interconnectivity of Black communities who have in some ways fortified their position on U.S. territory to the extent that they find space and time to commune. The continuing instances of Alex's political awareness about the world, Blackness, and electoral politics would perhaps stem from early conversations with their parents while watching MSNBC, speaking on current events, or perhaps debating over Black music. Alex would further their political understanding through joining groups and organizing alongside feminists, incorporating a politics of gender as well as race into their activism.

Further, Alex's connections to the Black radical tradition may also constitute their approach to working with young people. As an undergraduate studying science, they would work predominantly with children of shared or similar ancestry and go on to prepare to teach in a city populated by Black children and communities as well as in a charter school around the city where they grew up. I argue that these connections are not coincidental as Black people do more than simply sit together in the cafeteria; by the Black radical tradition we form communities of care with each other amidst the weather of anti-Blackness that have necessitated our survival against the presence and afterlives of chattel slavery (Hartman, 2022). Alex's interactions and relationships with the staff and faculty at his school building would have been mediated by

Blackness, as perhaps a closeness or perceived kinship, as their rapport with students and their families would allow for some common ground in the generative care for the next generation.

Alex's curriculum was at times challenging for the Black, Afro-Caribbean community he grew up with, as is often the case with forms of political activism that differ generationally within many communities. From a gender politics that engaged cissexism via discussing intersex positionality in a biology curriculum to encouraging young Black boys to question their relationships with the gender-marginalized classmates, these tensions were met and handled within that same community. The mediation we find through the Black radical tradition of Alex's continuing even after teaching to live in a predominantly Black area in the south and organize and work with others around issues that Black communities face may represent a racial conviction that similarly declares the Black radical tradition an on-going process by which many come to their political activism and service to communities.

Carmen's ancestry and upbringing call similar connections into consideration. She explains her family story from the point of departure of southern living in the U.S. during the 1900's. A moment of reformation occurring across the country as not but one generation prior would perceive the constitutional law around citizenship changing. The reconstructive emancipatory period that followed led to several migrations of Black families, if possible, from the south to the east, west, and northern territories of the U.S. in search of work and new political possibilities in other states that had otherwise not guaranteed their legal emancipation. Carmen's grandparents dug roots in the west coast, purchasing property, securing in many ways a stable environment to raise children and build community with their neighbors. The city Carmen was raised in being regarded by popular culture and media as a dangerous and derogatory "hood", but to Carmen a place wherein she felt relatively safe. Like Alex, Carmen's political awareness

would grow alongside her parents and family watching MSNBC. She would learn early lessons about Blackness, racial and economic identity, and the U.S. electorate from discussions held in the household, as well as a staunch counter-narrative against anti-Blackness that supplemented a Black power/Pussy power politic of race and gender intersectionality. These messages would perhaps be further by, as Carmen retells, receiving a watching of *Roots* for her seventh birthday. The Black radical tradition is alive in this household as we notice the extensive nature of which a family cemented in their children what it meant to live and be in a world painted by anti-Blackness by encouraging positive and expansive depictions of Black social life and opportunity.

Carmen's description of Blackness as a politic would frequently arise in her educational experiences, teacher preparation, approach to science teaching, and continued work as a teacher educator. Blackness as a politic, which quite appropriately details the context of this study, assists the unassailable reliance upon one's knowledge of self and awareness of the sociopolitical stakes. Carmen at a young age would realize that despite the conditions set by an anti-Black, gender-marginalized, capitalist society her educational autonomy should be fought for, as well as the educational autonomy of others. Her approach to science teaching would land her in a large metropolitan city on the east coast teaching and learning with predominantly Black children who would represent diverse parts of the Black and African diaspora she would come to learn more about through her work. She found opportunities to engage them in their own self-advocacy through social studies and then afterwards through science teaching by providing safe and expansive spaces for racially and culturally relevant learning wherein other "nerdy Black kids" could investigate what their communities were facing and how to shift the paradigms of public health on their block. Carmen's politics of Blackness continues at the nexus of gender relations, as Black feminist/womanist teaching and thinking become philosophically and practically

relevant she transitions from teaching to mentoring and through mentoring to teaching at the higher education level. Mediated by Blackness, Carmen's challenges with predominantly white institutions and their pedagogical and curricular practice are met with the Black radical tradition of resistance, dissent, and rigorous development of self and community concept.

Alex and Carmen had both been chosen for this study because the period in which they left teaching was during the post-Obama era. This period, stemming from the inauguration of the U.S. first Black president, Barack Obama, marks a period of perceived post-racialization that believed by some represent the epitome of the Black radical tradition. I argue instead that the post-Obama era represents distinct betrayals. For at the time when the U.S. would be so progressive and "post-racial" as to elect a Black commander in chief, we witnessed the continuance and exacerbation of anti-Black violence domestically and internationally at the hands of the state (George, 2013). Most notably within this context, Alex and Carmen's preparation and approach to science teaching are marked by anti-Black violence in the form of the murders (assassinations) of Philando Castile, Michael Brown, Trayvon Martin, and countless others. These deaths, or extrajudicial robberies of Black life, are coterminous with both the political structure of the world and afterlives of slavery and visible in the working conditions and approach to science teaching of two Black former classroom teachers raised on opposite ends of the country.

Alex and Carmen engage Blackness as a politic and the Black radical tradition in their approach to science education by combatting the educational inequity facing Black students in the sciences and dissenting from the normative positionality of science education as a tool for further subjugation. Alex's brief teaching preparation program in a large metropolitan area would not be interrupted when Philando Castile was fatally shot by a police officer in front of his

partner and four-year-old daughter. Alex's decision to march in solidarity with others, educators included, who felt moved to act at this moment of racial reckoning was not coincidental. At another point during that same summer, Alex would dissent from business as usual upon realizing that one of his student's friends had been a victim of gun violence, much to the chagrin of their overseeing teacher. Alex would comfort their students during the election and inauguration of the following president, Donald Trump, a celebrity, businessman, and overt white supremacist. They would hear their students' fears of themselves, or their family being deported by Trump's clear disgust for immigrant populations. Carmen would fight similar battles, struggling against the conditions by which her teacher education program would attempt to leave her stranded without a degree program required to teach in the very city for which she was being prepared. The day after Trayvon Martin was shot and killed in his own neighborhood by a white vigilante, Carmen would walk into a school building and look at her students attempting to find words to conceive of the anti-Black world that persisted lynching into the 21st century.

