

## **Black Spaces Matter: Post-Pandemic Culturally Responsive Trauma Approaches for Urban Black Youth**

Laurie Garo

*University of North Carolina at Charlotte*

Bettie Ray Butler

*University of North Carolina at Charlotte*

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### **ABSTRACT**

This study utilizes a mixed methods approach to assess trauma and Black student disparities within high adversity zip codes vs those in well-resourced settings. Spatial statistical mapping of trauma vulnerability by block group reveals where any student, irrespective of zip code, may be at greater risk for trauma from violence, racism, and/or other adversity. Outcomes for 2019-2020 school year are compared between four high schools of varied spatial trauma. Retrospective reflections discuss the traumatic impacts of the pandemic on two Black boys living in medium and low trauma zip codes. Results suggest that Black students do not necessarily benefit from access to high performing schools in well-resourced zip codes, and school management policies and practices may be a more significant predictor of Black student experience than zip code. Recommendations call for continued mixed method designs that amplify student voice in the quest for solutions to trauma in Black spaces.

**Keywords:** culturally responsive, urban schools, Black youth, education, racial trauma, inequality

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The 2020 dual pandemics of COVID-19 and racial injustice have forever changed how we view, understand, and address trauma in urban schools. During this crisis, countless youth will have been exposed to some form of traumatic stressor (e.g., witnessing home or community violence, experiencing a loved one's death, emotional

paralysis from horrific racial violence, and/or having suffered a significant loss of household income), with exacerbated trauma among Black students. Those students already faced with conditions of poverty and neglect are particularly hard hit. Researchers and practitioners (Maghzi, et.al, 2022; Bloomfield, et.al, 2022; Liu, et.al, 2022; Figley, 2021; Sedillo-Hamann, et.al, 2021; Navarro, 2020; Guessoum, et.al, 2020) across the nation have begun writing about the traumatic impacts of quarantine, virtual school and work, mental health, and navigating covid-related variants in efforts to return to in-person environments. Few, however, delve deeply into the pandemic-related traumas experienced specifically by Black students through a spatial lens, and the impacts on their academic and social-emotional outcomes. Such focus is needed given the disproportionate effects of the pandemic on Black child well-being (Browne et al., 2020; Lipscomb & Ashley, 2020). We are aware of the relationship between zip code challenges, trauma, and poor outcomes for those students living in homogeneously higher poverty zip codes (Estrada, et.al, 2014; Lewis & Moore, 2008; Walker & Smithgall, 2009; Tyler, et.al, 2010). Not all zip codes are demographically homogenous (ProximityOne, 2022), however, and many Black children live in urban and suburban settings of mixed race, ethnicity and income. They attend schools with better access to resources and higher academic achievement. Mickelson (2001) found that attending a school such as these is not a guarantee of positive outcomes for Black students. Many get resegregated into special education and suspended at disproportional rates. Given that Mickelson's study was conducted over 20 years ago, this study intends to take a fresh look into the experiences of Black students living in these mixed and upper income zip codes to evaluate the ways that Black children continue to be impacted notwithstanding their zip code of residence.

The literature on urban child trauma demonstrates a direct link between trauma and exposure to violence at any scale (home, neighborhood, police, community, school, etc.), with related effects on physical and mental health, brain development, and cognitive and behavioral abilities (Barbel, 2022; Bethell, et.al, 2014; Dye, 2018; Garo, et.al, 2018; Perry, 2007). Trauma can affect the students' capacity to focus on learning, and influence post-traumatic stress-related aggressive, defiant and/or depressive behaviors that may be misdiagnosed as AHDH (Perry, 2007) or misinterpreted as insubordination and punished with out of school suspension, arrest, and other marginalizing practices (Beasley, et.al, 2014; Butler, et.al, 2014). Studies also demonstrate positive youth outcomes for those living in areas of social and economic stability (e.g., middle and high median household income, home ownership, parental education attainment (CMS, 2018; Delmelle & Thill, 2014) and lesser outcomes for youth from neighborhood conditions of instability such as high percentage of persons living in poverty, largely rental properties, residential turnover, high rates of violent and property crime, and lesser access to nutritious food and healthy outdoor spaces (FIFCSF, 2013; Garo, et.al, 2018; Iruka, Winn & Harradine, 2014; Roy, et.al, 2014).

The research also reveals that racism affects physical and mental health and wellness (Alvarez, et.al, 2016; Butler & Garo, 2022; Comas-Diaz, et.al, 2019; Garo & Lawson, 2019; Walker, 2020). Black children growing up in predominantly White urban and suburban neighborhoods experience racist treatments that may also affect

behavior and learning in school. While we, as urban educators, know this to be true, our trauma focus tends to center on those children living in zip codes of predominant volatility and violent crime. Less attention is paid to the traumatic impacts of racism especially among families living in mainly well-resourced zip codes. The pandemics of 2020, however, have forced us to pay more attention to widespread trauma relating to isolation, job instability, loss of life associated with covid, and the mental health impacts of racism. Each of these occurs across zip code lines. Black, and other children experience trauma even within zip codes of wealth. We do not diminish the traumas associated with exposure to poverty and violent crime. These are evident in the research literature and require specific attention by school personnel. We do, however, bring attention to the fact that Black children and youth living among wealth and access, incur zip code trauma too. Their race, their brand of zip code trauma, that of fear and mental anguish, and their school experiences are intertwined. Their challenges are the focus of this paper.

To study this type of zip code trauma, we must look to smaller areas within zip codes because residential areas of stable and unstable conditions may or may not encompass an entire zip code. Smaller-scale geographies enable analysis of spatial inequalities that pose risk for child trauma, particularly for Black children and adolescents. In this study, we therefore examine Black child experiences in relation to zip code, school attendance zone, and block group. We define Black spaces in this study as anywhere Black children live so that we can evaluate risk for trauma at these varied spatial scales. We are interested in the following research questions:

1. How are neighborhood zip codes used to assess risk for trauma?
2. What are the lived experiences of two Black boys across zip code and block group in a southeastern region of the United States during the COVID-19 pandemic?

To address these questions, we utilize a mixed methods approach involving mapping of spatial inequalities in relation to risk for trauma, and retrospective reflections to capture the Black male student experience. Spatial statistical mapping of trauma vulnerability by block group is developed and explored to determine where any student, irrespective of zip code, is at greater risk for trauma from violence, racism, and/or other adversity (e.g., poverty). Through spatial modeling, we establish trauma vulnerability by block group just prior to the pandemics and compare school outcomes for 2019-2020 school year between four high schools, two categorized as high poverty, one moderate poverty and one low poverty. Given data limitations for understanding zip code trauma for Black students, a qualitative approach using retrospective reflections is then carried out to better understand the traumatic impacts of the pandemic on two Black boys living in a medium and a low trauma zip code.

