Standin' Tall: (De)criminalization and Acts of Resistance Among Boys of Color in an Elementary After School STEM Program

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STANDIN’ TALL:

(DE) CRIMINALIZATION AND ACTS OF RESISTANCE AMONG BOYS OF COLOR
IN AN ELEMENTARY AFTER SCHOOL STEM PROGRAM

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The final copy of this dissertation has been examined by the signatories, and we find that both the content and the form meet acceptable presentation standards of scholarly work in the above mentioned discipline.

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Standin’ Tall: (De)Criminalization and Acts of Resistance in an Elementary After School STEM Program

Dissertation directed by Associate Professor Erin Furtak and Assistant Professor Enrique Lopez

Abstract

The United States current incarcerates more citizens than any other country in history, by disproportionately targeting men and boys of color through mechanisms such as the school to prison pipeline. In better understanding the processes that fuel the school to prison pipeline such as criminalizing practices and the ways boys of color resist them, we can begin to identify teaching practices and perspectives which work to disrupt those processes. Examining criminalization and acts of resistance in STEM education is particularly salient because of the high social and economic status STEM knowledge bears in dominant U.S. culture, and the ways access to STEM learning functions as gateways in our education system. Through a longitudinal study in a multi-site elementary after-school STEM program, I examined what criminalization and acts of resistance look like, the ways they interact, and how staff in the program work to disrupt those cycles. I found that criminalization and acts of resistance are normal and ordinary occurrences, frequently interacting in response to each other in escalating patterns. I also found that staff engaged in multiple categories of decriminalizing practices based on highly respectful interactions and viewing boys of color as brilliant students who engage in acts of resistance as a healthy response to oppressive measures.
Dedication

This is for my family by blood, by paper, and by lived experiences
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Chapter I

Introduction

It was about 45 minutes after the end of the regular school day and the halls were empty, except for Rolando, who was walking back from the bathroom. Even though during the school day there are strict rules about proper posture and what side of the hallway students may walk, Rolando wandered the hall in a zig zag manner, arms halfway up, leaning left and right as if he were imitating an airplane. A regular school day teacher turned the corner and instantly began yelling at Rolando: “What are you doing in the hallway? And why are you on the wrong side? You absolutely know better. I’m sick of dealing with you disrespecting our school and our rules. You’re done mister. Come with me.” Rolando responded, “But I was just going to bathroom. I want to go to science. We’re building simple machines!” The teacher grabbed Rolando by the arm and said, “Not after what you did. I’m sick of this. I’m writing you up.”

This scene, which I observed in an elementary school predominantly operating in the service of Black and Latino students, was all too familiar to me as a researcher, an educator and a man of color. What had Rolando done wrong? He was part of an after-school STEM program and had just gone to the bathroom. Did the school really take walking in the halls that seriously? Sure Rolando knew the hallway rules - and maybe he was breaking them on purpose - but no one else besides the program kids, staff, and a few school day teachers were even in the building, let alone the hallway. And now Rolando was going to miss the design phase of building the simple machines. He was so excited about it and had so many awesome ideas the day before. The timing of the unit was tight, so chances were good that he would be behind the whole time and may not even be able to finish building his simple machine. At the same time, I wondered, did the teacher
even have a right to take Rolando away? If these types of interactions were common, how could the teacher’s actions negatively affect Rolando’s participation in school over time?

Boys of color like Rolando, despite not engaging in deviant behaviors any more than their white peers, have been and continue to be hyper-criminalized, disproportionately policed and overly punished in schools across the country (Hirschfield, 2008; Thompson, 2011). Aligning this with increasing and disproportionate incarceration rates of men and boys of color with the increased and disproportionate rates of suspensions, expulsions, special education and other negative labels and outcomes for boys of color in public education, a clear pattern emerges (Alexander, 2012). This consistent, systemic process of criminalization (part of a larger youth control complex) both funnels boys of color into the school-to-prison pipeline and also consistently denies boys of color access to education as a daily, normalized practice - particularly in science and mathematics.

Along with the social perception of intellectual elitism, possession of science and mathematical knowledge leads to and maintains social power (Aronowitz, 1988). “In today's world, economic access and full citizenship depend crucially on math and science literacy…” (Moses & Cobb, 2001, p. 5). One scientist put it, “If you are good at math then you are clever. Therefore if you aren’t good at math then you aren’t clever…if you aren’t good at math it undermines your whole being” (Boaler, 2013). In school, mathematics is often used as a proxy for general academic educational performance (Sahlberg, 2011). As a result, science and mathematics are forms of gateway knowledge to advanced K-12 academic courses, college entrance and funding, and STEM (and other lucrative) careers.

Scientists, mathematicians and engineers represent the intellectual elite in our society. Since the National Defense Education Act of 1958, public education has sought to among other
things train the “intellectual elite” to lead advances in science and technology (Basile & Lopez, 2015; Basile & Murray, in press), indicating that access to mathematics and science education serves as a gateway to elite intellectualism. In this way science and mathematics education have become what the National Council for Teaching Mathematics in 1989 called a “critical filter” to future economic success.

While STEM education continues to be a focal point of state and federal attention, specifically for the economic gain of the country’s corporate projects, little attention has been paid to the ways in which STEM education can benefit students of color (Basile & Lopez, 2015). For example, learning to apply science and mathematics in reading and writing the world is a fundamental component of liberation for communities of color (Gutstein, 2006a). Thus, when boys of color are consistently denied access to STEM education – particularly through criminalizing practices – they are denied access to (a) further and advanced educational opportunities; (b) the social status of STEM intellectualism; (c) knowledge and practices which can serve them and their communities in liberatory ways.

In the past decade there has been an increase in popularity of STEM-focused magnet schools and programs across the country with particular attention given to the ways in which these schools and programs can promote gifted and skilled students to the economic and military benefits of the country. There has also been an effort to migrate interventions for students in at-risk populations into out-of-school and after-school programs as well (Dejarnette, 2012). Out-of-school and after-school STEM education/intervention programs have drawn on standardized test scores, drop-out rates, and college entrance rates (Niehaus, Rudasill, & Adelson, 2012), which provide only a piece of the picture of the function and impact of these programs (Constan & Spicer, 2015). I aimed through my research to contribute to that larger picture, specifically in the
ways boys of color are treated in these kinds of programs. More specifically, I wanted to explore the processes of criminalization and acts of resistance in an after-school STEM program. At the same time, I hoped to look at ways that adults in these programs acted to disrupt these processes.

In this study I have investigated criminalization and acts of resistance of boys of color in an after-school elementary school STEM program, and ways the staff of the program have worked to disrupt cycles of escalating criminalization specifically targeted toward boys of color. Accepting the premise that racism is a permanent construct in our society (Bell, 1992, 2004), using a Critical Race Theory lens I looked to understand the intersectionality of and the simultaneous criminalization of boys of color and the acts of resistance in which they engage. Further, I looked to understand how alternative avenues of access to opportunities for engagement in mathematics and science education (STEM education) may lead to additional, and possibly, alternative, positive outcomes for boys of color. I used multiple data sources including fieldnotes, stories, discipline and attendance data to identify and describe criminalization and acts of resistance; they ways they interacted with each other; and how the staff in the program worked to disrupt these patterns.

I begin Chapter II by presenting the theoretical foundations for my research including perspectives on criminalization, acts of resistance and Critical Race Theory. In Chapter III, I present my sources of data, which included fieldnotes, stories, disciplinary data and attendance data, followed by my methodological approaches to analyzing this data. I present my results in Chapter IV, detailing what criminalization and acts of resistance looked like, patterns in how they interacted with each other, and how staff members in the program both reproduced these
patterns and worked to disrupt them. I conclude in Chapter V with a discussion of the masternarrative surrounding boys of color, and the counternarratives my research unveils.
Chapter II

Theoretical Framings

I begin this chapter with a statement of positionality to provide the reader with the context necessary to identify the position from which I have conducted this research, and as a statement of validity as a person of color. I follow this statement with a brief synopsis of my theoretical framing, followed by an in-depth look at criminalization, Critical Race Theory, and acts of resistance. I conclude the chapter with my research questions.

I am a multi-racial Latino and African American man. As a man of color, I have experienced multiple low and middle socio-economic situations throughout my life. As a boy of color and a student, I was subjected to many similar racialized and oppressive experiences I observed during this research, both in and out of school. Later, as a K-12 teacher of color working in low income Black and Brown schools, I observed many of these same oppressive measures being levied upon my students; in truth, at times I even acted as a vessel through which systemic racialized oppression flowed. Teaching at what was at the time the lowest performing high school in the state, I bore witness to the school to prison pipeline in action and many of the ways in which boys of color were criminalized. I bring all of these life experiences to bear upon this research, and all of my work as a scholar. Informed by these life experiences, I draw upon three inter-related theoretical framings to better understand the persistence of oppression boys of color continue to endure in school, and particularly within STEM education.

Criminalization

Criminalization is the collective processes by which a criminal identity is prescribed to an individual or group of individuals through discourse, demeanor and modes of punishment, monitoring and control (Boduszek & Hyland, 2011; Costelloe, Chiricos, & Gertz, 2009).
Criminalization of men of color has been in place since the emancipation of African American peoples in 1863 and has served specific economic hegemonic purposes including labor exploitation, social control, and among others, the commodification of Black and Brown bodies (Muhammed, 2010). Beginning in the 1980’s, those economic purposes have flowed primarily through the prison industrial complex, a collective mode of targeted racialized and gendered incarceration via a privatized, for-profit corporate conglomerate (Donziger, 1996). Since its inception, the prison industrial complex has driven policies and practices akin to Jim Crow segregation and post-emancipation slave-labor practices via corrupt courts of law (Alexander, 2012; Muhammed, 2010).

I view criminalization in education both as the processes by which boys of color are funneled into the school to prison pipeline, as well as the practices by which boys of color are denied access to STEM learning. Examining criminalization (and ultimately decriminalization) in STEM education is particularly salient because of the high status and assumed necessary skillsets STEM knowledge bears in dominant U.S. culture (Aronowitz, 1988). STEM education carries powerful liberatory potential for low socio-economic students (Gutstein, 2006a) in part because, as the Board on Science Education (2012) claimed, “Science, engineering, and technology permeate nearly every facet of modern life, and they also hold the key to meeting many of humanity’s most pressing current and future challenges” (p. 1).

Boys and men of color continue to be incarcerated en masse, and privatization of prisons has made this mass incarceration an economic benefit to the ruling class (Justice Policy Institute, 2011; Ogbar, 2005). These prisons, many of which are now private entities owned by several corporations, generate profits both from a per capita stipend from state or federal funds and through the sale of goods produced by those incarcerated thus effectively creating a free, captive
labor force provided and paid for by the state (Thompson, 2012). Our society continues to condone this injustice through the criminalization of men and boys of color (Alexander, 2012; Martinot, 2003; Nunn, 2002; Rios, 2011). School has become a significant vehicle through which the criminalization of boys of color is mechanized (Flores-Gonzalez, 2005; Leonard, et al., 2009; Winn & Behizadeh, 2011).

The criminalization of men of color. The United States presently maintains a prison population far exceeding that of any other country in the world both in raw numbers and per capita (Guerino, Harrison, & Sabol, 2011). Beginning at the start of the modern prison industry complex in the 1980’s, African American and Latino men have been subjected to continued disproportionate targeting by laws and law enforcement via actuarial methods (Harcourt, 2007). The prison industry labor force is maintained and expanded through the continued criminalization of the Black and Brown male body (Fulcher, 2012). These criminalizing mechanisms have transpired through the War on Drugs (Nunn, 2002), “Three Strikes” laws (Tyler, 1997), racial profiling (Cole, 1999), and gang databases - a practice particularly salient in Colorado (Alexander, 2012). All of these mechanisms have worked to create and maintain the dominant social view that all men of color are probably criminals and as such need to be incarcerated (Costelloe et al., 2009).

The US public has maintained the view that incarcerating more people than any other nation on the planet is a necessary and justified step to both exact vengeance for perceived criminal behavior and to maintain personal safety (Irwin & Austin, 1997). The dominant ideology holds that most criminals are violent; however, in fact the majority of those incarcerated are drug-possession convictions (Guerino et al., 2011). This dominant view is
maintained even when faced with the increasingly high costs of incarcerating individuals (Schiraldi, Holman, & Beatty, 2000).

Through these mechanisms, the male body of color is viewed as in need of being controlled out of notions of fear and misplaced blame (Aldama, 2003). These enduring views are projected not just to the adult man of color, but to the boy of color as well which has led to the drastic increase in the incarceration rates of juvenile boys of color in recent years (The Sentencing Project, 2011). Rios (2012; 2006) detailed the lived experiences of working class Black and Latino youth in west coast urban settings with an expressed focus on the ways the criminal justice system and law enforcement hyper-police and criminalize the boys. He described how boys of color routinely experienced police “stop and frisk” interrogations, sometimes handcuffed on a curb or bus stop for 45 minutes or more for no apparent or justifiable reason.

**Criminalization in Schools and the School to Prison Pipeline**

As we see boys of color subjected to these criminalizing processes in public spaces (Rios, 2011) and in the generational reproduction of criminal identities (MacLeod, Truth, & Times, 2009), it is no surprise we see criminalizing processes in schools as well. Garland (2012) identifies it as a natural progression.

Wacquant (2001) has viewed this kind of criminalization as a symbiosis wherein schools in low-income neighborhoods have now taken on the same processes, apparatus and treatments as prisons. In many urban schools employ police in addition to School Resource Officers (SROs); private security guards now patrol hallways, students are searched and passed through metal detectors on their way into school, video surveillance monitors less public areas, dress codes and sometimes uniforms are strictly enforced, bars adorn windows and exterior doors remain locked at all times barring unapproved entrance and exit (Nolan, 2011). Even the
presence of SROs originally assigned to schools to promote positive anti-drug interactions with students - more often in low-income schools - may be increasing the criminalization of boys of color through excessive hyper-policing and over-monitoring of students, and in the recruitment of SROs to handle school discipline rather than school administrators (Theriot, 2009). Further, in multi-racial schools, boys of color are often segregated out of standard classes, not only for low academic performance but also for behavior, into alternative programs and schools which exhibit more extreme examples of similarities to prisons. In Texas, for example, boys of color exhibiting low test scores have increasing been sent to alternative education programs originally designed and intended for juveniles with criminal records and persistent delinquent behaviors (Reyes, 2001). More benign behaviors of boys of color are hyper-policing and hyper-criminalized as well (Rios, 2006). Actions such as socializing, standing up, not looking at the teacher and talking out of turn are all examples of some of the kinds of behaviors that are hyper-policing by teachers, beginning in elementary school. Even “potentially ambiguous behaviors, such as rolling eyes or sighing” are hyper-policing and criminalized when exhibited by boys of color (Langhout, 2005).

The processes of criminalizing boys of color begins in school (Noguera, 2009). By 4th and 5th grades, a troubling number of boys of color are already labelled as criminals by teachers and administrators (Ferguson, 2001). Elementary school boys of color are referred to with direct language indicating incarcerated futures. They are scolded, sent to backs of rooms, sent out of rooms, sent home, isolated in the classroom and often not permitted to speak even when White peers are allowed (Langhout, 2005). “[Students of color] are disciplined and suspended more frequently than White students for subjective behaviors like disrespect, excessive noise, threats, and loitering (Meiners, 2007, p. 33)” (Winn & Behizadeh, 2011, p. 153). Teachers and
administrators have come to expect this disparity, producing a culture of normality with regard to the school–prison nexus (Brown, 2009; Hirschfield, 2008; Wacquant, 2001).

Criminalization in schools has longitudinal consequences for youth of color, playing a significant role in pushing them into the school to prison pipeline. The school to prison pipeline is a funnel which not only sends boys of color to prison, but also directly prepares them for an incarcerated life (Hirschfield, 2008). According to the New York Civil Liberties Union (2007):

The School to Prison Pipeline is a nationwide system of local, state and federal education and public safety policies that pushes students out of school and into the criminal justice system. This system disproportionately targets youth of color and youth with disabilities. Inequities in areas such as school discipline, policing practices, high-stakes testing and the prison industry contribute to the pipeline. The School to Prison Pipeline operates directly and indirectly. Schools directly send students into the pipeline through zero tolerance policies that involve the police in minor incidents and often lead to arrests, juvenile detention referrals, and even criminal charges and incarceration. Schools indirectly push students towards the criminal justice system by excluding them from school through suspension, expulsion, discouragement and high stakes testing requirements. (p. 3)

Further, although boys of color are hyper-criminalized in school and disproportionately punished, policed, and incarcerated, they do not engage in violent behaviors or drug use any more than their more affluent White peers (Thompson, 2011; Winn & Behizadeh, 2011). Given this disparate racialized practice, Hall (2010) identified the criminalization of boys of color as cruel and unusual punishment and a violation of the United States Constitution. These practices have persisted since the advent of the Prison Industrial Complex, growing into what Rios (2006)
calls a youth control complex wherein boys of color are criminalized in ways that serve to levy constant control over bodies. While awareness has grown significantly over the decades of these practices, there has been little to no meaningful state or federal legislative response to accompany that awareness (Boyd, 2007).

**Consequences of criminalization on STEM learning.** Access to STEM education is a civil and legal right (Tate, 2001). “A democracy demands that its citizens make personal, community-based, and national decisions that involve scientific information” (Michaels, Shouse, & Schweingruber, 2007, p. 3). As such, we can align criminalization in schools, the school to prison pipeline and the youth control complex to the systemic and acute practices which deny access to STEM educational opportunities.

Effective teaching in a STEM classroom requires equitable access to all aspects of learning, building new knowledge from the previous knowledge students are bringing into the classroom (The National Council of Teachers of Mathematics, 2013). STEM classrooms should be regularly structured with students in small groups participating productively in STEM problem solving and engaging in peer-to-peer discourse (Michaels et al., 2007). Students should collaboratively ask questions and search out plausible logical answers to those questions via critical thinking and experimentation (The Board on Science Education, 2012).

**Connecting STEM teaching practices and criminalization.** As boys of color are consistently both formally and informally sent out of classrooms and denied use of equipment, manipulatives, supplies and participation in small groups, for disciplinary infractions which are no more frequent or severe than those of their White counterparts, we see how civil rights are denied to boys of color in similar ways to post-incarceration denials of the right to vote, bear arms, etc. (Winn & Behizadeh, 2011).
I use this criminalization framework to understand how STEM education practices, the value of STEM knowledge in society, and the oppressive nature of the school to prison pipeline all closely interact. However, I still require a framework which allows me to unpack the intricacies of the historical, pervasive and persistent racism that brings criminalization in STEM education to bear in disparate ways upon boys of color.

**Critical Race Theory**

Because of its social construction, race is difficult to define. Omi and Winant (1994) state, “Everyone "knows" what race is, though everyone has a different opinion as to how many racial groups there are, what they are called, and who belongs in what specific racial categories” (p 3). Offering an attempt at an academic definition, Omi and Winant state, “…race is a concept which signifies and symbolizes social conflicts and interests by referring to different types of human bodies. Although the concept of race invokes biologically based human characteristics (so-called "phenotypes"), selection of these particular human features for purposes of racial signification is always and necessarily a social and historical process” (p. 55). Keeping this as undergirded to the notion of race, I move forward with the understanding that “…Whiteness racializes different groups of people in different ways at different times in response to changing needs…” (Basile & Lopez, 2015).

Critical Race Theory (CRT) emerged out of critical legal studies in the 1970’s as a scholarly response to the lack of attention given to the roles race and racism play in societal structures (Crenshaw, 2011; Delgado & Stefancic, 2012). CRT scholars incorporate history, sociology, economics, political science and other disciplines to understand and ultimately to deconstruct the ways in which systemic racism works to entrench, adapt and replicate itself (Decuir & Dixson, 2004; Gotanda, 1991; Leonard, et.al., 2009; Leonardo, 2011, 2012; Martin,
2006; Rosebery & Ogonowski, 2010; Stinson, 2008; Tate, 1994; Williams, 2008). Although arguably a relatively new concept, the ideas and visions that compose CRT have been explored and written about for over a century, dating back to W.E.B. DuBois (1903) and Carter Woodson (1933).

CRT directly challenges the notion that we live in a post-racial society. It not only explicitly identifies the social facts of systemic racism - i.e. higher loan rates provided to Peoples of Color (Cavalluzzo, Cavalluzzo, & Wolken, 2002), disparate educational resources, food deserts (Guthman, 2008; Slocum, 2010), etc. - but also argues that these conditions serve a purpose and did not occur by accident (Bell, 1992, 2004; Delgado, 2001). Delgado and Stefancic (2012) identified six CRT tenets:

(a) racism is ordinary and a part of the everyday lives of most People of Color in the United States;

(b) *Interest Convergence* - race and racism serve the material interests of Whiteness and the psychic interests of Peoples of Color;

(c) the concept of race is a social construction, not a biological one;

(d) *Differential Racialization* - Whiteness racializes different groups of people in different ways at different times in response to changing needs;

(e) *Racial Essentialism* - dominant society works to ascribe both groups and individuals of color a “a single, easily stated, unitary identity”;

(f) scholars of color may be able to speak to issues of race and racism in ways White scholars may not.