As teacher retention and workforce development initiatives acclaim diverse representation as evidence of progressive occupational reform in the post-Obama era, Alex and Carmen's racial experiences are incongruent with a merely statistical representation of science teaching in the U.S. workforce. There is evidence to support that they're upbringing, educational experiences, pathways, and approaches to science teaching are in conversation with the positive and negative sociopolitical experiences they've encountered that have led them to the field. Each of their narratives interrogate interpretations of what it means to be Black from several ideological standpoints, echoing the intersectional realities of Black working-class people who

enter the field of education in search for educational equity and social justice for marginalized children and their communities.

Historical Materialism and Proletarianization

Historical materialism in education and the teaching occupation interrogates the conditions under which two Black former science teachers act as political subjects amidst the dialectic of labor and power. This interrogation cannot occur without analyzing anti-Blackness, as the very nation under the topic of this study expands the epistemological, economical, and libidinal territory that has benefited from anti-Black violence since its inception. Following the nonevent of the emancipation of enslaved Africans, the end of chattel slavery “by no means marked the end of bondage” (Hartman, 2022, p. 221). By the 13th amendment, slavery was simultaneously outlawed and transformed, some would say perfected, by de facto and de jure permutations of the anti-Black state. It is critical within Black studies as well as anti-capitalist and anti-imperialist studies to problematize anti-Blackness and anti-Black violence alongside labor and working issues as the plantation economy persists into the 21st century.

Alex and Carmen’s ancestors would most likely not have been allowed to have enter the teaching profession not three centuries ago. The Black teacher arose at the turn of the 19th century from specific and conditions, peculiar origins, as well as a call to assimilate the Negro into a world now altered by their ancestor’s captivity. Although the Black teaching workforce would find its origins in the Black petit-bourgeois, a middle class of freed Blacks who had achieved small forms of civil structure such as land and legal status, less than a century later the Black schooling structure would be integrated almost completely into the white hegemony of national schooling and thus the expectations and permutations of worker relation advanced from chattel slavery.

The afterlives of slavery and perfections of the plantation economy persist as the shape, form, and approach of schooling in rural and urban areas. Alex and Carmen would enter a cohort of educators rushed into the educational system, joining alternative teacher preparation programs that sacrificed pedagogical theory for urgent mercenary recruitment. A rise in such needs-based approaches to staffing classrooms and diversifying the workforce continues as city and statewide programs identified their teaching shortages in areas that coincidentally were populated by the largest concentrations of Black children and families as well as the economically disadvantaged. Shaped by neoliberal capitalism, these tactics would come to shape the very entrance pathways by which organizations search for, prepare, and match novice teachers with schools in high-needs areas.

Alex and Carmen each shared in experiencing the deleterious working conditions of the educational system. Their narratives and descriptions of working conditions align with the factors and outcomes of a schooling institution managed and governed by the proletarianization of the field of science teaching by being tasked to adequately perform intensified job duties with little to no resources and mentorship (Amitai & Van Houtte, 2022; Dunn et al., 2017; Dunn, 2018; Glazer, 2018; Marx et al., 2023).

Alex began their storytelling of entering the field of science teaching by interrogating the contradictions of their summer teaching preparation; working with students who in the metropolitan area should have required the teachers with the highest experience. Instead, these students' summer school instruction was used as a training ground. Alex's tenure as a classroom teacher would last two consecutive years teaching at a community charter school wherein their facilities would be the basement space of a former office building, arguably unsafe and raucously positioned next to the school cafeteria. Their workday would not encompass the massive

amounts of cognitive labor they would require to both create their own curriculum from scratch during the first week of teaching. The long hours and weekends lost to extended work would go uncompensated, and in addition to their classroom duties they would feel responsible even for assisting with extracurricular programs outside of the school day. Carmen would experience a similarly dysfunctional teacher preparation program, dishonestly masquerading as a graduate school and nearly sacrificing her opportunity to teach in the process. The public charter middle school she would teach at would be under-resourced, requiring additional labor in seeking out textbooks and science teaching supplies. The almost non-existent curriculum she was provided at the beginning of her career required her to use free online websites to construct entire school years of instruction. Carmen's self-advocacy and conviction in her approach to teaching promoted pushback against the lack of professional development and mentorship. Eventually, as she would transition to a more resource-rich but workload intensive school, she encountered even more stringent cognitive and emotional demands. With extensive meetings, heightened surveillance, and little compensation for the extended efforts of learning how to teach an entirely new subject of physics, the result of this demanding working condition brought upon the critical incident of realizing how much of this stress had weathered her physical and emotional wellbeing.

Although the field of teaching has been said to become professionalized with increased compensation, qualification, and incentives for entering high-needs subject areas, Alex and Carmen's experiences paint an entirely different picture. Proletarianization has been argued to be the offset of so-called professionalized occupations as workers within the field who are granted increased compensation due to privilege social capital do not reflect most of the profession (Buyruk, 2014). Alex and Carmen's working conditions represent the adverse effects of

neoliberal capitalism in an increasingly privatized educational system sufficed by the ideological principles of control and exploitation drive the market value of teacher labor. More resources and effort are extracted from the Black educator as a result, with little compensation or autonomy granted in the way of occupational mobilization. It is of no surprise that Alex and Carmen both have perceivable passion and admiration for the process of teaching and learning but critiques of the field and institutions in which it is held captive.

It must also be recognized that the role of the Black science teacher possesses contentions within the proletariat or working class. Science education under U.S. imperialism proliferates a specific weaponization of anti-Black violence domestically and abroad. In the 21st century, the field of science education has received increasing incentives to further the assimilation of U.S. citizens into the cadre of a scientific industry that benefits directly from the expansions of the U.S. military, policing force, and international trade of and extraction from the African continent and Global South of precious labor and natural resources (Cole, 2017). Science teachers are thus expected to both operate and functionally represent U.S. exceptionalism, expansion, and extraction while being given little resources or training to teach with integrity, purpose, and advocacy for the domestic and international masses subjugated in its wake.