## **LITERATURE REVIEW**

The study of zip code trauma has implications for urban education, thus an understanding of what constitutes “urban” is important. Urban schools are generally characterized by issues of size, diversity of peoples, economic disparity, students with

health problems, transportation difficulties, administrative inefficiencies, shortage of qualified teachers, and teachers/administrators who are socially, culturally and economically isolated from their students (Kincheloe, 2007). In spite of these challenges, urban schools house a student body rich in diversity and creative intellectual potential. As urban educators, we must understand the challenges these children face, but in ways that enable and empower their scholarly creativity.

What are these challenges? Urban schools tend to be large, often overcrowded; growing faster than resources can keep pace. Many have segregated populations due to the often-segregated nature of housing in urban areas. “A segregated inner-city school is almost six times as likely to be a school of concentrated poverty as is a school that has an overwhelmingly white population” (Kozol, 2005, pg. 20). Factors associated with poverty that may interfere with student performance in school include inadequate health care and nutrition, stress-induced physical and substance abuse and other family dysfunction, neighborhood crime and violence, language barriers, teen parents, teens who take care of siblings or have to work, transience within the family, and lack of family involvement in school (Haberman, 1995). Segregation in low to poverty income schools affects the academic outcome for lower income, Black [and other minoritized] students, thus plays a major role in maintaining the racial academic achievement gap (Mickelson, 2001). Even in more integrated middle and high schools, Black students tend to be re-segregated through tracking into lower rigor and special education courses, limiting their access to the higher quality education given to white students. (Mickelson, 2001). Compared with suburban schools, segregated urban schools have fewer qualified and experienced teachers, fewer resources, less “gifted”, and more vocational curricula, and differential (lower) per pupil spending (King, 2005; Kozol, 2005). Curricula for standardized testing, lowered expectations and tracking does not honor the cognitive abilities of urban youth coming from lower economic class and non-white backgrounds. (Kincheloe, 2007) Urban environments are characterized by growing information technology-based economies that require higher levels of education and training than previous manufacturing economy, leaving those with lesser education to take minimum wage jobs. Corporate globalization thus affects low income urban families who increasingly live in poverty conditions that include overcrowding, lack of medical care, loss of extended family, long work hours that lead to child neglect, difficulties affording childcare (yet loss of benefits if the mother chooses to stay home and take care of the children), low satisfaction-high stress jobs that may induce aggression at home, environmental stresses that increase crime and violence, lack of access to cultural enrichment and recreation, and racial discrimination (Goldfarb, 2007).

These various descriptions and definitions of urban, mostly negative, create an expectancy among too many that the “urban school problems” lies with the students and their families. Recommendations and solutions are sought to “fix” them rather than the systems in which they live and are affected by (Milner, 2012a). There are, rather, a myriad of social and systemic forces that shape the lives and wellness of children and families attending urban schools. Addressing these systemic forces is urgently needed. Milner (2012a) advises us to incorporate “caring” into our research such that we understand the mental health consequences on the children (and families), and to incorporate solutions that include healing and transformation.

Charlotte, North Carolina, contains many of the above challenges. The city is highly segregated by race/ethnicity and income. Over the years, the city boundaries have expanded to encompass suburban areas with fewer challenges. The Charlotte-Mecklenburg School system (CMS) serves both city and suburb, thus to illuminate zip code trauma and urban schools in CMS, we need to understand the urban characteristics of this socio-economically diverse city. To this end, we look to Milner (2012b) conceptualizations of “urban”. Milner (2012b, p 560) conceptualizes three categories of urban:

Urban Intensive: These are large metropolitan areas of 1 million or more people, highly populated, high density, and with social inequities relating to income and poverty. Housing and transportation present challenges in providing sufficient resources and services to urban intensive schools. Such cities include New York, LA, Chicago and Atlanta.

*Note*: Charlotte now has over 1 million people (2020 Census) thus Milner’s (2012b) conceptions may need to be revisited. He noted them as talking points that can be revised. Otherwise, cities like Charlotte might move up in classification.

Urban Emergent: These are also large cities but not at the same magnitude in terms of numbers of people and density of built environment as those in urban intensive cities. They face similar socioeconomic issues as Urban Intensive cities, but to lesser extent. Cities such as Charlotte (now over 1 million in population as per the 2020 census), Nashville, Columbus, Ohio, and Austin Texas fit within Urban Emergent.

Urban Characteristic: This third category is in reference to smaller cities, rural areas and suburban districts that experience some of the challenges found in urban emergent and urban intensive environments. These might include comparatively large numbers of families in poverty, and English language learners.

In our study, the City of Charlotte fits within Milner’s (2012b) Urban Emergent category, based on its 2012 population. For purposes of this study, we use Milner’s (2012b) categorization of Charlotte as Urban Emergent for schools in Charlotte’s central city. Charlotte’s boundaries have expanded to assume such suburban areas as Huntersville, Mooresville, Mint Hill and Matthews; these suburbs are encompassed within the Charlotte-Mecklenburg Schools (CMS). The suburban schools, however, are situated in areas more closely matched with Milner’s (2012b) Urban Characteristic category. We thus reference both Urban Emergent and Urban Characteristic as we discuss urban trauma and impacts on Black children. We return to these classifications in describing our study methodology, discussion and recommendations.

## **Urban Schools, Coronavirus and Variants, and Trauma**

Urban schools have the ability to foster an optimal environment for academic achievement, health and wellness, and positive youth development through provision of social-emotional supports (counseling and related programming), nutritious meals, access to physical activity (recess, physical education classes, in-class and after school activities) (Calvert, et.al, 2022) and provision of academic curricula and technology assistance. While potentially available to all schools, resource and policy issues often limit the ability of schools serving high poverty communities and minoritized racial and ethnic groups to provide these services sufficiently to meet the needs of their students. The onset of COVID-19 and the overnight transition into virtual learning affected all students, yet exacerbated these resource and service inequities for those living in high poverty-high trauma zip codes (Butler & Garo, 2022). Health and wellness, and technology supports were particularly challenging. Children and adolescents of all backgrounds experienced emotions ranging from fear and anxiety of getting sick, and of impacts of job loss on family resources, to loneliness of isolation, depression from missed socialization, and grief from loss. These were compounded by physical and mental health decline due to lack of physical activity, poor nutrition, too much technology, and irregularities in sleep. Domestic violence increased as a result of added economic stressors, making home life unsafe for some, and with no escape. Academic challenges relating to technology added to student stress (Butler & Garo, 2022). Students with disabilities and/or housing instability, and those with existing incidences of Adverse Childhood Experiences, post-traumatic stress disorder, and other mental health diagnoses faced even greater challenge (Guessoum, et.al, 2020; Lipscomb & Ashley, 2020).