When operationalized CRT has served as a powerful tool to help us understand and ultimately work to dismantle the practices of structural ideologies of systemic and endemic
racism in education practice and policy (Crenshaw, 2011), such as racial commodification, racial essentialism and differential racialization (Basile & Lopez, 2015).

**CRT in Education Research**

CRT was not formally introduced as an explanatory and analytic tool into educational research until 1995 by Ladson-Billings & Tate. Since then, CRT has established a strong and growing presence in the field (Bonilla-Silva, 1997; DeCuir & Dixson, 2004; Ladson-Billings, 2005, 2012) and multiple scholars have utilized CRT to better understand racial structures in African-American, Latino/a and Asian-American specific education research, as well as education pedagogy and policy research (Jain, et.al., 2011; Kohli & Solórzano, 2012; Leonard & Evans, 2008; Leonardo, 2011, 2013; Martin, Gholson, & Leonard, 2010; Solórzano & Ornelas, 2002; Yosso & Ravine, 2007; Yosso, et.al., 2009; Yosso, 2005). Legal scholars such as Bell (1992, 2004, 2005), Delgado (1990, 2000, 2001, 2011), and Crenshaw (1995; 1991, 2011), among others, have made significant contributions to the development of CRT in ways that have influenced its applications in education (Tate, 1997).

Education researchers have used CRT to expose the ways practices and procedures such as color-blind approaches to teaching, the obsession with achievement gaps (Gutiérrez, 2008; Rodriguez, 2001), and racialized tracking (DeCuir & Dixson, 2004) which have all worked to maintain and expand racism and racialized power hierarchies. Solórzano and Yosso (2001) have identified five characteristics of CRT scholars and researchers in education:

(a) recognizing the centrality of race and racism as it intersects with other forms of oppression;
(b) challenging the dominant ideologies of objectivity, color-blindness, science and mathematics for all rhetoric and other similar claims act as camouflage for continued replication and expansion of the power and privilege of dominant structures and groups; 
(c) committing to continued work towards social justice; 
(d) recognizing and expressing the central value of the experiential knowledge via interdisciplinary methods such as narratives, counter-storytelling, and histories that Students of Color carry with them; 
(e) maintaining a trans-disciplinary perspective in understanding race and racism in education.

CRT in education also functions with the understanding that our society is based on property rights and Whiteness - that is the ability and privilege to own and operate material goods and spaces, products of labor and intellectual property - is in and of itself a form of property, a privilege not historically afforded to Peoples of Color (DeCuir & Dixson, 2004; Ladson-Billings & Tate, 1995). The term Whiteness does not implicate any one individual but rather a system of structures and perspectives that inform a dominant hegemonic project. Although White peoples (and other individuals afforded limited access to Whiteness) often engage Whiteness in ways that benefit and privilege them, some individuals also engage Whiteness in critical, deconstructing ways - a necessary component in beginning to dismantle the dominant hegemonic project (Leonardo, 2002, 2004).

The notion of Whiteness as property is particularly salient in STEM and STEM education because of the high value the United States places on STEM enterprises and knowledge. As such the material goods and spaces, products of labor and intellectual properties of Peoples of Color in STEM fields often fall under the ownership of the owners and operators of Whiteness through
racial commodification (Basile & Lopez, 2015; Leonardo, 2013). Against these practices, CRT scholars in STEM education operate with an expressed purpose to help create counternarratives to the dominant ideologies created and maintained in the main body of academic STEM education research, also known as masternarratives.

**Challenging Masternarratives in STEM Education**

Beginning with the publication of the now-renowned Coleman Report in 1966, the main body of education research, particularly in mathematics and science education, has created a masternarrative of underachievement, limited persistence, and social and economic depravity of boys of color (Martin, 2003, 2006, 2007; Stinson, 2006; Swanson et al., 2003). The arguments are often environmentally-based through an deficit achievement lens, and often with a Whiteness-at-the-center point of view (Bell, 1992, 2004, 2005; D. Martin, 2003, 2007a). According to this masternarrative, boys of color have parents that lack the psychological resources of their White counterparts (Swanson et al., 2003), are more sensitive to economic hardships (Swanson et al., 2003), and are particularly depressed by the hardships of larger society (Noguera, 2003). These deficits have been placed into a historical context (Ladson-Billings, 1997) and as such the achievement gap has become “normal” and an accepted component in education (Gutiérrez, 2008). This “normal” decline in achievement in boys of color in mathematics occurs as early as 4th grade (Davis, 2003) and possibly earlier.

Critical Race Theory (CRT) and its related research challenge this masternarrative. It offers instead a counternarrative based on research that focuses on the experiences and viewpoints of boys of color. Using an oppressed-at-the-center frame (Freire, 2000), and acknowledging that race is important (Ladson-Billings & Tate, 1995), the counternarrative examines the ways boys of color form their identities, what those identities are and the ways in
which the dominant ideology affords and constrains the opportunities for these identities to persist. Schools play a major role in both the academic and street identities of boys of color (Flores-Gonzalez, 2005) and as such the lack of opportunities for boys of color to form positive identities, particularly in mathematics disciplines, is largely the fault of the school’s treatment of them (Ladson-Billings, 1997).

Research based in the larger Critical Race Theory and Methods traditions have begun to reveal a counternarrative of boys of color as agents of resistance, forming identities to match. Using first person accounts, researchers have uncovered identities of participation and non-participation in schools that are often purposeful and based on individual agency (D. Martin, 2003, 2007b; Nasir & Hand, 2008). Boys of color often develop identities of resistance in response to marginalized access to mathematics (D. Martin, 2003, 2006) and to the criminalizing treatment of the education system’s larger youth control complex (Rios, 2011). The formation of identities of resistance can become positive as they lead to the development of a critical consciousness (Leonard & Evans, 2008; Stinson, 2008) which can ultimately strengthen a positive racial identity (D. Martin, 2003, 2006, 2007a). Simultaneously, discourses of deficiency and rejection block the formation of other, and sometimes alternative, positive identities (Stinson, 2006).

Langhout (2005) conducted a salient study on how students in elementary school, and particularly boys of color, are made invisible through stereotypes, and the ways students resist. In her research, Langhout identified multiple practices employed by teachers and administrators used to enforce uniformity in actions and appearance such that the students “behave”. Significant energy, resources and time spent policing the bodies of those students which is particularly important, as Langhout pointed out, when framed by the fact that students are not permitted (by
law) to leave the classroom or school building. In this way, uniform masternarrative stereotypes are forced upon students as racial and gendered collectives, such as abilities to read, access to food, and drive-by shootings. In doing so, the teachers erase the individual experiences of each student, thus rendering them invisible as individuals. Langhout used hallway policing and enforcing as a particularly salient example. She detailed ways students are lined up, silenced, made to walk evenly paced with each other, eyes set front and are punished - sometimes severely - for a lack of compliance. The boys of color were particularly over-policed in these settings.

Students however tended to not fully conform. Langhout found that the more students are levied with this oppressive control, the more they (often subversively) resist:

“Children’s identities, especially the identities of boys of color, are threatened via control and discipline. Here, children are rendered silent through controlling and disciplining their bodies in the hallways, through the classroom behavior management system, and by teachers literally demanding silence. When children’s identities are threatened via control of their values, motivations, goals or assumptions, they will resist. Their resistance can be verbal (e.g. talking about the [assistant] duty aid), non-verbal or symbolic (e.g. littering in the classroom), targeted (e.g. drawing stickers on a behavior sheet) or diffuse (e.g. scratching the classroom floor), individual or collective, authorized (e.g. drawing) or unauthorized (e.g. littering), facilitative (e.g. trying to reach the goal of behaving well), or oppositional (e.g. working against a school assumption that all teachers are right). (p. 152)”

Here Langhout articulated a counternarrative with specific examples the ways in which students engaged in actions that actively challenged and resisted the masternarrative, and the broader implications those acts have on their own identities.
Acts of Resistance

In a broad sociological sense, resistance theorists examine the ways in which humans engage in defiance, the affordances and consequences of those conscious and subconscious decisions, and how defiance affects identity and other outcomes. In education, resistance theorists have focused on youth resistance, with an emphasis on socio-economic class and opposition (Bourdieu, 2000; DeMarrais & LeCompte, 1999; Giroux, 1981, 1983). This literature has largely made the call to view acts of resistance from students as moral and political acts of an oppressed working class (Abowitz, 2000).

With a significant focus on socio-economic class, resistance theory has largely ignored issues of race (Akom, 2003), and in some cases has even openly dismissed race as a significant issue in resistance in the classroom. Critical scholars suggest the opposition Students of Color perpetrate have been largely ignored and under-theorized. Utilizing work within and outside of education including sociology, linguistics and critical race theory, critical scholars analyze findings from their own studies to challenge the more traditional masternarratives of resistance: “In other words, the majority of resistance studies provide information about how youth participate in oppositional behavior that reinforces social inequality instead of offering examples of how oppositional behavior may be an impetus toward social justice” (Solórzano & Bernal, 2001). Some general themes that emerge from the scholars who have done this work include the notion that acts of resistance from boys of color are, as a collective, acts of rebellion against an oppressive regime of punishment and marginalization.

Acts of Resistance in Education Research

Particularly in mathematics education, the introduction of socio-cultural theories have created spaces to consider the entire social and cultural contexts within which students engage
mathematics and science, including issues of race, ethnicity, gender, and socio-economics (Gutiérrez, 2010). Forays into this context include CRT and other critical examinations of STEM education along with sociocultural and situative perspectives. While racialized histories of oppression and marginalization may seem to be an obviously large component of the sociocultural and situative contexts of students of color when examining resistance, it has been largely ignored save those scholars specializing in racial foci (Akom, Scott, & Shah, 2013; Akom, 2003). The sociocultural and situative theorists who have examined resistance with regard to race have largely ignored the counternarratives and perspectives of the students of color themselves.

For example, Hand (Hand, 2009) examined opposition in low-tracked middle school mathematics classrooms using qualitative measures interpreted with a situative perspective. Hand considered the ways in which teachers and students co-constructed opposition, and the ways in which teachers resisted their students. She found that “classroom opposition is fostered by weak opportunities for meaningful mathematical engagement and the transformation of a polarized participation structure into an oppositional one” (p. 97).

An assumption made in this research, however, is that college admission is the goal for students’ mathematics education. As such, Hand interpreted students’ oppositions as meaningful, purposeful, and culture-rich, but also ultimately detrimental to their futures. This assumption and consequent negative view of opposition represents a masternarrative in the academic body of work on resistance and opposition in understanding some of the causes, motives and outcomes of the acts of resistance of boys of color. Recognizing this limitation in interpreting her data, Hand left unaddressed why boys of color are openly and consistently resisting mathematics they have the ability to do and as such calls for more research:
The boys [of color] in the openly oppositional group did not appear to be significantly different from their peers in terms of their capacity to understand mathematics. They were often left to their own devices to socialize and wander the class, while the teacher directed his attention to the others. In reviewing their exams and working with them on a consistent basis through-out the year, I observed that like other students in the class, they rarely turned in their work and received poor grades because of this. However, they were often able to grasp mathematical concepts quickly, compared to some of their peers. Thus, in this classroom, it did not appear to be the case that lack of mathematical ability predicted oppositional behavior. This finding would be interesting to pursue in future research.” (p. 116)

Here Hand indicated that the boys of color were able to do the math and potentially be academically successful but perplexingly still engaged in consistent acts of resistance. Understanding and theorizing the ways in which acts of resistance intersect with criminalization in schools may provide the counternarratives for socioculturalists to understand what it is that does predict opposition in boys of color and why they engage in acts of resistance despite academic ability.

McFarland (2001) disagreed that race plays a role in student resistance. McFarland positioned resistance as negative and undermining to teacher authority and acting against the teacher's will. Using regression analysis, he examined science, mathematics and English high school classrooms quantifying many descriptors for students notably including the categories “magnet minority”, “broken home/nonnuclear family”, “parent occupational status”, “social hierarchical standing” and “physical attractiveness” among others. McFarland calculated that
race and class backgrounds do not matter in student resistance, whereas gender and physical attractiveness do.

In positioning his work, McFarland dismissed resistance and critical theorists for only having examined resistance on an individual level and as such have missed “the effects that social contexts and specific situations have on decisions to disrupt the class” (p. 617). In this research, McFarland assumed that resistance is a fully negative and undesirable occurrence – that it works against the student’s best interests and that it only undermines teacher authority and the teacher’s will. These assumptions erase the differential lived experiences of students of color by assuming that (White) teacher authority and the teacher’s will function in the best interests of all students. Additionally, by creating a numerical scale of physical attractiveness based on consultation with specific students in the study, McFarland effectively created a racialized hierarchy of physical attributes. CRT interpretations of his work may question not only the morality of his methods, but also his motives for erasing race from his research frameworks.

Rios (2006, 2011) has also looked closely at resistance in boys of color and has detailed how the boys often acted in open defiance and at times subversively to the control exerted over their bodies, sometimes resulting in increased monitoring and control. According to Rios, the boys do this to express control over their own bodies and minds, choosing when and where to engage in resistive acts in an oppressive system which works to constantly monitor and exert control over the boys’ bodies.

Akom, Scott and Shah (2013) recently (re)theorized resistance in STEM education. They used an approach “…based in critical education, ethnic studies, science, technology, engineering, math, environmental studies, sociology, history, law, and public policy- to better understand the social and material conditions impacting Black working-class youth in STEM fields and how to
transform these conditions (p.164).” With this approach, they critiqued the dominant body of academic work on resistance theory and particularly in STEM education as largely remaining silent on issues of race. They argued resistance theory in STEM education has failed to address the deficit frameworks used explain Black STEM educational underachievement nor the deficit paradigms which have served the interests of Whiteness, making the power, privilege, and self-interest of dominant groups invisible.

Akom, Scott and Shah called for the creation of counternarratives to hegemonic resistance theory, and claimed that in order to challenge oppressive structures and systemic racism, youth of color engaging in structural resistance is necessary and healthy. While they did link race and the accompanying socio-economic issues to power-privilege structures, dominant ideologies, and oppressive practices in STEM education, they did not specifically consider the role of criminalization and the school-to-prison pipeline which significantly impacts youth of color.

While the research above has focused entirely on high school aged boys of color and their critical understandings and strategic uses of acts of resistance, elementary school students have gone largely under-researched in this area. According to Duncombe (2002), youth may engage in acts that serve the purposes of resistance without having resistance in mind when engaging in those acts. Youth, particularly those with emerging critical understandings such as those in intermediate grades, may engage in acts of resistance without fully understanding it as serving that purpose.

Langhout (2005) has set a precedent of researching acts of resistance of elementary school students of color by examine the ways in which students of color resist control. She identified multiple categories of resistance and theorized acts of resistance from boys of color in
ways congruent with broader social analyses. In doing so she has provided both the space and some of the elements of identifying the criminalization of boys of color in elementary schools. Langhout says of elementary school students of color: “Examining resistance in children allows us to see how the resistance is manifested for those who are developing and may not yet have the cognitive complexity and language skills to fully name their oppression, yet know that something is amiss (p. 152).”

Other critical STEM scholars have identified and referenced acts of resistance of boys of color in their research, but have not made it a focal point in their data collection or interpretations. Martin (2006, 2007a, 2009, 2013) has consistently used iterative approaches to coding which references acts of resistance in ways that suggest it may have been a common but less frequent emergent pattern in his coding results, although this fact remains unclear. Similar references appear in the works of Stinson (2006, 2008) and Leonard (2010; 2002). Researchers Gutstein (2006a, 2006b) and Martin (2009) when theorizing the liberatory nature of mathematics education for students of color have aligned acts of resistance to iterations of a statement made by Malcolm X to read and write oneself to freedom.

**Categories of Resistance**

Solórzano & Bernal (2001) have used qualitative inquiry and *counterstorytelling* as methods by which they examine Chicana/Chicano student resistance. Using two historical accounts accompanied by a dialogue of two representative characters in an interpretive vignette, Solórzano and Bernal identify five types of oppositional behavior - three of which they define as acts of resistance, and two which are not. This analytic approach helps to distinguish acts of resistance - which may more closely interact with criminalizing practices - from other forms of oppositional behavior.
The five categories of opposition are neither discrete nor static, and may vary particularly between girls and boys. Solórzano and Bernal (2001) identify (a) reactionary behavior, (b) self-defeating resistance, (c) conformist resistance, and (d) transformational resistance as four categories of oppositional behavior exhibited by students of color in their research. They attribute the distinctions as adaptations of Giroux’s (Giroux, 1981, 1983) work on resistance theory. Solórzano and Bernal also identify (e) resilient resistance that they attribute to unpublished work by Yosso.

Solórzano and Bernal define the first two categories above as oppositional behaviors, but not acts of resistance. They describe reactionary behavior as non-resistive behavior which is disruptive to the school environment without any connection to social conditions or awareness of oppressive practices, and may result from things like student boredom. They describe self-defeating resistance as the traditional notion of resistance. This is behavior which indicates an awareness of social conditions on the part of the student but bears no orientation in social justice, creating social change or creating tensions with possibilities of positive outcomes. An example of this is a boy of color quietly dropping out of high school because of racially differential treatment he continually receives from the school system. While these first two categories represent oppositional behavior but not acts of resistance, the next three categories are all forms of acts of resistance.

Conformist resistance is motivated by or works toward social justice, but without much awareness of or challenge to the systems of oppression. These acts of resistance operate within the system. Social change is a possible but unlikely result from these acts. Students engaging in these acts often blame themselves for oppression. An example of this is a student persistently and repeatedly asking for more food during school-provided breakfast despite being continually
denied and dismissed. The student cites the fact that he is very hungry and cannot concentrate during school, but still blames himself and his family for not having food. The fourth category Solórzano and Bernal identify is *transformational resistance*. This is an act of resistance which demonstrates some level of awareness of systemic oppressions and a desire for social justice. An example of this could be a student who assists another student with his math homework to help him improve his grades and math abilities, even though the school-day teachers frown on and sometimes discipline the behavior. The student is aware of the social justice nature of his actions and that the rules of working alone disproportionately negatively affect many boys of color like himself.

The fifth category is *resilient resistance*. Here acts of resistance are responses beyond full compliance by the student to direct microaggressive and oppressive treatments, with the intention of surviving and/or succeeding through the microaggression. The student chooses a resilient resistance act with some level of awareness of the oppression being levied. An example of this is a student who is suddenly asked to leave the room by a teacher for no discernable serious infraction does so quickly without objection only to quietly return without permission a few minutes later when the classroom activity changes. These five categories of opposition and resistance provide and inform not only initial coding schemes for my own analytic approaches to my data, but also a means by which to discern acts of resistance from other forms of opposition which may be observed.

Adding to the five categories Solórzano and Bernal put forth, Rios (2011) – and along with co-author Cesar Rodriguez (2012) add a type of resistance he called *dignity work*:

Dignity work involved acts of resistance that often placed the boys at risk of punishment. The delinquent boys calculated that it was worth taking the risk of losing their freedom in
order to gain some dignity from the system. The non-delinquent boys worked at fighting for their freedom by evading situations in which they might encounter school discipline, police contact, or targeting for criminalization. These boys found creative ways to avoid criminalization…I found that despite having the skills to navigate between two worlds, the non-delinquent boys often found themselves in a Catch-22: even when they followed the rules, authority figures still criminalized the boys because they lived among the delinquent boys…Even if the boys attempted to adapt to school or police norms and codes, they were still treated with the suspicion that they might commit crime like their peers. (Ch. 7, paragraph 7)

Here Rios describes the contradictory nature of criminalization in schools: regardless of whether or not boys of color conform, they are still treated and thought of as criminals. Thus, dignity work becomes a functional and understandable modality of resistance.