Alex and Carmen both share experiences that exist within a domain of political inquiry. Although they differ in background and approach to science teaching, their working conditions and teaching environment share similar methods of labor exploitation. Both would find minimal training and little to no curricular resources provided for their science teaching, charged with both being instructors, curriculum developers, educational theorists, and highly specialized pedagogues tasked with developing new pedagogical approaches with little to no administrative support or coaching. Although much attention at their schools was given to the standardized

testing and curriculum of English Language Arts (ELA) and Mathematics, their courses were often mitigated partway through the year for test preparation in other subjects. Alex and Carmen were tasked with being flexible, innovative, and exceptional in their approach to science teaching with little to no recognition of their talents and skills in the classroom.

Both Alex and Carmen would successfully integrate relevant and critical elements of their sociopolitical awareness into their curriculum. Alex would utilize the biology classroom to allow students an opportunity to explore biological sex and the experiences of people born intersex. At times they would receive pushback about the content of their lessons from students and parents, and thankfully supported by their school leadership, would remind students and parents that their position was not to enforce belief, but to engage in the scientific principles surrounding real concepts people in the world deal with. Their exploration of gender marginalization in the sciences is as well an example of the insurgent additions to the classroom and school culture that benefited students' relationship-building and intercommunal behavior, attitude towards marginalized genders such as Black girls and women in the sciences, and led to affirmative activities constructed by the students themselves. Carmen would create her curriculum whole cloth from her usage of BetterLesson.com, her sociological aptitude, and politics of Blackness. She would lead students to uncover hidden figures, misinformed histories, and develop advocacy at the center of the science classroom. Her work would be recognized and awarded honor by citywide officials, through which she would further allow students to exercise their activism, research about food quality and public health issues they faced in their neighborhood, prompting and positioning scientific advocates of the future.

The amount of exceptional, critical, and sociopolitical labor found in these two narrative-biographies of Black former science teachers presents several self-thematized perspectives that

include humility, mobilization, intellectualism, class, Blackness, activism, advocacy, and self-identity formation. The post-Obama era brought to the field of science teaching new contestations with public, charter, and district and school funding; each initiative driving forward the market-based maneuvers of a neoliberal capitalist state profiteering from science education as assimilation of children and families into a violently globalized 21st century order. Alex and Carmen operated at the intersection of multiple facets of anti-Black violence, post-racial ideologies, and the continuing expansion and extraction of the U.S. empire.

5.7 Summary

Under considerably tumultuous working conditions, both proximal and contextual, Alex and Carmen's narrative-biographies reveal the fascinating impact two Black science teachers and their politically informed science teaching had on students, families, schools, communities, and their decision-making. By estimate, Alex and Carmen combined would have spent 11 years in the science classroom, working with hundreds of students and families. Their choice of teaching in predominantly Black schools led to many of these students and families sharing similar ancestry and cultural backgrounds within the Black diaspora. Alex and Carmen would continue relationships with their students well after their time as classroom teachers, and as well continue to become life-long educators in varying vantage points of the field of social, educational, and community service.

Two Black former science teachers have shared their life history through the form of narrative-biographical storytelling, elucidating their experiences as young people, students, workers, educators, classroom teachers, advocates, organizers, activists, family members, and friends. Their lives are the infoldings of multiple simple and complex themes of which they each chose three, describing from their own story-telling what each period of their lives could be

summarized as in an imaginative, introspective methodology of qualitative research. Throughout each self-thematization, I have explored the connections and thematic continuity available to both narrative-biographies, and as well placed each story and story-teller against the backdrop of an interpretative, phenomenological analysis of the historical and material aspects of their experiences exist in relation to the context during which they have been explored. I offer the examples of political struggle, resistance, and continued efforts of Alex and Carmen's time before, during, and after science teaching during the post-Obama era that reflect and transmit the phenomenon of proletarianization of their working conditions and anti-Blackness of their social and professional lives.

I finalize by discussing three critical tenets of political resistance that surface throughout this analysis, that of: a) advocacy, b) mobilization, and c) dissent. Alex and Carmen's sociality, their personal and social identities alongside their experiences, exist entirely within their own self-thematization and narrative-biographies. I argue that in the field of science education, and beneath the question of teacher attrition, these three tenets of political struggle and resistance examine the integrity of the decision-making processes present in these two Black former science teachers' stories that may have led to their leaving the science classroom and teaching profession. In addition to considerations of the research on teacher attrition, the structural and historical conditions of anti-Blackness and anti-Black violence have been sequenced throughout each narrative-biography and the material conditions each having faced in their efforts to provide exceptional and equitable science education to their charges is worthy of note and further consideration to be discussed in the final chapter of this dissertation.

Chapter 6: Summary of Research Findings

The self-thematization of two Black former secondary science teachers in the U.S. who have decided to leave the profession during the post-Obama era following 2017 yielded intrapersonal, interpersonal, social, emotional, and political interpretations of each participant's life history, educational experience, approach, and decision-making to leave the science classroom. Alex and Carmen's self-concept, identity formation, and awareness of the relationships they had with their family, friends, coworkers, students, and student's family and communities were prevalent throughout each narrative-biography.

Alex's belief in mobilizing, thoughts about connection through humility, and life-long teaching beyond the classroom were tied to their upbringing, friendships, rapport with students and their communities, and working relationships with other staff and faculty. The strong cultural, ancestral, and interpersonal connections were a large part of Alex's decision-making to entire the field of science teaching with experiences in educational equity and a love of sparking joy and curiosity in young people's minds. During their preparation and time as a science teacher, they would devote extra time and labor into connecting what was happening in the classroom with the outside world with rallies and marches against anti-Black violence, lessons and activities about biological sex and gender, and moments of joy. Simultaneously, social and political crises developed alongside their political integrity and struggle for social justice for students and their communities that deserved acknowledgement, representation, and redistribution of necessary material resources. Alex's political struggles would range from advocating for specialized educational staff and equitable district policy to preserving community schooling and denying privatized education the ability to strip necessary resources from neighborhood schools.

