



## Transforming the future of quantitative educational research: a systematic review of enacting quantCrit

Wendy Castillo & Nathan Babb

To cite this article: Wendy Castillo & Nathan Babb (2024) Transforming the future of quantitative educational research: a systematic review of enacting quantCrit, *Race Ethnicity and Education*, 27:1, 1-21, DOI: [10.1080/13613324.2023.2248911](https://doi.org/10.1080/13613324.2023.2248911)

To link to this article: <https://doi.org/10.1080/13613324.2023.2248911>



Published online: 24 Aug 2023.



Submit your article to this journal [↗](#)



Article views: 825



View related articles [↗](#)



View Crossmark data [↗](#)



# Transforming the future of quantitative educational research: a systematic review of enacting quantCrit

Wendy Castillo and Nathan Babb

School of Public and International Affairs, Princeton University, Princeton, NJ, USA

## ABSTRACT

Quantitative Critical Race Theory (QuantCrit) is a burgeoning field of study seeking to challenge and improve the use of statistical data in social research. It pulls lessons and insights from Critical Race Theory and applies them to understanding social challenges. In this paper, we aim to improve the quality of quantitative research produced by showing examples of how pioneers in this field are effectively enacting QuantCrit. We conducted a systematic review of the literature to include all empirical education studies published since 2010 through 2022. Twenty-seven studies fit the criteria. Our data shows there is room for innovation, experimentation, and exploration. However, the study highlights exemplars of authors who embody QuantCrit principles through their professional and personal positionality statements, cognizance of community, robust racial/ethnic categories, intentionality on *not* centering whiteness, use of atypical methods, new measurement tools centering Black and Brown students, and innovative interpretations of findings.

## ARTICLE HISTORY

Received 27 January 2023  
Accepted 10 August 2023

## KEYWORDS

QuantCrit; research design;  
research methods;  
quantitative; systematic  
review; critical race theory

## Introduction

Quantitative Critical Race Theory (QuantCrit) is a rapidly emerging field of study seeking to challenge and improve the use of statistical data in social research. It pulls lessons and insights from Critical Race Theory and applies them to understanding social challenges by using quantitative data (Gillborn, Warmington, and Demack 2018). As QuantCrit continues to proliferate the education and broader social sector, it is important that, unlike other anti-racist or Diversity Equity Inclusive (DEI) approaches, QuantCrit is not co-opted by stakeholders to mean something it is not, does not replicate existing practices, and does not become just another DEI checklist (Newby and Hoffman 2022; Sawchuk 2021). In this systematic review, we aim to improve the quality of quantitative research produced by showing examples of how pioneers in this field are effectively enacting QuantCrit.

As initially formulated, QuantCrit rests on five tenets: (1) the centrality of racism within our social fabric; (2) numbers are not neutral or objective; (3) categories, like racial groups, are arbitrary; (4) like qualitative observations, data cannot speak for itself; and (5) quantitative data and analysis can and should inform our understanding of the nature

and depth of social justice/equity as well as strategies for and progress toward achieving it (Gillborn, Warmington, and Demack 2018). Most quantitative researchers implicitly understand and agree with these principles (Ziliak and Nansen McCloskey 2008). Applying QuantCrit is reckoning with the racist structures that have existed and exist, and examining your role in them (Garcia, López, and Vélez 2018) to transform your research practice in the service of more informed, racially conscious, and equitable ways (Castillo and Gillborn 2022).

In this synthesis, we will uplift prominent design strategies and analytic methodologies anchored on the QuantCrit framework. This paper can serve as a starting point for researchers to reference when they desire implementing a racially conscious quantitative work. To address this intent, this study is guided by the overarching question: For those who explicitly stated to incorporate QuantCrit in their quantitative empirical study, how did they apply tenets within their study? Additional questions to frame the inquiry are anchored on QuantCrit's promising practices (Arellano 2022; Castillo and Gillborn 2022) and include the following:

- To what extent (if any) did the author(s) address their privilege in society?
- What was the role of community (if any) in their study?
- What racial/ethnic categories were used and why? Were white people used as the default reference group?
- Were any novel or underutilized quantitative approaches presented?
- How do the authors talk about and interpret their findings? Do they consider systemic racism?

We recognize that this process is iterative, and although this paper may lay the foundation, we must continue to refine, unlearn, and relearn indefinitely. We also recognize that applying any framework and set of practices will not dismantle systemic racism; however, as a field, we are developing tools and strategies to begin reimagining the role that research and data can play in an anti-racist society. Before delving any further into the study, we want to acknowledge our own privileges and positionality in writing this paper.

The first author identifies as Latina, grew up in a working-class household, is the daughter of undocumented immigrants, a first-generation college student, and an English learner. She understands that she cannot separate her life experiences because they have influenced her outlook on the topics she researches. She is proud of her bias to use data to help Black and Brown communities. As an early adopter and scholar of QuantCrit, she also acknowledges that she has a bias of holding others to a high bar when it comes to doing research related to quantitative data and race. Additionally as a lecturer in econometrics and statistics at a prestigious institution, she understands the privileges and assumptions that are associated with these affiliations.

The second author identifies as a white, cisgender man from the South who grew up in a middle-class household that centered education. He recognizes that his interest in education and teaching stems from being in a family full of public school teachers. He is a graduate of public magnet schools, a public PWI undergraduate university, and a private PWI graduate university. These educational experiences informed his understanding of privilege and inequity and motivated his interest in QuantCrit. He recognizes that his personal experiences have informed his outlook and research interests. He learned about

QuantCrit as a graduate student and has since sought channels to implement QuantCrit principles in his own teaching, where presently he is a graduate instructor of econometrics and statistics at a prestigious university.

## QuantCrit

QuantCrit weaves quantitative data and its analysis with the principles of Critical Race Theory. As originally articulated (Crenshaw 2010), Critical Race Theory had more straightforward applications towards qualitative data, and the growth towards quantitative applications came around 2018 when a group of researchers in education were working on a contribution to a special issue of *'Race Ethnicity and Education'* (Garcia, López, and Vélez 2018). Critical Race Theory alone did not develop or institute strategies for the use, handling, and interpretations of quantitative data, and it is academic work since 2018 that has used new strategies and underutilized methods to begin the process of learning 'How to QuantCrit'.

Gillborn, Warmington, and Demack (2018) propose five principles, or tenets, that define QuantCrit. These are listed below, followed by definitions of each.

- (1) The centrality to racism – Racism is intertwined in the fabric of society through *de jure* and *de facto* means, and unless the researcher is conscious of this fact, they are liable to reify these systemic racial biases and 'legitimate' them through quantitative analysis.
- (2) Numbers are not neutral – Numbers are simply the messengers for systems and behaviors that are already present; in academia this has historically been dominated by Eurocentric and White Supremacist ideals (Crawford et al. 2019). Numbers alone do not confer any more, or less, objectivity than data that is collected qualitatively.
- (3) Categories are not natural – Especially when it comes to race, there is no scientific distinction among humans; our understanding of race is socially constructed.
- (4) Data cannot 'speak for itself' – research and analysis do not just happen – they are shaped by questions, hypotheses, donors, and other interested parties.
- (5) Social justice/equity orientation – this tenet ties together the above four into the overarching concern of CRT – to eliminate racial oppression in striving for social justice. Researchers are reminded of the power they wield in the narratives they write – or omit – around the data. By threading together the above four tenets with a social justice orientation, researchers will be working in the direction of QuantCrit.

QuantCrit is instead an articulation of how to use the current analytic tools or creating new ones in the service of more informed, racially-conscious, and equitable ways. Since its development in 2018, the principles of QuantCrit have been implemented in a myriad of ways; major takeaways from our review of the literature suggest that QuantCrit often: utilizes Ordinary Least Squares (OLS) and logistic regression frameworks, offers an introspective justification of using particular groups as the reference, offers positionality statements by the authors (sometimes called 'self-reflectivity' statements), and explanations of results that recognize systemic drivers of outcome variation instead of individually driven, identity-based explanations.