Table 1

Categories of Acts of Resistance Described by Critical Scholars

<table>
<thead>
<tr>
<th>Category</th>
<th>Example</th>
<th>Scholar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Verbal</td>
<td>Talking negatively at or about a teacher</td>
<td>Langhout (2005)</td>
</tr>
<tr>
<td>Non-verbal</td>
<td>Wandering the room</td>
<td>Langhout (2005)</td>
</tr>
<tr>
<td>Symbolic</td>
<td>Not turning in homework even though it is completed</td>
<td>Langhout (2005)</td>
</tr>
<tr>
<td>Targeted</td>
<td>Tagging a refocus form</td>
<td>Langhout (2005)</td>
</tr>
<tr>
<td>Diffuse</td>
<td>Scratching on the classroom floor</td>
<td>Langhout (2005)</td>
</tr>
<tr>
<td>Oppositional</td>
<td>Working against the assumption that all teachers are right</td>
<td>Langhout (2005)</td>
</tr>
<tr>
<td>Dignity work</td>
<td>Defying demeaning teacher demands such as &quot;put</td>
<td>Rios (2012)</td>
</tr>
</tbody>
</table>
your head down on your desk while the rest of us learn" in order to gain some dignity from the system

<table>
<thead>
<tr>
<th>Overt</th>
<th>Acts which are external and visible to others</th>
<th>Solórzano &amp; Villalpando (1998)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Covert</td>
<td>Acts which are either internal (deciding to act the way requested but with oppositional compliance) or subversive in nature (deciding not attend a history class with racist undertones under the guise of being sick)</td>
<td>Solórzano &amp; Villalpando (1998)</td>
</tr>
<tr>
<td>Conformist</td>
<td>Asking for more food during school-provided breakfast despite being continually denied</td>
<td>Solórzano &amp; Bernal (2001)</td>
</tr>
<tr>
<td>Transformational</td>
<td>Against the teacher’s rules and assisting another student with math work</td>
<td>Solórzano &amp; Bernal (2001)</td>
</tr>
<tr>
<td>Academic</td>
<td>Quietly returning to class without permission after being kicked out</td>
<td>Yosso (2005)</td>
</tr>
</tbody>
</table>

As a critical research collective, we know acts of resistance can be categorized and organized in several ways but in practice exist as a continuum rather than categorical. We know acts of resistance are oppositional in nature, but not all oppositional actions are acts of resistance. Acts of resistance can be overt and covert, verbal and non-verbal, and direct and indirect responses to oppression. Acts of resistance can occur as an immediate or delayed response to direct instances of targeted oppression and also as an unpredicted response to longitudinal and
continued oppressive practices. They can take multiple forms of social justice orientation and can be on behalf of the student or of his peers.

According to Solórzano and Villalpando (1998) traditional empirical research has found it difficult to discern, identify, describe and understand covert acts of resistance. They claim CRT (in particular counternarratives and storytelling) can help to reveal and understand acts of resistance which may in turn help to reveal the positive counternarratives of both covert and overt acts of resistance. Acts of resistance should be viewed as a positive means by which boys of color resist panoptic control of their bodies and minds (Bernal, 2001). To that end Solórzano and Villalpando expressly call for research "that identifies and analyzes how individuals and groups use different and often unrecognized forms of resistance in response to domination (p. 215)."

**STEM Research in After School Programs**

There is a body of research in STEM-oriented after-school programs servicing students of color. This research has focused on components such as student engagement, community-based content, and increasing interest in STEM careers, among others. I review some of the more recent of this research below.

El Pueblo Mágico is an elementary age after-school program focused on technological design, scientific knowledge, health sciences and energy. K-8 students from predominantly non-dominant communities work closely with college students to develop problem-solving skills, investigate scientific and health-related topics, and gain expertise as designers in cyber environments. Multiple STEM and learning science design-based research studies have come from this program. Recently, Schwartz, DiGiacomo & Gutiérrez (Schwartz, DiGiacomo, & Gutiérrez, 2014) examined how “making and tinkering” are developing as an approach to re-
mediate normative STEM learning. They found that as the practice of making and tinkering continues to develop, functional strategies in one context can remove agency from students in another.

**After-school science-specific programs.** Calabrese Barton has been at the forefront of this work with research centering around multiple after-school science programs aimed at underrepresented youth. In the one of her more recent co-authored pieces Birmingham & Calabrese Barton (2014) conducted a critical ethnography of an after-school STEM program located at a local Boys and Girls club servicing middle school students. The students in this program put together a “green carnival” in which they provided learning opportunities for members of their community to learn about environmental issues that affect them. With a focus group of six African American girls, they found that by creating science expertise in a place-based context the students created “…a space to open dialogue and alter the relationship between science and their community” (p. 286).

Aguilar & Krasny (2011) examined an after-school environmental science club which gathered together 10 to 35 Latino students once per week at each of several local middle schools. The club spent most of their time conduction local science such as testing streams for water quality and discussing their results. Aguilar & Krasny found that the clubs could be viewed as communities of practice “…characterized by the development of joint enterprise, mutual engagement, and shared repertoire…” (p. 217). They found this framework was useful in understanding how participation in the club resulted in changes in identity formation for the students.

In a park-based after-school science program servicing middle school youth living in urban poverty, Frazier, et.al. (2012) examined how outdoor, problem-solving science and service
supported minority students with “disruptive behavior problems”. They found that with leaders that looked more like them, positive reinforcement and group discussion, the program promoted mental health in the students.

**After-school mathematics-specific programs.** Francisco & Maher (2011) conducted a mathematics-based after-school research study servicing middle school-aged low income Latino and African American students. In this study, students worked on “challenging, well-defined mathematical tasks” (p. 52) while teachers worked to understand how the students were engaging in mathematical reasoning. The teachers discovered that their students were able to develop valid problem-solving strategies and functionally communicate what they found in mathematically justifiable ways.

Vomvoridi-Ivanovic (2012) examined how Mexican-American preservice teachers used culture as an instructional resource in an after-school mathematics program for students of Mexican heritage. The program serviced 4th and 5th graders wherein teachers met with students twice a week to work on mathematics topics. The study revealed that the use of culture in learning varied greatly by topic, with abstract topics having very few, and superficial connections to cultural whereas topics connected to community such as “recipe projects” had deep cultural connections.

**Summary and Research Questions**

Our society regards STEM as the highest and most valuable forms of knowledge. High-level STEM courses are gateways to further education. Some argue that STEM learning is thus a civil right. Best practices in STEM classrooms and teaching include hands-on, project and problem based activities, and meaningful student to student discourse. Through multiple and varying criminalizing practices, boys of color are consistently denied access to this learning, and
thus access to our society’s most valuable knowledge as well as access to the gateways to further and higher education. Boys of color activity resist this criminalization, possibly in healthy ways. Some research has been done in understanding this resistance, but very little of that research has been conducted in STEM education or in elementary settings. In research surrounding after-school STEM programs, much attention has been given to maintaining student interest in STEM, creating agency, and improving test scores, but little has been done in understanding the roles criminalization or resistance may play in these settings. This dissertation aims to begin to fill this void. Using a Critical Race Theory lens, I investigate criminalization and ways boys of color resist it in an elementary after-school STEM setting. Additionally, I consider ways in which adults in these settings may work to disrupt this criminalization.

To this end, I ask:

1. In what ways are criminalizing practices evident in a STEM after-school program targeted at elementary students of color?

2. In what ways do boys of color in the program resist this criminalization?

3. How are criminalizing practices and acts of resistance related in this program?
Chapter III

Methods

To respond to my research questions, I have constructed a critical ethnography of a STEM after-school program. The foundation of my critical ethnography is guided by ethnographic methods described by Emerson, Fretz and Shaw (2011), Goodall (2000), Merriam (1998), and (Miles, Huberman, & Saldana, 2014) further shaped by specific components of the critical race methodologies described by Solórzano and Yosso (2001, 2002) and other decolonizing methodologies (Bull, 2004; Chinn, 2007; Lincoln & González y González, 2008; Smith, 1999).

Goodall’s ethnographic methods focus on the high quality capture of interpersonal relationships by closely examining individual voices, personal experiences, engagements with others and self-reflection through the use of narrative-based, post-interaction fieldnotes and journaling. Employing this approach I interacted with students and staff during my visits not only as a researcher but also as a member of the community. In doing so, I attempted to “hear in” to the interactions and relationships of the other members of community. Only at the end of each visit, I recorded all that I saw and heard that day through my lens of a community member interacting with others.

I use Critical Race Methodologies to further inform and guide my treatment of stories and storytelling. Soloranzo & Yosso (2002) define Critical Race Methodology as:

…a theoretically grounded approach to research that (a) foregrounds race and racism in all aspects of the research process. However, it also challenges the separate discourses on race, gender, and class by showing how these three elements intersect to affect the experiences of students of color; (b) challenges the traditional research paradigms, texts,
and theories used to explain the experiences of students of color; (c) offers a liberatory or transformative solution to racial, gender, and class subordination; and (d) focuses on the racialized, gendered, and classed experiences of students of color. Furthermore, it views these experiences as sources of strength and (e) uses the interdisciplinary knowledge base of ethnic studies, women’s studies, sociology, history, humanities, and the law to better understand the experiences of students of color (p. 24).

Critical race methodology justifies and guides me in foregrounding race, both in my use of research and perspectives from multiple fields outside of education, as well as in taking a transformative and solution-oriented approach to my ethnographic methods (as opposed to a more traditional objective participant observer). Critical race methodology also validates my position as a man of color, complete with a lifetime of racialized experiences and stories that I bring to bear in unique and meaningful ways in this research context.

In this chapter I begin by detailing my research settings including a description of the after-school program, the staff, and the students. I then provide the details of my sources of data and the methods I used to collect them. Next, I explain my analytic approaches and tools by data source. I finish by addressing issues of validity and reliability.

**Research Setting**

**After-school Program Description**

I conducted my research at an elementary after-school and summer STEM enrichment program that takes place at three elementary schools in a Colorado school district. The program operates as a part of the school district with all members of the staff being district employees. While the program takes place at specific Title I schools, it is a separate entity from the individual schools and as such has the ability to maintain continuity even when administration...
and teachers turn over at said schools. The program services Title I students from grades three through five and has been operating for over a decade.¹

Students are invited to join the program based on teacher, administrator and program staff recommendations. These recommendations are done in the form of a survey and are followed up with brief, informal interviews. There are no fees to participate in the program and bussing is provided to take students home after the program is concluded, again at no cost to the students or their guardians. Students are asked to leave if they consistently skip the program and do not show any willingness to improve attendance. This is not done in a punitive way, but rather from the perspective that if the program is not helping the student, both the program and the student will benefit more from moving on. At the same time, students who do not attend the regular school day cannot participate in the after-school program on that day. Because of the loose structure and tolerance to irregular attendance, numbers of students fluctuate from day to day with some students coming two to three times per week and some students taking blocks of time away from the program. All three sites had core groups of students who had been with the program for one or more years, and attending the program year-round regularly.

The program runs Monday to Thursday beginning immediately after the regular school day ends, including early release days, until 5:15pm beginning approximately three weeks after the start of the school year and concluding one to two weeks before the end of the school year. The end of school is typically around 3:15, although on Tuesdays or Wednesdays the schools normally release at 1:15pm for teacher professional development. Students gather in the cafeteria

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¹ In an ethical effort to uphold anonymity, I will not be reporting specific percentages and numbers. While this may make it more difficult for the reader to place this research in its exact context via traditional reporting, I believe I have provided enough non-quantitative data below to provide sufficient context for the research. This approach is similar to research conducted by Boaler (2008), who studied equitable teaching practices in mathematics education at three different California high schools. Ultimately, the protection of the identities of the participants in my research is of the utmost importance.
and are provided with a snack supplied by the school’s nutrition services. Following snack time, students break into two and sometimes three groups. These groups then proceed into rotations.

One of the two rotations is mathematics homework help/supplemental instruction/group support. Here students gather in table groups to work together on mathematics homework assignments (which they all have every day). Staff members move around and conduct mini lessons, explanations and extensions. According to the program director and staff, using homework as the catalyst, mathematics is made much more accessible in this environment and students who are labelled as poor math students often begin to demonstrate willingness, ability and sometimes eagerness to engage math. It is important to note that regular school day teachers often require homework to be done alone and at times high object to the methods used in the program.

The second rotation is science and engineering experiential learning. Here students engage in what the director identifies as “super-charged” engineering units, which include familiar activities such as egg drops, rocketry, and simple machines. Some of the STEM units have much more innovation and some social justice components to them. These may include topics such as water quality testing, school breakfast/lunch dietary analysis, and game design. In all of these units, students learn content and also apply them into engineering tasks. For example, students built simple machines out of supplies such as cardboard boxes, scrap wood, paper cups, art stuffs, toilet paper rolls, etc. to put on a game carnival for community families.

Students are admitted based on need, which can come in the form of financial situations, the need for after-school care, the need for academic assistance and motivation, and the need for social support. Often students exhibit several or all of these. The program excludes students who are not Title I qualified, although unofficial qualification is accepted. The program does not
accept students with high levels of emotional or special education need, as the staff is not qualified to meet those students’ needs.

The program is focused heavily on STEM learning, and physical spaces and staff training are oriented as such. Math rooms were typical set in library spaces which have tables to accommodate four or more students working in groups. Science and engineering typically took place in regular school day classrooms or similar spaces, but specific spaces were set aside to house supplies, desks were put into groups or tables were brought in and a spare vacuum was typically available to clean up the inevitable messes characteristic and endemic to the kinds of problem and discourse-based science and engineering learning environments supported by the program. Staff received regular – although often limited - training in the math and science concepts students were working on. These concepts, while not specifically driven to precisely mirror regular school day content, typically were aligned to learning standards.

Participants

Students. Students in the program are almost entirely of Latino/a ethnicity and boys typically outnumber girls in the program. The actual percentages vary because of mobility in the program, but on any given day I have never observed more than two White students in attendance at any site and boys composing somewhere between just more than half to sometimes over three fourths of the overall student group in attendance. The majority are fourth and fifth graders. More than half of the students are labeled as English Language Learners (ELLs).

Each site may service up to 100 students in a given school year, but at any given time may have as few as 35 students on the current roster and a daily attendance of 20 - 25 students. In the past year, I did not witness any site on any given day with more than 45 students in
attendance. Because of this flux in numbers, tracking exact numbers of students who had dropped out of the program (and thus the study) was difficult.

Despite the policy of not accepting students with severe emotional or learning needs, there exists an unwritten notion that students of color are disproportionately (and often unnecessarily) labelled as SPED and ED and as such individual cases are considered in lieu of that knowledge. Of important note here is that the program is not following a selection model such as ones employed by KIPP schools, selecting the “best and brightest” or highly-motivated students. Rather, the program looks for any students that demonstrate need and the potential to benefit in any way educationally or socially from the program.

Staff. There are approximately 22 to 27 staff members who work in the program. This includes the program director, a site director at each of the four locations, three to four site aides at each site, two to six teaching fellows, and one or two certified teachers at each site. The program director is an experienced administrator who was a co-founder of the program. The site directors and site aides are all classified staff who have been informally and “organically” trained in alternative methods of education but more so according to the director were hired based on the director’s notions that the individuals had non-deficit views of students of color. Certified teachers are employed to teach the engineering units, but in the last few years the program director has had difficulty finding and keeping high quality teachers appropriate for the program. To assist in this, I developed a pre-service teaching fellowship for the program which recruits underrepresented pre-service teachers from various teaching programs in the region. To date, this fellowship has serviced nine pre-service teachers.

Fellows. Between two and six pre-service teachers are selected each semester to join the teaching staff in the program. The fellows attend the program every day, participate in all
meetings and are otherwise socially treated as staff. They work in teams of two and undergo a series of training sessions to both learn the structures and functions of the program and also are explicitly trained in the emerging decriminalizing practices from this study (see Chapter 4). Typically, groups of two rotated between all three sites, designing and implementing engineering-based learning units which typically lasted about 2 weeks. The fellowship has been in place for four semesters at the time of this writing.

**Researcher.** As a researcher, a participant observer, and active member of the program, I bring a set of lived experiences to this study and as such my analyses are fully informed by my positionality. As a multiracial Latino and African American man who himself passed through the American education system, I bring these experiences in particular to bear upon my analyses of my data. As discussed in the Theory section, according to CRT my lived experiences as a researcher of color are valid, unique and valuable. Along with the ways in which my experiences give me a rare and unique perspective in my analyses, my positionality has also granted me opportunities to form relationships and bonds with many of the boys of color attending the program which may not be available to White researchers.

**Figure 1**

**Structure of Research Sites**
To respond to my research questions, I draw upon four sources of data: fieldnotes, stories, disciplinary data and attendance data.

Fieldnotes

In my preliminary observations which informed this research, I took periodic open fieldnotes once or twice per week across a period of one year. I began this process knowing only that the after-school program had been a memorable and impactful experience for some of the boys of color in the program. This notion came from the stories and artifacts the program director presented to me before the start of the preliminary study describing the boys who had returned to see her upon graduating high school. As such, when my preliminary study began, I attended specifically to the boys of color (nearly all the boys in the program are Latino or African American). These open fieldnotes led me to focus specifically on the interactions of boys of color with adults, and began to unveil the presence of criminalizing practices, acts of resistance and the ways in which the two interact.
My fieldnotes attended to the individual voices, personal experiences, and engagements with the boys of color in the after-school program experience. I particularly attended to interactions, communications and experiences in which the boys engaged that bore greater potential to incite resistance or unveil criminalizing practices and procedures. Examples of this include moments when staff addressed a behavior issue with a boy, moments when a boy or boys became loud, move about the room, or interact with other students or other students’ work, and moments when staff were speaking to each about a student, among others.

As a standard practice, I recorded fieldnotes at the completion of each of my visits to a research site. I wrote my fieldnotes in a narrative fashion with my own thoughts and insights on what I am recording prefaced either with a capital C or with the entire comment written in italics. All fieldnotes were recorded electronically using Microsoft OneNote. OneNote allowed me to record fieldnotes using a laptop, an iPad, or my mobile phone. With OneNote available on my mobile phone I was also able quickly take a photo of particular scenes to assist in my memory of details of settings. These photos were intended only for my own use and have been deleted at the time of the completion of this document to help protect the participants in this study. During the focus period of approximately 13 weeks, I took a total of 28 days’ worth of focused fieldnotes. These were complimented by approximately a year and half’s worth of observations recorded approximately once a week in the form of researcher memos (see Appendix A for fieldnote sample).

**Stories**

As a cultural practice, the staff, parents and students themselves routinely engaged in the distinct act of storytelling. Stories are marked by specific shifts in tone of voice, movements of the body such as leaning in or moving to stand in front of the listeners, and often have preambles
delivered with excitement introducing the historical account such as “Oh my I have to tell…” or “Sooooo today Enrique was amazing!” or “You’re not gonna believe this!” Stories are frequently of a boy of color’s recent experiences, often regarding upsetting, or sometimes unexpected and positive regular school-day event.

The stories are often intact accounts of the lived (de)criminalized experiences of boys of color and the acts of resistance in which they subsequently engage. As such, I employed them to inform my own thoughts and perceptions on (de)criminalization and acts of resistance before analyzing other forms of data, and also using the stories as vignettes helping to illustrating the story of (de)criminalization and acts of resistance to be told in the final products of this research. As such, the stories I captured informed and illustrated my responses to both of my research questions.

The stories of the experiences of boys of color in the program were frequently told by staff members, teachers, and the students themselves. Due to the colonizing nature of the histories of traditional ethnographic methods, recording these stories in my fieldnotes were not morally acceptable to me as a researcher of color. Instead, I turned to Decolonizing Methodologies proposed and used by critical native scholars and those researching first peoples (see Bull, 2004; Chinn, 2007; Lincoln & González, 2008; Smith, 1999) to promote the use of value systems which reflect those who are being studied. African American, Latino and Native peoples all have rich histories of oral narratives which in many differing ways hold high cultural status (Solórzano & Yosso, 2002). As such, the use of intact stories and storytelling are appropriate for my research but do require consideration and care separate from fieldnotes. In consultation with the program director and at her request, each site director and occasionally the fellows began writing out the stories they wished to share with each other – and contribute to
this research study - in a collective Google document online. This practice was not driven by my data collection needs but rather as a way to allow the site directors to benefit from recording the stories. At times those recording their stories found difficulty in typing the stories due to limitations and embarrassment at their literacy skills. On those occasions I met with them and acted as a scribe, typing up their exact words for them and in front of them. During the study, nine different individuals contributed stories to the online collection.

**Disciplinary Records**

I was granted limited access to district-level online data for the expressed purpose to collect disciplinary and attendance data. I was allotted three days to have this access and I was required to be on location, under the supervision of a particular staff member. For each student, I recorded disciplinary data including infraction type, punishment levied and the descriptive notes entered by school staff. I then sorted these data into categories based on the identifications in the online data: marked boys of color (see Chapter 4), other boys of color, girls of color, white boys, and white girls. In the students of color categories, I included the school district identifiers: *Hispanic/Latino, African American, Native American, and Asian*. I chose to include the *Asian* racial identification because, according to staff, the very few Asian students in the program all come from low-income southeast Asian families which the regular school day teachers and staff generally regard as being “Brown”. Upon completing the collection of this data, I ran one analysis with students names intact, recorded the results and then immediately redacted all student names.

**Attendance Data**

For each student in the program, I recorded attendance data including both absent and tardy labels as well as excused and unexcused labels. I also recorded all demographic data for
each student. Once organized into an Excel spreadsheet form such that demographic data, the date and day of the week were searchable, I again redacted all student names.