Carmen's upbringing and understanding of socio-economic class would evolve alongside her community of nerdy Black kids, familial support, pedagogical and curricular excellence beyond closed doors, working outside of her integrity, and getting back to self. Carmen's conviction that a quality education was deserved by her and the students she would work with featured historical and scientific truths, contextual and culturally relevant themes, and a relationship with self and others that nurtured the development of racial integrity within predominantly white institutions where there remained consistent attempts to remove her soul from her work in science education. Carmen's commitment and approach to science teaching would bring her work to middle and high school buildings under drastically disparate working conditions to a point wherein continuing to work outside of her integrity was non-negotiable. The decision to leave the classroom meant re-entry into the field of science education as a teacher educator with almost a decade of experience as a mentor and curricular and instructional leader.

The narrative-biographies and self-thematizations of two Black former science teacher educators reveal through an interpretative phenomenological analysis several aspects of their working conditions, life histories, and decision-making as political struggle and resistance to anti-Blackness and proletarianization. Alex's belief in mobilizing and Carmen's Blackness as politics arose as central to their resistance to inadequate working conditions; tenets of the Black radical tradition are clear in their advocacy, mobilization, and dissent while working within the field.

Blackness, anti-Blackness, and the Black radical tradition triangulate the life histories of Alex and Carmen's upbringing, early educational experiences, and approaches and decisions to leave the science classroom. Their narratives reveal contradictions of the post-racial

progressivism of diverse representation in science education in the U.S. during the post-Obama era. Teaching and learning within a nation driven politically by neoliberal capitalism and imperialism worsens their working conditions through educational privatization, anti-Black violence, and dismissal of the stakes that face Black children in their families in the metropolitan environs in which they were charged and interested in teaching. Carmen's evocation of "Blackness as a politic" points to the nature of resistance to overwhelming oppression concurrent with the intellectual and emotional workload of Black working-class people fighting for educational equity inside and outside of the classroom. We see in both Alex and Carmen's experiences as Black science teachers the under-resourced, individualist requirements of their labor as a lack of curriculum, false autonomy, and the disparaging toll of dilapidated working conditions attempting to minimize their impact on children's education (Doherty, 2020).

I find Alex and Carmen's decision-making in leaving the field to be directly connected to their self-thematization and biographical storytelling of the incidents that led to their exit from the science classroom and retirement from the teaching profession. Alex, whom even when entering the field had stated they were always thinking about continuing to graduate school, mentioned that they otherwise would have remained in the classroom if not for the compensation. They shared that they at times regretted their decision to leave, although they knew the experience of moving to a different area and pursuing a graduate degree was worth the change. Alex's decision to leave the classroom was influenced by their working conditions as well as the learning conditions of the children at their school.

The similarities in Alex's experiences are concomitant with the literature of teachers facing heightened emotional and cognitive labor (Kariou et al., 2021; Wiggin et al., 2021) and regret in their decision-making (Dunn et al., 2017; Kelchtermans, 2017). When asked about a

critical incident during which they felt it was time to go the story of a student in crisis was told. However, Alex's consequent push to get this student the care and service they required even after the incident being met with further negligence may have cemented Alex's belief that the administrative policies of the school was insufficient to keep students safe, indicating the presence of agency (Glazer, 2018) and political dissent (Morales-Doyle et al., 2021) in their approach to social justice and science teaching. The student of this critical incident would face the authoritative protocols and policies of the school administration policy, a foundationally anti-Black carcerality of public schools discussed by Blaisdell and Gray (2024) that often places teachers at the center of resistance instead of leaders and school administrators.

Carmen had the distinct experience of working as a teacher both within and outside of the science classroom, beginning her tenure as a social studies teacher and never wavering, even when switching subjects, in her approach to pedagogical excellence. Carmen's thematizations would convey that working outside of her integrity, perhaps an integrity of self-care and socioemotional awareness, while telling the story of when they thought it was time to leave the field. Carmen's gripping of the clipboard, at a place in which she felt she was operating outside of her integrity, represents working conditions of a place wherein integrity and conviction are antithetical to reprieve. The tension, as physical stress, rising to the surface within a position in which otherwise would have had mentorship, support, and adequate facilities speaks to the myriad of ways the incentives of teaching science seldom outweigh the costs. In Carmen's case, the emotional stress of teaching (Farmer, 2020; Ryan et al., 2017; Skaalvik & Skaalvik, 2017) and intensified workload (Creagh et al., 2023; Mabeya et al., 2019) manifesting as physical stress and pain. Carmen's continued efforts however to make the use of her time in the classroom meaningful and impactful for her students, graduating from a doctoral program in science

education, and continuing to work with and support other science teachers speak to the return to self and removal of conditions under which her integrity was a part of the expenses in the first place.

6.1 Discussion of Research Findings

At the culmination of this study two glaring conclusions are worthy of note and discussion regarding the rigor and validity of this project: a) a culturally competent anti-oppressive research practice (CCAORP) using self-thematization was effective in engaging two Black former science teachers in descriptions of their lived experiences and working conditions through story-telling and critical reflection and b) using an interpretative phenomenological analysis (IPA) of anti-Blackness and proletarianization reveal contextual particularities, or rhizomes, that clarify interconnected social and political themes in the self-thematized narrative-biographies of Black science education workers. Alex and Carmen's life histories, educational experiences, approaches to classroom science teaching, and decision-making in leaving the science classroom are narrated by their own interpretations and via phenomenological studies of historical materialism share and differ in their approach to combating the working conditions, successes and challenges, relationships and connections, and radical traditions of the Black and African diaspora.