Teachers and administrators across the nation, while experiencing their own personal covid-related traumas, stepped up to address student academic and health and wellness concerns as best they could. A study by Calvert, et.al, (2022) zoom-interviewed 50 staff members from 39 mostly urban, predominantly moderate to high poverty elementary schools, during the period of transition to online learning. Meal provision was a major priority. Great effort was made to provide continued nutrition to students in need via “grab n go” meals at designated pick up locations or through school bus delivery. Wellness resources such as yoga, mindfulness and relaxation videos were provided on virtual learning platforms. Counseling occurred online, and staffs have maintained connections with families using virtual platforms as well as home visits. Many schools struggled to quickly obtain and learn virtual classroom platforms. Once established, technology assistance became another priority task. Much effort went into providing laptops and internet access via hotspots issued to families or set up in parking lots (Calvert, et.al, 2022). While their study confirms school awareness of issues and willingness to help, it fails to acknowledge the vast numbers of students who were further marginalized in spite of the aforementioned efforts. The literature also lacks data on the extent of education setbacks for children whose learning was either supervised by parents who were overwhelmed by their own switch to work at home while teaching; nor those students who had to teach themselves while parents still had to go to work. We don’t know their emotions nor their outcomes. And less is known about those students living in harsh conditions

such as housing transiency or extreme domestic dysfunction. Furthermore, upon returning to in-person learning, schools had to utilize hybrid teaching to work around coronavirus variants that keep people sick and hospitals overwhelmed. Thus, at the time of writing, we are not yet out of the pandemic and not fully able to assess the impact of the pandemic on the state of our children's education.

## **Racial Trauma**

The racial injustices of 2020 have brought national and global attention to the traumatic impacts of racism. Spatially, racial discrimination and race-based incidents can occur in Black spaces, irrespective of zip code, with consequences for health and wellness. Walker (2020, p. 70) notes that "...racial discrimination is psychologically and physically harmful to Black people". Race-based traumatic stress may occur as a result of "(a) an emotional injury that is motivated by hate or fear of a person or group of people as a result of their race; (b) a racially motivated stressor that overwhelms a person's capacity to cope (c) a racially motivated, interpersonal severe stressor that causes bodily harm or threatens one's life integrity; or (d) a severe interpersonal or institutional stressor motivated by racism that causes fear, helplessness, or horror" (Bryant-Davis, 2007, p. 135–136; Garo & Lawson, 2019). As with posttraumatic stress from acts of violence, racism and race-based incidents can cause persons to feel unsafe, resulting in hypervigilance or fight-or-flight (van der Kolk, 2014; Walker, 2022). A key difference between racism and other acts of violence is that with racism, the Black person does not have to be the actual victim in order to have a hypervigilant response (Driver, 2022). The world-viewed video of George Floyd being suffocated to death by a Minneapolis police officer sent chills around the globe, yet for Black people, there is the added fear that it could happen to them too. This, coupled with other ongoing acts of racism and racial microaggression, make it difficult for Black people to relax and rejuvenate in all spaces. When a Black person remains in a chronic state of fight or flight, it can lead to physical and mental health problems, as the human body is not meant to stay hypervigilant for long periods (Walker, 2022). There are "...positive associations between internalized racism and cardiovascular disease, diabetes, psychological distress, alcohol consumption, lowered self-esteem and a lack of socioemotional development among the children of mothers with internalized depressive symptoms, and other health problems" (Bryant-Davis & Ocampo, 2005 in Garo & Lawson, 2019, p. 50).

Structural racism contributes to racial trauma through policies and practices that inhibit access to physical and mental healthcare, equitable education resources, day to day living (e.g., housing, employment, transportation), and financial supports. This form of racism works to lessen individual, family and community resiliency to racial trauma (Garo & Lawson, 2019).

Historical or Intergenerational trauma are those encounters that are race-based in origin, and experienced by prior generations. When left untreated and unhealed, such trauma can be passed on through behaviors that may serve as coping mechanisms for the traumatized, yet inflict harm onto loved ones. Historical (or collective) trauma may manifest in several ways including substance abuse and addiction, self-hate or internalized oppression, child and other domestic violence, post-traumatic stress

disorder, and related mental health issues such as depression, anxiety and suicidality (Unity Inc., 2022). Historical trauma may be present in all Black spaces, exacerbated by ongoing racial discrimination and race-based incidents prior to and during the pandemic. These can affect in-school behavior among Black students. Now, more than ever, culturally responsive approaches that center healing and wellness are needed in schools to help students manage posttraumatic stress-related behaviors and experience positive school outcomes.

### **Spatial Analysis of Trauma**

Spatial Analysis enables the discovery of patterns and relationships among spatial data (Garo, 2017). The mapping of spatial inequalities is a useful analytical tool for demonstrating differential access to wealth and services between locations. Maps can reveal areas of unequal access to education, healthcare and other social services. Likewise, effects of spatial inequality on human health can be visually represented for problem solving purposes (Garo, et.al, 2018). COVID-19 cases are an example of data that has been collected and mapped by zip code. Peretz, e.t.al, (2020) documented a study conducted in New York in the early days of the COVID-19 outbreak in which 8 of 10 zip codes with the highest numbers of cases were home to low-income Black, Hispanic and Asian families. As a result, additional healthcare assistance was sent to these areas in the form of community health workers and other health-related community-based organizations. This and other types of spatial analyses are made possible through Geographic Information Systems (GIS), a software that handles locational information and characteristics or attributes related to mapped features (Garo, 2017). GIS has been used to study community issues relating to public health, resource allocation, city planning, and proximity to social services, including for those with mental health challenges (Siegal, et.al, 2021; Townley et al., 2018). Berkowitz, et.al, (2020) used GIS to establish a link between highly segregated and structurally vulnerable neighborhoods and COVID-19 morbidity. GIS and spatial analysis are used in this study to model and assess block group trauma vulnerability (Garo, et.al, 2018) and to evaluate spatial variations in school outcomes by zip code.

### **Context of Study**

The present study explores the lived experiences of two Black boys (DJ and Jeremy), situated in two separate zip codes, navigating through the COVID-19 pandemic. Using spatial mapping and retrospective reflections, the authors (i.e., the grandparent of one participant and the parent of the other participant) capture some of the unique challenges Black students, boys especially, encountered while enrolled in urban schools in the year 2020 and 2021—a period marked by mask mandates, social distancing, virtual education and heightened risk of trauma in well-resourced zip codes.

### **Spatial Boundary Definitions**



In the study of zip code trauma, it is important to understand the capabilities and limitations of spatial analysis when representing individuals and groups within human-determined boundaries. Grouping of individuals within human geographic boundaries generalizes everyone within the boundary as if they all share the same characteristic. Additionally, data collected within boundaries characterize a specific moment in time while these variables may be constantly changing. In this study we reference data within zip codes and block groups for understanding spatial patterns of trauma.