Table 2

Summary of Data Sources

<table>
<thead>
<tr>
<th>Source of Data</th>
<th>Perspective Represented</th>
<th>Aligned To</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fieldnotes</td>
<td>Researcher(s)</td>
<td>1, 2 &amp; 3</td>
</tr>
<tr>
<td>Stories/Storytelling</td>
<td>Staff and students</td>
<td>1, 2, &amp; 3</td>
</tr>
<tr>
<td>School-level Disciplinary Records</td>
<td>School-day Teachers and Administrators</td>
<td>1 &amp; 3</td>
</tr>
<tr>
<td>Attendance Data</td>
<td>Students</td>
<td>1 &amp; 3</td>
</tr>
</tbody>
</table>

Analytic Approach

Unit of Analysis

For my fieldnotes and the stories I collected, I identified my unit of analysis as an *episode of interaction*, which I define as a bounded set of verbal and non-verbal interactions between one or more boys of color and one or more adults. This level of analysis allowed me to specifically attend to the interactions occurring between adults and students. In my observations, boys of color do not engage in continuous interactions with adults. That is, generally these two groups of people may occupy the same room but generally only communicate with each other in sporadic interactions which I discerned as having distinct beginnings and ends. This unit of analysis is on the individual level, existing within a classroom and within a school. The first step in my
analysis process was to identify all episodes of interaction present in my fieldnotes and the stories from the focused portion of the study. In total, I identified 111 episodes of interaction.

**Coding Criminalization and Acts of Resistance**

I relied on *heuristic inquiry* and *long-term observation* to validate my identification of criminalization and acts of resistance (Merriam, 1998). That is, I did not attempt to significantly remove the ways my own lived experiences informed my perspective in attending to these phenomena. Rather, I leveraged my own past experiences as a boy of color in elementary school settings to enhance my methodological trainings through the school of education and ethnic studies departments. Applying these experiences and training on my preliminary observations across the year and a half I spent at my research sites has worked to reduce the level of exogenous meanings ascribed to the phenomena, which are inherent in any social research (Emerson et al., 2011).

I began the coding process with sets of codes derived from my theoretical framework (see Chapter 2). These deductive codes served as a start list only with the intention that they would be examined closely for fit and utility, and revised as necessary (Miles et al., 2014). I used a modification of a constant-compare method (Dye, Schatz, Rosenberg, & Coleman, 2000) to examine the episodes of interaction. The constant-compare method of analysis involves a continuous and consistent comparison of the coding applied to any given single instance of that code against the collective instances of that code in the data as a whole. In doing so, I adjusted, renamed, broken apart, combined or dissolved codes altogether. This method provided a vital benefit of ensuring that important single incidents were given attention and allowed to influence the emerging story(ies) the analysis told tell, even when coded late in the process.
I selected the mixed methods computer analysis program MAXQDA to conduct all of my coding. I began by entering main category codes, *criminalization* and *acts of resistance*, and their respective sub-codes. The sub-codes were those I derived from the literature – categories identified by other researchers, which I previously presented in Chapter 2. I then conducted a trial run using the codes on various episodes of interaction from fieldnotes from my preliminary study. I first applied only the two main category codes. I then went back through the episodes of interaction a second time, applying the sub-codes. I repeated this process a third time until I felt confident with using the coding schemes.

I began the actual coding process for the main study after completing my first week of fieldnotes. I wrote up my fieldnotes in OneNote, exported them into Microsoft Word documents and imported those .docx files into MAXQDA. I exported each story from the online Google document also into a .docx file, subsequently uploading it into MAXQDA. In the second week, I began the constant-compare process of adjusting the codes as described above.

At the end of each week of the main study, I gathered all my fieldnotes from that week and also went online and collected any new stories which had been written. I then read through all fieldnotes and stories and identified all episodes of interaction. Reading through each episode of interaction several times, I applied codes in their current iteration. After doing so, I compared each instance of each code to those of the previous week(s), searching for discrepancies, disconfirming evidence and overlaps. Then, based on what I found during this comparison, I combined, deleted, or adjusted the names and definitions of each code as necessary to reach a point where no exceptions to any definition or name of a code existed.

In the 13 weeks I deleted two of the original criminalization codes (which were initially derived from the literature): *deficit identifiers and denial of access to learning*. I also deleted
three acts of resistance codes: transformational, targeted, and diffuse. I deleted these codes because ultimately they (a) consistently overlapped with other codes in redundant ways; (b) required too high a level of inference for me to effectively make claims based on those codes with confidence; or (c) proved to be too broad and as such could be applied to all instances of the parent code. I list the final coding schemes for criminalization and acts of resistance in Figures 2 and 3.

Figure 2

Final Coding Schemes for Criminalization and Acts of Resistance
Inductive open coding. Around week three of focused fieldnotes, I began a process of inductive coding where I looked for events, responses or patterns of interest which were not captured by the theoretical notions of criminalization and acts of resistance. Multiple codes emerged such as nutrition/food, humanity of boys of color, and program as family. Ultimately, I determined these codes were outside of the scope of this study, but I continued to code them and label as “inactive codes”. I did this anticipating the potential for future and further analysis. I did
however keep the *non-criminalizing adult responses* code active, which I consistently found existing within episodes of interaction involving criminalization and acts of resistance.

Based on my preliminary research I suspected the presence of adult practices which were not part of the criminalization narrative. Following the hunch, I looked closely for and identified what I initially coded as *non-criminalizing adult responses*. At this point, I moved into second cycle coding as I began to examine patterns of interaction to further delineate this code (Miles et al., 2014). I detail the outcomes of this coding in Chapter 4 as decriminalizing practices.

**Table 3**

**Data Totals**

<table>
<thead>
<tr>
<th>Categories</th>
<th>Number of coded instances</th>
</tr>
</thead>
<tbody>
<tr>
<td>Episodes of interaction</td>
<td>111</td>
</tr>
<tr>
<td>Instances of Criminalization</td>
<td>103</td>
</tr>
<tr>
<td>Instances of Acts of Resistance</td>
<td>67</td>
</tr>
<tr>
<td>Instances of Non-criminalizing adult responses</td>
<td>63</td>
</tr>
</tbody>
</table>

**Descriptive codes.** In order to investigate the specific STEM settings in which criminalization and acts of resistance may occur, I applied three sets low-inference codes to serve as markers to help me identify patterns across settings. I applied these descriptive codes (*physical location*, *grouping*, and *type of work*) to every episode of interaction and story I analyzed. Using the *physical location* code, I identified whether an episode of interaction took place in the *math room*, the *science/engineering room*, or in another (*other*) location. Using the *type of work* code, I identified for each episode of interaction whether students had been directed to be *listening*, engaging in *activity-based work*, or engaging in *paper-based work*. Using the
grouping code, I identified for each episode of interaction whether students were working or being spoken to in a whole group, in small groups, individually, or with a staff member sitting and explicitly working with an individual or small group.

At the completion of process of code development, I engaged in a series of validity checks through peer evaluation, which I discuss in detail later in this chapter.

Figure 3
Descriptive Coding Scheme
Analysis of Coded Data

At the completion of the first coding phase and peer evaluation, I began a second cycle of analysis, running a series of reports from MAXQDA looking for emerging patterns (Emerson et al., 2011; Merriam, 1998; Miles & Huberman, 1994). I first ran baseline reports tabulating each parent code with its sub-codes separately. I developed a basic claim based on these reports but soon became concerned with contexts. During my research I visited three different sites, with two different STEM-oriented rotations, in which students engaged in different types of activities grouped in different ways. All of these variables were vital in considering what criminalization and acts of resistance looked like and how they interacted. Based on this consideration I ran a series of more relational reports, increasing in complexity through a progression. The reports provided me with numerical frequencies and also allowed me to quickly examine each episode of interaction that qualified for each of the inquiries. The progression of reports was:

(1) A series of reports of occurrences of criminalization, then of acts of resistance sorted by descriptive codes: first by physical location, then type of work, and then grouping

(2) A series of reports of occurrences of criminalization, then of acts of resistance sorted by all combinations of two overlaid descriptive codes: first physical location plus type of work, then physical location plus grouping, then type of work plus grouping

(3) Two reports of occurrences of criminalization, then of acts of resistance by the combination of physical location plus type of work plus grouping

(4) One combined report of all instances of criminalization plus acts of resistance sorted by the combination of physical location plus type of work plus grouping

(5) All reports above run again with non-criminalizing adults responses overlaid
(6) All reports above run again delineated by individual research site (see Appendix B for an example of these reports)

Through iterative readings of each of these reports, I generated a series of claims based on the report. I then moved to the next report in the progression looking for confirming and disconfirming evidence. Many of these hypotheses were generated by either eliminating or verifying variables as significant factors in any variances in criminalization, acts of resistance and non-criminalizing adult responses. For example, after running the reports in number six I was able to eliminate site location as a variable – criminalization and resistance looked similar at all three sites (this particular example also serve as a form of internal validity for me).

Ultimately, only the hypotheses I generated based on emerging patterns from the more complex reports, such as “criminalization in the math room where students are typically engaged in paper-based work while grouped individual most often took the form of hyper-policing and over-monitoring”, withstood my search for disconfirming evidence.

During my iterative readings of the episodes of interaction as they were organized in the more complex reports, I also captured emerging patterns of who was engaging in acts of resistance and who was being criminalized. I subjected the hypotheses developed from this pattern to triangulation with disciplinary notes and attendance data; and to member checking.

I also identified patterns in the ways criminalization and acts of resistance interacted with each other in various settings. This led to a series of hypotheses suggesting pathways and sequences in which criminalization and acts of resistance occur, which I again subjected to scrutiny via disconfirming evidence.

Finally, I looked at how non-criminalizing adult responses interacted with the patterns of criminalization and acts of resistance. I found these instances had their own set of sequences, but
in examining these patterns more closely I saw enough variances that I subsequently delineated non-criminalizing adult responses into six sub-categories which I derived both deductively from notions developed in my preliminary observations and inductively based on iterative readings. I later identified these sub-categories as types of decriminalizing procedures and responses, which formed my fifth finding of my results (see Chapter 4).

**Analysis of Disciplinary Data**

In my description of this part of my methodology, I will again be limiting the specifics and details of some of this process. I do so to (a) take the utmost care to ensure anonymity; (b) to honor the dignity of several participants in this research; and (c) to honor several requests made to me by participants in the study over the course of the two years.

In analyzing the disciplinary data, I used a low-inference, iterative, open coding approach. I gathered the data into an Excel spreadsheet, which was comprised of student’s name, gender, racial/ethnic identity, and a short narrative describing the infraction and the punishment. In total I recorded approximately 120 incidents. After collecting these data, I first used the data to triangulate an emerging finding in my fieldnotes and in the stories, that some boys of color were subjected to criminalization in ways that others were not. After making this comparison, I removed all of the students’ names from the data. I did this on-site, immediately following the completion of the collection process. Following my University of Colorado and school district IRB approval, there were no student names in my data when I left the school location where I collected the data.

Through iterative readings of the narratives, I then added columns for “Infraction” and “Punishment” to the spreadsheet, which I filled in based on what I discerned from each narrative. Through multiple readings I refined categories of infraction and made slight adjustments to
categories of punishment. Categories of infraction included hitting/striking another student, other unacceptable interactions with other students (calling another student names, sending unkind notes, bullying, etc.), kicking or hitting another student’s chair, theft, clear violation of school rules (such as wearing a hat, going outside of safe spaces in the playground, pulling a fire alarm, etc.), and disrespect (includes a wide range of infractions, some of which were indiscernible as to what the child actually did, but all included the word or an iteration of “disrespect”).

Punishments were much more clear and delineated: warning, student to give a written or verbally apology, lunch detention, in-school suspension, and out-of-school suspension (ranging from one to three days).

Once coding was complete, I organized the data using Excel’s built-in sorting feature. I executed a sort with four levels: by category of infraction, then by punishment, then by gender, then by race/ethnicity. Then, for each category of infraction, I compared the severity of the punishment by gender and race/ethnicity. Based on the emerging hypothesis, I executed a second sort by race/ethnicity, then by gender, then by category of infraction. From this sort, I generated a second hypothesis. I then reviewed all disciplinary entries for confirming and disconfirming evidence to the hypotheses. I detail the results of this in Chapter 4.

Analysis of Attendance Data

In my analysis of attendance data, which I also collected in an Excel spreadsheet, calculated absent and tardy percentages for all students from the time they entered into the program to the date of data collection. This ranged from 1.5 years to two months, depending on the student. I then sorted the spreadsheet by gender, then by race/ethnicity. I identified marked boys of color (see Chapter 4), and redacted all student names. I then calculated averages for absences and tardies for each gender-race/ethnicity sub-group and compared the results. Again,
for moral considerations, I do not report the actual percentages or raw data, but in Chapter 4 I do
detail the comparative results.

**Validity and Reliability**

In addressing issues of validity and reliability, I turn to the methods put forth by
Emerson, Fretz and Shaw (2011), Miles, Huberman and Saldaña (2014), and Merriam (1998).
Merriam identifies three areas of concern: internal validity, reliability, and external validity.

**Internal Validity**

According to Merriam, internal validity is concerned with how research findings match
the reality of what lies in front of the researcher and whether investigators are actually observing
what they think they are measuring. While research of this nature cannot nor intends to engage in
what I may refer to as the fallacy of objectivity when looking through the CRT lens, the issue of
internal validity must still be addressed. To this end, Merriam puts forth six elements to examine
and enhance internal validity: triangulation, member checking, long-term observation, peer
examination, participatory or collaborative modes of research, and clarifying researcher biases.
Of particular note are my use of member checking and long-term observation.

**Triangulation.** As I analyzed each of my four sources of data, I consistently compared
the emerging patterns from each source to those of my other data sources. By using multiple
sources of data (see Table 2), I have decreased the likelihood of any unpredicted bias present in
any one of the data sources and reduced threats to the validity of my findings (Mathison, 1988).
By triangulating data, I also increased the likelihood that I would more easily locate
disconfirming, corollary and other evidence divergent from or complementary to the primary
narrative. Multiple data sources helped strengthen the development of my coding system,
provided validation of overlapping similar findings, and unveiled unexpected findings such as
the presence of marked and unmarked boys of color (See Chapter 4, Finding 1).

**Member checking.** Member checking is a particularly powerful method of increasing the
validity of data (Bryman, 2004) and is a method used by previous critical scholars examining
race in STEM education (Leonard & Dantley, 2002; Leonard & Evans, 2008; Stinson, 2006,
2008).

I engaged in two types of member checking in this study. I favored member checking in
ways that served a primary benefit to the participants. The first form, I visited some of the site
directors to assist in transcribing some of the stories they wanted to tell, but for various reasons
had shied away from typing those stories up in their entirety. I offered to assist them by visiting
them and simply transcribing their words for them as they read along with what I was typing.
While the stories already contain a level of embedded member checking in them, this provided
an additional layer of verification and opportunity for me to ask about any details that may
otherwise have been left out. In addition to this, I also asked the site directors to look at a list of
the students in the program and identify any students they thought were targeted, overly
punished or had teachers/staff “on them all the time”.

I also engaged in member checking periodically with the fellows regarding specific
episodes of interaction I recorded in my fieldnotes. During informal meetings which occurred
roughly once per week, I would ask the fellows to describe what they saw regarding specific
incidences. I gave only the briefest description of the incident for them to identify the incident. I
then let them describe what they saw and compared it to my notes, filling in any details they
described that I missed or left out. These exercises were intended to help develop the fellows
noticing abilities in preparation for their own teaching practice, and as such primarily served to their benefit and secondarily providing me with the member checking opportunities.

**Long-term observation.** I visited my research sites 2 to 4 times per week for two school years, with a one-year preliminary study followed by a 3.5 month focused main study.

**Peer examination.** At the end of the 13 weeks of the focused research I engaged in a peer review process to increase the internal validity of the final coding schemes (Merriam, 1998; Miles et al., 2014). I chose to conduct the process with researchers and practitioners of color due to: (a) the CRT tenet that an individual of color’s lived experiences create a valid and unique perspective, one which my White colleagues cannot know; and (b) the particular issues of which I am researching are ones that have a greater potential to be partially or fully invisible to White researchers. For most individuals of color, these issues are visible and part of our everyday, normal lived experiences, although not necessarily by the names or frames I set forth in this research. As such, I conducted three peer evaluation sessions, one with each of the following: an independent scholar of color familiar with CRT, one of the fellows of color in the program, and two independent STEM educators of color.

When meeting with the independent scholar of color, I trained him on my coding scheme and coding method; first describing and defining the codes, then demonstrating how I applied the codes on several examples in the preliminary study. I then asked him to code four random samples from the main study. Due to the scholar’s growing interest in the research, we continued long past the initial review goal and ultimately examined to some level approximately half of the identified episodes of interaction in my fieldnotes. We discussed his results after each of his evaluations of an episode of interaction in depth. During this process, I made three adjustments to the codes:
(1) I renamed the acts of resistance code *resilience* (a named derived from the literature) to *academic resilience* in order to avoid unintentional overlap with discussions and writings on the resilience-versus-grit debates currently prevalent among some critical scholars in different sub-disciplines.

(2) I combined the criminalization codes *hyper-policing* and *over-monitoring* after findings the differences between the two to be too nuanced. My peer reviewer could readily recognize instances when one or the other was taking place, but we did not consistently agree on which was taking place. Distinguishing between the two did not appear to have any significant impact on emerging patterns.

(3) I eliminated the criminalization code *disparate treatment*. In discussing with my peer reviewer, we agreed that the code was too broad to be used effectively in this context.

In the second phase of the peer review process, I met with one of the fellows in the program, conducting a very similar peer evaluation. After I began training her on the coding schemes, I found that she was struggling to understand the more nuanced language I was using in the sub-codes. Noticing that her struggles appeared to be giving her some anxieties and potential feelings of intellectual inferiority, I immediately removed the sub-codes from the process and instead trained her only in the three main codes: *criminalization*, *acts of resistance*, and *non-criminal responses*. She expressed and demonstrated confidence in understanding these main codes. I then asked her to code approximately 15% of randomly sampled episodes of interaction from my fieldnotes and stories. After completing all of the coding, we discussed her findings in comparison to my own.

Serving as a third round of peer review, I met with two middle school STEM educators from a nearby school district who I knew previous but who were not familiar with my work.
Both educators are teachers of color – one male and one female. After discussion our original purpose for meeting, they requested to hear about my research and I took the opportunity to do some peer evaluation. I first described the context and methods of my study. I then put forth each umbrella code and described each sub-code within each set. While the terms in my frameworks were new to them, both recognized the concepts. I gave them six sample episodes of interaction from my fieldnotes and asked them first to identify if any criminalization or acts of resistance were present, and of so what type. During this, both teachers expressed resonance and agreement, telling me they recognized much of what I was describing as being present in their own school settings. This provided me a type of evaluative validity Miles, Huberman and Saldaña (2014) call “That’s right!” peer validation. After this third phase of peer evaluation, I went back through all episodes of interaction and either verified or adjusted each code I had applied based on these three discussions.

Table 4

**Criminalization Codes**

<table>
<thead>
<tr>
<th>Type of criminalizing practice</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Criminalization Code</td>
<td>Definition (s) with examples</td>
</tr>
<tr>
<td>Controlling the Body</td>
<td>Instances of excessive targeted behavior management such demanding silence, eyes front, walk perfectly in a straight line, sit perfectly facing front and do not move from that position, move to a place of isolation in the room. These hyper-controlling measures are similar to those</td>
</tr>
<tr>
<td>Category</td>
<td>Description</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Systemic &amp; School Structures</td>
<td>School-wide policies and infrastructure which serve to administer control over students: key-controlled light switches, locked doors, monitoring systems, school-wide behavior procedures and plans built around discipline and behavior</td>
</tr>
<tr>
<td>Hyper-policing &amp; Over-monitoring</td>
<td>Control of clothing, over-monitoring for negative behaviors such as socializing, standing up, not looking at the teacher, talking out of turn, rolling eyes, sighing, touching equipment without instructions</td>
</tr>
<tr>
<td>Severity of or Disparate Discipline</td>
<td>The practice of levying punishment more frequently or more severely toward certain individuals (i.e. boys of color) compared to their peers. This includes the practice of levying punishment for some individuals, and not for others committing the same “infractions”, or punishing some more severely than others.</td>
</tr>
<tr>
<td>Interrogating</td>
<td>Scolding, questioning, reprimanding, lecturing an individual or small group in</td>
</tr>
</tbody>
</table>
aggressive manners, for excessive periods of time

Labelling

Behavior-based: referring to student as unable to control themselves, violent, disrespectful

Achievement-based: referring to students as unable to learn, low-performing, learning disabled

Table 5

Acts of Resistance Codes

<table>
<thead>
<tr>
<th>Type of act of resistance</th>
<th>Definition (s) with examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic Resilience</td>
<td>Engaging or attempting to engage in learning activities despite adults or systems actively working to stop it. For example: a student taking his math with him to work on in the hallway after being kicked out of class.</td>
</tr>
<tr>
<td>Conformist</td>
<td>Through voice and body, expressing resistance while still following directives and rules. For example, a student who has been directed to pick up five pieces of trash in the room as a punishment and he picks up the very smallest pieces of trash located all around the room even though five much larger pieces were located right at his feet.</td>
</tr>
<tr>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>----------------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Dignity Work</td>
<td>Directly defying demeaning directives or rules, despite an increased risk of punishment. For example, a student writing a letter home telling his mother of how the teachers are trying to force him to write a letter against his will admitting he did something he didn’t do.</td>
</tr>
<tr>
<td>Maintaining or Regaining</td>
<td>Taking actions to active exercise and demonstrate that control of his body lies with the student, not the adult – often this resistance is also Oppositional and/or Dignity Work. For example, a student sitting up tall and refusing to move when ordered to go to the back of the room and sit by himself.</td>
</tr>
<tr>
<td>Oppositional</td>
<td>Openly defying criminalizing directives from adults. For example: refusing to look at a teacher after being directed to do so during an aggressive deficit-perspective lecture about the student’s behavior.</td>
</tr>
<tr>
<td>Symbolic</td>
<td>Engaging in resistance which provides little or no benefit to the student and often little risk of punishment but may still make the resistance visible to an adult. For example, a student putting a line through the word “fun” on a homework worksheet.</td>
</tr>
</tbody>
</table>

**Participatory or collaborative modes of research.** As a researcher I took an active participant role in the program. During my preliminary study, I regularly sat and assisted
students both in the math room and the science/engineering room. I collaborated with teachers on lesson development, and developed and implemented the fellowship program all of whom contributed to the stories and informed the ways I have identified decriminalizing practices. I included a fellow in the peer review process as well as the member checking process.