## Methods

We conducted a systematic review of the literature to include all empirical education studies, including higher education, published since 2010 (given that QuantCrit is a relatively newer term) through 2022 that stated to explicitly implement QuantCrit. We searched eight electronic databases and search engines. The following search terms were used to capture relevant studies: ‘QuantCrit’, ‘CritQuant’, ‘Critical Quantitative’, ‘Critical Race Theory’ AND ‘Quantitative’. See [Table 1](#) for the number of studies found.

The leftmost column ‘Citations Identified’ does not delineate whether the citation was unique to that database alone. For example, a paper that we ultimately included in our sample of 29 for this paper might have been identified across several databases, thus showing up multiple times in our leftmost column. However, it is represented only once in our rightmost column and is attributed to the database where we first identified it. ERIC was by far our most efficient database as its search results were the right combination of QuantCrit and applied research. Google Scholar provided the most results but was too broad in returning results in which the key term was simply mentioned.

All unique search results ( $n = 420$ ) were screened to evaluate whether the abstract was relevant based on the following three criteria: 1) Explicitly claim to use QuantCrit, 2) use quantitative methods inclusive of mixed methodology (i.e. interweaving both qualitative and quantitative methods) 3) Empirical Pre-K-12 or Postsecondary education studies. Studies could be primary (i.e. gathering new data for the purposes of the study) or secondary research (i.e. new analyses of existing databases). Studies that expanded on or wrote about QuantCrit as a theoretical framework were excluded because they were not using the theory to apply it to a new analysis (whether primary or secondary). International studies in English were also included. [Table 2](#) identifies the 29 relevant studies.

Based on our aforementioned research questions and using promising practices found in QuantCrit and related work (Arellano 2022; Castillo and Gillborn 2022; Chicago Beyond 2019, Urban Institute’s Guide to Racial Equity in Research 2020; Parekh, Andrews, and Peckoo 2019) we developed a review protocol that was completed for each article that met our criteria from reading the abstract ( $n = 64$ ). The review form included answering questions about the study’s methodology, positionality statements, community input, racial/ethnic categories, reference groups, measurement, limitations, and interpretation of findings.

**Table 1.** Article selection process by database.

Source/Database	Citations Identified	Reviewed Abstract for relevance	Review ed article	Included in Article
Google Scholar	18,500	200+	4	1
EBSCO	128	128	14	6
JSTOR	10	10	0	0
ERIC	56	57	34	18
PROQuest	251	10	4	0
Project Muse	9	9	2	1
WWC	3	3	3	0
Hand Search	3	3	3	3
Total	18,960	420	64	29

**Table 2.** List of papers included in review.

Author	Title
Anyon et al. (2021)	Sent out or sent home: understanding racial disparities across suspension types from critical race theory and quantcrit perspectives
Baker (2019)	A QuantCrit approach: Using critical race theory as a means to evaluate if rate my professor assessments are racially biased
Brochet (2020)	Who Loses Financial Aid?: A Critical Examination of the Satisfactory Academic Progress Policy at a California Community College
Campbell-Montalvo (2020)	Being QuantCritical of US K-12 demographic data: using and reporting race/ethnicity in Florida Heartland Schools
Campbell (2020)	Ratings in black and white: a quantcrit examination of race and gender in teacher evaluation reform
Cobian (2019)	Interlocking Struggles, Interwoven Success: College and Career Pathways for Women of Color in STEM and Healthcare
Crawford (2019)	The one-in-ten: quantitative Critical Race Theory and the education of the 'new (white) oppressed'
Cruz, Kulkarni, and Firestone (2021)	A QuantCrit analysis of context, discipline, special education, and disproportionality
Garcia et al. (2022)	Advancing QuantCrit to Rethink the School-to-Prison Pipeline for Latinx and Black Youth
Garibay, West, and Mathis (2020)	It Affects Me in Ways That I Don't Even Realize: A Preliminary Study on Black Student Responses to a University's Enslavement History
Guenther (2021)	Taken for a ride? The disconnect between high school completion, employment and income for remote Australian First Nations Peoples
Harmon et al. (2022)	Black Fathers Rising: A QuantCrit Analysis of Black Fathers' Paternal Influence on Sons' Engagement and Sense of School Belonging in High School
James (2022)	Otherwise engaged: A Quantcrit Examination of Student Engagement in English 10 Classrooms in an Urban-Suburban, Majority Minoritized High School Setting
Jang (2020)	The schooling experiences and aspirations of students belonging to intersecting marginalisations based on race or ethnicity, sexuality, and socioeconomic status
Kilgo et al. (2019)	High-impact for whom? The influence of environment and identity on lesbian, gay, bisexual, and queer college students' participation in highimpact practices
López et al. (2018)	Making the invisible visible: Advancing quantitative methods in higher education using critical race theory and intersectionality.
Morris (2021)	Challenging the Stereotype that Minority Segregated Schools are Unsafe: Are Crime and Violence Really More Prevalent in Segregated Minority High Schools?
Park et al. (2022)	Racial discrimination and student – faculty interaction in STEM: Probing the mechanisms influencing inequality
Pérez Huber, Vélez, and Solórzano (2018)	More than 'papelitos': A QuantCrit counterstory to critique Latina/o degree value and occupational prestige
Priddie (2021)	A Pathway toward Cultural Relevance: A QuantCrit Analysis of Collaborative Learning Experiences for Black STEM Students through an Anti-Blackness Lens
Ramos et al. (2022)	Uncovering the effects of the sociopolitical context of the Nuevo South on Latinx college students' ethnic identification
Reynolds and Tabron (2022)	Cultivating Racial Diversity or Reproducing Whiteness?: A QuantCrit Analysis of School Districts' Early Principal Hiring Practices
Street et al. (2022)	Do numbers speak for themselves? Exploring the use of quantitative data to measure policy 'success' in historical Indigenous higher education in the Northern Territory, Australia
Suárez et al. (2021)	Exploring Factors That Predict STEM Persistence at a Large, Public Research University
Templeton et al. (2021)	A QuantCrit analysis of the Black teacher to principal pipeline
Van Dusen and Nissen (2020)	Associations between learning assistants, passing introductory physics, and equity: A quantitative critical race theory investigation
Van Dusen et al. (2021)	A QuantCrit investigation of society's educational debts due to racism and sexism in chemistry student learning
Wronowski et al. (2022)	Moving toward a Comprehensive Program of Critical Social Justice Teacher Education: A QuantCrit Analysis of Preservice Teachers' Perceptions of Social Justice Education
Young and Cunningham (2021)	Repositioning black girls in mathematics disposition research: New perspectives from QuantCrit

**Table 3.** Breakdown of Total Sample by Quantitative Complexity.

Research Method:	Count	Percent
Basic descriptive stats (including simple linear regression)	13	.45
Advanced regression models	16	.55
Causal	0	0
Total	29	1.00
Qualitative and Quantitative	3	.10

Of those 64 studies only 29 met all of the criteria. After completing the review protocol forms for all 29 studies, the study used an emergent synthesis design (Suri and Clarke 2009), which coded the qualitative answers in a way that allowed for an iterative development of themes anchored on the five QuantCrit tenets. Our form also served as an organization tool for data collection and documentation. To ensure flexibility in our coding of emerging themes, our form had open text boxes. The open text space allowed for reflections, emerging insights, and identifying specific examples. We summarized methodological elements and uplifted emerging patterns. The last stage of analysis resulted in additional refinements and re-organization based on saturation of salient themes.