Zip codes are postal boundaries established for mail delivery. Street addresses include zip codes, making them an easy way to match the same individuals across different data sets. Everyone is familiar with zip codes; thus, they are a logical boundary for the study of school outcomes by location. In terms of geography, however, zip codes have several drawbacks when it comes to studies that require demographic data. Some zip codes are related to PO boxes where people do not live. Zip code boundaries are not aligned with any other boundary and can change at any time making longitudinal analysis problematic. Large zip codes may differ demographically across space, making it easy to overlook populations in need of services. Within a large zip code, for example, there may be pockets of poverty that get ignored by assuming the zip code is one of wealth (ProximityOne, 2022). And census data are not collected and recorded by zip code.

The US Census Bureau uses more consistent and geographically logical boundaries to define unit areas in which census and other data are collected. Census tracts are the largest geographic unit, followed by block groups and then census blocks. The smaller the unit, the easier to establish homogenous areas for purposes of demographic analysis, however, block groups are often used for local, within-city or within-county analyses. Data are collected for these boundaries every 10 years, with projected data calculated annually based upon percent growth or decline per unit area. Benefits of census tracts include: entire US coverage, alignment with county boundaries, exact known area measurements; smaller and more homogenous populations for data analysis purposes; and boundaries are stable enabling time series analyses (ProximityOne, 2022). Unfortunately, many disciplines are not well-versed with such boundaries, and census data access and use require specialized skill (e.g., GIS) or instruction. While census boundaries tend to be overlooked in many studies, it was especially important to include within the present analysis.

### **Participants: DJ and Jeremy**

At the time of the study, the male participants—DJ (age 5) and Jeremy (age 9)—were both in elementary school. During the first quarter of 2020, DJ was in kindergarten and Jeremy was in the 3rd grade. As the pandemic persisted through the fall of the same year, DJ started 1st grade with a combination of in-person and virtual education, also referred to as hybrid instruction. DJ participated in face-to-face learning two days of the week, with the remaining three days designated towards online learning. DJ's schedule continued in this manner through spring 2021. Similarly, Jeremy started 4th grade participating in hybrid instruction; but, would

later shift completely to full online learning. After October 2020, Jeremy engaged in virtual education until the end of the academic school year (i.e., spring 2021).

Apart from the variation in educational delivery models, DJ and Jeremy’s schooling experiences differed in noticeable ways. DJ attended a tuition free K-8, urban emergent public charter school. He participated in general education programming wherein he was educated with his peers 100% of the school day. Academically, DJ is considered gifted. His strongest subject area is reading. DJ is a quick learner, but has a short attention span so he relies on an active learning environment to stay focused. Behaviorally, he is both charming and energetic. Overall, his behavior was considered appropriate for his developmental stage. Jeremy was enrolled in a magnet program and attended a Title I K-5, urban characteristic STEM school. Jeremy also participated in general education programming. While he was educated the majority of the school day alongside his peers, twice a week for 20 minutes he participated in group speech therapy. Academically, Jeremy is considered an average student. His strongest subject is math and science. He is highly skilled in technology. Jeremy, however, is a kinesthetic learner who needs opportunities to practice content through hands-on application in order to retain information. More importantly, he relies heavily on positive affirmations from his teachers to remain actively engaged in the classroom. Behaviorally, he is mild-mannered and easy-going. Overall, like DJ, Jeremy’s behavior is considered appropriate for his developmental stage.

With regard to social context, DJ comes from a single-parent household. He resides within the city boundaries primarily with his biological mother and has no live-in siblings. DJ regularly engages in extracurricular activities with his grandmother, but has never been a part of any organized sports or social groups. Jeremy, on the other hand, comes from a two-parent household. He resides in the suburb of the city with his biological mother and father, as well as, his younger sister. Prior to the pandemic, Jeremy was heavily involved in organized sports (i.e., basketball and flag football) and actively participated in youth groups through his local church. During the pandemic both boys received free breakfast and lunch at school, but Jeremy would have been ineligible for free/reduced meals otherwise.

The zip codes in which DJ and Jeremy reside represent two separate urban neighborhoods located in the southeastern region of the United States (US). DJ’s neighborhood zip code, 28213, is categorized as urban *emergent*. It is situated within a large, metropolitan city (Charlotte, North Carolina). According to the 2020 census (US Department of Commerce, 2022), this city has a population of about 874,579 individuals. Jeremy’s neighborhood zip code, 28078, is categorized as urban *characteristic*. It is situated within a suburb of a large, metropolitan city (Huntersville, North Carolina). According to the 2020 census (US Department of Commerce, 2022), this town has a population of approximately 61,376 people.

**Table 1: Similarities and Differences between Study Participants**

Characteristics	DJ	Jeremy
Personal		

Gender	Male	Male
Age	5 years	9 years
Race/Ethnicity	Black	Black
<b>School</b>		
Level	K-8	K-5
Program	Charter (Tuition Free)	Magnet (STEM)
Type	Public	Public
School Services	---	Speech Therapy
Locale	Urban Emergent	Urban Characteristic
<b>Home</b>		
Type	Single-Parent	Two-Parent
Free/Reduced Lunch	Eligible	Ineligible
Live-In Siblings	No	Yes
Social Networks	No	Yes
Locale	City	Suburb

## **METHODS**

This study used a mixed methods research design that combined spatial modeling (quantitative) and retrospective reflection (qualitative) to examine zip code trauma. By using both qualitative and quantitative methods, we were able to detect spatial disparities to explore the relationship between trauma vulnerability, student outcomes, and home address. Moreover, we were able to supplement data with reflections drawn from DJ and Jeremy’s lived experiences to demonstrate the extent to which Black boys living among wealth and access experienced trauma during the pandemic.

### **Data Collection**

Quantitative data was collected from the Charlotte-Mecklenburg *Quality of Life Explorer* (Metropolitan Studies Group, 2021) to aid in spatial modeling. This data tool looks specifically at the social, housing, economic, and environmental and safety conditions in Charlotte, North Carolina and surrounding areas—including Huntersville, North Carolina. In using this data, the authors were able to map out trauma vulnerability based on the following neighborhood zip codes: 28213 and 28078.

Qualitative data was gathered through retrospective reflection using participant memory. Retrospective reflection is a conscious, collaborative attempt to

systematically explore a phenomenon by re-examining key themes surrounding a past event in order to learn from it (Krogstie, 2009, p. 418). We (the authors) engaged in a series of critical dialogue through video conferencing and standard phone calls, between 2020 and 2021, and discussed the impact of the pandemic on urban youth. During each discussion, we spent considerable time sharing how the participants (DJ and Jeremy) were coping through the pandemic academically, behaviorally, and socioemotionally. In the spring of 2022, we met on three separate occasions for a minimum of one hour to recall and collaboratively record our reflections of the previous conversations and observations we had pertaining to DJ and Jeremy's experiences with managing school work and their well-being during the pandemic. This form of reflection-on-action (Schön, 1987) allowed us to thoughtfully consider DJ and Jeremy's trauma exposure and identify ways to mitigate its effects.