**Explaining researcher biases.** The notion of offering my readers an explanation of my biases is one of transparency and self-reflection. It challenges me to reveal both my own positionality and lived experiences as a man of color from multiple socio-economic backgrounds. It asks me to detail my experiences both as a boy of color in the American school system and as a professional educator in the same system. It would even require me to detail my position and experiences as a husband and father, my sexual orientation, my training and previous experiences as a researcher and other perhaps even more personal elements as well. And then I must reflect on all of these to speak the ways in which all of these lived experiences work to bias how I am interpreting my data. While there are many issues here worthy of discussion and dissection, I will briefly direct my readers to my statements of my positionality in my Introduction and Theory chapters as well as invoking the CRT tenet that as a researcher of color, my views are valid and valuable, thus adding to the internal validity of my research here.

**Reliability/Dependability**

According to Emerson, Fretz and Shaw (2011), Miles, Huberman and Saldaña (2014), and Merriam (1998), reliability considers to what extent a study and its findings can be replicated. As Merriam notes, a CRT lens dismisses that notion in that while various peoples of color have a set of shared experiences, they nonetheless have within group differences. Additionally, the lived experiences of the researcher likewise cannot be replicated and as such, this notion of reliability appears invalid. This does not, however, alleviate the concern of what
Merriam calls dependability, “That is, rather than demanding that outsiders get the same results, a researcher wishes outsiders to concur that, given the data collected, the results make sense – they are consistent and dependable” (1998, p. 206). In the pursuit of dependability, Merriam suggest three approaches to addressing dependability: explaining the investigator’s position, triangulation, and creating an audit trail. To this end, I have previously detailed my own background and positionality as a researcher, detailed the triangulation of my data, and provided thorough details into my analytic process.

**External Validity**

External validity addresses generalizability. That is, to what level may the results of this study be applied to other similar or dissimilar scenarios. At its core, the nature of qualitative research and again, the CRT lens to a certain extent dismisses this idea. However, the nature of education research arguably dictates generalization to some level. In this study, the question of external validity is particularly salient due to the structure content of the findings. As such, to address the question of external validity I look to Merriam’s elements of rich, thick descriptions, typicality or modal category, and multisite design. The first of these three elements, rich and thick descriptions, is perhaps the most subjective but nonetheless provides a guiding principle I have followed throughout the research process and have strived for in this document. Ultimately, the level to which I have achieved this lies in the minds of my readers to judge. The second element, addressing typicality or modal category is a less easy task, in that I find it difficult to speak to the typicality of the program I studied due to the fact that I was drawn to it for its reputation as being different than others. That being said, I can say that the program has met and continues to meet certain criteria required for its state and federal funding, which suggests that it in structure bears multiple and perhaps many similarities to other programs across the country.
Finally, I have addressed the issue of multisite design organically in that it is the nature of the after-school program and as such in the design of my study, I included all three locations.
Chapter IV

Results

In this dissertation I asked the following three questions:

1. In what ways are criminalizing practices evident in a STEM after-school program targeted at students of color?
2. In what ways do boys of color in the program resist this criminalization?
3. How are criminalizing practices and acts of resistance related in this program?

Using the methods described, the five major findings of my research are as follows:

(1) criminalization took place in the elementary school settings as a normal and regular practice, the severity of which varied across settings;
(2) some boys of color were marked;
(3) marked boys of color engaged in acts of resistance as an ordinary and normal everyday practice, and these acts varied in STEM settings;
(4) acts of resistance were themselves heavily criminalized, which in turn incited more resistance; and
(5) staff at times engaged in certain sets of practices which disrupted patterns of criminalization.

In this chapter, I detail the data supporting these five major findings, organized by research question.

Research Question 1:

In what ways are criminalizing practices evident in a STEM after-school program targeted at low-income elementary students of color?
In responding to my first research question, I present two findings. In the first finding, I describe criminalization and a regular practice, and I detail what it looked like in various STEM settings. In the second finding, I identify that some boys of color are marked, and regularly subjected to criminalization.

**Finding (1)**

*Criminalization took place in the elementary school settings as a normal and regular practice, the severity of which varied across settings.*

I observed and recorded criminalization of boys of color first-hand at all three research sites and to varying degrees. In some instances, criminalization persisted for long periods of time, escalating in the intensity of criminalization steadily as the episode progressed. In other instances, criminalization (and even escalation) would take place in an episode of interaction lasting less a minute. I also observed variations in the ways criminalization took place in different STEM learning environments, including the ways students were engaging content and the ways that engagement was structured.

In this example from my fieldnotes, hyper-policing escalates to labeling and controlling the body in five sentences of discourse. The setting was an engineering, small group-based problem-solving project wherein students were attempting to build a structure to support a loose bag of nails using only a deck of cards and various adhesives.

…the staff member looked up and shouted, “Julio, WHY are you standing up?” Julio lifted his shoulders, turned his palms up and raised them about halfway up the sides of his chest and responded, “I’m walking to my work table. I just came back from the bathroom.” The staff member replied, “I CANNOT believe you’re being so disrespectful
to me right now! I want to see you in that chair, head up and getting your work done.”

Julio dropped his arms, shrugged his shoulders, shook his head and went to his seat…

In types of small-group problem-based environments similar to this example - which is more aligned to the type of science learning environment called for in the NGSS (NGSS Lead States, 2013) - criminalization typically occurred in brief episodes of interaction when boys of color were in some way individually more visible to the adults in the room, such as in this example when Julio had left to go the bathroom or when engaging in acts of resistance (see Finding 3). While examples like this or ones lasting in the one to three minute range were the most common, in some instances criminalization in an episode of interaction lasted 10 minutes or more.

This example from my fieldnotes occurred in the math room where on this day most students were working on school-day homework individually. Here over-monitoring and hyper-policing escalated in intensity, and eventually gave way to a staff member attempting to exert control over the boy’s body:

At the start of the math rotation, Antwon [a marked boy of color] came in and walked around the normal workspaces into a secluded area and climbed under a desk. He opened his backpack, took out his math work and began working. He appeared to be visibly upset, with somewhat tense muscles and was a little fidgety. Nonetheless, he was beginning to work on his math with what appeared to be more focus than usual. A staff member came around to where he was sitting under the desk and sternly told him he needed to come over to where the other students were.

As Antwon resisted, the staff member’s criminalization shifted to exercising control over his body, first through words, then physical intimidation, and ultimately the staff member attempts to physically move him with her hands. While controlling the body escalated, the staff member
also engaged in labeling, using the rhetoric of disrespect to and shift the justification of the criminalization to Antwon’s disrespect:

The staff member said loud and firmly, "You do not have a choice. I need you to come over here NOW. Everyone else is over there." The staff member stepped forward towering over him. The staff member continued to persist in now ordering Antwon to return. The staff member was becoming more stern in voice and changing demeanor to hands on hips, finger pointing. He did not look up at all but explained how he is doing his homework and there was no problem. The staff member was unrelenting and non-stop repeating the same command. The staff member then raised her voice further: "I don’t like this disrespect at all. That’s what this is about now". Antwon refused to come out from under the desk…The staff member spent the next few minutes trying to force him to move forward, eventually putting hands on him and attempting to physically force him to return. He provided sufficient force back to resist moving…

During this entire episode, Antwon continued to attempt to work on his math worksheet, which the continued criminalization denied him the opportunity to do so. Instances of escalation such as this one often included some attempt by the boys to continue to engage in the learning activity, particularly when the activity was oriented around problem solving. Although this was one of the more extreme examples of an episode of criminalization from a staff member in the program, it provides a salient example of the ways disparate treatment, hyper-policing, labeling and exercising control over the body can work to deny boys of color access to STEM learning. Because of the high social value and gateway status of math and science, episodes such as these become magnified in their academic impact on boys of color, particular with regard to STEM futures
Various forms of criminalization were also prominent and frequently at the center of the stories I collected. In some cases, stories told of continued broader unfair treatments of boys of color in the program:

Most of our boys are Hispanic or Black. These kids aren’t “disrespectful” (well, they can be) but more of “different”. They were raised differently than some people. Some of these differences are cultural differences, some of them are economically different.

In this example, a staff member addressed and challenged the continued masternarrative of boys of color as disrespectful present in the regular school day (but at the same time keeps Whiteness at the center, labeling students of color as “different” and affording space for the “disrespect” label to persist). Some stories also addressed the disparate and severe treatment of boys of color in the regular school day.

Here a staff member described the ways in which boys of color are routinely singled out and punished for not being quiet for sustained periods of time. The staff member identified cultural contexts for why the boys aren’t used to being quiet, and also suggested causality for why a boy of color may choose to be loud when told to be quiet:

I am always amused when [school day] teachers ask their classrooms to be silent and then really punish our boys for not sitting quietly and listening. It’s ridiculous and it happens all the time. For example, I have two students who live in a two bedroom apartment with 10 people. Do you think their apartment is quiet? No. A quiet room probably makes them uncomfortable. It also probably makes it a lot harder for them to possibly focus, especially when you consider this is a whole different environment than they are used to being in? It’s so cruel what the teachers do.
In instances such as this one, oppositional resistance serves as a response to a teacher who is attempting to control the bodies of her students and then hyper-policing the boys of color for their resistance to said control.

Stories also included criminalizing incidents experienced by individual boys of color. These stories usually contained more detail regarding the criminalization. This next example contains more explicit examples of criminalization wherein regular school day teachers and administrators suggested and then openly labeled Juan as a criminal, and presented him that way to the teacher. They also demonstrated the disparate treatment common for boys of color such as Juan. This example also contains examples of the ways in which acts of resistance (the ‘fuck you’ statement) are often hyper-criminalized (calling the police because he cursed):

Last year I had a student named Juan. He was in fourth grade. When I first got him, the office and his teacher showed me his file where they keep all referrals, write ups, etc. It was no joke about 2 inches thick. They laughed and told me “good luck”. When I got him, I was nervous. But when I got to know him he quickly became one of my favorite human beings on the planet. He was sweet, funny, and extremely bright. I found myself constantly defending him when talking about him with staff. One time he got in trouble for punching somebody after-school, I had no choice but to call mom and send him home. When mom came he didn’t say a word. When I was telling mom what happened, the principal came out and kept saying things like “This is what we deal with every day. He’s going to kill somebody or end up in prison.” Juan said “fuck you” to the principal and she just kept making it worse by telling him about how awful he was and that she was calling the police to have him arrested cause that’s where he belongs. Juan and I built
an awesome friendship and I rarely ever had problems with him, probably because I treated him with respect all the time.

Accounts of criminalization, such as the examples above, regularly appeared in the stories I collected.

These specific examples illustrate trends I gleaned from disciplinary records at the schools. Disciplinary infractions documented in school records started for boys of color typically in 3rd and 4th grades. In comparing the documented infractions of boys of color to similar infractions of their White and female peers, I found that boys of color were (a) punished more severely than White and/or female peers; and (b) placed into a master narrative of being malicious, deviant, dishonest and disrespectful – a narrative not present for White and female peers.²

**Severity of punishment.** Marked boys of color (a distinction I discuss in my next finding) were regularly punished more severely for infractions compared to their female and White peers. I examined approximately 120 infractions across the three research sites. Despite marked boys of color representing only approximately 20% of the program students, over half of those 120 infractions were attributed to marked boys of color. Additionally, every marked boy of color in the program had at least one disciplinary infraction on record and at least one disciplinary note that cited some iteration of “disrespect”.

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² In a more traditional context, my readers may expect raw numerical data and/or quoted examples to follow these claims. Due to several moral and ethical reasons which are: (a) there is a history of this sort of data being used, sometimes in unpredictable ways, to the harm of peoples of color; (b) to honor the dignity of several participants in this research; and (c) to honor the requests several participants made to me over the course of the two years I spent at my research sites; I am not able to provide traditional tables, etc. Rather than omitting this data entirely, I believe this part of the story needs to be told. As such, I have attempted to report the disciplinary disparities in frequency and severity of punishment levied upon the marked boys of color in my research in alternative but still authentic ways.
Boys of color were also punished more severely for similar infractions, compared to their female and White peers. For example, unacceptable interactions with other students was one of the more common infractions. Boys of color typically received some form of formal suspension for this infraction ranging from one day of in-school to two days out of school. Female and/or White peers received less severe discipline for the infraction, ranging from a warning to one day of lunch detention. For every category of infraction I coded, marked boys of color were consistently punished more severely than their female and White peers.

**Labeling as disrespectful.** For boys of color, notes suggesting malicious intent and disrespect were the norm. In multiple instances, according to the notes, a boy of color indicated he was dealing with trauma at home such as a family member in jail, death in the family, etc. These statements were often worded with phrases like “claims that…” or “used the excuse that…” and followed with dismissive statements similar to “nothing is on file verifying this”. The notes also typically identified the infraction, the interactions the note-writer had with the student afterward, or the boy himself as being disrespectful. These phrases act to suggestively discredit the boy and work to maintain the masternarrative of boys of color as disrespectful and behaving as criminals.

In contrast, narratives for female and/or White students with similar infractions described those students with phrases such as “appeared sad”, “says he is feeling sad because his grandpa died”, and similar sympathizing statements. For these students, the notes did not indicate anything regarding whether the school had documentation verifying student’s claims of trauma at home. There were less than three notes describing White and/or female students as either themselves or their acts being disrespectful. In some cases, the notes even indicated that the
student the adult recording the incident was sure the girl “didn’t mean to hurt anyone” or similar statements excusing the student from the infraction in some way.

The numbers demonstrated this trend as well. Every marked boy of color had at least one disciplinary infraction which contained within the notes some narrative labeling either the boy or his actions as some iteration of disrespectful. The disparate severity of punishment and the masternarrative of disrespect are congruent with the criminalization I identified in my fieldnotes and in the stories I collected.

**Variations of criminalization across STEM settings.** While I observed criminalization consistently at all three of my research sites; the forms of criminalization varied in form by location and the type of work being done. I observed these variations regularly during my site visits.

Work in the math room was normally individual and worksheet-based, with staff sometimes pulling one or two small groups together to learn a specific math topic. In these settings, criminalization typically and most commonly took the forms of over-monitoring, hyper-policing, and interrogating. Staff members sometimes stopped making cycles from table to table and instead stepped back and took up very close monitoring of the entire room, keying in on marked boys of color and typically interrogating them regarding their behavior, focus, speed of work, and other varying reasons. I observed less criminalization in those small group settings than when boys were working individually.

In the science and engineering room, criminalization typically and most commonly took the forms of controlling the body and behavior-based labeling. The majority of the criminalizing episodes took place during whole class instruction and individual-oriented activities. When
students worked in small groups on project–based learning, I observed notably less criminalization overall.

**Finding (2)**

*Some boys of color were marked.*

In my analysis of my fieldnotes, the stories I collected and in the disciplinary notes, I found that approximately half of the boys of color in the program were consistent and regular targets of criminalization both by program staff and in the regular school day. I refer to this as being *marked*.

**Marked in fieldnotes and stories.** This pattern first emerged in the MAXQDA reports I ran selecting all instances of criminalization. I noticed the same student names (assigned pseudonyms) appearing in many of the criminalizing episodes. In comparing the program rosters with reports of instances of criminalization and reports of all episodes of interaction per site, I found that about half of the boys of color on the rosters regularly appeared in episodes of interaction and criminalization, while the other half of the boys of color virtually never appeared in any episodes of interaction.

Delineating this comparison further, I found that all but one of the African American boys in the program fell into the marked category, often being the most prominent students in teacher and staff discussions. For example, when testifying to the success of a particular engineering lesson with a group of about 20 students, a White middle class teacher proclaimed multiple times during the discussion some version of: “The lesson was so good, even Tyree and Jermain were into it.” Afterward the staff of color spoke with me about the fact that Tyree and Jermain were both active and engaged boys who didn’t like attention and really enjoyed science. The staff couldn’t understand why this teacher kept singling those two boys out (they were the
only two African American students in the class of 20+ other Latino/a students). This example demonstrates one of the ways adults criminalized marked boys of color, such as labeling them as having behavior problems, not being interested in learning and otherwise being disrespectful. From this analysis, I generated a list of marked boys of color to use in triangulating this finding. Using this list, I examined the instances of criminalization in the stories I collected and found the same trend that marked boys of color appeared in the majority of episodes of interaction involving criminalization.

**Marked in disciplinary records.** Using the list I generated, I confirmed the distinction of marked boys of color in the disciplinary data. Before I redacted student names in the disciplinary data, I compared the list of students with disciplinary infractions to my list of marked boys. Every one of the marked boys of color I identified through fieldnotes and stories also had multiple disciplinary infractions. Further the marked boys of color, in comparison to their female and White peers, received the most severe punishments, bore the majority of the discrediting comments, and a high percentage of their infractions involved some component of labeling the boys as disrespectful. In fact, every marked boy of color had at least one disciplinary entry with disrespect as the single infraction. Only a very few of their female and White peers had infractions based on disrespect, and in those few examples female and White students were punished less severely than marked boys.

**Marked in attendance data.** “These boys just don’t come to school. How can they learn if they’re never here?” This statement from a regular school day teacher (as told in one of the stories) illustrates an element of the masternarrative surrounding boys of color which I heard multiple times in various contexts during the preliminary phases of my research. Within this context, I expected to see marked boys of color attending school less. As such, using the same
list of marked boys of color I generated, I compared the average daily attendance and average tardies of the marked boys of color to all other students in the program (see Table 6). I did this specific by site and then for the entire program. Surprisingly and potentially disconfirming to the rest of the data within the framing of the masternarrative, marked boys of color actually attended school more often than all other students on average, and came to school late less often than their peers.

However if I place this data, in combination with all other data sources I reviewed above, into a counternarrative framework and context, the data suggest that despite coming to school more often than their peers, marked boys of color are labeled as being frequently absent and tardy. In this way, the attendance data serves as confirming evidence for marked boys of color in that they are disparately labeled as truant.

Table 6

<table>
<thead>
<tr>
<th>SITE</th>
<th>CATEGORY</th>
<th>AVERAGE ABSENCES</th>
<th>AVERAGE TARDIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site A</td>
<td>Marked Boys</td>
<td>5.80</td>
<td>1.53</td>
</tr>
<tr>
<td></td>
<td>All Other Students</td>
<td>6.00</td>
<td>1.84</td>
</tr>
<tr>
<td>Site B</td>
<td>Marked Boys</td>
<td>0.21</td>
<td>0.05</td>
</tr>
<tr>
<td></td>
<td>All Other Students</td>
<td>1.54</td>
<td>0.66</td>
</tr>
<tr>
<td>Site C</td>
<td>Marked Boys</td>
<td>8.42</td>
<td>4.00</td>
</tr>
<tr>
<td></td>
<td>All Other Students</td>
<td>11.47</td>
<td>6.23</td>
</tr>
<tr>
<td>Totals</td>
<td>Marked Boys</td>
<td>4.81</td>
<td>1.86</td>
</tr>
<tr>
<td></td>
<td>All Other Students</td>
<td>6.34</td>
<td>2.91</td>
</tr>
</tbody>
</table>
**Marked in member checking.** To further validate this finding, I conducted member checking with the site directors asking them if any boys of color were singled out more than others and if so, to mark down which ones on an official program roster of all students. For each of the three sites, the directors identified all of the boys I had previously identified as marked, adding one or two additional boys to the category per site.