## Results

Our results were categorized into the subheadings that matched our research questions: Positionality Statements, Community Input, Racial/Ethnic Categories, White Reference Groups, New Approaches, and Interpretations. We classified our 29 studies into either 'basic' or 'advanced' statistical methods. 'Basic methods' included descriptive statistics such as t-tests, chi-squared tests, and/or simple regression models (e.g. Ordinary Least Squares 'OLS')<sup>1, 2, 3</sup> We classified studies as being 'advanced' if they used a more complex model than a simple OLS regression. Many studies ( $n = 13$ ) used basic statistical methods. None of the studies reviewed used causal methodology, such as a randomized controlled trial or quasi-experimental design.<sup>4</sup> For studies that used advanced statistics, ( $n = 16$ ) they frequently used a logistic regression<sup>5</sup> model (seven out of 16). Psychometrics, which is the broad category to describe the statistical techniques used to validate an instrument (e.g. survey, rubric, questionnaire), were also considered advanced and only five studies developed new measures. Three of the 29 studies used both qualitative and quantitative methods, and one of those explicitly and strategically (Creswell et al. 2011) used both methods classifying it as mixed methods. Table 3 shows the breakdown in methodologies.

### Positionality statements

Positionality statements are an exercise of vulnerability, accountability, and deep introspection of the authors' positions in society. They are often a common practice for qualitative work, but rarely used in science or quantitative studies (Hampton, Reeping, and Sevi Ozkan 2021). A central tenet of QuantCrit is 'the centrality of racism', it follows that QuantCrit researchers should be aware of how they have benefitted and/or been oppressed by the systems of racism. Furthermore, scholars who use QuantCrit should critically think about how their life

experiences and identities may lead to unconscious or conscious bias. ‘Data does not speak for itself’, but the researchers are the first interpreters of the data, and thus, the readers should know their backgrounds and be aware of any biases they may hold.

Less than half of the studies we reviewed had some type of positionality statement (13/29 or 45%), though there was wide variation. Each positionality statement was reviewed based on the framework developed by Sybing (2022). Although Sybing (2022) developed a framework for ethnographers, many of the main components are relevant: form of positionality statement (separate paragraph or section) and explicitly stated socio-cultural and professional identities. Castillo and Gillborn (2022) recommend including socio-cultural and professional identities that directly tie to the study. For example, in a healthcare study, the researcher should talk about their experiences with the healthcare system and access (or lack thereof) to healthcare throughout their life.

Two of the 29 studies wrote a sentence or two on their racial backgrounds. We did not classify this as a positionality statement. Kilgo et al. (2019) state

First, we must acknowledge that as a group of White people, our race is rarely if ever aggregated with other racial groups for the purposes of statistical analyses. Kilgo et al. (2019) pg. 428

This statement was not in a separate section but was embedded in the data analysis section. The authors acknowledged and described their choices of aggregation of certain racial/ethnic categories. Although one sentence does not suffice to be considered a positionality statement, it is a step in the right direction of recognizing their white privilege in statistical analysis. However, they do not relate their racial identities to the known or unknown biases they bring into their research, a key component of a positionality statement.

We observed many positionality statements where authors listed their identities; while identities are important, positionality statements should be more reflexive and relate their identities and background to the research at hand. We chose the following three examples that exemplified this practice. Pérez, Vélez, and Solórzano (2018) wrote a combined positionality statement and in addition to their identities, they explicitly mentioned how it informed their work:

... **Cultural intuition informed our critique of the dominant discourse on degree value in higher education.** We drew explicitly from [our] own experiences in the educational pipeline and those related to what our postsecondary degrees have meant to us, our families, and our communities. This is our personal knowledge. The academic and professional forms of knowledge we draw upon are grounded in our years of experience as researchers in the field of education, examining the educational experiences of Latina/os communities, and **particularly related to this study, those concerning academic outcomes and degree attainment** . . . . (emphasis added) Pérez, Vélez, and Solórzano (2018) pg. 211

In another example, West of Garibay, West, and Mathis (2020), described his identity which is inextricably tied to the research topic, how he personally views the topic, and where he gained his knowledge on the topic.

... His paternal grandparents are of African descent and are immigrants from Brazil and Haiti, while his maternal fourth great-grandfather was born on a plantation still standing in Spotsylvania, Virginia, to the plantation owner and his enslaved laborer . . . . **West approaches this work acknowledging the enslaved labor throughout the world, including the Caribbean and Latin America, and sees the African diaspora in America as**



**inextricably linked because of the transatlantic slave economy.** He learned about the history of slavery in the Americas through family oral histories and by attending Black-majority public schools in Washington, DC. (emphasis added) Garibay, West, and Mathis (2020) pg. 701

Finally, if space is a limiting factor authors can follow Van Dusen and Nissen's (2020) example and provide a separate section with a brief two-sentence positionality statement with an *additional attachment* in the supplemental online information.

### **Community input**

It has long been criticized that researchers conduct research *on* communities and not *with* communities (Chicago Beyond 2019; Parekh, Andrews, and Peckoo 2019). QuantCrit's fifth tenet is about using a social justice orientation, and in this case it means unlearning our old research practices and relearning new ones to include community. Giving communities a voice in creating and shaping that data is essential for using data with a social justice orientation.

The inclusion of community input or lack thereof was coded for each study using the recommended practices from Chicago Beyond (2019), Urban Institute's Guide to Racial Equity in Research (2020) and Child Trends' Five Guiding Principles for Integrating Racial and Ethnic Equity in Research (Parekh, Andrews, and Peckoo 2019). Some of the recommended strategies that were highlighted include but are not limited to 'change how you engage with community to identify research questions and study outcomes', 'propose timelines for research differently, for example to support trust-building, or to develop survey instruments with community input and community testing', 'incorporate community voices . . . as a part of the research design phase or product review. and communications', and recognizing a community's contribution.

In an ideal research study that embodied QuantCrit, communities would be involved in the entire process from the research agenda setting stage through the analysis and dissemination stage (Chicago and Beyond 2019). In some cases depending on the type of research, author(s) experience, and/or the time and financial constraint involving them at every step might not be possible. Many authors provided copious literature reviews that acknowledged context, tensions, and were cognizant of the community they were studying. Nonetheless, they still did not engage or partner with a community. In this synthesis, we want to highlight two studies that began the process of including community voices and engaging with the community in their research.

First, Street et al. (2022) created a research governance group to oversee their entire research process from design to dissemination. The group consisted of eight individuals, seven of whom identified as indigenous scholars from multiple institutions. Through the research study the group engaged with the researchers through formal and informal meetings as well as correspondence. Although non-academic indigenous people (target population) were not involved, including a governance group with representation of indigenous individuals is a step in the right direction towards a more inclusive process.

Next, Campbell-Montalvo (2020) involved one community member during her data collection. She first recognized that she was a white woman with limited Spanish skills. Thus, to support her in data collection, she conducted all interviews and observations with a bilingual Spanish-speaking middle-school Latina student (target population). The

student received volunteer hours for her service. Although involving one community member may not suffice to classify the study as partnering or engaging with community, it is better than the status quo of quantitative research (e.g. typically not include community voices).

### **Racial/Ethnic categories**

The importance of obtaining accurate racial/ethnic data cannot be more underscored since it affects resource and funding allocation for social services. Studies by Campbell (2009), Saperstein (2006), and Telles and Lim (1998) have found that different approaches to measuring race portray different pictures of the extent of racial inequality. For example, Hispanic people were not counted until the 1970 Census, and before that they were classified as white (Lopez, Manuel Krogstad, and Passel 2022). In the 2020 Census, the Hispanic population was undercounted by 5% because ethnicity remains a separate question even though researchers have recommended to merge the question of race and ethnicity to gain more accurate numbers (Castillo 2022; Prewitt 2018). Hispanic individuals are forced to choose a race and many choose white even if they don't identify with white. This leads to a consistent overcounting of the white population, which was repeated in the 2020 Census (Wang 2022).