### **Spatial Modeling: *Trauma Vulnerability Index***

Spatial modeling involves calculation of phenomenon based upon multiple data collected within specified boundaries. The modeling in this study involved a weighted aggregation of socioeconomic data to determine local vulnerability or risk for youth to experience trauma, named the Trauma Vulnerability Index (TVI). Garo (2017) developed a TVI per neighborhood profile area [block group] for Charlotte-Mecklenburg with data from the Charlotte Quality of Life Index, 2014. Quality of Life variables are derived every two years from other data sources (e.g., census, police, school, health, social services, etc.) within block groups. This provides a wealth of data for analysis and longitudinal study on factors impacting the city residents' quality of life. Earlier years contained fewer data variables and covered Charlotte but not the entire county. The initial TVI was calculated for four time periods using violence exposure and susceptibility to trauma but did not encompass resiliency as there were few statistically suitable resiliency variables available within the time series data. TVI for this study is modified from the 2014 version to include Quality of Life data collected for 2016 through 2020, and resiliency data from a 2016 study conducted by the Charlotte-Mecklenburg Schools (CMS, 2018).

The variables selected for modeling trauma vulnerability were patterned after natural hazard modeling by Hagenlocher, et.al. (2013). Their model incorporated variables for exposure to the hazard, factors influencing residents' susceptibility to, and resiliency from the hazard. Their model is calculated as weighted aggregation of Exposure + Susceptibility – Resiliency.

For trauma vulnerability, the following variables were substituted for Exposure, Susceptibility and Resiliency:

#### ***Exposure***

The Violent Crime Rate serves as the exposure variable. The rate represents violent crime incidence in relation to neighborhood population and is calculated as a rate to indicate the number of violent crimes occurring per 1000 persons per neighborhood (Metropolitan Studies, 2021). Exposure to violence is linked to trauma and posttraumatic stress disorder (CWIG,

2015; Perry, 2007; van der Kolk, 2014), thus serves as an appropriate variable for the model.

### ***Susceptibility***

There are three susceptibility factors that contribute to a person's lack of resilience to trauma, thus greater susceptibility to be traumatized by violence. These three variables were weighted using factor analysis, and then aggregated to form the susceptibility variable in the model.

### ***Percent Receiving Food and Nutritional services (FNS)***

Determined by income and family size (Metropolitan Studies, 2021). Families must earn below 130 percent of the poverty line (Center on Budget and Policy Priorities, 2017). FNS serves as a poverty variable. Stressors of poverty make it difficult for families to support children and are thus known to affect child health and wellness (FIFCSF, 2013; Iruka, Winn & Harradine, 2014).

### ***The Adolescent Birth Rate***

Calculated as the percent of all births born to females under age 19, represents teen pregnancy. Teen parents are at greater risk for dropping out and facing various social, economic and health challenges that affect the health and wellness of their child (Metropolitan Studies, 2021).

### ***Percent who Identify as Non-Hispanic, Black or African American***

This variable represents persons at great risk for experiencing racial trauma. Black families provide resiliency through strong kinship networks (Galster & Santiago, 2006; Iruka, Winn & Harradine, 2014), yet Black children and adolescents encounter racism outside their neighborhood, at school and in communities beyond their own. Their exposure to police and other violence and acts of racial and social injustice further exacerbates racial trauma, (Ginwright, 2016; Johnson & Taliaferro, 2011; Skiba, 2013) especially for those already exposed to multiple and chronic trauma-related risk factors (Adams, 2010; Perry, 2007). Neighborhoods with a high percentage of Black residents represent spaces most likely to experience racial trauma.

### ***Resiliency***

Variables that strengthen resilience to trauma help children and families remain strong and healthy in the face of traumatizing adversities. Two variables were selected to represent resiliency; these were weighted with factor analysis, and aggregated to form "Resiliency" in the model. Given

that resiliency strengthens resistance to trauma, this aggregated factor is subtracted from the aggregate of the exposure and susceptibility variables. (See also below).

In 2016, CMS developed a Socioeconomic Status (SES) variable per block group using data from the US Census, American Community Survey (ACS). Their index aggregated the following data (CMS, 2018, p. 1)

- English Language Ability (i.e., whether or not English is spoken very well in the home)
- Family Composition (i.e., is the home a single or multi-parent home)
- Family Income
- Home Ownership
- Parental Education Attainment

These factors, when combined, identified block groups with predominance of either low, medium or high SES. Student addresses were geocoded within block groups per school attendance zone, and then the total numbers of low, medium and high SES students were determined for each school. Likewise, all schools are given a School Poverty Status (low, medium, high) based on the dominant SES group within the school. This unique type of spatial study would not adequately represent SES groups with zip codes.

The SES per block group was utilized as a resiliency factor in the calculation of TVI for this study. Block groups designated as Low SES were assigned a value of .33. Moderate SES block groups were scored with .66, and High SES block groups received a value of .99. The higher the SES, the more resilience to trauma, based upon socioeconomic status. The value for SES was weighted and aggregated with a Prenatal Care variable from the Quality-of-Life Index. Prenatal care is a measure of health for mothers and infants. Without prenatal care, the infant faces more health risks which can eventually affect the child's school outcomes. SES and Prenatal Care were thus weighted and aggregated to form the resilience factor. Resiliency was subtracted out of the weighted aggregation of Violence and Susceptibility such that the higher the SES (more resilience to trauma), the lower the overall TVI score.

The above variables passed statistical tests for normality, skewness and kurtosis, and multicollinearity. For final modeling, each variable was normalized to values between 0 and 1, enabling the aggregation (addition) of data collected at different scales. Normalization was done using a Min-Max equation (Hagenlocher, et.al, 2013). Following normalization, the variables were factored (using factor analysis after Hagenlocher, et.al, 2013) to determine relative weights (Table 1), and then aggregated.

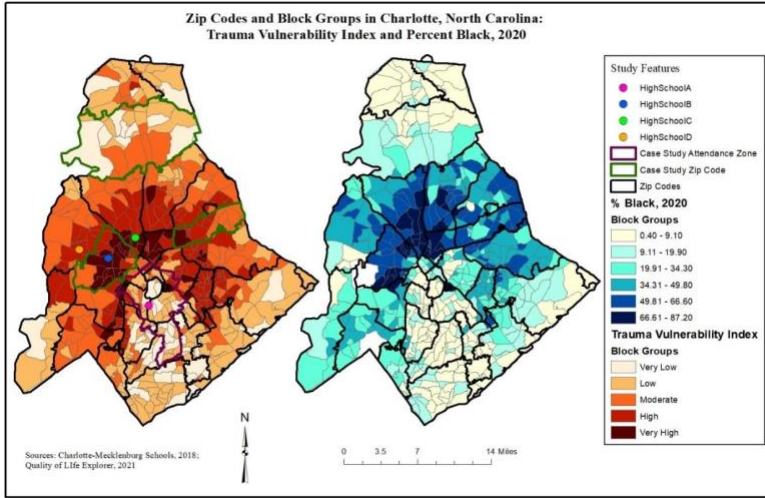
### **Constant Comparative Method**

The notes taken from our collaborative reflections were analyzed using a constant comparative method of analysis (Schwandt, Lincoln & Guba, 2007). This process allowed us to identify, categorize, and discuss key themes simultaneously; or rather, as the data was being gathered. After recording our reflections through the