**Research Question 2:**

**In what ways do boys of color in the program resist this criminalization?**

**Finding (3)**

*Marked boys of color engage in acts of resistance as an ordinary and normal everyday practice, and these acts vary across STEM settings*

Acts of resistance are a collective of immediate or delayed oppositional responses to targeted, longitudinal, and continued oppressive measures. They can take multiple forms of social justice orientation on behalf of the student or of his peers. Below I report on what acts of resistance looked like in my fieldnotes and the stories I collected, and the ways those acts varied in different STEM learning settings. Acts of resistance were also evident in the disciplinary notes, however I have chosen not to report on those details due to reasons I expressed above.

**Acts of resistance in fieldnotes and stories.** Acts of resistance at my research sites were common. In every site visit I made, I observed multiple acts of resistance from marked boys of color. The acts of resistance I witnessed were twice as often overt than covert. They were often acts focused on maintaining or regaining control of their bodies, but many styles, forms and elements of resistance were visible. They occurred slightly more frequently in the science and
engineering room than the math room, but more intense and lengthy episodes occurred in the math room.

The math room. I regularly observed three types of resistance in the math room. They often overlapped with each other, typically occurring when students engaged in worksheet-based activities such as homework sheets or extension problems. When boys were engaged in small group work with a staff member assisting, acts of resistance were rare. Boys of color predominantly engaged in acts of resistance to regain or maintain control of their bodies, complimented with academic resilience and dignity work.

When boys of color worked to regain or maintain control of their bodies, they were frequently responding to excessive amounts of criminalizing control, doing so in oppositional ways. These oppositional acts of resistance were also often forms of dignity work and had elements of academic resilience. Episodes were usually brief, but several went on for extended periods of time – in a few cases the entire rotation. Typical episodes resembled this example from my fieldnotes:

…a staff member walked up and told Tyrell to move to a table by himself because he could not behave. I could not discern anything Tyrell was doing that was different from everyone else in the class. However Tyrell, a marked boy of color, was uncharacteristically sitting with three girls and all four were working together on similar homework. Tyrell shook his head and refused to move. I heard him say, “Why? I am working hard and I’m helping my friends with their homework like we’re supposed to.” The staff member said, “I asked you to move now move your body to that empty table.” Tyrell again refused to move saying he’ll stop talking to the girls and get his work done
but that he wasn’t going to move…the staff member left and he continued to complete his homework and help the girls as well.

In episodes like this Tyrell, although potentially lacking the recognition that he was being singled out likely because of his race and gender, recognized that something was unfair and amiss. By engaging in an act of resistance – refusing to move – in an act of opposition he maintained control of his body, resisting the criminalization of the adult. He acknowledged and expressed that he was engaging in academic discourse and doing nothing wrong. This is particularly salient in a mathematics setting such as this wherein students are engaging in academic discursive practices, which the NCTM has identified as a vital component to the development of mathematical problem solving skills (The National Council of Teachers of Mathematics, 2013). While discursive small group practices may be found in all classrooms, in STEM settings, students along with solving the problem must also learn how to solve the problem. In other words, along with finding a solution to the problem, students must also learn specific methods of problem solving such as multiplication or the scientific method – skills not typically found in humanities classrooms. Although Tyrell appeared to have reached some level of problem solving ability in this particular task, by teaching it to his peers he was not only acting in the benefit of them but also strengthening his own understanding of the concepts and methods.

Further, moving to an empty table in a room where all other students are working in groups would single him out and indicate that he was being punished (i.e. criminalized). By leveraging the fact that he would continue working but would not move, he demonstrated academic resilience by continuing his learning and school work despite the criminalization.
Thus, by refusing to move he used opposition to (a) maintain control of his body; (b) maintain some amount of dignity; and (c) demonstrate academic resilience.

In another example of this overlap from my fieldnotes, a marked boy of color refused to show a staff member his completed math homework:

…a staff member approached him and asked if he finished his math homework. He said, “Yeah” without looking up and continued to pick out colors for an extension project he had started. The staff member said she wanted to see it. He said, “I did it” again without looking up. She said, “Ok good, then let me see it because I think you’re lying.” [It is common for staff to check over students’ homework to look for mistakes or places to help the students but have not I seen it done under the premise of a student lying] The student said, “Ask Julio [another student], he saw it. Why aren’t you asking to see everyone’s homework.” Again, he never looked up. She ordered him again, “Look at me. Get the sheet out and show me. I know you didn’t do it. I don’t care what Julio says.” He said, “Nope” and remained seated, not having looked at her at all. The staff member stood very close to him standing over him not saying anything. Eventually, once he completed the coloring portion of his extension worksheet, he pulled his bag over with his foot, took his homework out and held it up first to Julio, then to the staff member – he never looked at her the entire time. His homework was complete and entirely correct. The staff member just walked away.

Again, a marked boy of color recognized unfair treatment and engaged in an oppositional act of resistance. He only revealed his completed homework when he was ready to do so thus maintaining control of his body and some dignity. These styles of resistance were normal and
ordinary in the math room. However, acts of resistance looked different in the science and engineering room.

*The science and engineering room.* In the science and engineering room resistance, similarly to the math room, often focused on maintaining control of the body. In contrast, control of the body was often achieved through conformist resistance and symbolic resistance rather than oppositional resistance. In an example of symbolic and conformist resistance from my fieldnotes, Devarius (a marked boy of color) had early that day been informed by a staff member that he could no longer put his headphones on during the program because the music (exclusively hip hop) was distracting and inappropriate for him:

During the science rotation, students were writing down responses to what they had taken away from the STEM unit they had just finished. Students were relatively calm and went about the task as usual. Devarius entered the room a little late and walked right up to me. He said, “What's up Mr. B.” and gave me a handshake-hug appropriate to two men of color familiar with street culture. This is the first time he has done such a thing and he didn't quite have it all down perfectly, which we smiled to each other about. He then went to his seat at the table next to where I was seated. During the next set of instructions, a staff member said to the class to put their names on the tops of their papers. Devarius very quickly shouted out, "I'm gonna put G3 on mine" and did so. [G3 is the name of a hip hop group with a single titled "Life in da Ghetto" which Devarius had me listen to on his ipod a few weeks before this episode] He looked at me briefly and nodded his head up and down in an exaggerate manner with some rhythm to it, as if he were listening to the music on his iPod.
In this example, Devarius found a way to engage in an act of conformist resistance that symbolically represented the opposition he may have wanted to exhibit regarding being told he could no longer listen to his iPod. He chose to conform to the request to put his name on the top of his paper, but did so using a symbolic form of resistance, which bore much less risk of punishment for him as well. Additionally, symbolic and conformist resistance appeared to be less severely criminalized than other forms of resistance. While the act did nothing to enable him to listen to his iPod, and as such he remained conformist, but it did indicate he was not complacent with having his music and the act of listening to it be criminalized.

In another example, several marked boys of color engaged in a symbolic act of resistance overlapping with maintaining control of their bodies:

… a staff member said, "kids I need your attention for a moment. Everyone stop what you are doing.” When very few if any students complied, he then said louder and more sternly, “Everyone put your hands on your head!” Most students immediately did so. Three marked boys of color did not. Julio crossed his arms across his chest and sat upright, appearing tense in his whole body, staring straight forward. The two other marked boys who also did not put their hands on their heads, looked around the room appearing nervous. When both of them spotted Julio, they copied his physical stance. Julio then slowly shook his head left and right. The staff member seemed not to notice the three boys had done this. After giving a few brief instructions, he sent the students on a writing task. The three boys did not write immediately even when all others in the class were doing so. After about a minute one by one they began the writing task…

In this example, the three boys engage in a symbolic act refusing to put their hands on their heads. The staff member’s command for everyone in the class to put their hands on their heads
did not appear to be an intentional criminalizing act, it was still procedurally criminalizing and the marked boys were sensitive to it. According to staff members, many of the boys of color in the program had already had multiple run-ins with the police.

Conformist resistance typically took forms such as how students located themselves in the classroom, such as sitting in a chair in the corner of the room when ordered to sit down; and how students complied with orders that compromised their dignity such as picking up the very smallest bits of paper next to their feet when ordered to clean the floor. Symbolic resistance often took form in the ways boys completed academic tasks, for example one boy drew a large animal face on simple machine he built which he frequently and openly described as being an animal that hated mean teachers.

In the science/engineering room, acts of resistance occurred the least frequently and with the least intensity when students were directly engaged in problem-based small group work as well as the academic discursive practices highlighted in one of the math room examples above.

The examples above and many other of my observations during the two years I spent at the research sites have left me to strongly suspect that many marked boys in color in fact have far more awareness of their oppressive surroundings and the ways in which they resist them than previous research and popular discourse in education has given them credit for. To understand this as well as the ways in which procedurally-decriminalized, discourse-oriented, problem-based STEM learning (see Finding 5) still produce criminalized outcomes, I have looked at the patterns and ways in which criminalization and acts of resistance interact with each other.

**Research Question 3:**

How are criminalizing practices and acts of resistance related in this program?

Finding (4)
Acts of resistance were themselves heavily hyper-criminalized, which in turn incited more resistance.

**Figure 4**

**Criminalization-Acts of Resistance Pattern**

In basic terms, acts of resistance were responses to criminalization (see Figure 4). In more complex terms, boys of color that regularly resisted criminalization were subjected to further and more intense direct criminalization. Acts of resistance by boys of color were frequently given the label of disrespect. In other words, boys of color who resisted criminalization were not doing so in the eyes of adults in most situations. Instead, adults in most situations gave this resistance a label of being disrespectful. Actions given the label of disrespectful were then hyper-criminalized and heavily punished. This general pathway of criminalization-acts of resistance-criminalization had multiple iterations, varying generally by STEM setting. I further explain the complexities of these pathways below, using detailed examples from my fieldnotes and the stories I collected. I additionally offer an overview of the evidence of this process in the disciplinary notes.

**Criminalization-acts of resistance pathways in fieldnotes.** I frequently observed the escalation of criminalization inciting acts of resistance which led to more intense criminalization.
The criminalization was sometimes directed at the whole class, systemic, or otherwise more diffuse with regard to the direct impact to an individual student. More often the criminalization was directed toward the individual student. Whether diffuse or directed, when a marked boy of color engaged in an act of resistance, it was frequently met with much more intense and direct criminalization such as hyper-interrogation, hyper-controlling the body, labeling, disparate punishments, etc. At times in a single episode of interaction involved multiple repetitions of acts of resistance leading to hyper-criminalization leading to more acts of resistance leading to more hyper-criminalization and so on. Other times the pattern ran through one cycle terminating with severe and disparate punishment.

In this example, a marked boy of color accidentally discovered a way that a lens interacted with sunlight and begins to explore further. A staff member criminalizes the boy assuming he is engaging in devious acts. The boy covertly and symbolically resists by using the newly discovered power of the lens, and maintains control of his body by initially refusing to relocate when commanded to do so. The staff members then began a stream of interrogation and labeling culminating in severe and disparate punishment – denying him the ability to continue to engage in the STEM learning activity. The boy, despite being told he was done participating for the day, engaging in resistance again via academic resilience by covertly getting his science notebook and attempting to draw what he discovered with the lens:

…a marked boy took one of the lenses outside [the back door of the room was propped open and students were moving freely in and out to have more room to work]. He put the lens in the sunlight and noticed a small circle of concentrated light at his feet. He crouched down to look at it closer and saw that it changed size. [He seemed surprised. Most students reported never have touch a lens before…very few students in the program
had glasses]. He moved the lens up and down noticing the size of the concentrated circle changing…a staff member came outside moving quicker than usually and in a loud and stern voice said, “Orlando, what are you doing? Stop that! You’re supposed to be figuring out how the lens helps you see. Not screwing around! Get back inside.” The staff member suddenly shifted her attention to another student…Orlando stood up slowly with his hand with the lens by his side, watching the circle of light change. While the staff member was still looking the other way, Orlando tilted the lens so the circle of light moved onto the foot of the staff member and wiggled it around. The staff member looked down at the light on the staff member’s foot and yelled, “I thought I told you to get inside and knock off all this screwing around. This is constantly happening with you. You never listen or do what I tell you to do. That’s the worst part! Give me the lens. You’ve lost the privilege to use it since you can’t use it appropriately. No get inside and sit down. You’re done!”…[Orlando went inside, sat down, took out his science notebook and began drawing a picture of the lens and something similar to a ray diagram of the light going through the lens and getting smaller].

Orlando’s actions are typical types of dignity work involved in the escalation of criminalization-acts of resistance-criminalization pathways. Of note, examples such as this one contain elements which are endemic to STEM learning. During this entire episode, even during the escalation pathway, was learning through tinkering (Schwartz et al., 2014) and in essence doing what he was supposed to be doing. Having the lens in hand, experimenting and implementing his learning instantly his new knowledge of the natural world are again not typically experiences found in other subjects and classrooms.
This example also illustrates the ways in which these processes can work to deny boys of color the opportunities to engage in STEM learning. Not only was Orlando overtly denied the opportunity to continue engaging in the learning activity, through the initial criminalization he was also denied the opportunity to demonstrate and validate his discovery that the lens in some way adjusted sunlight. I found similar pathways in the stories I collected.

**Criminalization-acts of resistance pathways in stories.** While program staff participated in criminalization as an ordinary practice, regular school day teachers who, for various reasons, were passing through the STEM rooms delivered the most extreme episodes of criminalization. Staff wrote about these types of interactions multiple times in the their stories. I suspect this was due to the staff’s reaction to the extreme nature of the criminalization combined with the fact that the teachers arrived uninvited by staff. In this example from a fellow describing an event she witnessed in the math room, a regular school day teacher comes in unannounced and quickly targets a marked boy of color, subjecting him to a series of escalating criminalizing responses to his acts of resistance. Due to the length of this particular story, I name each segment of the escalation pathway as the story progresses:

This school teacher came into the room, scanned the room and locked onto Antonio [a marked boy of color]. I assume the teacher knows him because she picked him out from the middle of the tables. He was one of like 5 or 6 students standing up but he wasn't doing anything different than anyone else that I could see. She walked very quickly up to him and said all loud "What are doing right now?" Antonio said "homework". She said, "That doesn't look like homework. You had better get over there right now and start doing it".
Here the regular school day teacher engaged in over-monitoring and hyper-policing, picking out Antonio from the crowd. Notably, the teacher criminalized Antonio when she had no impetus to do so. She had no affiliation with the after-school program, was not invited into the room, nor was there any discernable event to justify her intervention.

[Antonio] turned and walked to his seat, head low (he had gone to visit another student at the table next to him. He was looking over a kids shoulder watching him do his homework…at least six other students were doing similar stuff). The teacher then walked to where a staffer was standing and rolled her eyes (big roll) and said "Typical." The staff member said "Yeah" and let out a few short, staccato laughs. It seemed like the staff member was not comfortable agreeing with what that teacher was saying.

The school day teacher then followed the initial criminalization with the practice of labeling, suggesting Antonio must always be hyper-policing.

When he got to the table, Antonio put his hat on and then stared at his math worksheet for like 2 minutes. I thought it was badass cause he knows you can’t wear hats in the building.

Here Antonio engaged in a symbolic act of resistance. The storyteller suggests that Antonio did this as dignity work, saying it was badass that he put his hat on right in front of the teacher.

The teacher stared at Antonio during the whole time. After about 2 minutes, she walked back over to him and stood very close, towering over him and all that. She stood there for a moment then said, "Do it now." He said, I don't know how to do it. I’m pretty sure he knew exactly how to do it. She said loudly, “Yes you do!” and read the instructions aloud to him and then said “Now do it”. She had her hands folded over her chest the whole
time. She did not appear to be monitoring his actual calculations, only that he was writing on his paper when she said, "Do it".

The teacher continued her over-monitoring and hyper-policing, followed by attempting to hyper-control his body by ordering him to take specific actions while physically intimidating him. Antonio engaged in a conformist act of resistance, indicating he was attempting to comply but he didn’t know how to do the math (according to the storyteller Antonio did in fact know how to do it). This incited the teacher to further escalate her criminalization shouting at him that he does know how to do it.

After about 5 minutes, she started to look around more and more, then suddenly wandered off without saying anything to Antonio. A few moments after she left, Antonio quickly glanced up and looked all around the room to locate the teacher (she was all standing in a corner, using her phone - she left the room entirely shortly after that). When he saw she was gone, he totally relaxed his body, tilted his hat to the side and started doing his math work.

As the teacher left, Antonio ended the episode of interaction by again escalating his symbolical resistance tilting his hat to a position that I have witnessed staff have a more visceral reaction to due to perceived notions of the position indicating gang or drug sales affiliation. Antonio demonstrated academic resilience completing the math work he resisted doing in front of the teacher.

I was thinking why the hell did that teacher even come in here and what was she doing. It was like she came in just to put all that control and hate on that boy. It was like the worst thing I’ve seen happen in the program. I thought it was amazing how Antonio did all that
stuff like put his hat on and say he didn’t know how to do it and all and he’s only a 4th grader. Strong kid.

The storyteller finished this story highlighting the extreme nature of the criminalization and placed positive value Antonio’s acts of resistance (see Chapter 5).

This example demonstrates how over-monitoring, hyper-policing, interrogating, labeling, and controlling the body can all work together in one intense episode of interaction. These incidents of school-day criminalization in juxtaposition with the treatment boys of color received in the program affirms sets of patterns of criminalization acts of resistance-criminalization I found in my fieldnotes.

**Figure 5**

**Escalation Pathways**

![Criminalization-resistance pathways in disciplinary notes](image)

Criminalization-resistance pathways in disciplinary notes. Discerning the more complex patterns of criminalization and acts of resistance in the disciplinary notes was not always clear due to both the brevity and variance in detail of the notes. However, there was a pattern of hyper-criminalization of acts of resistance in the regular rhetoric of disrespect pervasive in the disciplinary notes of marked boys of color. Two examples of this pattern are:

1. a marked boy of color being suspended for purposefully not standing in line correctly after having been warned twice
2. a marked boy of color being sent home for not sitting in his chair properly after being ordered to do so.
These examples indicate that the boys were given specific orders which they refused to comply with and were subsequently severely punished, which fits a pattern of hyper-criminalization of acts of resistance. These conclusions require a higher level of inference due to the limited nature of the description of the events, but in juxtaposition with the evidence of these patterns in other sources of data, the interpretation of hyper-criminalization of acts of resistance in the disciplinary notes becomes stronger.

Finding (5)

*Staff at times engaged in certain sets of practices which disrupted the patterns of criminalization, which in turn led to changes and reductions in acts of resistance, an effect which was magnified in STEM settings.*

I identify this set of practices as *decriminalization*. Decriminalizing may initially be defined as the converse of criminalization – i.e. *not* engaging the criminalizing practices when the opportunities to do so emerge. Decriminalization in practice, however, appears to be more complex than just this. Based on my observations and analysis of stories, I further and expansively define decriminalizing practices as those rules, policies, words and actions put into play by an adult(s) who:

(a) reduced the need for and/or likelihood of criminalization and subsequent acts of resistance from occurring;

(b) identified and made visible criminalization and/or acts of resistance for the purpose of reducing their frequency and negative impact on boys of color;

(c) worked against the negative effects criminalization produce for boys of color.
These practices occurred often but erratically throughout the study, and their positive effects were magnified when in certain STEM settings such as small group, activity-based learning environments.

Staff, through stories and anecdotal statements, expressed general awareness that something negative was routinely happening to some of their boys, and that they may be sometimes participating in that system. This story demonstrates how one staff member engaged in the pattern while simultaneously expressing awareness that something was amiss:

[a staff member] pulled him aside. She asked him, “Why would you talk to [a non-program teacher] like that. That is so disrespectful.” [Another staff member] came in a bit later and began to chime in. I finished setting up and caught the last parts of the conversation. “But I didn’t do anything…” Antwon [a marked boy] began, then [the other staff member] said, “It’s your attitude towards a teacher. You don’t disrespect any teacher like that…ever.” [The first staff member] added, “You’re in 5th grade you should know better. Next year you’ll be going to middle school and you won’t make it far if you are acting like this. Middle school won’t accept that and then you might drop out of school.”…Afterwards, [the staff member] told me that [regular day] school took a toll on the boys. She even noted that she knew the boys didn’t like [that teacher] and that she gets it. Talking to me I could tell that she believed what she was saying but she also didn’t seem to have remorse about how she dealt with the boy’s resistance. It was like she thought the boys shouldn’t be treated the way she was treating, but that she had to treat them that way…

Based on data such as these, the program staff do not appear to engage in the criminalization of acts of resistance as frequently or with the same intensity as the school system
around them, although more research is necessary to substantiate this. I did regularly observe that staff had a general unwillingness to “finish” the pattern. That is, once the point of severe punishment was reached in the cycle, staff took any number of alternative pathways. This is particularly notable in these STEM learning environments because, as the staff member indicates, official and openly labeled tracking of students into different STEM classes – one of the most important gateways to further education – begins in middle school, although unofficial tracking practices may begin as early as kindergarten.