Several changes in language and theoretical approach were utilized throughout the data analysis sections of this dissertation study. Worth mentioning are the transitions between terms political struggle and political resistance, which at first did not appear germane. In the literature, a lens of political resistance was often defined similar the decision-making to leave the classroom or "exit as resistance" (Glazer, 2018, p. 72). However, from literature of critical Black studies there exists at times subtle enduring descriptions of political struggle as the "struggle

over ideas” (Adeleke, 2000, p.41). As I constructed the narrative-biographies from the interview transcript data I interpreted political resistance and struggle as often synonymous. Each moment, when comparing the stories shared by Black former science teachers as social and political subjects to the broader perspectives of historical political resistance and struggle, signified persistence to take up space in the oppressive circumstances of U.S. science classroom teaching. What I perceived as a difference between struggle and resistance may have been a judgment in the moment of narration and has become more clearly interconnected when attempting to understand the sociopolitical positions Alex and Carmen had taken through their approach to science teaching and decision-making to both enter and leave the field.

Another shift occurred in my understanding of the differences between participant’s lived experiences to that of their self-thematized narrative inquiry. It was quite reasonable to discuss the participant’s narrative-biographies because of the way in which they chose to tell their stories, weaving throughout their self-thematizations of what each story meant in the way that it was told and how these themes take into consideration the position of the storyteller at that time. The self-thematization process was incredible to witness from interview to manuscript as I felt removed almost entirely from the participant’s narrative retellings yet critically involved by the process of maintaining as best as possible their integrity as both authors of their own life history and the stories shared. It is worth restating that including long narratives of raw data of participant’s voices and unabridged storytelling was a deliberate and impactful analytical tool. Save for a few transcription alterations, I argue that resisting the normative expectations of educational research by leaving Alex and Carmen’s oral storytelling to proceed largely unedited from interview to manuscript preserves their cultural, linguistic, and agentic decisions of how and why these narratives were shared.

Although it is not possible at this time to gauge the long-term repercussions of this research methodology and its outcomes, during and after each narrative-biographical interview there exist several poignant considerations about: a) the phenomenon of teacher attrition in the field of U.S. science education, b) the integration of critical, anti-capitalist, and anti-imperial Black studies in U.S. science education research, and c) discovering methods of anti-oppressive research methodology in science teaching that stimulate political thinking. Both participants expressed their interest and gratitude in both the purpose and approach to the study, as did I as a researcher in their vulnerability and candor while sharing their life histories. I found some of the research questions used in my methodological approach to be far too general. In retrospect, it was indeed necessary to highlight a specific period during which Black science teachers left the classroom as the beginning of the post-Obama era represents a particular time interval under which neoliberal capitalism, race reductionism, U.S. imperialism, and anti-Black violence intersect and appropriately position the interpretive phenomenological framework of this study. Although this may have limited the number of participants, a narrative-biographical approach yielded detailed and emphatic discussions during the interviews that situated Alex and Carmen's lived experiences both within and outside of their time as classroom science teachers.

Teacher Attrition in Science Education

The dominant perspectives I found in research on teacher attrition consisted of qualitative and quantitative methodologies of examining of human and social capital phenomenology in teacher retention and mobility. Few articles I found attempted to discuss the combined racial and structurally political standpoints in teacher attrition that explained attrition as a dialectic, responding to the sociopolitical and working conditions that teachers faced while in the field. Focusing on two Black former science educators granted insight into the material working

conditions of the field that may be shared across differential school types, school regions, and subject areas.

Science education has been prioritized and incentivized specifically within the emerging fields of STEM and STEAM teaching and learning through private and public institutions as an increasing STEM workforce is of national priority. However, we see from Alex and Carmen's preparation and time as science teachers they would face working conditions that ranged from little or no surveillance to hyper-surveillance, intensified cognitive and emotional workload demands, little or no resources and opportunities for professional development, and unfair or minimal compensation for their time spent working amidst inadequate facilities for teaching science. Alex and Carmen's shared experience of being deprioritized and having to truncate their curriculum to prepare for state and district standardized testing in mathematics and English language arts is in juxtaposition to the national and federal claim that scientific learning is a priority at the school level.

A possible explanation of this juxtaposition is that Alex and Carmen would be teaching in areas of high-need for science education workers, but little need for engaging and critical science pedagogues. The U.S. has profited from its scientific advancement and resource extraction since its conception and is able to devote billions of dollars of grants and funding as a Western imperial power to its investments. This subterfuge promotes a political aesthetic of beliefs in educational equity and scientific literacy, but in the metropole full of working-class, Black students and students of color there is little need to recruit or retain future science workers outside of the necessity to fill representational gaps in employment and offer proletarianized jobs to those who advance. Science teachers and their working conditions may sit at the nexus of these implications. As former science workers or students themselves, their belief and interest in

the curiosity of the natural world and physical setting or belief that scientific literacy should be available to all are often manipulated to enter such a social service as science education. It is clear through Alex and Carmen's sociopolitical struggles both inside and outside of the field of science education, and rightfully to their own successes in delivering quality exceptional science education to students regardless of their working conditions, that these contentions must be explored in future discussions of the occupational socialization of science teaching.

With regards to teacher attrition in science education research specifically, the ruse of political aesthetics of neoliberalism must be problematized. Alex and Carmen's commitment to their students and communities represents conviction in educational equity that counteract the mythology of classroom teaching as a calling. The realities of the lived experiences shared throughout their storytelling place the labor, compensation, and sacrifices of science classroom teaching in the U.S. as a material condition with real world implications for their and others' physical, mental, and emotional wellbeing. As a study of the decision-making factors that affect teacher attrition, the enduring sociopolitical climate of the field, industry, and policy of science education fails to be overshadowed by the economic reasoning of workforce retention and mobility.

Science Education and Critical Black Studies

Black science teachers in the U.S. are a specific group that has both suffered from the increased privatization, professionalization, and repression of the teaching field yet are highly sought after in urban and metropolitan areas, incentivized through rapid traditional and non-traditional teacher preparation and placement programs, increased compensation, and routinized workplace entry. Black teachers invariably have positive effects on students of all racial backgrounds and consist of a qualified pool from which the workforce can easily attract, but not

retain, adequate occupational representation. However, Black teachers and educators reflect a myriad of political beliefs, such as the petit-bourgeois interests of Black mis-leadership of the 19th and 20th century who advocated for the education of Negroes as an assimilationist practice in capitalist interest of upward mobility. The neoliberal myth of post-racial meritocracy persists into the 21st century as the Black masses, including the precariat, lumpen-proletariat, and proletariat, continue to suffer from the political blowback of the Black bourgeois' capitalist interests.