process of jotting (i.e., where a few words or short sentences were written down on paper during a discussion to help recall something that was said in-the-moment), we organized our thoughts into two categories (i.e., school and home) and then identified patterns—similarities and differences—between DJ and Jeremy’s lived experiences before talking through what these patterns meant in relation to zip code trauma. To ensure consistency in coding and interpretation, we used a standardized method (i.e., cross-rater agreement) to establish desired levels of interrater reliability (IRR). The IRR estimate (or percent of agreement) produced a score of .90, which suggested that our interpretations were mostly in accord with the data and, in turn, the themes we collectively identified were coded consistently and with confidence.

## **FINDINGS**

To get a clear picture of heightened risk of trauma, we used the previously mentioned calculation to find the TVI (see equation 2). TVI was mapped into 5 relative categories: *Very Low*, *Low*, *Moderate*, *High* and *Very High*, with light to dark shadings respectively. TVI for Charlotte-Mecklenburg is mapped in Figure 1 along with an adjacent map of the Percent Black per neighborhood. Percent Black represents Black Spaces in this city. Shown also are zip code boundaries, with case study boundaries highlighted in green on top of TVI, and the school attendance zone for Case Study 1 highlighted in purple. The four schools analyzed in Case study 1 and 2 are shown as well. The Figure 1 map on the left illustrates relative vulnerability to trauma based upon the data variables in the calculation of the index. Given that the percent of persons identifying as Black or African American were included within the susceptibility variable, there is significant (but not complete) overlap between block groups with high percentages of Black residents and those with high to very high trauma vulnerability. The map on the right represents Black Spaces within Charlotte-Mecklenburg, and Black children attending CMS schools (although some attend charter, private, and home schools). FNS, a poverty indicator, was also a susceptibility variable, thus the high to very high trauma areas coincide with



**Figure 1. Zip Codes and Block Groups in Charlotte, North Carolina: Trauma Vulnerability Index and Percent Black, 2020 those of low to poverty level income neighborhoods while low to very low trauma overlaps with those of upper middle to upper income.**

Zip codes overlay each map to illustrate those that bound fairly homogeneously high or low income (and trauma risk), those that encompass a diverse range of race/ethnicity, income and trauma risk, and a few with isolated pockets of variance from the norm. Case Study 1 examined a situation pertaining to the latter type of zip code, within the High School Attendance Zone of School A, outlined in purple on the TVI map. Case Study 2 evaluates three high schools (School B, C and D) that share a common zip code, highlighted in green. Case Study 3 compares student experiences between our two Black male participants living within the zip codes to the north, and northeast (also highlighted in green).

### Case Study 1

The first case study, High School A, examines student outcomes within a school attendance zone located within a section of Charlotte referred to as the “wealthy wedge”. The area within the school attendance zone is largely White and wealthy (Metropolitan Studies, 2021), and with low to very low TVI. Block groups of moderate to very high TVI, line the northern fringes of the school zone (Figure 2-III). In Figure 2-I, the High School “A” Attendance Zone (dark purple) contains sections of nine different zip codes. Thus, students at School A live in one of nine zip codes. The dark-shaded block group in Figure 2-I, is enlarged somewhat in the inset map on the right (Figure 2-II), with trauma vulnerability by block group. Although a single neighborhood (block group) with similar demographics (74% Black, 78% on public nutrition assistance), the area is split into two different zip codes. Within the school



attendance zone, the zip code on the left of this block group contains moderate to very high trauma risk, while the section of this neighborhood on the right is grouped by zip code with block groups of very low to moderate risk. All residents within this split block group attend the same well-resourced school. Based upon zip code trauma, however, the residents on the right side of this very high trauma neighborhood would be expected to achieve positive outcomes as the tiny “very high trauma” area would be averaged into the larger, more affluent, and lower trauma set of neighborhoods. This demonstrates a weakness in using zip codes to determine trauma, and student need.

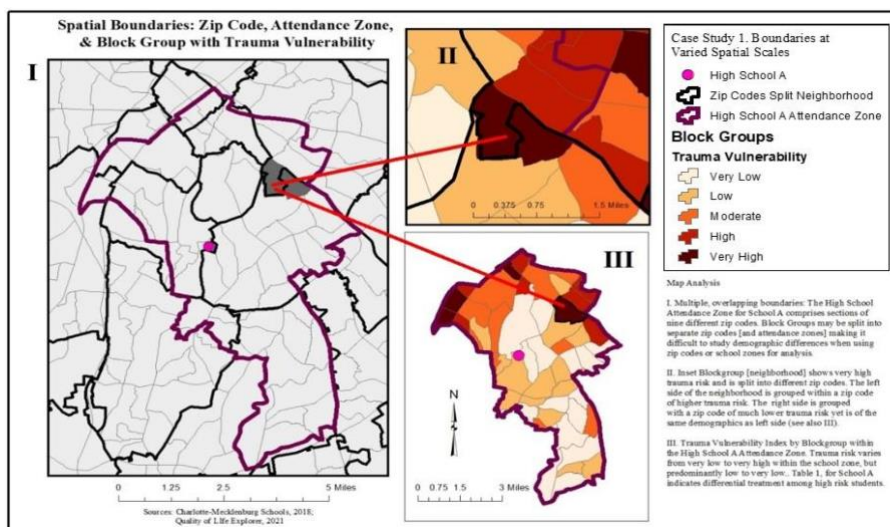


Figure 2: Case Study 1

School outcomes vary greatly for Black students within this attendance zone of predominantly low trauma zip codes. In Table 1, School A is designated as Low Poverty (CMS, 2018), with a “B” report card, and 23% who qualify for free or reduced lunch (ISP). Additionally, 20% of the students are Black, with 60% White. This is a very large school, however, thus 20% comprises 718 students, while 60% represents 2144 White students. According to the data, Black students at School A do not fare well. They form only 8.7% of AP courses, with 79% graduating in 4 years, and an OSS rate of 483.3/1000. White students form 79% of AP courses, with a 95% graduation rate, and are only suspended at a rate of 16.8/1000. White suspension rates are extremely low given the large numbers of White students. Outcomes for students of economic disadvantaged and with disabilities, mirror those of Black students.

The case of High School A demonstrates that wealthy zip codes and well-resourced, high performing schools do not necessarily guarantee Black students a positive schooling experience. These data, however, do not reveal the emotional

outcomes of Black students marginalized within an environment where they should be receiving an excellent educational experience.