**Overview of decriminalizing practices.** Decriminalizing practices often disrupted the criminalization-resistance-criminalization negative feedback loop in various ways. I observed staff at times working to cognitively and purposefully discontinue some or all; and/or the severity of the direct and indirect criminalizing practices. At certain times I was also able to identify potential awareness of what they were doing and why (e.g. advocating against labeling in staff gatherings, working to guarantee access and participation in STEM learning particularly for boys of color, et.al.). Staff worked against and started to dismantle some of the systemic criminalizing practices as well, by actions such as granting access to spaces in the building otherwise denied or monitored during the school day (i.e. allowing students to use the bathroom unaccompanied and unmonitored). Staff also at times treated STEM learning as a civil right, structuring learning experiences as student-centered and unpolic ed, with purposeful access to all learning opportunities. This was sometimes accomplished, for example, in treating STEM supplies and equipment as a resource belonging to the program as a whole, including the students, not the elite property of the school. Boys of color in particular were often sent to acquire additional supplies that exceeded the initial allotments from various storage areas without justifying what they were going to do with the supplies.
As such, boys of color in particular were able to interact with artifacts unpolic ed and unhindered. Staff at times honored cultural communication methods specific to boys of color, including their vernacular, in celebrations of success and expressions of frustration. For example, a table group of boys of color would sometimes stand up out of their chairs at their workstation, becoming loud and exclaiming things like “Oh hellz yes!” when they made breakthroughs or found successes in their academic group work. In the science and engineering room this was often permitted without much policing.

Staff sometimes viewed acts of resistance as positive and healthy responses to oppression, and validated those acts by acknowledging them in positive ways. I regularly observed these and other decriminalizing practices at all three research sites. Using the iterative open coding methods described in Chapter 3, I have organized decriminalizing practices into six groupings:

(1) structural and procedural
(2) honoring space
(3) assuming brilliance
(4) highly respectful interactions
(5) positive reframing
(6) repair

I provided detailed descriptions and examples of each of these below of the ways in which each of these sets of decriminalizing practices worked to disrupt the patterns on criminalization-resistance-criminalization, followed by a summarizing table of the groupings.

**Structural and procedural decriminalization.** This type of decriminalization afforded two pathways of disruption to the criminalization-acts of resistance-criminalization pattern. First,
when adults utilized systemic and procedural decriminalization in the layout and general function of the physical spaces, adults afforded themselves reduced opportunities to engage in patterned criminalization such as demanding students sit upright, eyes front and everyone be perfectly quiet while the teacher delivers instructions; and the subsequently hyper-policing and over-punishing boys of color for not meeting these demands. Second, systemic and procedural decriminalization functioned such that, to varying degrees, acts of resistance (a) were afforded space to occur without further criminalization; (b) were less often directed toward the adults in the room; and (c) were finite and brief, allowing the boys to return to participating in classroom activities, etc. without further incidents.

As an example of this type of decriminalization, on several occasions staff set up the science and engineering room wherein there was no frontal teaching and no whole group direct instruction. Instead students went directly into small groups, having received set-up instructions from staff (who greeted them at the door) as they entered the room. Staff moved from table to table with further instructions and students began activity-based learning and peer-to-peer discourse immediately. The design of the lesson contained provisions for variance in the ways in which students conducted their inquiries and investigations, and they were self and small group-paced. Staff rotated from table to table guiding and interacting with students. Without the need to address the entire group, staff eliminated the common pattern of criminalization that often accompanies conducting whole group, teacher centered instruction. Additionally, with staff focused on the particular table group they were visiting at any given time, they had less opportunity to engage in over-monitoring and hyper-policing during the lesson.

This subsequently (and perhaps inadvertently) allowed some of the small acts of resistance from boys of color to become more covert in nature. For example, several marked
boys of color during these lessons would quietly step away from their table groups into unoccupied floor space and do things like jump up and down while spinning in a circle, take a tissue and rip it into tiny pieces over a trash can, sit in a comfortable chair they are not normally permitted to sit in, or take a pencil from the teacher’s desk to use despite having a higher quality pencil of their own back at their table. In all of these cases, the boys engaged in these acts without attempting to garner the attention of any adults or students and after a brief period (roughly 30 seconds to three minutes), they returned to their table groups as active participants.

When staff engaged in procedural decriminalization two general pathways of resistance existed: the normal and ordinary pathway toward the disrespect label; and an alternative covert pathway that generally went undetected and afforded students easy access to return to academic participation.

**Honoring space.** While procedural decriminalization permitted covert resistance to go un-monitored, I also observed times when in small group STEM settings staff did appear to be aware of the boys’ semi-covert actions and as one of the fellows described, chose to “keep a loose eye on ‘em” instead of criminalizing the resistance. In this example from my fieldnotes, a staff member makes a decision to permit a marked boy of color to engage in what the staff member later called “anger management”. By honoring space, the boy was able to engage in the non-disruptive act and still participate in the STEM learning activity:

Carmino took up scissors and at this table began aggressively snipping up a paper towel he acquired from the dispenser near him into tiny pieces. He did it continually for about 5 minutes. The staff member kept an eye on it "to make sure he was safe" but did not adjust anything about the teaching methods. The staff member honored the act [Carmino had just came from math where he had consistently been heavily hyper-policed]. He was very
focused on the task hunched over and snipping away quietly. The staff member was glancing over often, but quickly and subtly. When the next phase of the activity began, Carmino started to participate and the staff member immediately stopped by the table quickly checking in with all the students but not singling out Carmino in any way. The staff member treated him as if there was nothing different about him or what he had just done. Carmino participated in the activity indiscernibly to me from the other students at his table group and in the second half of the rotation he helped other students with several ideas on how to build a simple machine that could potentially solve the challenge the learning unit was framed around.

In cases like these, the outcomes were similar and the boys dedicated only a brief period of time engaging in their resistance and then returned to participate in the lesson. I referred to this and similar practices of maintaining awareness while affording boys of the color the opportunity to engage in those acts of resistance which do no harm to self or others as honoring space.

**Assuming brilliance.** This decriminalizing practice took place in the interactions between adults and boys of color. It is the premise that boys of color are brilliant in both conventional and unique ways, and that interactions are based on this assumption. When I observed and read in the stories of assuming brilliance in practice, boys of color almost always responded with positive academic responses. In the math room, where students were more likely to be doing paper-based work such as solving computational problems, assuming brilliance was rare, more erratic, and subtle in practice. For example, in a story written by one of the fellows, she wrote about a marked boy of color who is frequently labeled as “low performing”, “not so bright” and “unwilling to learn”: 
…in a different [math] rotation, Devarius took out his math homework and sat for a minute by two other students. He began to complain saying, “I don’t geeet iiiiiit”. Clarise [one of the students at the table] always enjoys helping others with their homework and begins to help Devarius. Clarise sets it up for him. She says, “ok Devarius, what is a number between 1-10”. He answers, “uhh 12”. Clarise: Noooo, try again. D: Uhh monkey. C: Ugh noo, here I’ll show you this one. This continues for a while until Clarise takes a break from Devarius and helps another student. At this point one of the staff who did not know what was happening stops by and says, “my dude, I know you can do this math cause you know how to do math and you good at math, even when you don’t know it yet. You hella smart every time I look at ya. ”. Devarius says, “yeah it’s easy”. The staff says, “you gettin board again?”. Devarius: “yeah...I just be entertainin myself.” When I looked at his work, it was way below his grade level like many of the boys in here get. Devarius solicited help from Clarise multiple times and ultimately got her to fill out about 25% of his math work. Then like a minute before the rotation is over Devarius blows through his homework while basically laying off the side of his chair and stretching out his arm to write. He told me he probably wouldn’t turn in his homework to his [regular school day] teacher cause she isn’t cool to him. Devarius is seriously a genius.

In this episode, the staff member who came by the table entered into interactions with the assumption that Devarius was intelligent and able to solve the math problems. Whether or not he had mastered that particular set of math problems was not the focus, but rather that he was brilliant at math and could absolute master it. In other examples when the boys didn’t know how to solve the problems or were stuck, staff that assumed brilliance when entering into interactions
with them typically led to the boys ultimately continuing to attempt the solve the problems, or to at times search out resources to help them, including other students. They were not always successful at solving the math, but it was a notable difference from the outcomes of times when staff or school-day teachers criminalized the boys.

In the science and engineering room, the practice of assuming brilliance was much more common and often led students to significantly and starkly different outcomes than the normal, ordinary criminalizing outcomes. In this example, a staff member wrote about what she observed in the science and engineering room. The lesson was oriented around the Rock Cycle. Students were working in small groups with various types of rocks at the table and large piece of construction paper. The task was to find a way to visual represent the rock cycle and how it works:

… when I passed by him, Marvin was slamming rocks together and breaking the edges off of them, leaving bits of rock on the table. He looked at me and said, "I broke it." I thought he was gonna get in trouble with the teacher and get kicked out again. It seemed like Marvin is always getting kicked out of the room. Before I could say something to him, the teacher quickly came up very close to Marvin and asked him what he was doing. Here it comes. Marvin said he was breaking rocks and put his head down. The teacher told Marvin in a like a happy voice, "This is great! Marvin, you made sediment! Now, can you figure out how to use it to make a metamorphic rock? I'll be right back to see what you come up with." Marvin looked up at me all happy, "Sedimentary is where all the dinosaur bones are." The teacher left and came back a few moments later after quickly visiting another table. As soon as she arrived Marvin picked up all the sediment and squeezed them together in his hands as hard as he could. After a few moments he
said, "You may wanna come back…this is gonna take a while." As the staff member smiled and walked away, Marvin shouted out very loudly, "Like in a gazillion years or so.” He then dropped the sediment and returned to hitting rocks together to make more of the sediment.

In this story, the teacher entered into the interaction with Marvin assuming he had done something brilliant (which he had). By doing so, she provided the space for Marvin to further demonstrate the unique method he was developing to represent the Rock Cycle. The alternative outcome, as the writer of the story indicates, was for Marvin to get kicked out of class for “destroying” school property and be denied the opportunity to continue to learn and complete the project. This example represents what the practice of assuming brilliance typically looked like in the science and engineering classrooms. The ways it disrupted the criminalization-resistance-criminalization cycle was magnified in this setting due to the robust problem-solving nature of the lessons, which themselves at times bore elements of structural and procedural decriminalization. And again, with the social status and gateway nature of science these opportunities to remain in STEM learning environments have the potential for profound longitudinal outcomes – an area for future research.

It is important to note that assuming brilliance is not the same as other rhetoric common in k-12 science around “raising expectations and they will meet them” but rather a shift in thinking about what a boy of color already knows and can do. In other words, it isn’t a way of expecting them to be brilliant and then they will be, but rather an authentic assumption that they are already brilliant.

**Highly respectful interactions.** Some staff in the program would at times address marked boys of color in particular using a distinctly different mode of language which included
body language, tone, and word selection. When staff engaged in this particular style of communication, they often presented themselves to the boys with relaxed stature and lowered shoulders, addressing them by sitting down next to them, crouching or lowering their bodies closer to the height of the boys. Volume was typically lower than normal. I would frequently hear staff using words and phrases more akin to the ways in which they address their own peers and colleagues. Examples include phrases such as “Would you be willing to help me clean the floor up?” rather than the normal “Pick up all this trash you left on my floor”. When using this practice, staff frequently offered logical explanations for why a regulation was in place, a request was being made, or rule was being enforced. I observed on several occasions staff offering more intricate explanations of rules to marked boys of color. In this example from my fieldnotes, a staff member approaches several marked boys of color who were shooting markers across the room into a corner space in the room:

At the start of the rotation, after students were organized into their groups, three marked boys began shooting markers without caps on them off their table (like a kick in paper football) into the open air and onto the floor. Staff members spotted the markers flying through the air and two of them went right to the table. The two staff members explained together that shooting those markers, although fun, wasn't a good idea because they didn't have an endless supply of markers, so they should try to use the markers up on projects and so what they have so they and the rest of the program always has good quality supplies. They also explained that choosing to shoot those things around could be dangerous, but also they could mark up their own and other students' nice clothes. They then asked the boys if they would be willing to agree to not shoot the markers, for those reasons. The boys all three agreed and staff members directed them immediately to the
first task saying, "I think you may enjoy looking at these lenses. What do you think?" The boys each grabbed one of the lenses from the table, and the staff members moved to visit other tables. The boys continued to exam the lenses and began experimenting with them as part of the lesson. They did not engage in marker-shooting or any acts of resistance, and remained interacting with vigor with the lenses the remainder of the rotation.

This example demonstrates and represents a typical episode of interaction in which staff used highly respectful interactions and its outcomes. In other examples staff asked boys for their opinions on procedures and listened to their answers. I observed the majority of highly respectful interactions in the science and engineering room which I suspect may be related to both the greater potential for structural and procedural decriminalization, and the types of learning taking place in those spaces. This is another place where further research would be beneficial.

**Positive reframing.** Positive reframing is a decriminalizing practice wherein adults respond specifically to an act of resistance in ways that suggest the act has positive value for the boy. These responses include celebrating the act and connecting the act to other valuable components of the boy’s life.

In an example from my fieldnotes of celebrating an act of resistance, a marked boy of color approach a staff member and asked if he could go to another room to acquire some tape for a project he was working on. The staff member told the boy he still had some tape left and it was probably just enough to finish. The boy returned a few moments later with an empty tape dispenser in one hand. Without saying any words, he lifted up his other hand which was wrapped in tape. The staff member laughed and told the boy what he just did was awesome:
Dang Jose, you always be one step ahead of me. I don’t like that you wasted the tape like that. You know how hard it is for us to get extra tape. But I admire your ingenuity. Can you run over and get more tape and be back in time to finish the project? Jose nodded and return just a few moments later with a larger tape dispenser. Out of curiosity I stopped by his table to look at his tape. I didn’t initiate a conversation but Jose looked up at me and told me the tape he just got holds much better. I observed this type of positive reframing only several times from different staff members, but in each instance the boy appeared to me to have a high level of energy afterward which he directed toward whatever he was working on at the time.

While examples such as this were more common, I only observed a positive reframing of an act of resistance to connect to other positive elements of a boy’s life a few times, but the instances I did observe appeared to have a significant impact on the boy. One example from my fieldnotes:

A staff member came in the room asking other staff if they had seen Marcus [a marked boy of color]. They all indicated they had not seen him. The staff member left. A short time later and about 5 minutes into the rotation, Marcus came into the room chest raised and walking slow. [I later learned that at the end of the last rotation, a different staff member got down close to Marcus’ face and started yelling at him for never following the rules the way he should.] A staff member asked him with a whimsical tone where he had been. Marcus shrugged his shoulders. The staff member said, “Well, we missed you. You always know exactly what’s going on around here and are very observant, so I’m sure you were late to math for something important. Why don’t you get your math out and come on over to my table. I’d love to work with you on it. Marcus didn’t respond but came over, sat down, took his math out and began working. As he worked over the next
ten minutes, he periodically put his pencil down and leaned back in his chair. The staff member sitting with him would follow his lead and similarly lean back and stop paying attention for a time. When Marcus returned to the work, leaning forward and picking up his pencil the staff member would do the same and rejoin assisting him. Marcus worked like that the rest of the rotation and appeared to complete all his math homework just as the rotation finished up.

Marcus was a boy who was known both in the program and in the regular school day to almost never complete his math homework, according to staff. As such, observing Marcus having engaged in what would normally be a heavily punished act of resistance that a staff member positively reframed, and subsequently completing his math homework was profound to me.

Positive reframing, like highly respectful interactions are alternative responses to acts of resistance and a practice that not all staff members employed. While there were overlaps of highly respectful interactions and positive reframing, I observed both of these practices happening both together and independently from each other.

**Repair.** In this last category of decriminalization, adults engaged in any number of the decriminalizing practices I have described above, but did so immediately after a criminalizing act had taken place. In these instances staff would suddenly realize or become aware they or others were engaging in behaviors that were having negative effects on or unfairly singling out boys of color. In these cases they typically ceased their actions or stopped the actions of other adults, and then engaged in one or more decriminalizing actions.

Repair was sometimes triggered by an act of resistance, other times by some other impetus I was unable to discern. On a few occasions, I suspect a staff member suddenly remembering that I or the program director was in the room served as that impetus. The
following example is from one of my science and engineering rotation fieldnotes. It took place in the middle of a multi-day, problem-based project in which students designed a way to protect an egg from various types of impacts:

… using a loud "teacher" voice for everyone's attention, the teacher asked several times and then did a 3-2-1 countdown. The students all responded to this and became quiet. The teacher asked the class to raise their hand if they heard the instruction to only use one sheet of foam and nearly all the students raised their hands. The teacher then turned to a marked boy of color sitting on the floor and told him loudly and sternly (so that the whole class could hear) that everyone else heard the instructions and that he should not waste materials like that and that he needed to pay attention to instructions. The teacher then said everyone should get back to work. Afterwards, the teacher suddenly turned and approached me and spoke to me in a different, softer tone explaining to me that, “…the crime of it all is that it shouldn't matter if a kid wanted to use an extra sheet of foam. If the budget just wasn't as tight as it is…” Then the teacher quickly turned away from me and went back to the boy and said, using the same softer tone, “Julio, you know what, it shouldn't matter that you used an extra piece of foam. It's no big deal. We just don't have enough materials for everyone because our program doesn’t get much money from schools. But that foam costs like five cents. If you need another sheet of foam for your awesome idea Julio you get another piece. I'll find a way to get more.”…At the end of the lesson the teacher spoke to me again: …“the kids just aren't engaged when they are forced to sit and be quiet and face front and write or something like that. But when we let them do science and solve problems, they are all engaged. And here I am yelling at a kid
for wanting to use materials to build his awesome idea. Hell, that foam belongs to him anyhow, not us. It’s his learning.”

In this example, after realizing his criminalizing approach to Julio, the staff member engaged in repair with highly respectful interactions, assuming brilliance, and naming and acknowledging disparities. I observed repair in many iterations on both the math and science/engineering spaces. I suspect that for staff, the awareness of criminalization is a vital part of both repair and all other forms of decriminalization. Once again, this is an place where further research would be valuable.

Repair was not always effective with regard to returning a student to academic participation. This appeared to be potentially related to either the severity of the criminalization preceding the repair or the frequency with which the individual staff member had engaged in criminalizing acts prior to the attempted repair. Despite this, I strongly suspect that repair still positively impacted the boys, although that fact that repair was the least impactful decriminalizing practice speaks to the power and impact criminalization has on boys of color.

Table 7

Summary of Decriminalizing Practices

<table>
<thead>
<tr>
<th>Category of Decriminalization</th>
<th>Definition (s) with examples</th>
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<tbody>
<tr>
<td>Structural and Procedural</td>
<td>Making changes to rules and the physical environment which reduce or remove the opportunities or impetus for criminalization to occur. For example, setting up a classroom small group activity such that as students enter, they may immediately begin interacting with items at their tables without having to wait or sit down.</td>
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This removes the need to demand silence for instructions and thus avoids a situation wherein hyper-policing frequently occurs.

**Honoring Space**

Providing and allowing boys of color the use of physical space to engage in acts of resistance which do not disrupt or endanger themselves or others nor destroy things of value in the classroom, or to reduce the likelihood of criminalizing practices or events. For example, allowing a student to walk back and forth (seemingly without a purpose) in unused space in the classroom during a small group activity.

**Assuming Brilliance**

Beginning an interaction with a boy of color assuming what he has already done or said, and what he is about to say and do are brilliant and intelligent. For example, a teacher coming to a science table and seeing a large rock broken into tiny pieces in front of a boy of color and assuming the boy just simulated erosion.

**Highly Respectful Interactions**

Interacting with boys of color using the same language and tone used for interacting with adult peers. For example, a staff member picking up trash alongside of a boy of color.

**Positive Reframing**

Using language and actions to change negative occurrences or moments with expected punishments.
into positive ones. For example, celebrating the engineering intensity of a boy of color who just broke a carving tool from pressing too hard as a valuable and wanted trait.

**Repair**

Purposefully engaging in any or all of the practices listed above after recognizing that criminalization has taken place – the criminalization could come from another adult, systemic practices, or from the same adult engaging in the Repair. For example, apologizing and naming the resource disparities which led an adult to aggressively interrogate a boy of color for using a sheet of construct paper from the closet to complete an engineering project.

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**Summary**

In this chapter, I reported a series of findings that revealed a pattern of escalation for criminalization and acts of resistance as normal, ordinary, everyday occurrences for marked boys of color, and these patterns work to deny boys of color access to STEM learning experiences. I also found that staff engaged in certain decriminalizing practices which not only disrupt this pattern, but also become magnified in their impact when employed in certain STEM learning settings.