In QuantCrit, 'Categories are not natural nor given'. We create them. The majority of studies in our synthesis ( $n = 21$ ) used the most commonly listed racial ethnic categories (e.g. Black, Asian, Hispanic, white, Pacific islander, multi-racial) or something similar. Three studies used 'other' as a category for people who did not fit neatly into the common ways we collect data on racial categories. Using the word 'other' is de facto 'othering' those individuals, and directly contrary to two of the QuantCrit tenets, 'data is not neutral' and 'categories are not neutral'. Researchers may have used this categorization because they received secondary data containing this term. However, we can easily change the term without being inaccurate to non 'othering' alternatives like 'category not listed' or 'another race/ethnicity not listed'. Similarly, one author used the term 'Non-Resident Alien' in their list of racial categories. Like the term 'other' this term is dehumanizing – it suggests the person is from another planet. An alternative option is 'international student without a US Employment Visa'.

Five of the 29 studies used a single category such as 'Black' (Harmon et al. 2022; Jemimah and Cunningham 2021; Toni et al. 2021) or 'Indigenous' (Guenther 2021; Street et al. 2022) because their research question did not require them to collect multiple racial categories. In Table 4 we show how three studies used nuanced racial categories.

Crawford (2019) used the racial categories that represented the diverse British population, but that also helped answer their research question on the new oppressed, 'White working class'. Garibay, West, and Mathis (2020) wanted to understand the effect of an institution's history with slavery on students' emotional, physical and behavioral responses. It follows that they would want to disaggregate within the Black student group, thus they centered Black students and asked about their African heritage. They were able to disaggregate each of their survey constructs by African only, Two or more groups, Black mixed with other groups as well as other identifiers they collected, such as cisgender man, first generation, and class standing, among others. Ramos et al. (2022) aimed to understand the effect of the

**Table 4.** Examples of Racial/Ethnic Categories.

Study	Racial/Ethnic Categories
Crawford (2019)	Bangladeshi, Black Caribbean, Black African, Chinese, Indian, Pakistani, White British
Garibay, West, and Mathis (2020)	African only, Two or more groups of African descent or Black mixed with other groups
Ramos et al. (2022)	Mexican/Chicano, Native American, Guatemalan, Honduran, Salvadoran, Costa Rican, Nicaraguan, Panamanian, Argentinian, Bolivian, Brazilian, Chilean, Colombian, Ecuadorian, Peruvian, Uruguayan, Venezuelan, Puerto Rican, Cuban, Dominican

sociopolitical context on Latinx college students' ethnic identification in the South. Given the diversity of the Latinx community and to 'disrupt narrow census categorization', they provided ethnic categories, and participants had an open-ended option. To avoid the erasure of small segments within the sample, they grouped ethnicities by continental regions including North America, South America, Central America, and the Caribbean.

### **Rhetoric about centering whiteness**

The opinions of white people, the success of white people, the lifestyles of white people, and more, are made the center of our collective attention (Toldson 2019). This comes at the expense of attending to others' needs, such as societal inequities that are caused by disinvestment. Re-framing to whom and how attention is given has been evidenced in some media strategies of the past several years. One example is the charge for media outlets to cover the disappearance of non-white youth with the same vigor that is afforded missing white women, what has been termed 'the missing white girl syndrome'. The charge for the media's self-awareness of centering missing non-white victims has been around since at least 2005 (Liebler 2010; Stillman 2007).

When white people are centered – whether unconsciously or not – it reinforces a notion of a de-racialized group by which all others should and must be measured. Like in the media example above, for QuantCrit research we charge that choosing which group to center in analysis be given thought. Readers should be given insight into the researcher's decision into methods, such as omitting one group in regression analysis or comparing groups' outcomes. *Centering whiteness alone is not out-of-line with QuantCrit, but centering whiteness absent a critical perspective is.*

It is difficult to apply the QuantCrit principle of 'the centrality of racism', or said differently 'the centrality of whiteness', without decentering whiteness. "Through our review of the 29 relevant studies, we found that about half used 'white' as the comparison group for analysis. Introspective use of 'white' as the base racial category, however, was largely absent. We further analyzed each study to include whether the study's author(s) explained why they chose their reference group. There were three notable examples we would like to highlight.

In Van Dusen and Nissen (2020), White people were part of the sample, but their outcomes were measured within-group just like every other racial group. The researchers called this style of measurement 'equity of individuality' and defined it by saying

[it] occurs when an intervention improves the outcomes of students from marginalized groups. This perspective gets away from making comparisons with white, middle-class and what Gutiérrez and Dixon-Román refer to as ‘gap-gazing’...Gutiérrez argues that the focus on achievement gaps supports a deficit model of students from marginalized groups. Van Dusen and Nissen (2020) pg. 5

López et al. (2018) also centers white people in their study of educational achievement gaps in the American southwest. For these authors, making white women the reference group by which others are measured is a conscious and detailed decision:

It is important to clarify that we use white high-income women as our reference group because we are talking about educational attainment, and white high-income women have the highest educational attainment of any of the other social locations we investigate. If we were doing a wage equity study, we would instead use white highly educated men, as they would be the reference group that has the highest wages and salaries when compared to other groups at the same level of education. López et al. (2018) pg. 191

Lastly, Cobian (2019) offers an excellent demonstration of QuantCrit principles in their dissertation, and has their cake and eats it too when discussing the reference group. Cobian both recognizes White SES men as the dominant group and also discusses the group’s exclusion from other analyses in the paper:

While some scholars critique the use of dominant groups as referent groups for quantitative analysis, White SES men are intentionally used in this study for both theoretical and practical reasons. Theoretically, White men not only are most represented in almost all STEM fields (except for healthcare occupations such as nursing), they also hold positions of authority in STEM. Secondly, considering the use of interaction terms in this study and the interest of examining coefficients for women of color, White SES men are left out of the model so that the quantitative analysis can show the results for WOC in various SES groups. Lastly, because career outcomes in 2016 for WOC and White women become similar ... examining whether there were statistical differences between White men versus White women made more sense. Cobian (2019) pg. 92

## ***Innovative approaches***

### ***Interaction terms to measure intersectionality***

Research informed by intersectionality must take into account the intersections of social and historical context throughout its analysis (Hunting 2014). When researchers collect sufficiently large and diverse information on demographic identities, creating intersectional identities is a charge for QuantCrit analysis because – although categories are not natural – more accurately defined categories will better tell the complex stories of the data.

Interaction terms (or ‘interaction variables’) are generated when at least two independent variables are multiplied together – think Black x Male to identify a Black male, instead of looking at that person’s identities in isolation. In much of the quantitative research that we are familiar with, interaction terms often rely on racial categories being multiplied by the independent variable-of-interest, which allows researchers to see whether treatment is different across racial categories. There are two drawbacks to this approach, both of which are reductive: (1) researchers not familiar with QuantCrit tenets will typically use the racial interaction terms to insinuate that outcome differences, which

may in fact differ across racial categories, are due to racial differences themselves *instead* of recognizing the structural forces that operate on different racial groups, thereby driving the disparate impacts, and (2) by only using race-based interaction terms to study outcome differences, researchers miss out on the chance to study intersectionality within and across racial designations.

In an effort to better study point (1), we cataloged which papers in our sample wrote about race in a structural way rather than an individual way. We saw that most of the papers in our sample did this, which is in accordance with the ‘centrality of racism’ and ‘using data for social justice’ tenets of QuantCrit. One study did not, missing an obvious opportunity to remind readers that variation in the outcome variable is not because of any inherent racial distinctions, but because of the way the structural forces that shape society discriminate and mistreat people of particular racial groups. Regarding point (2), several researchers used interaction terms or simple crosstabulation tables of descriptive statistics (e.g. achievement descriptive scores by race and gender or race and socioeconomic status) in ways that we felt furthered the tenets of QuantCrit. In some cases, researchers used two-way interaction terms across different demographic data while some researchers proposed three-way interaction terms to better identify intersecting identities. One common thread across the examples we found was that language used by the researchers acknowledged intersectionality and wrote clearly about their intent to quantify this by using interaction terms.