Where science education and critical Black study meets exists as interrogation of both anti-Blackness that contributes to the dilapidated conditions of the science educator and worker and the assemblages of the Black radical tradition in anti-capitalist and anti-imperialist Black educators who choose to enter the field of science teaching. The disparaging inattentiveness toward anti-Black violence the field of science education both proliferates and promotes postures the field as progressive as the neoliberal governance of schools and schooling administrations increases rapidly in all corners of the nation. Alex and Carmen's working conditions and political resistance to these conditions attenuate the theoretical and practical implementation of critical Black study in science education. They were required to both provide quality science education amidst inexcusable workplace malpractice and combat with their socioemotional wellbeing while anti-Black violence proliferated throughout the murders, trials, and uprisings of Philando Castile, Freddie Gray, Trayvon Martin, and countless others. Their narrative biographies problematize the stakes of U.S. science education and the ability for the science teaching workforce to hold any safe space for Blackness, let alone equitable, quality education.

The degradation of science education working conditions can be intrinsically tied to anti-Blackness in U.S. education; the transition to neoliberal capitalism in the 21st century relying

upon the advancement of the plantation economy worldwide. The extraction of labor, naturally occurring minerals, and resources from the continent of Africa and the Global South as well as exploitation of indigenous continental and oceanic territories requires U.S. exceptionalism in science work and education to prosper. The marginalization and proletarianization of Black educators and Black science educators is typical of imperial expansion as the public and private sectors of STEM and STEAM industries lobby for and prioritize a workforce that by all measure is required to buffer the realities of plantation and libidinal economies with anti-Black labor for industry and profit. Alex and Carmen's refusal to allow the deterioration of the field to affect their ability to show up for and with Black youth is not coincidental and is in many ways in direct opposition to these conditions. A critical Black study of science education is toothless if it avoids engaging the anti-Black, capitalist, imperialist realities of political struggle in the field.

Research in Science Teaching

Research in science teaching is dominated by normative methodologies that reproduce and instrumentalize anti-Blackness, neoliberal capitalism, and U.S. imperialism as well as its concurrent offshoots of cis-heteronormative patriarchy, ableism, homophobia, transphobia, and xenophobia. Many of the studies found of teacher attrition in science teaching and teaching at large horrifically dissuade the sociopolitical ramifications of neoliberal capitalism in educational institutions and occupational socialization of teachers, exacerbating the oppressive bipartisan outcomes of U.S. scientific and economic supremacy. The approach to constructing Alex and Carmen's narrative-biographies problematizes the hegemonic research position that a science teacher, and labor in science teaching, merely regards curriculum and pedagogy as isolated epistemes. The political sphere of social being and human relation is consequential of the material conditions under which science educators enter the field resourced, incentivized, and

supported for their labor. Research in science teaching either supports or erases this distinction through its methodological approaches and ideological suppositions.

Practicing greater ethical care and reflexivity before, during, and after the data collection process is integral in advancing the possibilities of research in marginalized communities (Gunn, 2022). A narrative-biographical, anti-oppressive, and culturally competent methodology in science teaching research can stretch theoretical and practical boundaries utilizing agentic approaches such as self-thematization. Alex and Carmen's reflections, recollections, and story-telling provided both detailed, reflexive, and critical considerations that extend the political realities of research in science teaching. Qualitative research in science teaching can at best resist the pejorative and quantitative empiricism of Western, white hegemonic structures of epistemological violence while engaging political discussion that combats reductionism, reformism, and liberalism during times wherein brevity and hyperproduction truncate synthesis of critical theory and anti-oppressive practice.

Limitations

Although much was done at the outset of the methodological approach to this study, limitations occur frequently that affected the data collection and analysis process. Limitations for this study include but are not limited to: a) the challenge of recruiting large numbers of participants who have left the field of science teaching, b) the teacher preparation of each participant being solely in the non-traditional alternative pathway, c) the school level, type, region, and district of public-charter and charter schools, and d) the expansion of philosophical groundings to address further discussions of racialized oppression at the intersections of gender, sexuality, disability, and other intersectional identities.

The length of time for each interview and type of questions asked were modified to suit the smaller number of participants in the study. An increased number of participants would have presented further stories and experiences of Black former science teachers, but recruitment was challenged by accessibility to organizations or institutions that were dedicated to keeping in touch with teacher leavers. From my own experience in leaving the classroom there was no support or redress for the cognitive or emotional load of attempting to find a new job or career, and thus my own subjectivity limited the knowledge of resources and communities with whom teacher leavers could seek refuge and share their stories.

The alternative teaching preparation pathways of each participant also limited the scope of this study. As non-traditional programs vary in their commitment to preparing long-term or lifetime teachers the increasing number of alternative teaching preparation pathways presents questions about the effect of recruitment and retention strategies that are then placed in the responsibility of schools and school districts. Traditional teaching pathways such as schools of education and city or statewide teacher preparation institutions would provide narrative experiences of pedagogical support and occupational socialization mentioned briefly by Alex in their comparisons to local school district teachers they had met and known.

The type and location of schools taught represents a small fraction of the experiences held by Black former science teachers who have taught at public, private, and other types of public-charter and charter schools. Both Alex and Carmen would also teach in urban areas that offer school environments, demographics, and administrative policy. Rural and suburban areas where Black science teachers are of higher or lower percentage may offer comparative results. The conditions of public and private schooling paint a broader narrative of the political struggles of Black science teachers at varying types of institutions, as well as the extent of their decision-

making to leave the field based on varying compensation, workplace conditions, and economic background.

Finally, worthy of note within this study and its participants is attention to the multiple intersectionalities identified by the participants, such as the gendered form that racialized and classed oppression takes when addressing the working conditions of Black people of marginalized genders. The experiences of Black people of marginalized genders, or *Black MaGes*, are often overshadowed by the combined epistemological violence of sexism, cissexism, heterosexism, anti-Blackness, and cis-heteronormative patriarchy. Black MaGes include Black women and girls as well as Black genderqueer, agender, transgender, and gender non-binary experiences that locate intersectionalities within critical and contemporary Black feminist theory necessary in interpreting structural antagonism as the extensive social reproduction of anti-Black material struggle is predicated upon the gendered racialization and transfiguration of Black flesh. These intersectional inquiries extend to the possibilities of interpretation alongside anti-Blackness that extend to disability, queerness, nationality, ethnicity, religion, and other social identities worthy of future study.