These findings provide substantial insight into the lived experiences of some boys of color in elementary school STEM settings. They unveil and name elements of criminalization in
STEM education focused on a master-narrative of disrespect, which is congruent with practices research has identified in middle and high school settings. These findings also categorize the ways in which certain decriminalizing practices can disrupt criminalization, resulting in the potential restoration of access to STEM learning, a socially valued collective of skills and knowledge which serve as a gateway to further education.
Chapter V
Discussion

In this dissertation, I set out to investigate (a) what criminalization and acts of resistance looked like in an elementary after-school STEM program; (b) the ways criminalization and acts of resistance interacted with each other; and (c) the ways in which the program may disrupt some of the mechanisms of the school to prison pipeline. In this chapter, I first summarize my findings, and then connect them to academic literature and discuss interpretations. Next, I name the masternarrative surrounding boys of color in school and discuss the counternarratives my research has unveiled. I then discuss the importance, potential impacts, and implications decriminalization in STEM education may have. I conclude by considering how this research may influence the understandings of liberatory STEM education practices, and what future research building from this work may look like.

Furthering Understandings of Criminalization and Resistance

I found that in the after-school STEM setting in which I observed, criminalization of marked boys of color and their subsequent acts of resistance are normal and ordinary practices, and that they reacted to each other in ways that formed various pathways of escalation. These findings are congruent with the arguments of Noguera (2003, 2009), who identified that disparate treatments of Black boys begins in 4th grade, coinciding with subsequent declines in academic performance. Further, and congruent with Thompson (2011) and Langhout (2005), I regularly saw and identified criminalization in the stories told by staff members, in the disciplinary notes of students in the program, and in my observations and fieldnotes. I described criminalization in STEM education as both the processes by which boys of color are funneled into the school to prison pipeline and the practices by which boys of color are regularly and
consistently denied access to STEM learning. These included overly-frequent and excessively harsh punishments, hyper-monitoring, negative labeling, defaming, interpolating, controlling the body, severely over-punishing, and denying educational opportunities to boys of color. Some boys of color regularly resisted this criminalization. These boys became marked.

Historically, resistance theory has framed some of the types of resistance I observed as self-defeating (Akom et al., 2013; Solórzano & Bernal, 2001). For example, McFarland (2001) identified that White students engage in resistance for social benefits, while minority students do so to their detriment. Hand (2009) recognized resistance in middle school boys of color in mathematics, and while the actions seemed self-defeating to her, she called for future research to further illuminate the form and function of this resistance. Conversely, critical researchers (Langhout, 2005; Rios, 2011; Solórzano & Bernal, 2001) have taken a different perspective, identifying some of the ways acts of resistance serve students of color such as retaining control over their bodies and preserving dignity.

My findings continue this evolution of understanding acts of resistance from boys of color in STEM settings, suggesting that acts of resistance in which boys of color engaged, and the ways in which adults interacted and responded, make the story more complex. In escalation pathways, I regularly observed a pattern in which criminalization seemed to stimulate acts of resistance, which in turn were treated with increased criminalization. This pattern repeated itself in various iterations during my observations, and multiple stories articulated even more severe versions of the pattern taking place during the regular school day, a result verified by my analysis of school disciplinary data. These findings add a dimension of the ways we understand acts of resistance, how they may serve boys of color, and ways in which the education system continues to choose to respond to them.
Decriminalization

I identified five categories of decriminalization: structural and procedural, honoring space, assuming brilliance, highly respectful interactions, positive reframing, and repair. These practices afforded boys of color the respect, space and support necessary to function in school settings: i.e. to focus on learning science and mathematics, to be present and allowed to participate in STEM activities, and to engage in acts of resistance less often.

These practices were constituted in specific STEM learning environment which may have impacted (a) the kinds and styles of decriminalization which took place; (b) where they took place with the given environment; (c) the frequency with which they took place; and (d) the impact they had on students. In other words, STEM learning environments contain many unique components not found in other content areas. Activities from the examples above such as using optical lenses outdoors, grinding rocks together, and building simple machines provide certain contexts not typically found in other content areas. Criminalizing youth, especially for elementary-aged students, can have especially dire consequences for students interested in understanding the world around them through scientific perspectives. Students have the potential to take this knowledge and immediately apply it to their lives in liberatory and critical ways. Criminalization in STEM education thus may act as a catalyst to enacting and operationalizing racialized barriers to gateways in education pathways. These unique components create unique contexts and as such the decriminalizing practices employed by staff may not have the same impacts or effects outside of STEM learning environments, or may look different in non-STEM contexts. These are all potential areas of further research.

Future Research
The next steps in this research are to continue to look for these and similar practices in other contexts such as regular school day STEM settings and other after-school STEM programs. Simultaneous to this, I propose potential participatory action research into the development of informal or formal training in decriminalizing practices by both new and experienced STEM educators in various STEM learning contexts.

In one possible version of this work, I will bring together pre-service teachers of color (a version of the current fellowship) with veteran teachers of color recruited from multiple districts. In phase one, through a series of gatherings this group would discuss decriminalizing practices, and hypothesize extensions of them as well as other ways to employ them. The teachers would then over a period of time very purposefully implement them with their students. Through journaling they would record their experiences and observations – both how they felt as they implemented the practices and how they felt their students responded. In phase two, the group would reconvene and discuss their experiences and observations, further refining decriminalization. The teachers would then return to their teaching environments with further refined decriminalizing practices. This time, students would also participate in the assessment of the practices, perhaps being asked what they felt was different about the ways the teacher interacted with them than in the past, and how they felt. In phase three, after another gathering, teachers would hold small group seminars in which they discussed decriminalization (potentially using less potentially harmful language) and gathered feedback and information on how the boys of color want to be treated. Following this, and after another gathering, we would search for opportunities to for these teachers to begin to train their peers in these practices. This format of research may also be replicated with White teachers as well, potentially comparing results from the two studies. Through these next steps, I believe we may be able to expand, further delineate,
and ultimately replicate these decriminalizing practices, potentially across many different K-12 STEM educational settings, which I view as a hopeful prospect for our boys of color.

**Deconstructing the Masternarrative**

In education, there is a master-narrative of boys of color. This master-narrative is oppressive in nature; is an integral part of the systems and structures which make up the school to prison pipeline; and it is incorrect. It is focused on behavior and discipline (Langhout, 2005); and portrays boys of color as violent, unintelligent, lazy, unproductive, absent and disrespectful (Davis, 2003; Stinson, 2006). They are seen as only useful as commodified bodies either (a) to work in limited and controlled ways in STEM settings, only when needed, to the economic benefit of owners and operators of STEM enterprises (Basile & Lopez, 2015); or (b) to the profit of private prison industry enterprises as incarcerable subjects (Justice Policy Institute, 2011; Rios & Rodriguez, 2012; Thompson, 2012). In educational settings in which White, middle class, female teachers from outside of the community are the dominant educators of elementary school Black and Brown, working and lower class male students, the master-narrative works to maintain a racialized and hierarchical ontological distance between boys of color and their teachers. This distance is affirmed in many ways including educators using phrases like “these boys”, “my children don’t act that way”, “where I’m from they wouldn’t get away with any of it”, or similar statements which position boys of color as inferior in juxtaposition with Whiteness.

**Disrespect.** Prevalent in my research, iterations of the phrase “disrespectful” were a particularly problematic component of the master-narrative. It was used to justify multiple facets of the criminalization of boys of color, including punishment and control, which mirror prison treatment (Wacquant, 2001). In the last 30 years, the label of “disrespectful” has moved, through a school’s discretionary punitive powers, from a social and academic difficulty to a criminal
activity (Reyes, 2001). Disrespect is used to justify the need for boys of color to follow the commands of teachers and building staff regardless of how appropriate or extreme the command. It is used to justify the hyper-criminalization and escalation pathways of criminalization of boys of color.

A rhetoric of disrespect surrounded the marked boys of color in this research. The label was placed on acts of resistance, justifying the criminalization of those acts. The label also transcended acts of resistance to the bodies of the boys themselves. I saw this label of “disrespectful” pervasive in stories, my observations and the disciplinary notes of marked boys of color.

It may be tempting to take up an affirming interpretation of the disrespectful label. That is, one could take the excessive labeling of disrespect as evidence to affirm the masternarrative that boys of color are overly-punished because they deserve to be. There are several major problems with this line of thinking. When dealing with disrespect from White and female students, school systems tend to frame it as social difficulties, whereas for boys of color disrespect becomes a criminal activity (Reyes, 2001). This was the case in my findings. In consideration of this, we must then ask why there is such a disparate treatment of disrespect, which is now a national trend in education (Forsyth, Biggar, Forsyth, & Howat, 2014). One potential explanation is that disrespect has become a catch-all proxy for racialized ratchet-effect punishment – one of the mechanisms which drives the school to prison pipeline (New York Civil Liberties Union, 2007). In other words, there may be a difference between a disrespectful act and a disrespectful body in the eyes of the education system. As such, if the bodies of boys of color are consistently labeled as disrespectful, and being a disrespectful body is a criminal offense, then the major infraction becomes the existence of the boy of color – what one of my colleagues
referred to as *learning science while Black or Brown*. This further provides justifications for hyper-control of the body, and ties to the school to prison pipeline via the racial commodification (Basile & Lopez, 2015) of the male body of color by the prison industry complex (Fulcher, 2012; Thompson, 2012).

While this may seem a theoretical stretch, we can refer back to Rolando’s experience in the opening of this dissertation. His minor infraction was to zig zag in an empty hallway after school, which was punished by a school-day teacher. His major infraction, according to the masternarrative, may have been to dwell in a body of color. While the punishment was not revealed in terms of formal discipline, his body was ported away and the result – in effect, the greater punishment - was the denial of access to STEM learning - the highest valued gateway knowledge in our society - in which he **wanted** to participate.

Further, marked boys of color came to school as often and sometimes more often than their peers. If we place this fact in juxtaposition with the crime of dwelling in a male body of color, perhaps along with engaging in regular acts of resistance, marked boys of color may have also been marked simply because they were the male bodies of color who were consistently at school. In other words, if being a boy of color is in itself a crime, then just by showing up at school every day may be a contributor to why the marked boys of color were marked. When faced with consistent and continual processes such these, we may surmise it is no wonder that boys of color resist. We may even ask ourselves, “What did we expect would happen?”

My findings suggest that boys of color engage in acts of resistance for self-**serving** purposes. In understanding some of these purposes in juxtaposition with decriminalizing practices we may begin to develop a functional framework of teaching practices which assist boys of color in (re)gaining access to a rich and functional STEM education.
Critical scholars such as Akom, Scott, & Shah (2013) and Tan & Calabrese Barton (2010) among others have called for changes in the structure of STEM education such that it begins to take on relevance for students of color, that it functions in liberatory ways and that it embodies social justice. These changes are imperatives; however, they do not address that even if all of these changes were made to STEM curricula, STEM education would remain the property of Whiteness and continue to be delivered predominantly by White, middle class teachers who live outside of the communities they are teaching in. As such calls for an increase in STEM educators of color, from within the communities they teach are imperatives as well (Basile & Murray, in press). Complementary, and still a missing component, from these two vital changes necessary in STEM education, are the ways in which adults monitor and control access to STEM education for boys of color. Decriminalizing practices may begin to fill that void.

Identifying the decriminalizing practices and processes and their associated influence on decriminalization of boys of color in a STEM after-school program contributes important insights to our understanding of how such processes and practices may be replicated in other school day and after-school settings and as such, may have the potential to begin to disrupt the criminalization process, as well as reduced the ontological distance between White, middle class female teachers from outside the community and boys of color.

However, as educators we must be cautious in the ways we may wish to expand and generalize the decriminalizing practices I have identified. We may be tempted to begin to align decriminalizing practices to other teaching methods, classroom management tools, and best practices in STEM classrooms. That is, we may be tempted to claim these practices as effective for all students. This is problematic for three reasons. First, my research has focused on boys of color and as such there is no evidence to support that these practices hold the same efficacy or
impact on other students. Second, claiming these practices as positive for all students aligns decriminalization with the rhetoric of STEM-for-all, which has a history of erasing the lived experiences of students of color (Barton, 1998; Basile & Lopez, 2015). Third, claiming these practices as good for all students necessarily places Whiteness at the center, suggesting that we should consider using these practices in STEM classrooms because it is good for White kids also. The unspoken implication is that were decriminalizing practices not working to the benefit of White students, they would not necessarily be worth employing.

**Implications of decriminalizing practices.** The presence of decriminalizing practices represents a desire (and actions) to disrupt criminalization processes. That is not to say that the staff members actively and cognitively processed their actions in a criminalization-resistance-decriminalization framework, but rather they know something is not right in the ways the boys are treated and they were actively trying to do something different. This is important because as researchers, educators, activists, and humans we regularly assume that when we put forth potential ways to improve educational opportunities for student of color, that practitioners (a) recognize that there is a problem, (b) recognize that the problem is not with the child but with the system of which they are a part, and (c) actually want to make changes to the benefit of students of color. I suggest that these assumptions may be incorrect. As one staff member wrote about criminalization she witnessed by a regular school day teacher: “I was thinking why the hell did that teacher even come in here and what was she doing. It was like she came in just to put all that control and hate on that boy.” If we accept that teachers, like all of society, operate in and reproduce racism (Bell, 1992, 2004, 2005; Crenshaw, 2011), the fact that the staff members in the program were actively and regularly trying to change the experiences of boys of color is profound. That is, we may celebrate that the staff members were attempting to do something to
decriminalize boys of color. However, if we consider the context within which the staff members were working, i.e. historic and pervasive racism interwoven into the fabric of our society, and that there is little impetus or self-gain (it may even at times put a person at risk of physical, psychological or career harm) to actively pushing against this embedded racism in society and education; then we can see how the actions of the staff are much more significant. The actions become more than just advocacy for their boys of color. They become active measures combating the pervasive and systemic racism embedded in our education system. They also work to reveal counternarratives of our boys of color as thoughtful, present and brilliant students, eager to learn and do mathematics and science.

The counternarratives. In the data analyzed in this thesis, marked boys of color acted to retain control of their bodies and their dignity as normal human responses to oppressive measures. In examining youth (without heavy consideration to race) in other social contexts, scholars have described resistance as a normal response to oppression (Abowitz, 2000; Bourdieu, 2000; Giroux, 1981, 1983). Rios (2011) saw dignity work as a healthy response to criminalization, and one of the few modes of resistance consistently available to boys of color who are heavily criminalized in all aspects of their lives.

I propose a counternarrative of celebration, that our marked boys of color are resisting oppression and have not yet given in to the criminalization we levy upon them. Marked boys of color are brilliant. STEM learning settings provide unique and vital environments wherein boys of color can display their brilliance in many different ways. In many of the examples I presented in Chapter IV, boys of color demonstrated innovative and complex approaches to STEM content. Marvin, squeezing sediment together as hard as he could and after a pause telling the teacher to come back in a long while, demonstrated his understanding of metamorphic rock not only
kinesthetically but also with sophisticated wit. Arguably, this demonstration shows a deeper understanding of the process compared to his peers who did such things as glued rocks to a poster with arrows drawn between them. In other instances, marked boys of color completed math worksheets while subjected to heavy criminalization, even during days when many of their peers failed to do so.

Marked boys of color regularly engaged in academic resilience in STEM subjects. This suggests that marked boys of color want to learn and engage in meaningful and interesting academic activities despite the criminalization and oppression levied upon them. As one of the staff members told me, “They aren’t like that with reading and writing. They really like doing math probably cause they’re good at it. And they LOVE science. They love building all that stuff and solving all those problems. They brag about what they know.” As this staff member indicates, STEM learning is important to marked boys of color.

Marked boys of color appeared to be purposeful in many of their actions. One fellow proposed a hypothesis to me: “Ya know, everybody thinks them boys sit far away from teachers so they can get away from learning and to get away with more mischief. The more I talk to ‘em, I’m pretty sure they sit back there to try and reduce the volume of all that policing. Shit, if I was getting hit with all that crap, I’d sit as far away from it as I could too.” Likewise, staff members described situations where boys of color would not turn in completed math homework for weeks at a time even though they completed them all correctly. A staff member identified this kind of symbolic act of resistance as a powerful statement of “what is important to our boys”.

This counternarrative reveals a completely different story than the one that our educational system spins. It also creates a moral dilemma. If we accept this counternarrative, we must ask if the masternarrative is a problem in the eyes of our society. If it is, then we must ask
what are we doing to change it. Regardless of what the first part of the answer is, the second part of the answer is, “…but it isn’t anywhere near enough.” As such, we must face that every day, as a society, as a school system, and as individual educators we participate in systems that replicate this masternarrative about our boys of color and whatever it is that we are doing about it, it is insufficient. Of course, our boys of color are not helpless, and in fact many of them are empowered in ways their higher socio-economic White peers are not. They regularly resist their oppression, in powerful ways. One fellow described those ways as “badass” and the boys themselves as “strong kids”. From my research I add that the marked boys of color in the program are present, brilliant, dignified and academically resilient. Nonetheless, the moral dilemma still exists. And as my research also reveals, the staff in the program are doing something about it.

**Critical Race Theory**

In education research and literature, CRT has typically been used in sometimes rigid ways to (a) expose systemic racism including practices ignoring race; and (b) to support and develop variations of Culturally Relevant Pedagogies (Gutstein, 2009; Ladson-Billings, 1995; Leonard et al., 2009; Paris & Alim, 2014). These uses of CRT have made major contributions to education and education research, however traditional uses of CRT also present some limiting factors, including a somewhat rigid and delineated set of tenets which I described in Chapter II. In this research, I utilized CRT in more dynamic ways which informed my methodologies, such as the care I took in preserving the stories told by staff. Further, by foregrounding race throughout my research, I operationalized CRT in ways that privileged and prioritized the lived experiences of the students of color, and gave heavy consideration to protecting their well-being in ways not necessarily exercised by more traditional researchers. And while CRT does
recognize intersectionalities, it has not consistently foregrounded gender or within-group differences. As such, a more traditional and static use of CRT may not have unveiled that some boys of color were marked, while others were not.

CRT has traditionally offered little hope or direction for what we as practitioners and activists for social justice should and can do to incite and support changes. In this dissertation, I have taken up CRT as foundational lens by which I (a) validated my own positionality and lived experiences as necessarily vital to my understanding of what I bore witness to; (b) crafted an understanding of criminalization and the forces which undergird it; (c) connected criminalization and resistance to a historical racial context; (d) identified masternarratives of boys of color; and (e) unveiled counternarratives. Taking CRT beyond its more traditional uses, in this dissertation the counternarratives I identified were not static ones rooted in the constraints of the permanence of racism, but rather dynamic counternarratives which identified the healthy, positive and hopeful ways in which both boys of color and staff were pushing back in successful ways against and within the context of the permanence of racism.
Bibliography


Nunn, K. B. (2002). Race, crime and the pool of surplus criminality: or why the “war on drugs” was a “war on blacks.” *Gender Race & Justice, 381*.


Appendix A

Fieldnote sample

2.4.15_[SITE REDACTED]_VB

4:16pm Rotation 2

Before entering the science/engineering room, I saw and walked up near to a staff member interacting one on one with D’Angelo. He was sobbing, back against the wall hunched over. The staff member was facing him, leaned over and speaking to him softly. [As I approached, I thought D’Angelo may have been in trouble again] The staff member placed his hand on D’Angelo’s shoulder, his hand was more limp than tense and he did not clamp down on his D’s shoulder. When I got within earshot, I heard the staff member saying in a soft, higher pitched tone, “Why are you crying man? It's cool. You didn't do anything wrong.” D kept his eyes averted and low to the ground, refused to look up or answer. I started talking to the staff member, asking him how things were going today. The staff member said everything was great and that D’Angelo here was “absolutely killin it on this new unit.” D stopped crying and stood still. The staff member removed his hand from D’s shoulder and turned to face me. He said that he and D were just kickin out here so D could get square and get his A game back on. Out of the corner of my eye, I saw D lift his head just enough to be able to see us. His forehead has scrunched together like he was confused. The staff member looked me more intensely than he had been and asked me what I thought about the new unit and how everyone was doing. I interpreted this as a cue to keep the conversation going, and give D space. I told the staff member I was really excited about the unit. It looked like something the boys were gonna kick ass at, yet again. I followed the staff member’s lead as he slowly walked back into the classroom. D followed right behind us. The staff member and I turned right as soon as we walked in to be standing against the wall with
the whiteboard on it. D turned left and joined his group. When he got there, he lifted his head up and asked the group what they had been doing. The staff member then told me D had gotten mad and threw some scissors on the floor, and that the staff member had yelled at him “instinctively”. The staff member told me as soon as he yelled at D, he saw D’s face and realized he had done a bad thing, not a good thing. “So I took him outside like he was in trouble…and apologized to him,” he explained to me [It felt as though he were apologizing to me as well]. I told him it looked like D had bounced back, pointing to D’s table where he was laughing with his table group while cutting some foam down to size for his project.
This screenshot is an example of one of multiple reports I ran. These data allowed me to find patterns of occurrences, which ultimately led to identifying pathways of escalation.