**Table 2: 2019-2020 School Year Comparative Statistics among Selected Schools**

		Single Attendance Zone contains nine zip codes			
		Single Zip Code contains sections of three high school attendance zones.			
Data Item	School A	School B	School C	School D	
Number of Students (%)					
Black	718 (20)	905 (58)	1058 (77)	640 (55)	
White	2144 (60)	24 (2)	18 (1)	67 (6)	
Hispanic	454 (13)	558 (36)	187 (14)	342 (30)	
Asian/Pac Is	114 (3)	53 (3)	35 (3)	67 (6)	
Amer Ind	8 (0)	3 (0)	2 (0)	3 (0)	
2 or More	125 (4)	17 (1)	76 (6)	39 (3)	
2019 School Report Card Grade					
	B	D	D	C	
* %ISP	23	57	63	47	
* Poverty Status	Low	High	High	Moderate	
4 yr grad rate					
Black	77.80	71.40	71.30	80.50	
White	95.00	50.00	not listed	60.00	
Economically Disadvantaged	69.80	62.50	66.00	71.10	
Students w Disabilities	64.00	54.90	60.70	not listed	
% Students in AP					
Black	8.69	54.29	79.73	50.75	
White	79.01	1.43	not listed	6.53	
OSS Rate/1000					
Black	483.29	383.43	638.00	379.69	

	White	16.79	250.00	277.78	432.84
	Economically Disadvantaged Students w Disabilities	384.53	361.04	653.06	387.30
		273.47	326.09	774.04	313.43
ISS Rate/1000	Black	470.75	670.72	397.92	398.44
	White	35.45	416.67	388.89	194.03
	Economically Disadvantaged Students w Disabilities	400.00	605.46	394.96	372.95
		383.67	604.35	538.46	223.88
Criminal Acts	Black	16.71	43.09	17.01	28.13
	White	3.73	0.00	0.00	14.93
	Economically Disadvantaged Students w Disabilities	14.37	42.18	14.41	34.84
		12.25	30.44	28.85	14.93
Bullying & Harassment	Black	89.14	38.67	14.18	1.56
	White	2.33	0.00	0.00	0.00
	Economically Disadvantaged Students w Disabilities	69.61	32.26	9.60	4.10
		40.82	39.13	28.85	7.46
Chronic Absenteeism	Black	26.88	28.95	39.6	34.21
	White	5.73	45.83	38.88	44.77
	Students w Disabilities	20	23.91	36.05	27.61

\*ISP = Identified Student Percentage that qualify for nutrition assistance in schools;

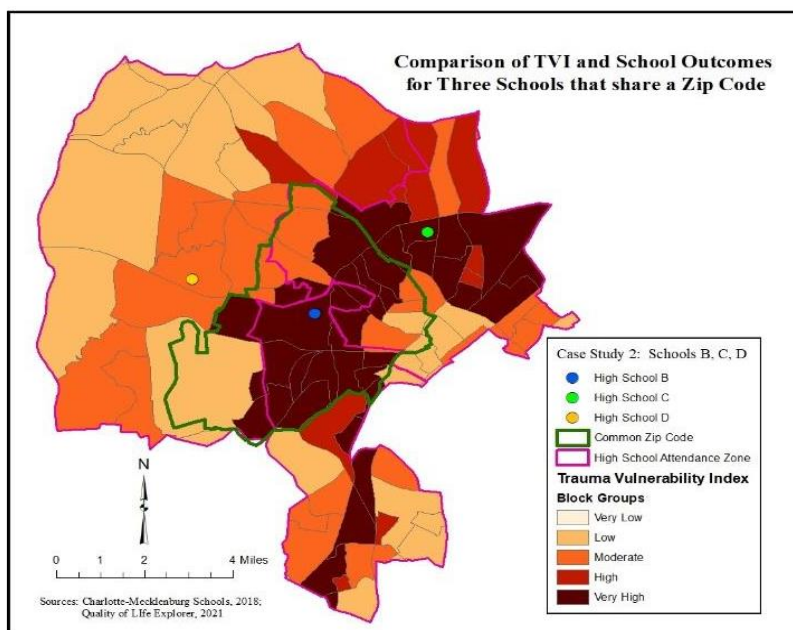
Poverty Status = Low (0-24% ISP); Moderate (25-50% ISP); High (51-100% ISP)

Sources: CMS, 2018; CMS 2020; NCDPI 2020

## Case Study 2

Case Study 2 evaluates TVI and school outcomes for three comparatively lower-performing high schools (B-D) that share a common zip code (green boundary in Figure 3). It is not evident from zip code alone, which school a student would attend. TVI within the shared zip code is largely of very high TVI, but not necessarily for other zip codes within each of the school attendance zones. High schools B and C

draw students from similar TVI conditions, that is, block groups that are largely at high to very high risk for trauma, and with smaller numbers of those at low and moderate risk. School outcomes are fairly similar as well for schools B and C. School B is more diverse, with a larger share of Hispanic students, but Black students dominate in each, at 58 and 77%, respectively, with very few White students (24 or 2%, and 18 or 1%). Both schools are rated with a “D” overall report card, and “High” in poverty with a similar percentage of ISP students. Both show a Black student 71% 4-year graduation rate, and comprise 54.3 and 79.7% of the AP courses, respectively. Black student OSS and ISS rates at School B are 383/1000 and 670/1000, respectively, with 638/1000 (OSS) and 397/1000 (ISS) at School C. The school data and neighborhood TVI do not clearly indicate reasons for such opposites in disciplinary environment. These are likely due to different administration and school climate, as the zip code boundaries and TVI suggest that students experience similar levels of zip code trauma. Both schools are Title I, possibly under-resourced, and similar in academic and behavioral outcome. A comparison of school management style between the two schools is needed to better gauge the discipline differentials evident in the data.



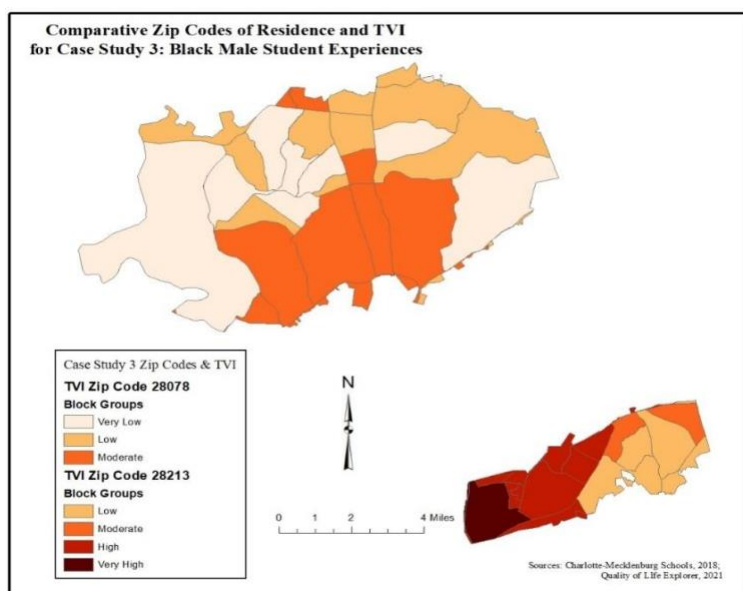
**Figure 3: Case Study 2**

School D comprises only a few block groups of very high trauma from within the shared zip code. The bulk of this school’s attendance zone consists of low and moderate TVI. Thus, the shared zip code is not a true indicator of zip code trauma for students in School D which has a “C” report card, 47% ISP and a “Moderate” poverty