6.2 Suggestions for Future Research

I write the final sections of this dissertation in the days following the landslide victory and inauguration of the second term of President Donald Trump. Like his administrative action at the helm of his first term, he has developed multiple executive orders ushering in harmful educational and legislative policy that will affect generations to come. However, I continue writing with the political and philosophical grounding in the Black radical tradition that recognizes that every president of the United States has offered little more to the executive policies of this country than the continued reformation of the same anti-Blackness, neoliberal

capitalism, and U.S. imperialism that supplants this country's position as a global power. A critique of post-Obama era educational and legislative activity continues to problematize the role electoral governance, bipartisan leadership, and representational politics plays on science education, especially as it profiteers as revolutionary and often postures as liberatory while advancing the U.S. empire. The contributions of the Obama, Biden, and Trump administrations to the field of education and science education brought continued perfection of the plantation economy, privatization of the field of teaching and education, and repression of the Black radical tradition in the form of a diverse heads of state who represents the terror felt both within and outside of the U.S. territory.

Alex and Carmen's approach to science teaching, developing in community a capacity for advocacy, integrity, and dissent are indicative of the sociopolitical resistance and struggle within and outside of science classroom teaching to these continually unstable political conditions. Against the backdrop of the Black radical tradition, their persistence within the field and as well decision-making to leave exemplify the long-forged characteristics of Black, laboring people throughout history that endure the gratuity of anti-Blackness and anti-Black violence at a structural and material level. This narrative-inquiry implies that the decision-making to leave the field manifests forms of Black radicalism antithetical to the mythology of progress within the academic hold. Alex and Carmen are living proof that there exist science educators who have found the educational institutions of the U.S. and western globalized world incapable of authoring Black liberation, repressive of its ideological foundations, yet have impacted utilized the field nonetheless to positively affect the lives of students, coworkers, and communities despite their disparaging working conditions. Their integrity, advocacy, and dissent

require the same type of courage that plants seeds of revolution in the hearts and minds of the Black masses throughout history.

Historical materialism is a powerful theoretical tool, as it generates critique and problematizes historical narratives situated in global power structures such as neoliberalism, capitalism, and imperialism. A critical Marxist inquiry clarifies rather than obscures the occupational socialization of the teaching workforce, including preparation, entry, and exit as mediated by the interests and aspirations of the ruling socio-economic class. Anti-blackness, critical Black study, and the historiological assemblages of the Black radical tradition identify the antagonistic structures of hegemonic narratives outside of the performative domain, problematizing race reductionism, participatory representation, and neoliberal reform initiatives that seek to obscure the structural relations of Black labor, agency, and activism. Alex and Carmen have provided a vulnerable and critical exposition of counter-hegemonies that particularize the conditions wherein Black science teacher labor is untenable for a myriad of social, economic and political reasons that persist in the afterlife of slavery and plantation economy of the U.S. empire.

Further research in the field of science education, Black education, teacher preparation, occupational socialization, and U.S. teacher attrition could expand and clarify these issues within the field, but the philosophical presuppositions of this narrative-inquiry centers investigations of political struggle and resistance in science classroom teaching that shed light on the hypocrisy, malpractice, and manipulation of neoliberal, progressive, educational reform. To suggest that this study concludes with determinate methods that science classroom teachers can be better supported, prepared, or incentivized is antagonistic of its conceptual and theoretical premise. Anti-blackness, neoliberal capitalism, and U.S. imperialism both structure and develop the

working conditions that two Black former science teachers faced while attempting to accomplish such simple tasks as securing adequate working conditions for themselves, their students, and their students' communities while advocating for educational equity. The inability of their teacher preparation organizations, school sites, administrations, and districts to provide these conditions is a feature, not a bug, of the sociopolitical world. The requirement to offer considerations to the field of science teacher education, preparation, policy, and research require the inadequate working conditions discussed in this study to maintain the status quo.

This narrative inquiry implores Black science educators, practitioners, and theorists including but not limited to elementary, secondary, post-secondary, public, private, urban, rural, international, and domestic to regard the formal and normative institutions of schooling of the U.S. and Western imperial powers as technologically advanced sites of capitalist accumulation beyond reform. Our educational labor and effort, if intended to prepare for the liberation of Black people, cannot co-exist with the maturation of the economic and libidinal policies, procedures, and practices of the modern social world. Alex and Carmen's labor and political struggle reify the position many Black and non-Black educators within these institutions face in a search for social and racial justice, yet there remain those who maintain that there exist adjustments and reforms which allow for escape, redress, and reprieve. An inquiry grounded in the critical Black study of anti-capitalist, anti-imperialist, Black liberatory activity posits that "only the most narrow parameters of change are possible and allowable", as evoked by Black intersectional feminist Audre Lorde, when it is believed that the master's tools can in anyway dismantle the master's house (Anzaldúa & Moraga, 1981, p. 98).

As the U.S. empire continues to expand its political, economic, and cultural reach these conditions will only worsen, and we are left to question to what end we seek to retain and

incentivize Black science teachers in the hold of an already sinking ship. Anti-Blackness, and the material conditions engendered by Western modernity it profits from, occupies the “position of the unthought”, in which “much of our political vocabulary/imaginary/desires have been implicitly integrationist even when we imagine our claims are more radical” (Hartman & Wilderson, 2003, p. 185). What is implied from the narratives of two Black former science teachers can be summarized in Alex’s words at the very end of their interview: the critical and radically courageous position, as well as call to action, that we deserve and require educational solutions for our own communities.