Cruz, Kulkarni, and Firestone (2021) use a two-way interaction term that identifies racial and IEP intersectionality (IEP – Individualized Educational Program – a document that details the differential learning needs for students with special needs). This is not particularly novel, but the authors do a good job of explaining *why* they are using this two-way interaction term. They write

To examine time points at which multiply marginalized students (i.e., BIPOC [Black, Indigenous, People of Color] labeled with disabilities) were more likely to experience exclusionary discipline, we first analyzed descriptive data for grade level and mean suspension. Cruz, Kulkarni, and Firestone (2021) pg. 6

Building out from the two-way interaction term, Jang (2020) proposes the use of a three-way interaction term. Their interaction term structure includes race or ethnicity with socioeconomic status and sexuality. Jang notes that results under the more typical two-way interaction term were better fitting statistical models, and thus, results throughout the paper do not show model specifications with the originally proposed three-way interaction terms. Jang’s models show different combinations of two-way interaction terms; examples of the two-way interaction terms from the paper include Black x LGBTQ, Black x FRL, Asian/Pacific Islander x FRL, LGBTQ x FRL, American Indian x FRL, and Hispanic x FRL. In the study, LGBTQ is a binary<sup>6</sup> variable to indicate whether a student self-reported their identity as LGBTQ or not and FRL is a binary variable to indicate whether a student was eligible for free or reduced-price lunch, a proxy for poverty. While Jang’s analysis ultimately did not include the three-way interaction term, its proposal was novel. Furthermore, the two-way interaction of LGBTQ x FRL interacted two demographic variables that are more commonly linked with racial characterizations, but not one another; seeing LGBTQ as its own identity unconditional on race, but conditional on FRL status, was an approach we rarely see in academic research.

In our sample, two additional research teams included three-way interaction terms in their analysis. López et al. (2018) do a great job of explaining the breadth of intersectional identities they account for. They write:

... [m]odels are saturated in that they include a full set of gender, race, and class dummy variables, as well as all possible interactions. Subjects in the sample report two genders, five mutually exclusive race categories, and fall into one of the two income quartiles. Thus, we have  $2 \times 5 \times 2 = 20$  social locations or unique ‘groups’ that we conceptualize as distinct categories of experience in our models. (López, et al., 2018)pg. 192

Examples of their three-way intersectional groups include Black x Low-income x Male and American Indian x Low-income x Male.

Suárez et al. (2021) follow in the footsteps of López et al. (2018), above. The authors use three-way interaction terms of their racial categories, first generation college status, and sex to create 24 distinct categories with which they construct marginal effects. In the case of their paper, the marginal effects measure the probability of college students to graduate with any major and later, graduating with a STEM degree. However, one drawback to their statistical framework is that the 24 groups have widely varying sizes; the number of students who fit into any one of the 24 groups is between 0 and 20,989. The researchers note that all marginal effects are significant at the 1% level, however. Worth highlighting is not only the analytic approach, but also the care with which the authors write about their methods. Suarez et al. (2021) pg.170 write ‘The findings from the second research question reveal a much deeper look at the intersection of ethnicity, gender, and first-generation status’ (emphasis added).

## **Measurement**

The education field is ripe for new measures that center communities of color, and are made by and for communities of color. Traditional assessments, surveys, and other measurement tools that exist have largely been centered and normed on white-middle class students and developed by white male researchers (Randall 2021). Our reliance in academia and research on arcane measures leads us into a vicious and endless cycle of replicating the systems of inequalities. In Guenther’s 2021 QuantCrit paper, he reminds us of the drawbacks of commonly used metrics of success by explaining that education and income are usually benchmarked against values prioritized by the non-indigenous majority in axiological and ontological terms. For example, this paper refers to ‘education’ in the context of university study and excludes traditional Indigenous education systems.

Our synthesis illuminates QuantCrit scholars who are thinking beyond commonly used metrics and taking a ‘social justice orientation’ lens. We found that six out of the 29 studies used a new survey or measurement tool.

Rather than rely on existing surveys, Garibay, West, and Mathis (2020), Priddie (2021), Ramos et al. (2022), and Wronowski et al. (2022) all created new surveys to ask questions that specifically answer their research questions. Garibay, West, and Mathis (2020) created the following three constructs using a Likert scale<sup>7</sup> in their survey to measure the impact of an institution’s history of slavery on students’ college choice, sense

**Table 5.** Items from Garibay, West, and Mathis (2020)'s Questionnaire.

Slavery History Behavioral Response Items
I avoid areas on campus that remind me of this institution's involvement with slavery
I don't participate in certain activities that remind me of this institution's involvement with slavery
This institution's involvement with slavery has had a major impact on my college experience

of belonging, engagement, learning, health factors, and other educational experiences. Table 5 lists the items for the construct 'Slavery History Behavioral Response'.

Similarly, Priddie (2021) developed a new survey to specifically measure Black students' experience in STEM and identify barriers unique to the Black students. Their innovative constructs include 'Afrocentric Worldview Orientation', "Acting White", 'Black women troops (Angry Black Woman, Black Mama)', 'Black Stereotypes and microaggressions', and 'Black student friendships with same race peers' among other constructs. Ramos et al. (2022) also developed a survey specifically to measure the sociopolitical context, curricular, co-curricular Latinx experience in the postsecondary institutions. Lastly Wronowski et al. (2022) aimed to measure critical social justice teaching. They created an instrument that asked questions about the following topics: racism, sexism, classism, ableism, heterosexism, privilege, oppression, identity, and positionality. Some questions include 'On a typical week, how many times do you hear or read about racism, sexism outside of school?' and 'How comfortable do you feel teaching about social justice in your own classes?'

The two other studies developed completely new measurement tools, rather than surveys, to answer their research question. Pérez, Velez, and Solorzano (2018) wanted to measure occupational prestige for people of color. However, they didn't want to use the standard Duncan Socioeconomic index used by the Census because it was normed on white males in 1949 and excluded all other races and genders. Instead, they strategically leveraged existing Current Population Survey (CPS) data and conducted a cluster analysis for a sample that included Hispanic, Asian, Black, and Native Americans to create a Critical Race Occupational Index.

Reynolds and Tabron (2022) aimed to examine the racial diversity in the principal hiring pipeline. Rather than simply looking at the number and percentage of white principals compared to other racial groups, Reynolds and Tabron (2022) created a rubric to evaluate where in the hiring process inequities were occurring. Their rubric consists of the following areas of the principal hiring process: preparing the job description, collecting application materials, recruiting applicants, screening applicants, and using written criteria. Each of these areas was scored in the rubric as either suppressing diversity, reproducing inequities, or diversifying.

### **Interpreting findings**

Not only does data not speak for itself, neither does data *analysis*. Readers may have widely varying backgrounds and confidences in data analysis, and this should also be considered when writing about findings. Firstly, researchers should not needlessly complicate the discussion of results; in fact, researchers should assume that their readers have no background knowledge in their analyses and should seek to provide

context of important findings so that they are digestible and not gate-kept. Secondly, apart from analysis techniques, QuantCrit researchers should remark and embed their findings referring back to the centrality of racism.