rating. Black students form 55% of the student body with 30% Hispanic and 6% White. Their diversity is similar to that of School B. Black students have the highest 4-year graduation rate of all four schools, at 80%, and just over half of AP course students are Black. OSS and ISS rates/1000 are similar for Black students at 379 and 398 respectively. The results for School D suggest that the comparatively lower zip code trauma is linked to better school outcomes for Black students. In both case study analyses, however, youth voice would lend greatly to our understanding of the impacts of zip code trauma (and school-related trauma) on student health and well-being, particularly at this time in which we are not yet through the pandemic.

### Case Study 3

Case Study 3 compares TVI measured by block group within the zip codes of residence of the Black males in the qualitative, retrospective reflection portion of our study. Zip code 28078 (upper area in Figure 4) displays the Urban Characteristic set of neighborhoods where Jeremy lives. As shown, this quite large zip code consists of block groups with very low to moderate TVI, suggesting comparatively lesser exposure to traumatizing incidents among children living here. DJ comes from the Urban Emergent neighborhoods shown in zip code 28213 (lower area in Figure 4). While much smaller in land area, children living within 28213 experience a more concentrated risk for trauma in block groups that span low to very high TVI. This part of the study thus examined whether the TVI composition of a zip code necessarily correlates with students' actual trauma.



**Figure 4: Case Study 3**

The findings from the retrospective reflection suggest that the TVI map, alone, is insufficient to determine zip code trauma. In analyzing DJ and Jeremy's experiences, we found that despite living in zip codes with exposure to differing levels of TVI, during 2020 and 2021 both participants experienced trauma that negatively affected their school outcomes and socioemotional well-being. Two themes emerged when coding the reflections: *school-level trauma* and *home-level trauma*. School-level trauma captured events that occurred in school that triggered traumatic symptoms (i.e., anxiety and withdrawal). Home-level trauma captured events that occurred at home that triggered traumatic symptoms (i.e., fear and worry).

DJ and Jeremy's schooling experiences during 2020 and 2021 were linked to anxiety and withdrawal that was not present prior to the pandemic. The loss of instructional time made learning new content difficult for both boys. During the onset of the pandemic a traditional 7-hour school day was reduced to 45 minutes of direct instruction and students were responsible for completing classwork independently. Because both boys are kinesthetic learners, the absence of active, hands-on instruction became the source what would later manifest into testing anxiety. This form of anxiety negatively affected DJ and Jeremy's academic self-concept (i.e., the belief in oneself to do well academically). In addition to anxiety, the transition from face-to-face instruction to virtual education seemed to have contributed to signs of educational withdrawal for both boys. DJ and Jeremy appeared to be less engaged academically during online instruction. Jeremy in particular, who was once highly participatory pre-pandemic, became less inclined to participate during class discussions. He also kept his camera off during instructional time (when it was optional). Neither DJ or Jeremy communicated a strong sense of belonging with their teachers or peers when they were attending class virtually during the height of the pandemic.

As a consequence of school closings and social distance mandates, DJ and Jeremy were confined to their home for an extended duration of time in 2020 and 2021. With limited access to social spaces, both boys experienced increased exposure to television. The racial unrest in 2020 and 2021 was broadcast daily and around the clock. Even the slightest exposure to news stories of the murder of unarmed Black men and women triggered feelings of threat in the Black community. In our observations of DJ and Jeremy's behavior we found evidence of fear and worry that was not present pre-pandemic. The age difference between the two boys triggered different reactions, but were still consistent with emotional stress. DJ, being the younger of the two, exhibited less visible signs of fear and worry. He grappled with racial trauma through asking questions. Jeremy, on the other hand, showed signs of fear and worry by wanting to remain indoors despite his usual active nature. In some ways, it is possible that Jeremy saw his home as a place of safety and if he remained indoors he could control what happened to him. DJ and Jeremy's behavior in school and at home indicated the presence of early trauma and would have been masked or even ignored if using TVI alone.

## **Recommendations**

This study demonstrated that zip code trauma is not easily detected. It showed how students of color in well-resourced zip codes are still susceptible to trauma. To understand the extent to which Black students, boys especially, have been impacted by the dual pandemics (COVID-19 and racial unrest) it becomes important to center their lived experiences. We have provided an example of the type of intentionality that must be embodied, by researchers and teachers alike, to begin to unpack and address the varied ways Black boys experienced trauma during the pandemic. By engaging in critical dialogue with students and families, teachers and researchers can co-construct culturally responsive approaches that facilitate the kind of healing that is needed to recover from the events of 2020 and 2021. It is, therefore, our recommendation that future research follow a mixed method design in approaching the study of trauma in Black spaces. Amplifying the voices of students and their families will help to paint a more accurate picture of zip code trauma and put us in a better position to propose solutions to help mitigate its effects.

## **CONCLUSION**

In this study we have modeled pre-pandemic trauma vulnerability by block group and evaluated spatial similarities and variations by zip code within two study areas. Through comparison of Black and White high school outcomes for 2019-2020 in relation to neighborhood trauma and zip code variability, we reveal that Black students do not necessarily benefit from access to high performing schools in well-resourced zip codes, and may actually experience racial trauma. Additionally, school management policies and practices may be a more significant predictor of Black student experience than zip code. Retrospective reflections of the lived experiences of two Black boys living among differing levels of block group trauma vulnerability uncovered shared, potentially traumatizing, challenges irrespective of their zip code. As we move forward through the pandemic, we urge greater diligence in the observation, and culturally healing-oriented treatment of all forms of trauma among Black children across all Black spaces.

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**LAURIE GARO**, PhD, is a Senior Lecturer Emeritus in the Department of Geography & Earth Sciences at the University of North Carolina at Charlotte. Her major research interests lie in the areas of trauma vulnerability, school-based trauma intervention and analysis of spatial inequities. Email: [lgaro@uncc.edu](mailto:lgaro@uncc.edu)

**BETTIE RAY BUTLER**, PhD, is an Associate Professor of Urban Education and the Director of the M.Ed. Program at the University of North Carolina at Charlotte. Her major research interests lie in the area of culturally responsive practices with special emphasis on restorative approaches. Email: [bettie.butler@uncc.edu](mailto:bettie.butler@uncc.edu)

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