6.3 Conclusion

Alex and Carmen’s narrative biographies present profoundly critical instances in which the field of science education, Black education, and science teaching working conditions in the U.S. take the form of material and structural political struggle. Research methodology that centers their self-thematizations, thematic interpretations of their own storytelling, and life histories presents an anti-oppressive and culturally situated agency in the analysis of post-service teachers, a category with which there is a challenge to locate without close and direct personal contact. The narratives of former teachers who have left the field should be considered as complex expositions of agency and decision-making individually formed yet influenced by the treacherous terrain of the sociality and polity in which they are told. Alex and Carmen’s self-thematizations include beliefs in organizing, connection through humility, working and learning beyond the classroom, nerdy Black kids, familial support, behind closed doors excellence, working outside of their integrity, and getting back to self. Each narrative biography reveals critical incidents in which the political conditions set during and after the Obama presidency in the U.S., the consequential Trump presidency, anti-Black violence both domestic and abroad,

student relationships, community relationships, working conditions, mentorship or lack thereof, support or lack thereof, protest, dissent, advocacy, mental and physical stress, and decision-making in leaving the field of classroom science teaching.

The narrative biographies of two Black former science teachers are also that of continued development, advocacy, mobilization, organizing, and conviction in the care and attention to Black and marginalized groups. The political thinking and activity of Alex and Carmen's stories reveals family, friends, colleagues, students, and coworkers whose lives intersect, converge, and diverge around the stakes of equity and justice in science education. Their stories continue as educators and teachers, as well as learners of their own identities and communities. The field of science teaching is impacted by their excellence and approach to providing quality experiences to the children of this nation, and yet their attrition from the field allows them to retain and use these same skills and talents from their bricolage in other ways. The expansive space that Alex and Carmen's sociopolitical selves brought to their classrooms can in many ways be considered more autonomous, less surveilled, and far less captive outside of the schooling institutions and facilities which they have left behind.

This critical narrative inquiry verifies the extension of the enduring afterlife of slavery, gratuitous violence, and material and structural influence of anti-Black worker oppression in the field of science education. The educational solutions our communities need cannot be excavated from the reformation of the advanced, technocratic plantation economies of Western modernity, but must instead render them obsolete by an unwavering commitment to addressing the foundations of the modern social world and its subsistence on the sociopolitical ideologies of anti-Blackness, neoliberal capitalism, and U.S. imperialism with direct, hostile antagonism.

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Appendix A

Table 1

Interpretive Phenomenological Analysis: Historical Materialism

Proletarianization & Teacher Socialization

“Extensive division of labor, private and public bureaucracy affecting working conditions, wage as primary source of income, and collective bargaining.” (Oppenheimer, 1972, p. 213)

“Rationalization, codification, routinization, fragmentation, and subordination to bureaucratic authority” (Macdonald, 1995, p. 130)

“Stress (tension, frustration, anxiety, anger, and depression), economic growth and recession, large-scale population shift, decline in teachers’ status, living conditions, attitudes towards family responsibilities, health, and ethnicity, insufficient incentive, intensification of work, and substandard working conditions.” (Macdonald, 1999, p. 840-841)

“...taylorization, standardization and bureaucratic controls, improved division of labor, advancements in technology, transfer of knowledge and power to management, and loss of autonomy in work performance” (Buyruk, 2014, p. 1712)

Table 2

Interpretive Phenomenological Analysis: Critical Black Study

Blackness, Anti-Blackness, and the Black Radical Tradition

“Blacks are still doing the work of the greatest slave state in history. The terms of servitude are all that have been altered.” (Jackson, 2020, p. 10)

“...Blackness is defined here in terms of a social, relational and structural position rather than identity; blackness incorporates subjects normatively defined as black, the relations among blacks, whites, and others, and the practices that produce racial difference. Blackness marks a social relationship of dominance and abjection, and potentially one of redress and emancipation; it is a contested figure at the very center of social struggle.” (Hartman, 2020, p. 94)

“Blacks are constituted by a violence that separates the time of the paradigm (ontological time) from time within the paradigm (historical time). At every level of abstraction, violence saturated Black life. To put it differently, for Black people there is no time and space of consent, no relative respite from force and coercion: violence spreads its tendrils across the body, chokes the community, and expands, intensifies, and mutates into new and ever more grotesque forms in the collective unconscious through literature and film.” (Wilderson, 2020, p. 218)

“Black radicalism, consequently, cannot be understood within the particular context of its genesis. It is not a variant of Western radicalism whose proponents happen to be Black. Rather, it is a specifically African response to an oppression emerging from the immediate determinants of European development in the modern era and framed by orders of human exploitation woven into the interstices of European social life from the inception of Western civilization.” (Robinson, 2020, p. 73)

Appendix B

Preliminary Questionnaire & Open-Ended Response

Item	Question	Expected Data
<i>Demographic Information</i>		
1	Full Name & DOB	<i>Identifier MM/YYYY</i>
2	Before leaving the teaching profession, were you fully licensed and/or certified to teach at least one of the following: <i>Physical science (Chemistry, Physics, etc), Life science (Biology, Environmental Science, etc.), Earth and space science (Geology, Oceanography, etc.), Computer Science, and/or Technology?</i>	<i>Yes/No</i>
3	<i>Do you identify as Black/African-American or a member of the African diaspora?</i>	<i>Yes/No</i>
4	Are there any other identities you would like to share?	<i>Social identity</i>
5	How did you join the profession? <i>Traditional, alternative, special pathway university, school district, teacher preparation program</i>	<i>Teacher preparation pathway</i>
6	In what city and state did you teach?	<i>Geographic location</i>
7	In what type of school or district did you teach? <i>Public, Charter, Independent</i>	<i>School type</i>
8	When did you enter the profession?	<i>MM/YYYY</i>
9	When did you leave the profession?	<i>MM/YYYY</i>

A. Please share a brief reflection of why you decided to leave the profession. Do you recall experiencing any of the following while working as a science teacher? Check all that apply. You may elaborate on any of the below as the “critical incidents” that prompted a decision for you to leave/retire early.

- heightened cognitive or emotional labor
- health and safety concerns
- policy concerns
- racial microaggressions
- high teacher turnover
- increased accountability or workload
- restrictive curriculum
- increased surveillance
- performance improvement plans, behavioral management, or push-out
- low administrative support
- verbal abuse