When interpreting binary outcome variables, effective examples from our review included the use of odds ratios by estimating a logistic regression.<sup>8</sup> Although seven of the 29 papers in our sample used logistic regression, four of the seven papers did so in a way that employed QuantCrit tenets: the researchers included explanations of the process and/or additional context for how to interpret the results of the regression. Researchers regularly used alternative logistic regression specifications that produced coefficients as odds-ratios, a convenient configuration that is easier to interpret, but nonetheless still requires an explanation. One such explanation from our survey was written by Morris (2021) who wrote about odds-ratios in the following way:

A shortcoming of logistic regression is that unadulterated results are presented in the form of log-odds, which are difficult to interpret in a meaningful way. To address this shortcoming, log-odds can be transformed into odds ratios by exponentiating the log-odds. Odds ratios express how much more or less likely an outcome is (e.g. report of victimization) for one group compared to another (e.g. attending a minority segregated school compared to a white segregated school). By transforming log-odds into odds ratios (OR) via exponentiating the log-odds in Table 3 . . . . Morris (2021) pg.14

An improvement on Morris's explanation would then be to draw the distinction between odds-ratios and probabilities, a common misperception in econometric education and, no doubt, to the lay reader. After that, QuantCrit researchers should explain how to make correct interpretations of odds-ratios. One example we found illuminating was that of Campbell (2020) who wrote:

Estimates greater than 1 suggest teachers are more likely to complete a Monitored Growth Plan; whereas odds ratios less than 1 suggest teachers are less likely to be required to complete a Monitored Growth Plan. Across the two specifications, Black women are about 1.6 – 1.7 times more likely to be required to develop an MGP. Teachers staffed in schools with principals of the same race but different gender or principals of a different race and different gender are less likely to be required to develop an MGP. (emphasis added) Campbell (2020) pg. 12

Four studies interpreted their results centering on the reality of systemic racism. This practice serves as a reminder to the reader that results which diverge across racial categories (which themselves are arbitrarily and socially constructed) are not driven by anything inherent, but because of the structures within society that racialize people differently. At the beginning of their study, Anyon and colleagues (2021) stated:

To be clear, the variables used in this study are not biological categories, they are social constructs, and the quantitative relationships in this study are associative, not causal. We interpret racial discipline gaps to be indicators of structural inequities, not 'pre-existing fixed qualities of students. Anyon et al. (2021) pg. 6

Similarly, in advance of presenting their model, López et al. (2018) write:

This association should not be interpreted as meaning that 'innate' or 'cultural' differences among blacks is causing this relationship, but that instead those individuals racialized and identifying as black may be subjected to different treatment, opportunities, and exposure to



structural, institutional, and interpersonal racism than others individuals in this context. López et al. (2018) pg. 193

Van Dusen and his colleagues (Van Dusen et al. 2021) explained their results as education debts that society owes to students because of racism, sexism, or both. They write:

Society's educational debts before instruction were large enough that women and Black men's average scores were lower than White men's average pretest scores even after instruction. Society would have to provide opportunities equivalent to taking the course up to two and a half times to repay the largest educational debts. Van Dusen et al. (2021) pg. 25

Finally, Harmon et al. (2022) present a section titled 'Resolving statistical contradictions with experiential knowledge' where they inserted their own experiences as Black fathers when unpacking their results concluding that Black boys with well-educated fathers report lower levels of feeling welcomed and supported at school. Through a dialogue between son and father they explained how Black fathers may socialize their kids to prepare them to overcome racism in schools, and in turn they may be more critical of curriculum and schooling environments and thus, feel less welcomed.

## Conclusion and Implications

In the QuantCrit field, our data shows there is room for innovation, experimentation, and exploration, especially using more advanced statistical models and tools. This is likely because QuantCrit is a relatively new framework that has gained traction in the last year with more than 400 relevant hits in our search compared to prior years (Castillo and Gillborn 2022). However, the study also brings to light exemplars of authors who embody QuantCrit principles through their positionality statements, cognizance of community, robust racial/ethnic categories, intentionality on *not* centering whiteness, use of atypical methods (e.g. interaction terms), new measurement tools, and innovative interpretations of findings.

Future QuantCrit research should continue the innovation found in many of the reviewed studies. A few unexplored possibilities include creating explicit measures for systemic racism in education, inventing new statistical tools or applying underutilized ones in more equitable ways, and/or developing new approaches for incorporating community voices in quantitative and mixed methods work. Although QuantCrit can feel like yet 'another intellectual exercise', it is not a checklist, rather it is an ever-evolving process of recognizing how systemic racism influences the research we do and most importantly pivoting to transform our research towards justice. The spirit of enacting QuantCrit, we want to conclude with clear implications for scholars, policymakers, and other stakeholders to implement.

In our study, many authors listed their identities. While identities are important, ***positionality statements should be more reflexive and relate it back to the research at hand.***

Understanding that authentic community partnership takes time, there were not many examples of true partnership and integration. QuantCrit urges scholars to ***partner with communities in the entire process from the research agenda setting stage through the analysis and dissemination stage.***

Researchers and policymakers should strive to use racial/ethnic categories that relate to answering their research question. Studies in this paper show that ***more granular categories can help study authors begin to understand, albeit with the limitations of quantification, the nuances and inequities between and within racial/ethnic categories.***

Authors in this study showed that it is possible to ***examine their own biases in their selection of a reference group and reckon with ingrained biases and racial stereotypes they may be unconsciously reifying by continuing to center whiteness.***

***Using existing and lesser used methods/measurement tools (e.g. interaction terms) as well as creating ones*** is encouraged to begin to unpack the complexity of systemic racism. Authors in this study showed how building new measurement tools and using interaction terms brought about new insights.

Regarding findings, QuantCrit researchers need to remember that data does not speak for itself. ***It is the job of the researcher to explain – and explain clearly and openly – what the limitations are, what results mean, how they were constructed, who is in them, and how to interpret them appropriately.***

## Notes

1. T-tests and Chi-squared tests are entry-level methods of statistical analysis commonly found in undergraduate level statistics coursework. They are two methods of determining difference and independence, respectively, which are foundational concepts used in quantitative research. They allow a quant researcher to ‘compare and contrast’ their data.
2. Ordinary Least Squares, or ‘OLS’, is another method of statistical analysis which is generally the capstone topic of a first semester undergraduate statistics class. It is a method that builds upon techniques from t-tests and Chi-squared tests to demonstrate relationships and storytelling within a set of data. ‘OLS’ is often preceded by ‘simple’ to connote its more introductory level of analysis.
3. More information about the above ‘basic’ statistical concepts can be found with DATAtab’s channel on Youtube. They offer clear explanations on a wide variety of quantitative analysis topics.
4. Causal methods, such as Randomized Controlled Trials (RCTs) or quasi-experimental designs, are design frameworks for using the above methods. They are to analysis what a blueprint is to an architect. The basic methods of OLS and t-test, etc, are akin to the construction tools.
5. Logistic regression a type of regression analysis that is used when the dependent variable of interest is a binary variable, and its advantage over OLS regression is that of a ‘better-fit’, or a more precise model for binary variables (e.g. 0,1).
6. A binary variable is a variable that takes one of two values. Survey questions that ask True/False or Yes/No questions are examples of binary variables.
7. A Likert scale ranges from one to five, or sometimes seven, in increments of one. They are commonly used in surveys that ask respondents to agree/disagree with one being ‘Highly Agree’ and five (or seven) being ‘Highly Disagree’.
8. Logistic regressions are like Ordinary Least Squares regressions, albeit with slightly different math behind-the-scenes. They are generally inaccessible to a reader without a background in undergraduate level statistics coursework.

## Disclosure statement

No potential conflict of interest was reported by the author(s).

## References

- Anyon, Yolanda, Kathryn Wiley, Ceema Samimi, and Miguel Trujillo. 2021. "Sent Out or Sent Home: Understanding Racial Disparities Across Suspension Types from Critical Race Theory and Quantcrit Perspectives." *Race, Ethnicity & Education* 26 (5): 1–20. <https://doi.org/10.1080/13613324.2021.2019000>.
- Arellano, Lucy. 2022. "Questioning the Science: How Quantitative Methodologies Perpetuate Inequity in Higher Education." *Education Sciences* 12 (2): 116. <https://doi.org/10.3390/educsci12020116>.
- Baker, Chuck Alan. 2019. "A QuantCrit Approach: Using Critical Race Theory as a Means to Evaluate if Rate My Professor Assessments are Racially Biased." *Journal of Underrepresented & Minority Progress* 3 (1): 1–22.
- Brochet, Anna. 2020. *Who Loses Financial Aid?: A Critical Examination of the Satisfactory Academic Progress Policy at a California Community College*. California, USA, Long Beach: California State University.
- Campbell, Mary E. 2009. "Multiracial Groups and Educational Inequality: A Rainbow or a Divide?" *Social Problems* 56 (3): 425–446. <https://doi.org/10.1525/sp.2009.56.3.425>.
- Campbell, Shanyce L. 2020. "Ratings in Black and White: A Quantcrit Examination of Race and Gender in Teacher Evaluation Reform." *Race, Ethnicity & Education* 1–19. <https://doi.org/10.1080/13613324.2020.1842345>.
- Campbell-Montalvo, Rebecca A. 2020. "Being QuantCritical of US K-12 Demographic Data: Using and Reporting Race/Ethnicity in Florida Heartland Schools." *Race, Ethnicity & Education* 23 (2): 180–199. <https://doi.org/10.1080/13613324.2019.1679748>.
- Castillo, Wendy. 2022. "Gathering Better Data on Latino Students is Key to Truly Meeting Their Needs." *The 74 Million*. <https://www.the74million.org/article/gathering-better-data-on-latino-students-is-key-to-truly-meeting-their-needs/>.
- Castillo, Wendy, and David Gillborn. 2022. *How to "QuantCrit": Practices and Questions for Education Data Researchers and Users*. No. 22-546. Working Paper.
- Chicago Beyond. 2019. *Why Am I Always Being Researched? A Guidebook for Community Organizations, Researchers, and Funders to Help Us Get from Insufficient Understanding to More Authentic Truth*. [https://chicagobeyond.org/wp-content/uploads/2019/05/ChicagoBeyond\\_2019Guidebook.pdf](https://chicagobeyond.org/wp-content/uploads/2019/05/ChicagoBeyond_2019Guidebook.pdf)
- Cobian, Krystle Palma. 2019. *Interlocking Struggles, Interwoven Success: College and Career Pathways for Women of Color in STEM and Healthcare*. PhD diss., University of California, Los Angeles.
- Crawford, Claire E. 2019. "The One-In-ten: Quantitative Critical Race Theory and the Education of the 'New (White) oppressed'." *Journal of Education Policy* 34 (3): 423–444. <https://doi.org/10.1080/02680939.2018.1531314>.
- Crenshaw, Kimberlé Williams. 2010. "Twenty Years of Critical Race Theory: Looking Back to Move Forward." *Connecticut Law Review* 43 (5): 1253. [https://www.csun.edu/sites/default/files/best\\_prac\\_mixed\\_methods.pdf](https://www.csun.edu/sites/default/files/best_prac_mixed_methods.pdf).
- Creswell, John W., Ann Carroll. Klassen, Vicki L. Plano Clark, and Katherine Clegg Smith. 2011. "Best Practices for Mixed Methods Research in the Health Sciences." *Bethesda (Maryland): National Institutes of Health* 2013:541–545.
- Cruz, Rebecca A., Sali S. Kulkarni, and Allison R. Firestone. 2021. "A QuantCrit Analysis of Context, Discipline, Special Education, and Disproportionality." *AERA Open* 7 (1): 1–16. <https://doi.org/10.1177/23328584211041354>.
- Garcia, Nichole M., Jonathan M. Ibarra, Rebeca Mireles-Rios, Victor M. Rios, and Katherine Maldonado. 2022. "Advancing QuantCrit to Rethink the School-To-Prison Pipeline

- for Latinx and Black Youth.” *Journal of Criminal Justice Education* 3 (2): 269–288. <https://doi.org/10.1080/10511253.2022.2027481>.
- García, Nichole M., Nancy López, and Verónica N. Vélez. 2018. “QuantCrit: Rectifying Quantitative Methods Through Critical Race Theory.” *Race, Ethnicity & Education* 21 (2): 149–157. <https://doi.org/10.1080/13613324.2017.1377675>.
- Garibay, Juan Carlos, Christian West, and Christopher Mathis. 2020. ““It Affects Me in Ways That I Don’t Even Realize”: A Preliminary Study on Black Student Responses to a University’s Enslavement History.” *Journal of College Student Development* 61 (6): 697–716. <https://doi.org/10.1353/csd.2020.0070>.
- Gillborn, David, Paul Warmington, and Sean Demack. 2018. “QuantCrit: Education, Policy, ‘Big Data’ And Principles for a Critical Race Theory of Statistics.” *Race, Ethnicity & Education* 21 (2): 158–179. <https://doi.org/10.1080/13613324.2017.1377417>.
- Guenther, John. 2021. “Taken for a Ride? The Disconnect Between High School Completion, Employment and Income for Remote Australian First Nations Peoples.” *Race, Ethnicity & Education* 24 (1): 132–147. <https://doi.org/10.1080/13613324.2020.1753674>.
- Hampton, Cynthia, David Reeping, and Desen Sevi Ozkan. 2021. “Positionality Statements in Engineering Education Research: A Look at the Hand That Guides the Methodological Tools.” *Studies in Engineering Education* 1 (2): 126–141. <https://doi.org/10.21061/see.13>.
- Harmon, Willie C., Jr, Marlon James, Jamaal Young, and Lawrence Scott. 2022. “Black Fathers Rising: A QuantCrit Analysis of Black Fathers’ Paternal Influence on Sons’ Engagement and Sense of School Belonging in High School.” *Equity & Excellence in Education* 1–15. <https://doi.org/10.1080/10665684.2022.2100011>.
- Hunting, Gemma. 2014. “Intersectionality-Informed Qualitative Research: A Primer.” *Criminology* 4 (1): 32–56.
- James, Teresa. 2022. Otherwise engaged in a quantcrit examination of student engagement in English 10 classrooms in an urban-suburban, majority minoritized high school setting. PhD diss. Indiana University.
- Jang, Sung Tae. 2020. “The Schooling Experiences and Aspirations of Students Belonging to Intersecting Marginalisations Based on Race or Ethnicity, Sexuality, and Socioeconomic Status.” *Race, Ethnicity & Education* 1–22. <https://doi.org/10.1080/13613324.2020.1842350>.
- Jemimah, Young, and Jahneille A. Cunningham. 2021. “Repositioning Black Girls in Mathematics Disposition Research: New Perspectives from QuantCrit.” *Investigations in Mathematics Learning* 13 (1): 29–42. <https://doi.org/10.1080/19477503.2020.1827664>.
- Kilgo, Cindy A., Jodi L. Linley, Kristen A. Renn, and Michael R. Woodford. 2019. “High-Impact for Whom? The Influence of Environment and Identity on Lesbian, Gay, Bisexual, and Queer College students’ Participation in High-Impact Practices.” *Journal of College Student Development* 60 (4): 421–436. <https://doi.org/10.1353/csd.2019.0038>.
- Liebler, Carol M. 2010. “Me (di) a Culpa?: The “Missing White Woman syndrome” and Media Self-Critique.” *Communication, Culture, and Critique* 3 (4): 549–565. <https://doi.org/10.1111/j.1753-9137.2010.01085.x>.
- López, Nancy, Christopher Erwin, Melissa Binder, and Mario Javier Chavez. 2018. “Making the Invisible Visible: Advancing Quantitative Methods in Higher Education Using Critical Race Theory and Intersectionality.” *Race, Ethnicity & Education* 21 (2): 180–207. <https://doi.org/10.1080/13613324.2017.1375185>.
- Lopez, Mark Hugo, Jens Manuel Krogstad, and Jeffrey S. Passel. 2022. Who is Hispanic? *Pew Research Center*. <https://www.pewresearch.org/fact-tank/2022/09/15/who-is-hispanic/>
- Morris, David S. 2021. “Challenging the Stereotype That Minority Segregated Schools are Unsafe: Are Crime and Violence Really More Prevalent in Segregated Minority High Schools?” *Race, Ethnicity & Education* 1–22. <https://doi.org/10.1080/13613324.2021.1937093>.
- Newby, Crystal E., and Michael Hoffman. 2022. “Walk the Talk on Dei: Actionable Strategies to Create a Diverse, Equitable, and Inclusive Organization.” <https://www.Gathervoices.co/gate/actionable-Strategies-To-Dei>.

- Parekh, Jenita, Kristine Andrews, and Shantai Peckoo. 2019. Five Guiding Principles for Integrating Racial and Ethnic Equity in Research. *Child Trends*. <https://www.childtrends.org/publications/five-guiding-principles-for-integrating-racial-and-ethnic-equity-in-research>
- Park, Julie J., Young K. Kim, Cinthya Salazar, and M. Kevin Eagan. 2022. "Racial Discrimination and Student-Faculty Interaction in STEM: Probing the Mechanisms Influencing Inequality." *Journal of Diversity in Higher Education* 15 (2): 218–229. <https://doi.org/10.1037/dhe0000224>.
- Pérez Huber, Lindsay, Verónica N. Vélez, and Daniel Solórzano. 2018. "More Than 'Papelitos': a QuantCrit Counterstory to Critique Latina/O Degree Value and Occupational Prestige." *Race, Ethnicity & Education* 21 (2): 208–230. <https://doi.org/10.1080/13613324.2017.1377416>.
- Prewitt, Kenneth. 2018. "The Census Race Classification: Is It Doing Its Job?" *The ANNALS of the American Academy of Political and Social Science* 677 (1): 8–24. <https://doi.org/10.1177/0002716218756629>.
- Priddie, Christen Audrey. 2021. A Pathway toward Cultural Relevance: A QuantCrit Analysis of Collaborative Learning Experiences for Black STEM Students through an Anti-Blackness Lens. PhD diss., Indiana University.
- Ramos, Delma, Elsa Camargo, Cathryn Bennett, and Arianna Alvarez. 2022. "Uncovering the Effects of the Sociopolitical Context of the Nuevo South on Latinx College students' Ethnic Identification." *Journal of Diversity in Higher Education* 15 (4): 438–452. <https://doi.org/10.1037/dhe0000307>.
- Randall, Jennifer. 2021. "'Color-Neutral' is Not a Thing: Redefining Construct Definition and Representation Through a Justice-Oriented Critical Antiracist Lens." *Educational Measurement: Issues & Practice* 40 (4): 82–90. <https://doi.org/10.1111/emip.12429>.
- Reynolds, Amy Luelle, and Lolita A. Tabron. 2022. "Cultivating Racial Diversity or Reproducing Whiteness?: A QuantCrit Analysis of School Districts' Early Principal Hiring Practices." *Leadership and Policy in Schools* 21 (1): 95–111. <https://doi.org/10.1080/15700763.2021.2022710>.
- Saperstein, Aliya. 2006. "Double-Checking the Race Box: Examining Inconsistency Between Survey Measures of Observed and Self-Reported Race." *Social Forces* 85 (1): 57–74. <https://doi.org/10.1353/sof.2006.0141>.
- Sawchuk, Stephen. 2021. Local School Boards are Banning Critical Race Theory. Here's How That Looks in 7 Districts. *EdWeek*. <https://www.edweek.org/leadership/local-school-boards-are-also-banning-lessons-on-race-heres-how-that-looks-in-7-districts/2021/08>
- Stillman, Sarah. 2007. "'The Missing White Girl syndrome': Disappeared Women and Media Activism." *Gender & Development* 15 (3): 491–502. <https://doi.org/10.1080/13552070701630665>.
- Street, C., J. Guenther, J. Smith, K. Robertson, W. Ludwig, S. Motlap, T. Woodroffe, R. Ober, K. Gillan, and S. Larkin. 2022. "Do Numbers Speak for Themselves? Exploring the Use of Quantitative Data to Measure Policy 'Success' in Historical Indigenous Higher Education in the Northern Territory, Australia." *Race, Ethnicity & Education* 25 (3): 309–330. <https://doi.org/10.1080/13613324.2021.2019003>.
- Suárez, Mario I., Alan R. Dabney, Hersh C. Waxman, Timothy P. Scott, and Adrienne O. Bentz. 2021. "Exploring Factors That Predict STEM Persistence at a Large, Public Research University." *International Journal of Higher Education* 10 (4): 161–174. <https://doi.org/10.5430/ijhe.v10n4p161>.
- Suri, Harsh, and David Clarke. 2009. "Advancements in Research Synthesis Methods: From a Methodologically Inclusive Perspective." *Review of Educational Research* 79 (1): 395–430. <https://doi.org/10.3102/0034654308326349>.
- Sybing, Roehl. 2022. "Dead Reckoning: A Framework for Analyzing Positionality Statements in Ethnographic Research Reporting." *Written Communication* 39 (4): 757–789. <https://doi.org/10.1177/07410883221114152>.
- Telles, Edward E., and Nelson Lim. 1998. "Does It Matter Who Answers the Race Question? Racial Classification and Income Inequality in Brazil." *Demography* 35 (4): 465–474. <https://doi.org/10.2307/3004014>.

- Toldson, Ivory A. 2019. *No BS (Bad Stats): Black People Need People Who Believe in Black People Enough Not to Believe Every Bad Thing They Hear About Black People*. Leiden, Netherlands: Brill Sense. <https://doi.org/10.1163/9789004397040>.
- Toni, Templeton, Chaunté White, April L. Peters, and Catherine L. Horn. 2021. "A QuantCrit Analysis of the Black Teacher to Principal Pipeline." *University of Houston*. <https://www.uh.edu/education/research/institutes-centers/erc/reportspublications/revworking-paper-102-21-black-teacher-pipeline.pdf>.
- Urban Institute. 2020. Urban Institute Guide for Racial Equity in the Research Process. [https://www.urban.org/sites/default/files/publication/103102/urban\\_institute\\_guide\\_for\\_racial\\_equity\\_in\\_research\\_process.pdf](https://www.urban.org/sites/default/files/publication/103102/urban_institute_guide_for_racial_equity_in_research_process.pdf)
- Van Dusen, Ben, and Jayson Nissen. 2020. "Associations Between Learning Assistants, Passing Introductory Physics, and Equity: A Quantitative Critical Race Theory Investigation." *Physical Review Physics Education Research* 16 (1): 1–14. <https://doi.org/10.1103/PhysRevPhysEducRes.16.010117>.
- Van Dusen, Ben, Jayson Nissen, Robert M. Talbot, Hannah Huvad, and Mollee Shultz. 2021. "A QuantCrit Investigation of Society's Educational Debts Due to Racism and Sexism in Chemistry Student Learning." *Journal of Chemical Education* 99 (1): 25–34. <https://doi.org/10.1021/acs.jchemed.1c00352>.
- Wang, Hansi Lo. 2022. The 2020 Census Had Big Undercounts of Black People, Latinos and Native Americans. *National Public Radio*. <https://www.npr.org/2022/03/10/1083732104/2020-census-accuracy-undercount-overcount-data-quality>
- Wronowski, Meredith L., Brittany Aronson, Ganiva Reyes, Rachel Radina, Katherine E. Batchelor, Rachael M. Banda, and Gul Rind. 2022. "Moving Toward a Comprehensive Program of Critical Social Justice Teacher Education: A QuantCrit Analysis of Preservice Teachers' Perceptions of Social Justice Education." *Perceptions of Social Justice Education the Teacher Educator* 58 (2): 1–27. <https://doi.org/10.1080/08878730.2022.2122094>.
- Ziliak, Steve, and Deirdre Nansen McCloskey. 2008. *The Cult of Statistical Significance: How the Standard Error Costs Us Jobs, Justice, and Lives*. Michigan USA: University of Michigan Press.